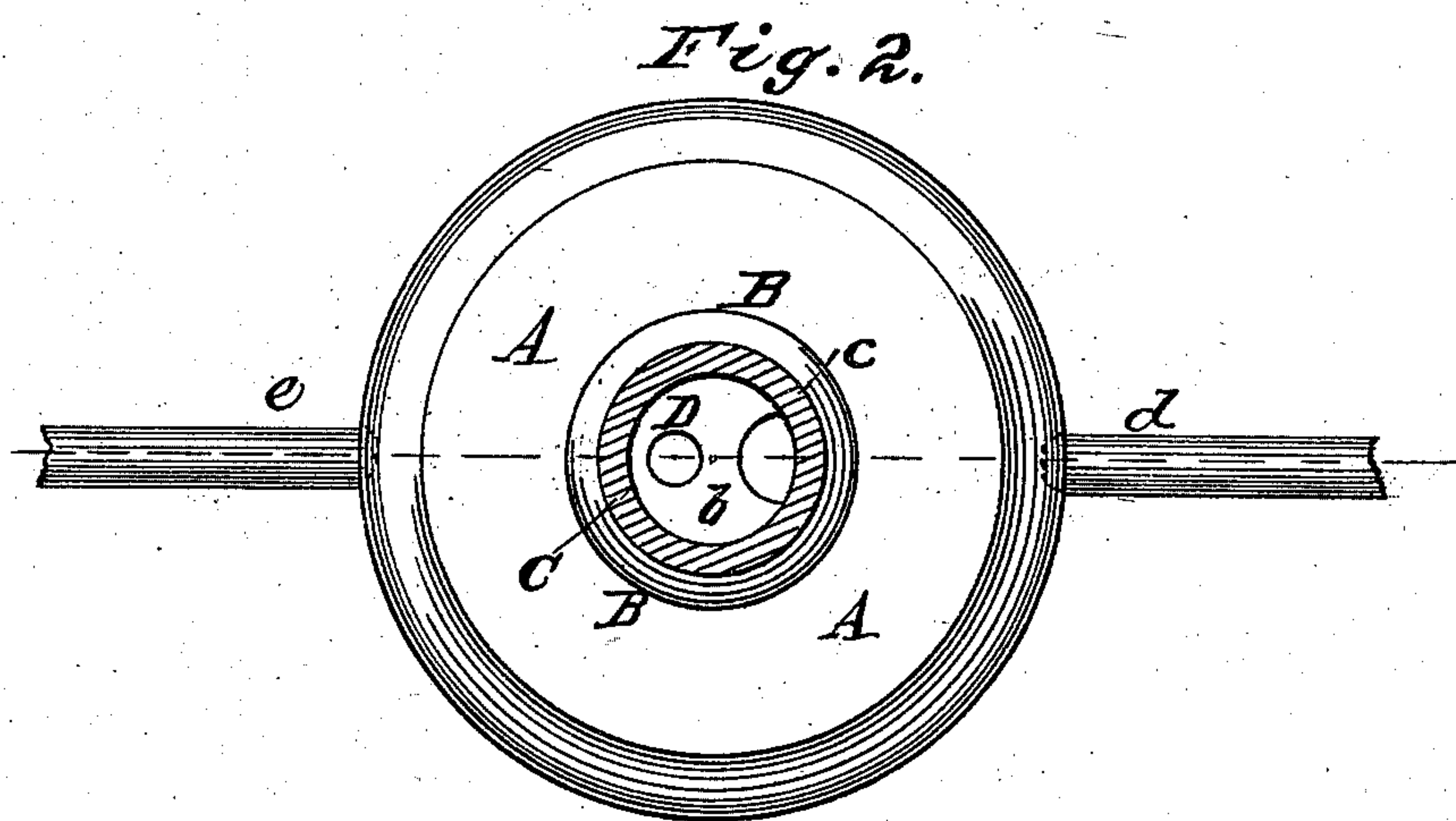
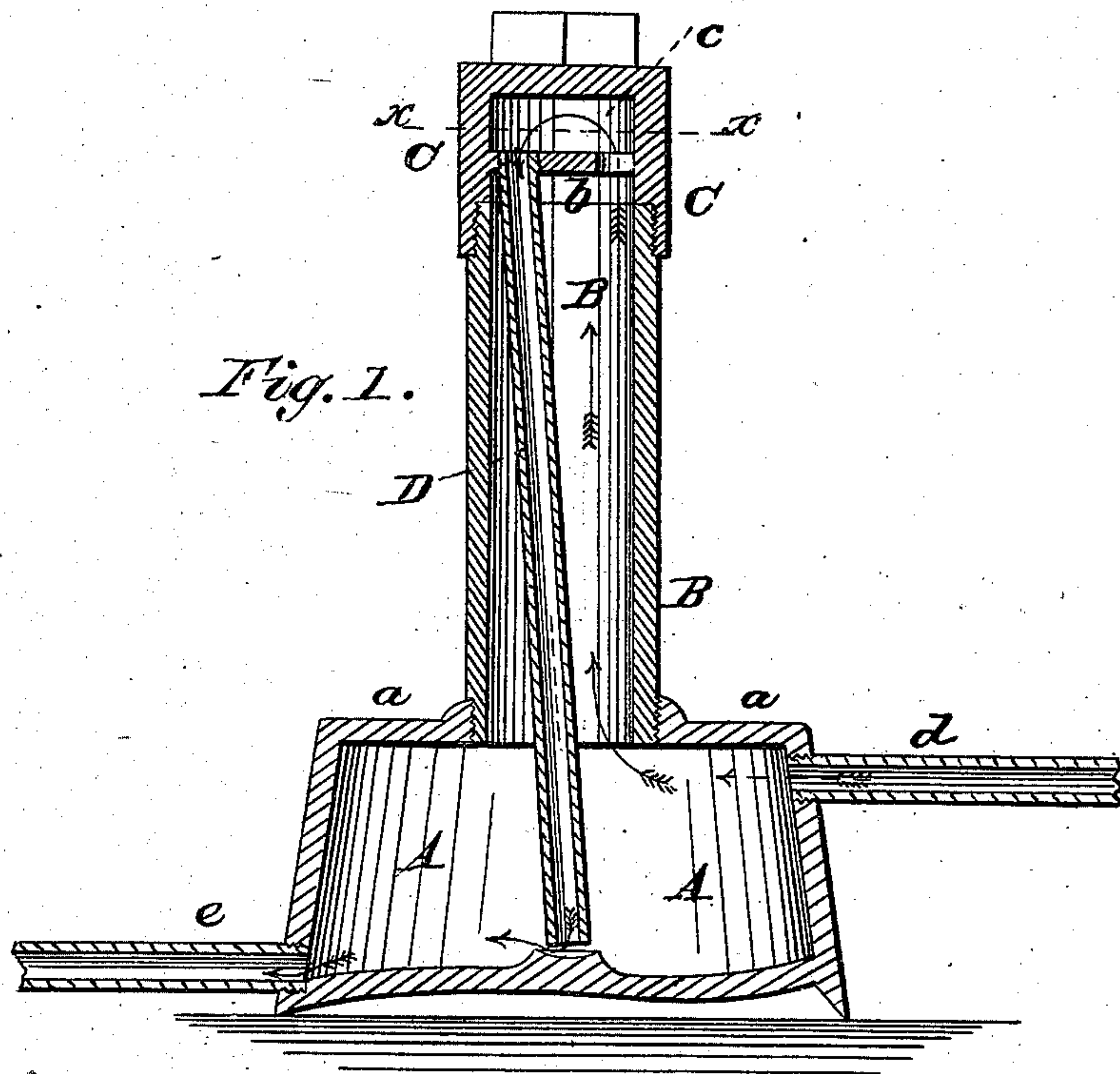


