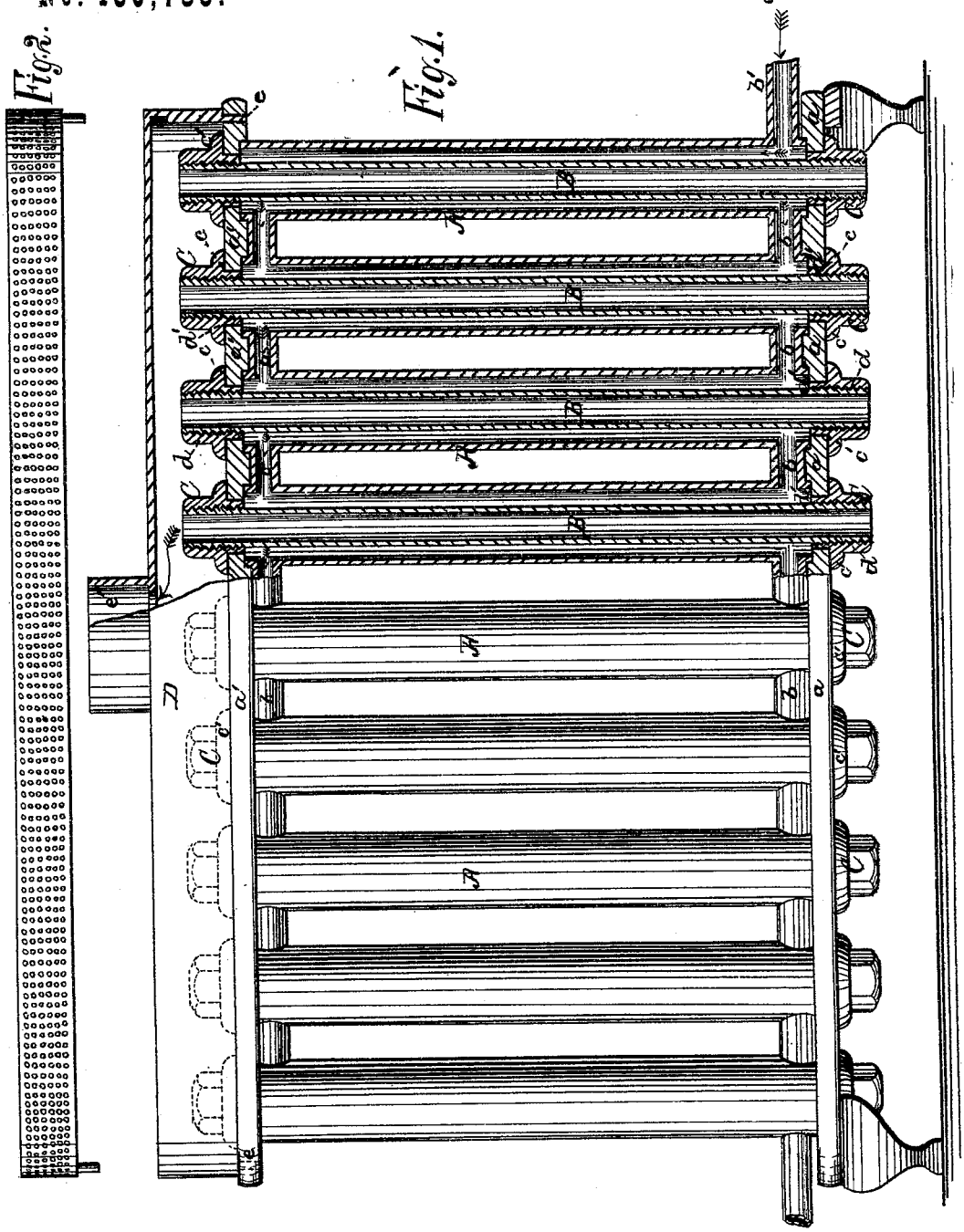
G. CURTIS & W. THOMPSON.

RADIATORS.

No. 180,755. Patented Aug. 8, 1876.

Fig. 2.

Fig. 1.



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UNITED STATES PATENT OFFICE.

GEORGE CURTIS AND WILLET THOMPSON, OF BRIDGEPORT, CONNECTICUT.

IMPROVEMENT IN RADIATORS.

Specification forming part of Letters Patent No. **180,755**, dated August 8, 1876; application filed May 4, 1876.

To all whom it may concern:

Be it known that we, GEORGE CURTIS and WILLET THOMPSON, of Bridgeport, county of Fairfield and in the State of Connecticut, have invented an Improved Heater-Radiator, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

Our invention relates to that class of steam-heating apparatus or radiators composed of a series of steam-pipes connected together, and having within, and extending longitudinally through, said steam-pipes, air-flues or tubes; and our invention consists in the combination of the said air-flues and steam-pipes when the latter are mounted perpendicularly on a suitable standard, and the air-flues are arranged and detachably held centrally within the said steam-pipes by annular lock-nuts, of the peculiar construction hereinafter set forth and more particularly recited in the claim, for the purposes specified.

