

(No Model.)

T. C. JOY.
STEAM RADIATOR.

No. 390,128.

Patented Sept. 25, 1888.

Fig 1.

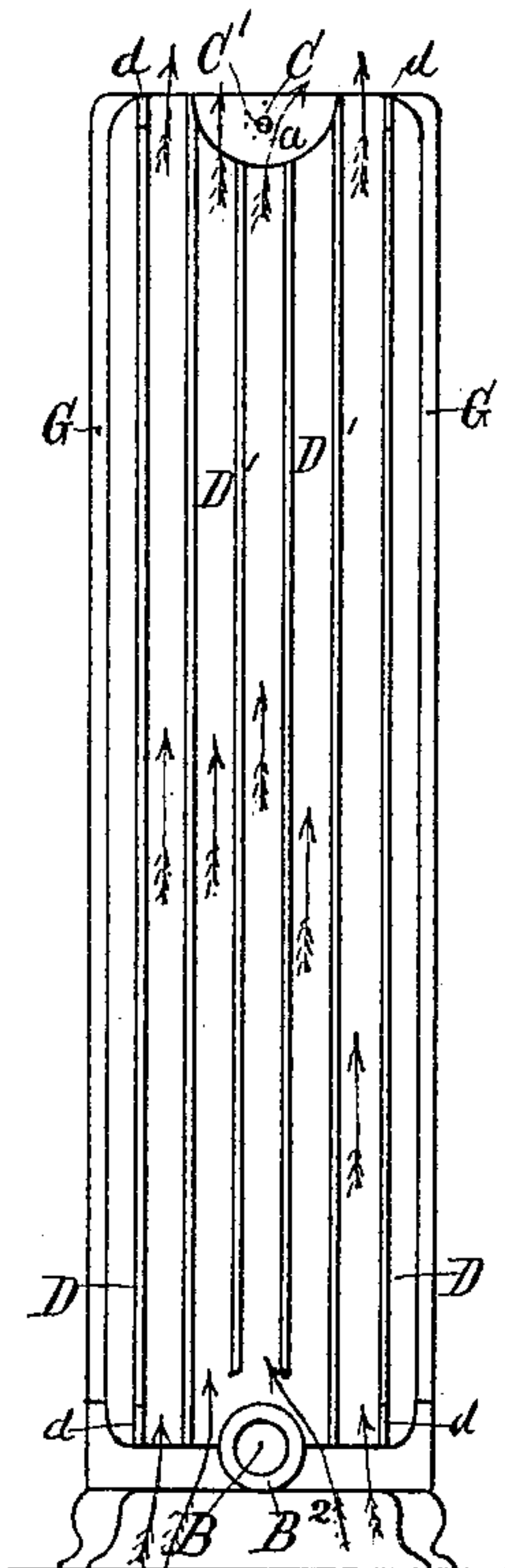


Fig 2.

