

J. R. REED.
STEAM-RADIATOR.

No. 176,056.

Patented April 11, 1876.

Fig. 1.

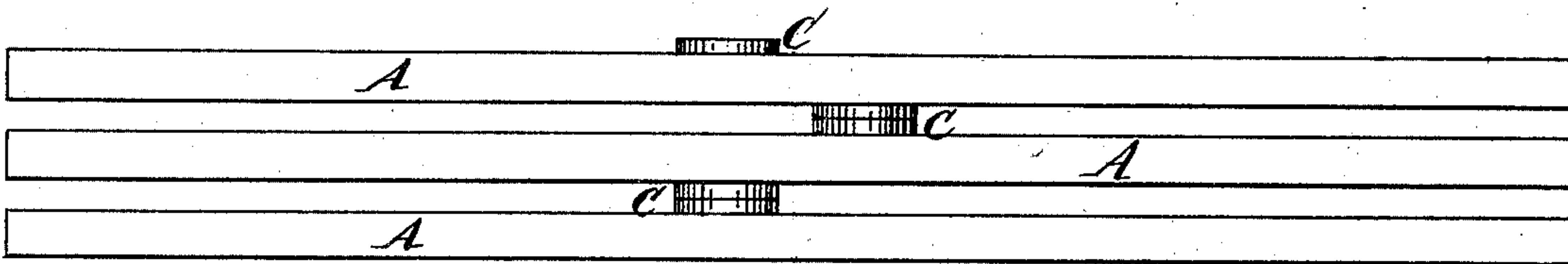
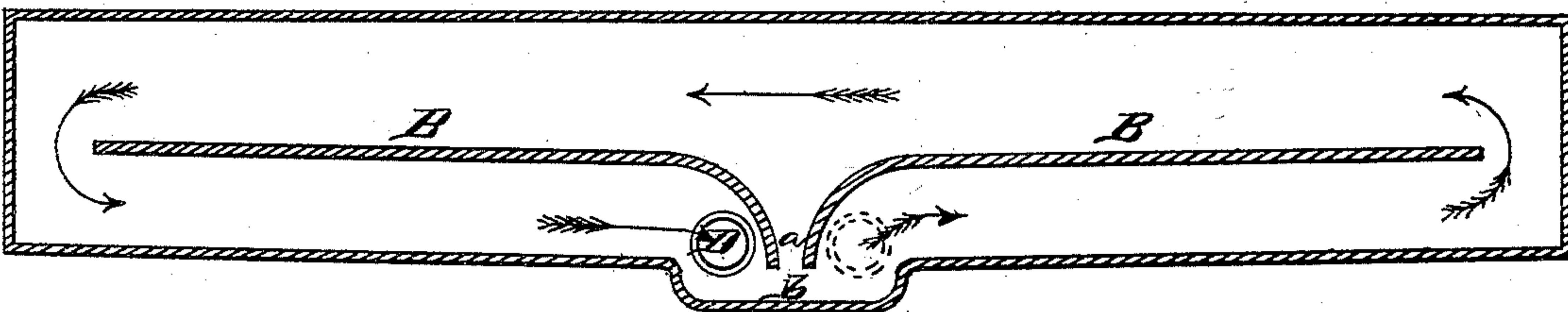


Fig. 2.



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IMPROVEMENT IN STEAM-RADIATORS.

Specification forming part of Letters Patent No. **176,056**, dated April 11, 1876; application filed January 22, 1876.

To all whom it may concern:

Be it known that I, JOHN R. REED, of Westfield, in the county of Hampden and State of Massachusetts, have invented certain Improvements in Steam-Radiators, of which the following is a specification:

This invention relates to radiators designed to radiate the heat derived from steam for the purpose of warming buildings, and for analogous purposes; and said invention is more particularly adapted to be embodied in what are known in the trade as indirect radiators, though it may be used in direct radiators.

One object of this invention is to provide a more available and convenient mode of connecting one section of a sectional radiator to another by a single joint, and said invention is also designed to facilitate the return of the water of condensation, and to insure a regular and perfect circulation of steam through all parts of the radiator.

One part of the said invention consists in the formation of the radiator-sections with internal diaphragms having downward projections, in combination with the arrangement of the connecting-pipes on alternate sides of said diaphragms, substantially as hereinafter more fully set forth.

Another part of the said invention consists in the construction of the said internal diaphragm in two parts, having an opening between them in the middle portion of the radiator-section to allow the water of condensation to pass off more readily, and also in giving a portion or the whole of the said diaphragm a downward inclination toward the said opening, substantially as hereinafter more fully set forth.

Another part of the said invention consists in the extension of the inner ends of the said divided diaphragm down to or below the level established for the surface of the water of condensation, to prevent the passage of steam down through the opening between the parts of the divided diaphragm, while at the same time allowing the water of condensation to pass freely through the said opening, substantially as hereinafter more fully set forth.