Figure 1 is a side elevation, partly in section, of a heater-radiator embodying our invention, and Fig. 2 is a side view of an ornamental top or cover, which may be employed to surmount the air-tubes, when a chamber for the collection of heated air is not used.

In the heater-radiator shown in the drawings, A A are steam-pipes, arranged to stand vertically upon a standard, *a*, and having a top piece, *a'*, into which the upper ends of the said pipes are fitted. Connecting the adjacent pipes at the top and bottom are the pipes *b*, thus permitting the free circulation of the steam through the apparatus, the steam entering through a port, *b'*. The standard *a* and top piece *a'* have openings through them at *c*, opposite to and directly over the open ends of the steam-pipes A, as shown.

It is our intention in fabricating our improved apparatus to cast the steam-pipes A, standard *a*, and top *a'* together, with the connecting-pipes *b* in one piece, preferably iron, the form of this portion of the heater being capable of such methods of construction.

B B are tubes, made preferably of wrought-iron, and located centrally within the pipes A, being introduced through the openings *c* in the standard and top, and extending longitudinally through said pipes and above and below said openings, as shown. The said tubes should be made of a less diameter than the steam-pipes, thus leaving a space around them in the said steam-pipes, as shown. To hold the air-tubes B in a vertical position in the steam-pipes, and sustain them centrally therein, we provide the lock-nuts C, which we form with a thread which turns upon a thread at *d* on the ends of the air-tubes, and with a post, *d'*, which enters and fills the space in the openings *c*, between the exterior walls of the air-tubes and the rim of the said openings, and with the flange *c'*, which fits upon the face of the top and base pieces around the said openings *c*.

By means of these nuts, constructed and applied as shown, the said air-tubes are held in a vertical and central position within the steam-pipes, while at the same time the air-tubes are made readily detachable for the cleaning of the steam-tubes, and joints formed by the said nuts are rendered steam-tight, and may, in case of any leakage at any one of them, be turned close down upon the surface of the top and base, and thus tightened. It is very desirable to have the openings *c* equal in diameter or nearly so to the diameter of the steam-pipes, so that the cleaning of the said pipes may be readily accomplished, which could not be done were the said openings made sufficiently less in diameter to fit about the ends of the air-tubes. In our apparatus, as shown, the openings *c* are equal in diameter, or nearly so, to the diameters of the steam-pipes, while by means of the port *d'* and flange *c'* of the nuts C this wide opening is closed above the air-tube and made steam-tight. The tubes B are thus held centrally within the pipes A, and being made with open ends, as shown, a passage or channel throughout the length of said pipes is formed on the interior of said pipes, while the tubes being removable by means of the lock-nuts the steam-pipes may be easily got at and cleaned, as is sometimes required.

It is evident that by means of these tubes B a heating-surface is formed on the interior of the steam-pipes, and that a circulation of air through said tubes will be created, the said air in its passage through said tubes being

heated by the radiation of said tubes, and a greater heating-surface, and consequent decrease in amount of necessary fuel, secured.

D is a chamber, which may be employed in connection with our described apparatus, which is made to conform to the shape of the top a', and arranged to be set upon the same, and preferably to be held in place by pins e passing into openings in the top a', as shown, so that said chamber covers the openings at the upper ends of the air-tubes B. This chamber is provided with a flue, e', opening out of it, upon which may be joined a pipe connecting with a register in another apartment from that containing the radiator.

It is evident that the air passing up through the tubes B, and being thus heated, will be collected in the chamber D, and, being conducted through the flue e', the heating of two apartments by the same radiator be accomplished.

We are aware that steam-heaters have been heretofore constructed with air-flues arranged on the interior of and extending through the steam-pipes. We are also aware that an air-chamber having one or more eduction-flues has been heretofore arranged to receive the air heated by passage through the air-tubes, and about the steam-pipes, and to conduct it to another apartment. Hence, it is not our intention to claim, broadly, herein either of these mentioned devices. We intend to limit our claim thereunder to the distinct and specific devices set forth and described—that is to say—

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

In a steam-heating apparatus the combination of the steam-pipes A, arranged vertically on the base a, and connected together at b, and provided with the top a', together with the air-tubes B located centrally within and extending longitudinally through the pipes A, the said air-tubes being being held in place and jointed to the top and base in the wide openings c by the nuts C fitted upon threads d, and having posts d' and flanges c', as described, and for the purpose specified.

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