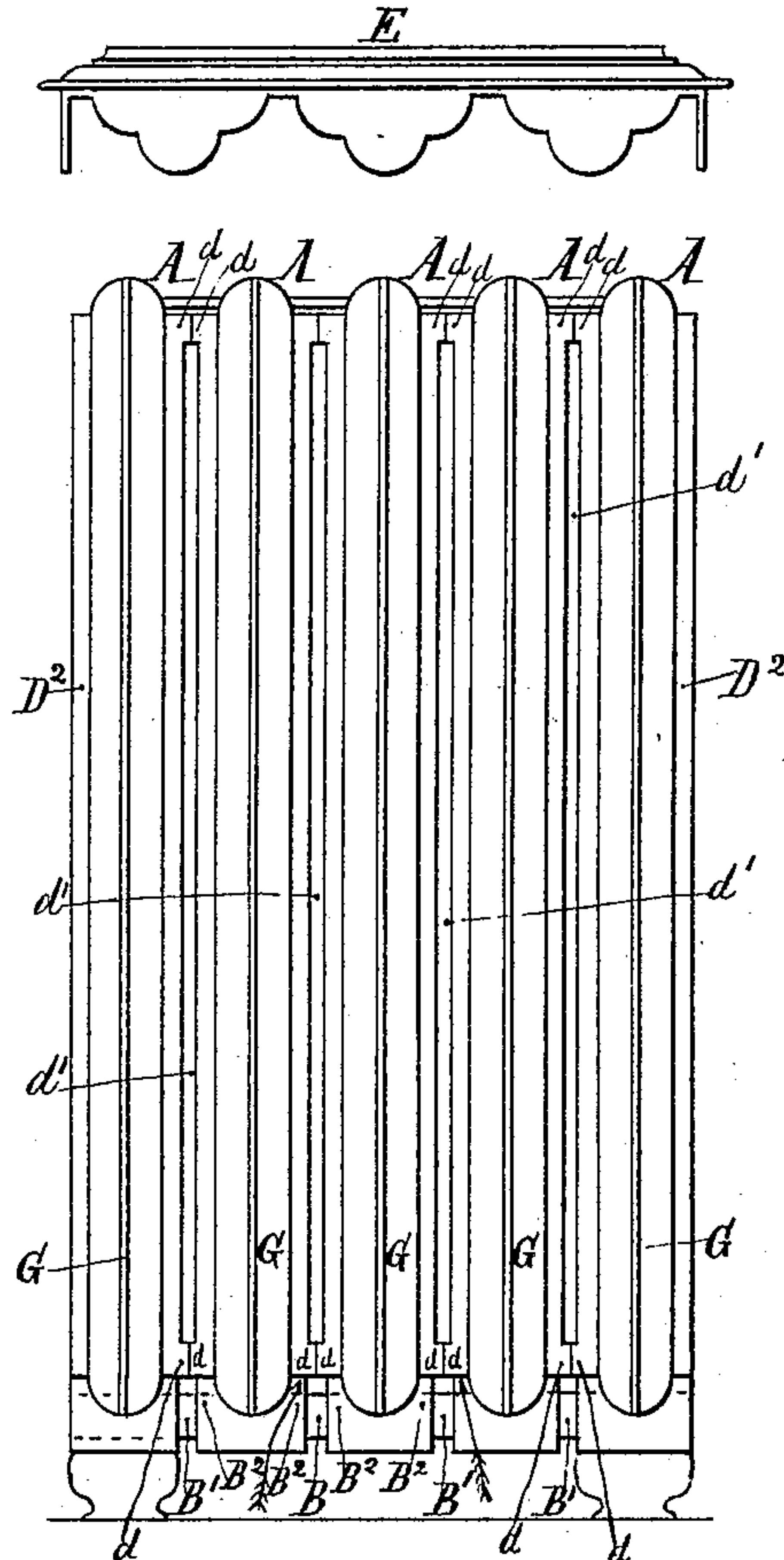


Fig 3.

