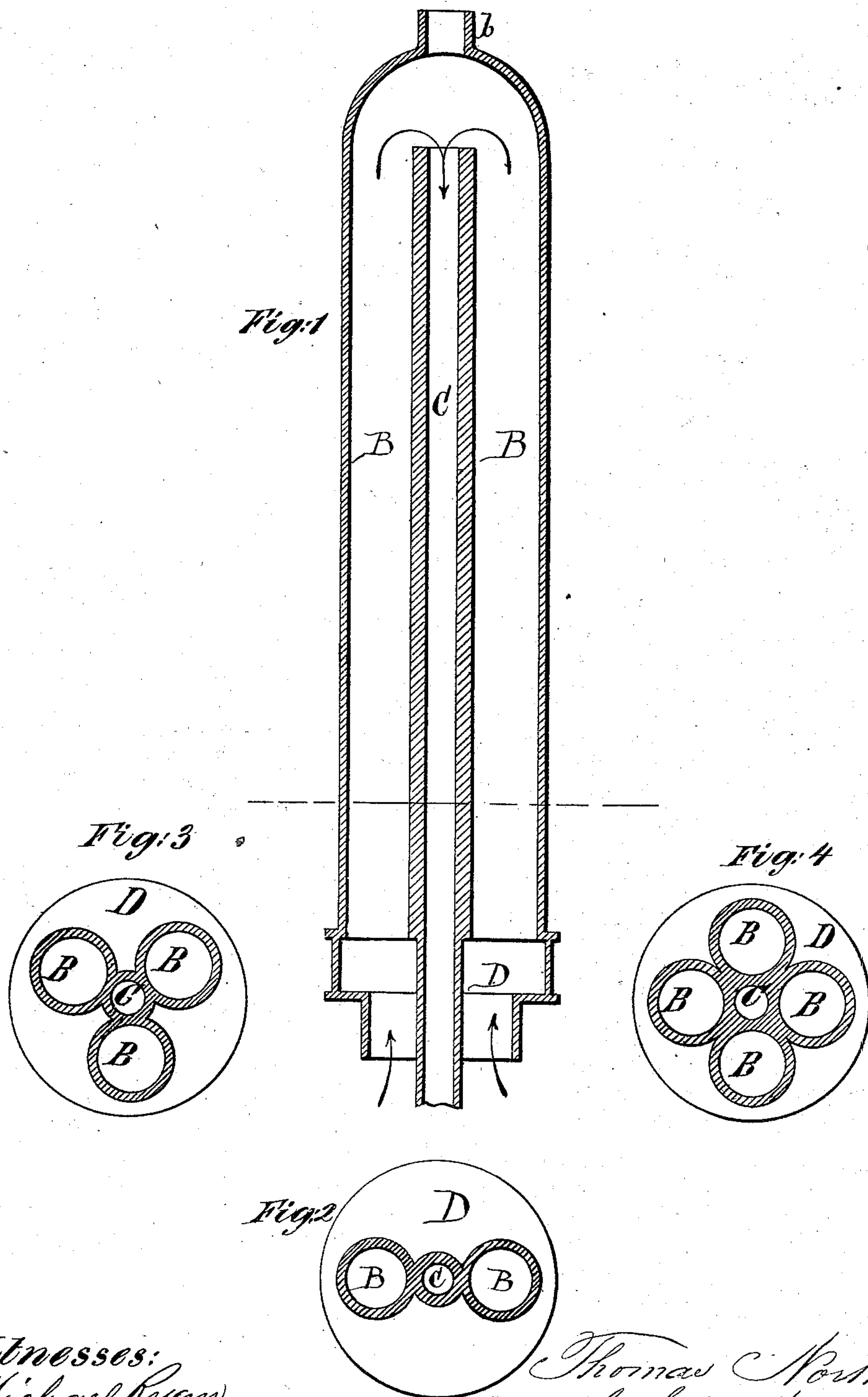


T. NORTH.  
Radiators.

No. 151,151.

Patented May 19, 1874.



Witnesses:  
Michael Ryan  
Fred. Haynes

Thomas North  
by his Attorneys  
Bennett & Allen

# UNITED STATES PATENT OFFICE.

THOMAS NORTH, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN RADIATORS.

Specification forming part of Letters Patent No. **151,151**, dated May 19, 1874; application filed April 20, 1874.

*To all whom it may concern:*

Be it known that I, THOMAS NORTH, of Brooklyn, in the county of Kings and State of New York, have invented an Improved Radiator, of which the following is a specification:

My invention relates to certain improvements designed more particularly for application to apparatus for heating buildings by steam. The invention relates to radiators, such as those wherein a steam-pipe is arranged in the radiator; and my invention, in contradistinction to such old and well-known arrangement, consists in a double tube, curved midway of its length, and having its ends communicating with the steam-chamber, and provided with a pipe leading from the curved portion to a point below the steam-chamber, for the purpose of conveying away the air and condensed steam which may be in the tube when the steam is introduced, and also to serve for the exit of said steam.

In the accompanying drawing, Figure 1 is a longitudinal vertical section of my improved radiator. Fig. 2 is a transverse horizontal section of the same. Figs. 3 and 4 are horizontal sections hereinafter particularly referred to.

The tube B, pipe C, and steam-chamber D are made in one piece, of cast-iron, the steam-chamber D being of circular or approximate form, and of a diameter somewhat greater than the distance between the outer sides of the two extremities of the tube B, so that when a number of these tubes are placed together in a frame there is a slight space be-

tween them. The lower portion of the steam-chamber is made of suitable form and size to facilitate its ready attachment to the hollow base or platform through which the steam is introduced. At the upper or curved portion of the tube on the outer surface is a hollow projection, *b*, to facilitate the removal of the core from the casting, after which removal the opening is plugged up, and the projection is used in attaching the tube to the top of the frame.

Instead of having but two branches, as shown in Figs. 1 and 2, the tube B may be formed with three branches, as shown in Fig. 3, or four branches, as shown in Fig. 4, said branches converging at the top and communicating with the pipe C.

When steam is introduced into the tube B, any air or condensed steam which may be in the tube is driven down through the pipe C and conveyed by said pipe to a waste-pipe located outside of the steam-chamber. The pipe C also serves for the exit of the steam from the tube.

What I claim as new, and desire to secure by Letters Patent, is—

The combination, in a radiator, of a series of tubes, B B, communicating at their bottom with the steam-chamber D, and at their top with an interposed pipe, C, said pipe C extending through the steam-chamber, substantially as described, for the purpose specified.

THOMAS NORTH.

Witnesses:

M. RYAN,

VERNON H. HARRIS.