G. M. WOODWARD.

Steam Heater.

No. 83,351.

Patented Oct. 20, 1868.



Witnesses:

Wm. A. Morgan  
J. C. Cotton.

Inventor:  
G. M. Woodward  
per Munroe  
Attorney.



# United States Patent Office.

GEORGE M. WOODWARD, OF NEW YORK, N. Y.

Letters Patent No. 83,351, dated October 20, 1868.

## IMPROVEMENT IN STEAM-HEATERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, GEORGE M. WOODWARD, of New York, in the county of New York, and State of New York, have invented a new and useful Improvement in Heat-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 make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a sectional elevation of my improved heat-radiator.

Figure 2 is a horizontal section of the same, taken on the plane of the line *z z*, fig. 1.

Similar letters of reference indicate like parts.

The object of this invention is to produce a heat-radiator of that class in which steam is introduced at the bottom, said steam rising to the top of the heater, and descending, so as to escape again from the lower part of the apparatus.

The steam, during its passage through the apparatus, heats the metallic or other sides of the same, which heat is radiated into the room or apartment in which the device is set up.

Radiators on the above plan were heretofore constructed, and consisted generally of a vertical pipe, secured upon an enlarged base, the pipe being, by means of a vertical partition, divided into two channels, communicating with each other at their upper ends.

The design was to cause the steam to enter the lower end of one channel, ascend in the same, and then pass into the other channel, in which it would descend; but as there was no sufficient means for guiding the steam into the particular channel in which it was to rise, it would enter both channels from the base, whereby circulation was interrupted, if not entirely stopped.

To avoid this last-named inconvenience is the principal object of my present invention.

I construct my radiator of a pipe or pipes, projecting from a hollow base. To the upper end of each pipe is screwed a cap, with a perforated false top, from which a tube projects downward, nearly to the bottom of the base.

The steam will only enter the pipe, as the end of the

tube is too low to be entered by the steam, which has a constant rising tendency. The steam, ascending the pipe, will enter the compartment formed between the false and real cover of the aforesaid cap, and will then, by the upward pressure of the steam in the base, be forced into the tube, downward into the base again, whence it will escape.

A, in the drawing, represents a conical, cylindrical, prismatic, oval, or other suitably-shaped vessel, made of metal or other suitable material, with an aperture or apertures through its covering-plate, *a*, for receiving the lower end or ends of one or more upright pipes, B.

In the drawing, but one pipe, B, is shown, but any suitable larger number may be applied to one base, A. The pipe is screwed or otherwise fastened to the top of the base.

The pipe B is open at both ends. Upon its upper end is screwed or otherwise fastened a cap, C, in which, by means of a perforated false covering-plate, *b*, an upper compartment, *c*, is formed.

From the plate *b* is suspended a small tube, D, which reaches nearly to the bottom of the base A, and which is open at both ends, as shown in fig. 1.

The steam for heating the apparatus enters the base through an aperture, *d*, near the top of the base A, rises then in the pipe B, enters the compartment *c*, through an aperture or apertures in the plate *b*, descends in the tube D, and escapes through an aperture, *e*, near the bottom of the base, its course being indicated by arrows in fig. 1.

It is evident that instead of steam any other heating-fluid may be employed in connection with my improved apparatus.

Having thus described my invention,

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

The cap C, secured upon the pipe B, and provided with a perforated diaphragm, *b*, from which the tube D is suspended, substantially as herein shown and described.

GEORGE M. WOODWARD.

Witnesses:

A. V. BRIESEN,  
GEO. A. BLOOD.