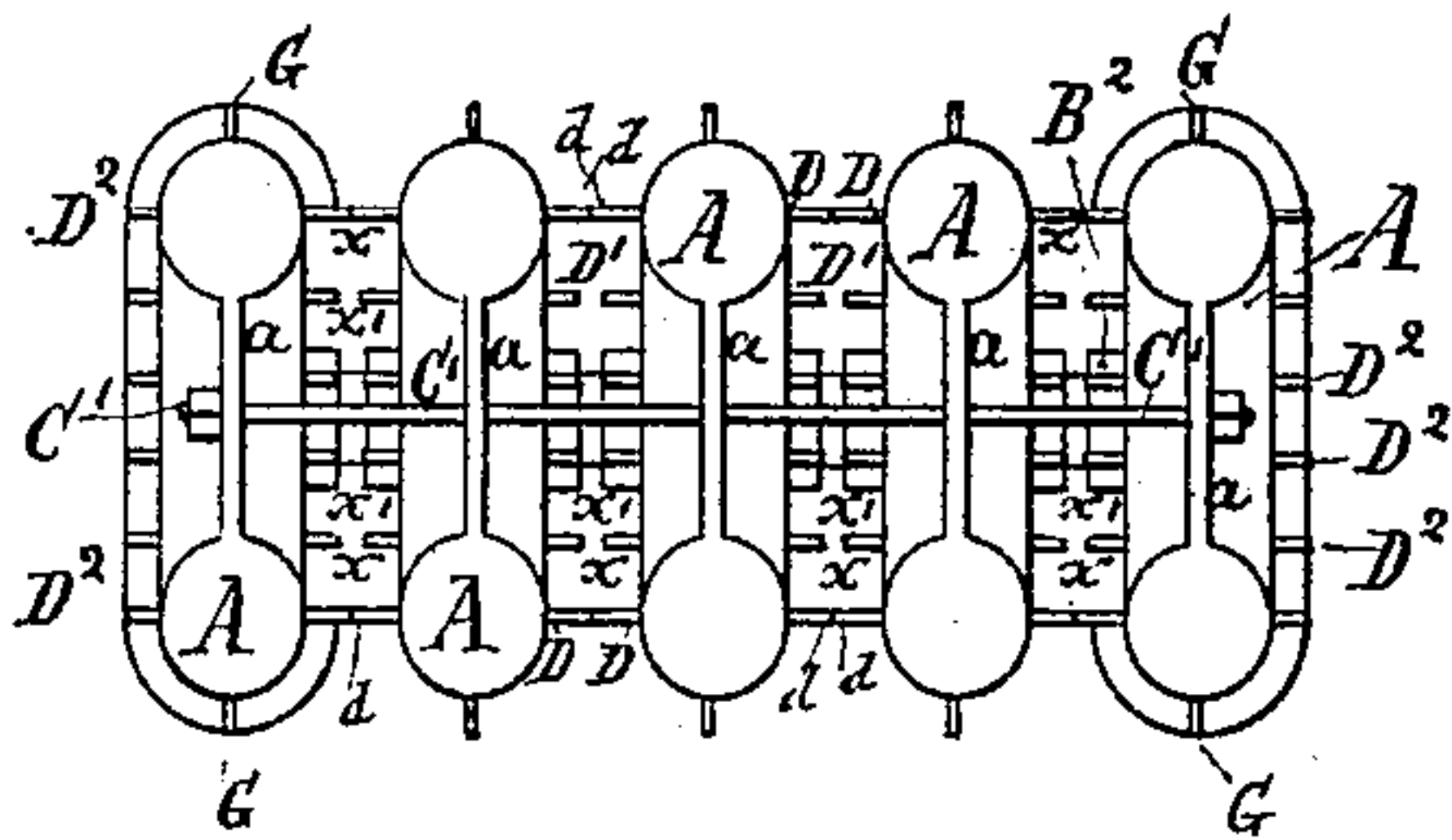
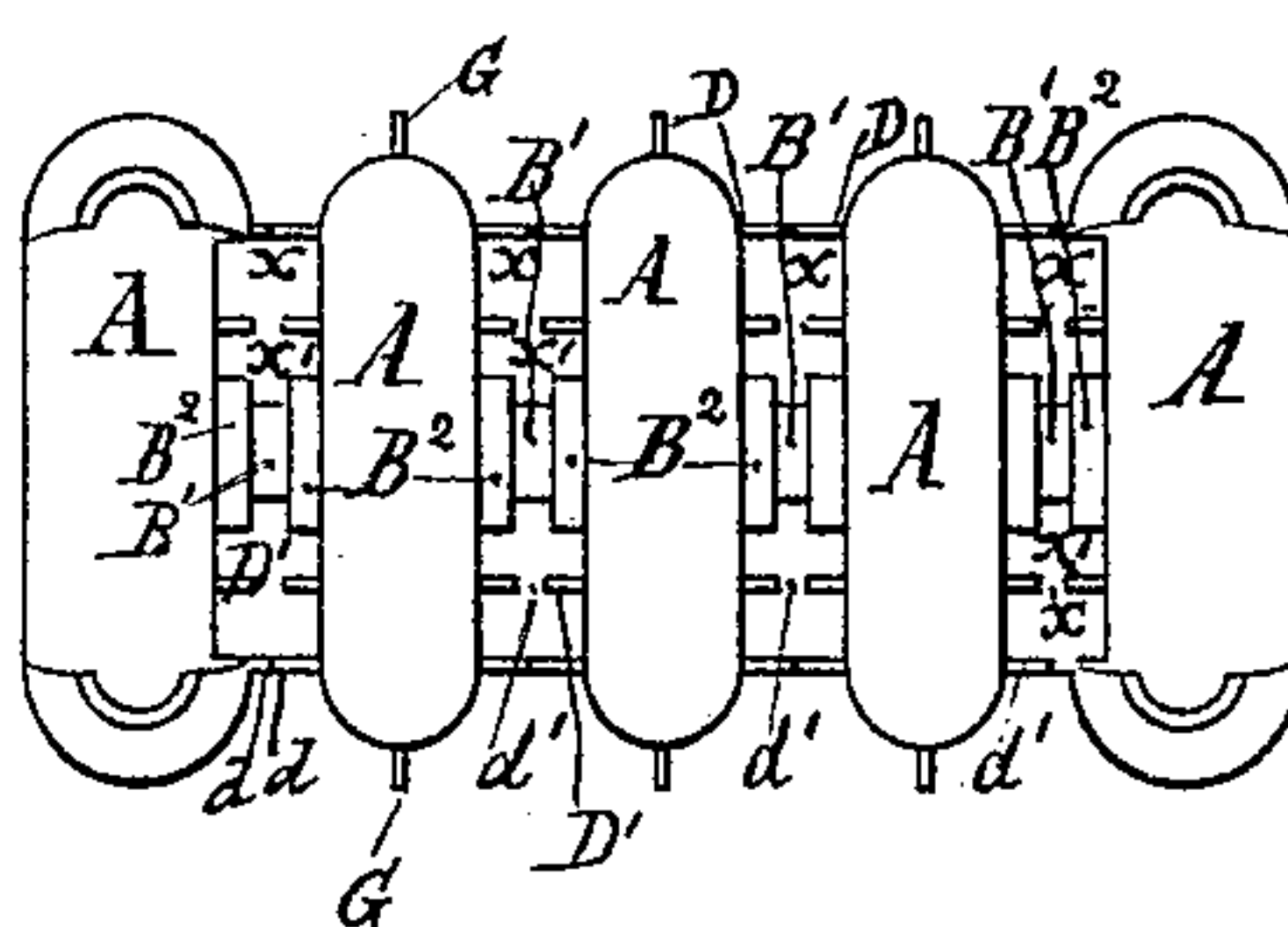