Figure 1 is a plan of a radiator, or a portion thereof, constructed according to my inven-

tion. Fig. 2 is a vertical longitudinal section of one of the sections or steam-chambers which compose my radiator, showing the internal construction.

A is the outside shell of a section of my radiator. These sections A may be, and properly should be, studded with projections on their vertical sides, for the more perfect radiation of heat as now commonly practiced; but these projections are omitted in the drawings, because they are not deemed essential to the proper illustration of my invention. Each of these sections is provided with a diaphragm, B, extending nearly its whole length; and I prefer to divide this diaphragm into two parts, as shown in the drawings, with an aperture between them at *a*, to allow the water of condensation to pass through instead of traversing the entire route followed by the steam. The inner ends of the parts of this diaphragm B are curved or inclined downward, as shown in the drawings, partly to more satisfactorily deliver the water of condensation, and partly for other purposes, which will be hereinafter explained. I prefer also to incline the entire length of each part of this diaphragm B downward toward the center of the section, for the purpose, among others, of causing the water of condensation upon it to flow more readily to the center, and be there discharged, as above suggested. The under plate of the section is also similarly inclined for a similar purpose. Said under plate of each section also has a more abrupt depression or well in it, as shown at *b*, to form a small cavity or well for the temporary lodgment of the water of condensation, from which the latter may be conveniently drawn off, and also to allow the connecting-pipes to be brought down, so as to bring the lower part of their opening as low or lower than the upper surface of the main portion of the lower plate of the section, thereby relieving almost the entire surface of this lower plate from any standing water of condensation, which might otherwise hasten the condensation of the steam in the lower part of the section. The sections A have hubs or bosses C cast upon them to regulate their distance apart from each other, and also to receive the connecting-pipes D, which connect the sections to each other.

These connecting-pipes D should be made of sufficient length to only reach from the inside of one section to the inside of the next contiguous section, and may be screw-threaded their entire length, or a very short unthreaded portion may be left in the middle to keep the pipe from going too far into either section, and the hubs C, correspondingly countersunk; or the screw-threads in the hubs may be cut with a tapered tap to afford the same security.

It will be observed, by an inspection of the drawings, that the pipes D are placed on alternate sides of the downwardly-projecting portions of the diaphragm B, as indicated by the positions of the hubs C in Fig. 1, and also by the full and dotted circles in Fig. 2. The object of this provision is to compel the steam, though introduced through a small aperture, to travel the entire circuit of each section, and the operation will be as follows:

Steam being admitted into the radiator through a pipe from the boiler, (which pipe may enter the radiator at the position shown by dotted lines in Fig. 2,) will take the directions indicated by the arrows to the pipe, (represented by the full lines in the same figure,) where it will pass into the next section, and passing this time to the left to the end of the diaphragm, and then to the right, over the diaphragm to the end, and then under the right-hand portion of it to the pipe which connects with the next section beyond, and so on through the entire radiator in like manner. When the steam is first introduced into the radiator a small portion of it may take a shorter route past the inner ends of the divided diaphragm; but when sufficient water of condensation has formed to fill the wells at *b* up to the openings in the connecting-pipes, it will also reach the descending ends or downward projections of the diaphragm, and the entire current of steam will be compelled to take the route already described. At the same time the water of condensation, which will fall upon the top of the diaphragm, will be delivered through the central opening between its parts without obstruction.

An exit-pipe, to return the water of condensation to the boiler, should properly be attached to the back of the series; and it is recommended to incline the radiator slightly

downward in that direction, so as to give a more free delivery, and prevent any portion of the water of condensation from returning to the boiler through the steam-pipe, and thus obstructing the flow of steam.

Various modifications might be suggested, which would more or less perfectly carry out my invention, or which would contain the whole or a part of its distinguishing characteristics, as, for example, the diaphragm might be made continuous throughout its entire length, with a projection extending downward from its underside to give direction to the steam, as already indicated; or the steam might be admitted at one end of the diaphragm on alternate sides of a downwardly-projecting end, operating in substantially the same way as the two downwardly-projecting portions in the middle of the diaphragm, as already described; and various other modifications could doubtless be made which would embody one or more of the valuable features of my invention; but the construction I have described I deem the best.

I claim as my invention—

1. The combination of a series of radiator-sections having internal diaphragms with downward projections, and pipes connecting the said sections, arranged on alternate sides of the said downward projections of the said diaphragms, substantially as hereinbefore set forth.

2. A steam-radiator section having an internal diaphragm, divided in its middle portion, and inclined downward toward the said middle portion, either in the whole or part of its length, to more readily deliver the water of condensation, substantially as hereinbefore set forth.

3. A steam-radiator section having an internal diaphragm divided in its middle portion, substantially as and for the purpose described, the inner ends of the parts of the said divided diaphragm extending down to the level of, or below, the lower portion of the aperture, for the delivery of the water of condensation, substantially as hereinbefore set forth.

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