

W. M. FULLER.  
STEAM RADIATOR.

No. 190,205.

Patented May 1, 1877.

Fig. 1.

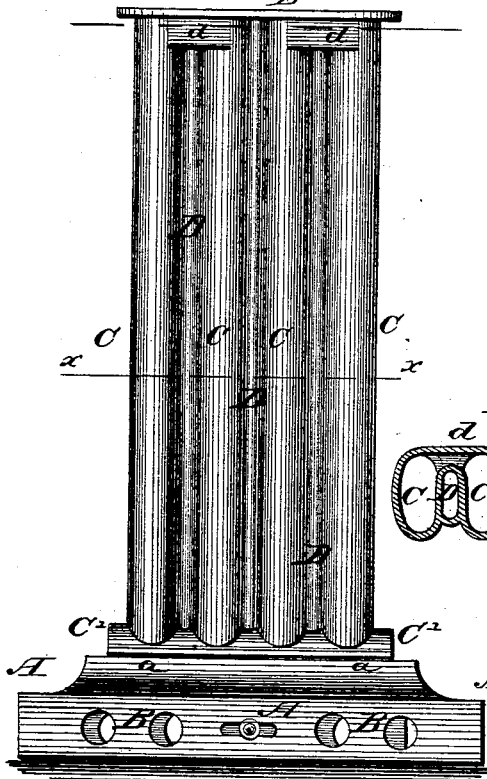


Fig. 2.

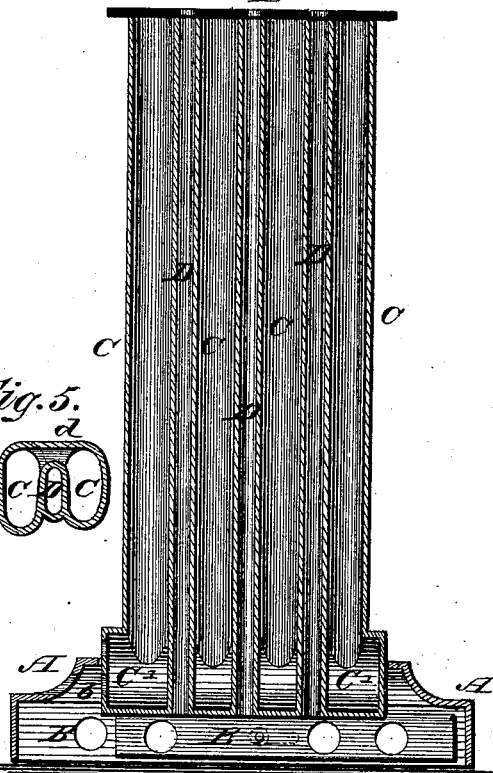


Fig. 5.

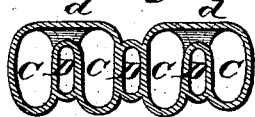


Fig. 3.

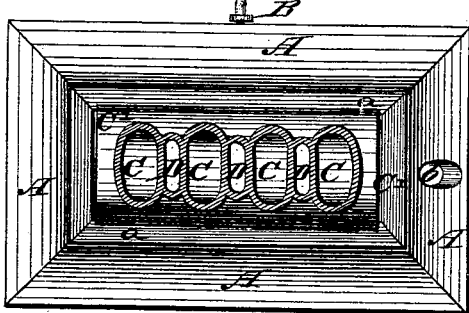


Fig. 4.

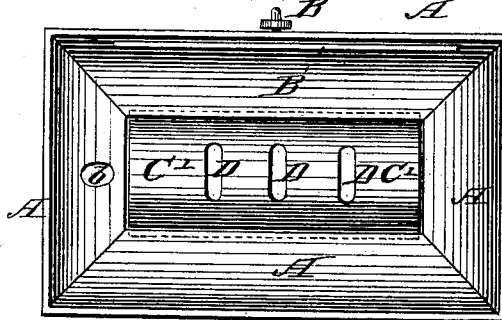
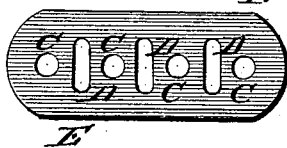


Fig. 6.



Witnesses:

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Per *C. H. Watson & Co.* Attorneys.

# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN STEAM-RADIATORS.

Specification forming part of Letters Patent No. **190,205**, dated May 1, 1877; application filed April 7, 1877.

*To all whom it may concern:*

Be it known that I, WILLARD M. FULLER, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Radiators; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of radiators in which a series of air and steam pipes are grouped together; and it consists in casting such air-pipes and steam-pipes solid together in one piece, and also in the construction and combination of parts, as will be hereinafter more fully set forth.

In the annexed drawing, Figure 1 is a side view of my invention. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a horizontal section through the line *x x*, Fig. 1. Fig. 4 is a bottom view, and Figs. 5 and 6 are detailed views.

A represents the base of the radiator, which, when set on the floor, forms the air-box, the air being admitted into the same through registers B. These registers are intended to be both in the front and back of the base, so as to take the air from the outside or inside of the room by opening or closing the registers, as desired. By means of these registers the admission of air is also easily controlled.

C C represent the steam-tubes, and D D the air-tubes. These are cast together, substantially as shown, so as to form a solid series of alternate steam and air pipes, all in one piece. At the bottom is cast a horizontal steam-pipe, C', communicating with all the steam-pipes C, while the air-pipes D pass through and open in the under side of said pipe C'.

This pipe C' is formed with side flanges or ribs *a a*, and fits in the base A, said flanges

or ribs resting on the base for supporting the series of pipes. The steam enters at *b* into the pipe C', and from thence through all the steam-tubes C, while the air admitted through the registers B into the base A passes up through the air-tubes D.

The top of the tubes is covered by a plate, E, having suitable apertures corresponding with the various tubes.

The steam-tubes C are connected at the top in pairs, as shown at *d* in Fig. 5, so as to form a circulation of steam.

By casting the steam and air tubes together in one piece, as described, no extraneous devices for uniting the pipes at top and bottom are required. This has been one of the most serious difficulties attending the use of radiators of this class, as the joints were always more or less liable to leak; but, by my invention of casting the pipes together in one piece, this is entirely obviated, and all screw-connections are dispensed with.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A series of alternate steam-tubes, connecting with the steam-chamber, and air-tubes connecting with the air-chamber, both steam and air series cast in one piece with each other and with passage C', no screw-threads being used to connect the pipes and base, substantially as specified.

2. The combination of the steam-tubes C, air-tubes D, passage C', and base A with register B, all constructed substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WILLARD M. FULLER.

Witnesses:

HENRY K. THOMAS,  
THOS. McEWAN, Jr.