Fig 4.



Witnesses:
J. P. Theo. Lang
R. L. Fenwick.

Inventor:
Thaddeus C. Joy
by his Attorneys
Mason, Fenwick and Lawrence

UNITED STATES PATENT OFFICE.

THADDEUS C. JOY, OF TITUSVILLE, PENNSYLVANIA.

STEAM-RADIATOR.

SPECIFICATION forming part of Letters Patent No. 390,128, dated September 25, 1888.

Application filed February 14, 1887. Serial No. 227,516. (No model.)

To all whom it may concern:

Be it known that I, THADDEUS C. JOY, a citizen of the United States, residing at Titusville, in the county of Crawford and State of Pennsylvania, have invented a new and useful Improvement in Steam-Radiators, of which the following is a specification.

My invention relates to that class called "sectional radiators," where the radiator is built up of sections, all the sections being constructed precisely alike and a sufficient number joined together to form a radiator of the capacity required, and it may also be called "direct-indirect," being placed in the room to be warmed and arranged to either warm the air already in the room or to be placed over a cold-air duct leading from the outside, warming the outside air as it enters the room, my object being to construct the sections with extended heating-surfaces so arranged that when the sections are placed together the ribs or extended surfaces shall form direct flues through which the air being warmed shall pass and give direction to the current as it enters the room.

My invention consists in a novel construction, combination, and arrangement of hollow-ribbed radiator-sections, as will be hereinafter described and specifically claimed, whereby straight, upright hollow columns forming air-inclosing ways are secured between the sections and their straight, upright, and oppositely-placed ribs, the castings forming said airways having no air-obstructing inner horizontally-projecting portions extending from them, so as to decrease the area of the lower air-entrance passages when the sections are brought together, whereby, also, said sections can be spaced and stayed by lug formations and suitably connected together.

In the accompanying drawings, Figure 1 is an inner side view of one of the radiator-sections; Fig. 2, a front view of a radiator as formed of five of the sections, the perforated cap being shown slightly elevated above the sections. Fig. 3 is a top view of the radiator, the cap being removed; and Fig. 4 is an inverted bottom view of the same.

A in the drawings represents the body of a radiator-section, formed, as usual, with a hollow steam-circulating space, provided the cast-

ing thereof is formed without a horizontal base projection on the surface or surfaces against which the air circulating between the sections impinges, of any known approved construction.

B is one of the two connecting openings or passages which are provided in each of the sections near the bottom.

B' are thimbles secured in any approved way in the collars B², which are cast on the sections around the passages B.

C is a hole in the web portion *a* of each section at top, through which a bolt, C', is passed for holding the several sections of the radiator together.

The radiator thus far described is not dissimilar to those in general use, and the shape and internal arrangement of the body of the sections and the manner of joining the sections together may be varied in accordance with any of the ways now in common use.

The respective sections A, as shown, are of greater height than width, in order to get a long vertical passage for the air being heated, and on the two broad sides of each section I provide vertical ribs D D', said ribs being thin projections—say of about half an inch in width—formed on the casting composing the section. The width of these ribs may be varied, and the outer ones, D D, are extended from the bottoms to the tops of the sections, while the intermediate ribs have a like extension upward and downward, except where they are cut short to accommodate the connecting thimbles and collars B' B², and allow the webs *a* to be formed at the points where the connecting-bolt C' is inserted. The outer ribs, D D, form inclosed air-column ways *x*, while the intermediate ribs, D', divide up these column-ways into a series of vertical air-channels, *x'*, and thus the air in its ascent is most perfectly controlled and kept in contact with the heating-surfaces of the sections, the amount of which heating-surfaces is greatly augmented by the extension of the same into the form of numerous projecting ribs D D', as shown. The air-column ways and channels *x x'* being almost wholly unobstructed at the bottom of the radiator-sections, there being only slight obstructions at the points where the connecting thimbles and collars are provided, a free

circulation of the air is insured, as indicated by the arrows, and the heated air is forcibly and rapidly discharged into the room through the usual perforated cap, E, of the radiator.

5 It will probably be best not to have the ribs of adjacent sections touch their entire length, and to provide against this and keep them apart, and at the same time have the sections stayed when set up for use, I form at the upper and lower ends of the outer ribs, D, extensions or lugs d , and have these extensions or lugs meet or abut against each other, as shown. This construction insures the bearing of one section against another and the leaving of lateral spaces d' for air to enter above and below the lugs, and the sections by bearing at each corner will, when bound together by the bolt C' and thimbles and collars, render the radiator more steady and substantial. It is contemplated in some cases to leave out all the interior ribs, D', thus making one wide air-column way between the exterior ribs, D, of the respective pairs of adjoined sections; but the plan shown is to be preferred, as the air is more effectively controlled and a larger heating-surface secured.

The ribs G at the narrow edges of the sections and those D² on the outside of the broad faces of the outer sections are for the purpose of increasing the direct radiating-surface and giving beauty and finish to the radiator. These form no part of the invention which I claim.

My invention as herein described may be regarded as an improvement on the radiator shown in the Letters Patent No. 28,686, and by comparing it with said radiator it will be seen that I have combined with the hollow sections straight vertical ribs, which are arranged with a vertical space between them, the said ribs being directly opposite one another, and forming vertical hollow air-column ways of a uniform diameter from bottom to top of the castings constituting the sections, excepting where the steam connecting pipe, bolt, and collars are located. The ribs which form said air-column ways, while aiding in confining and guiding the air in a straight course upward between the sections to the top of the radiator, interpose no obstruction whatever to its rapid ascent; also, I have combined with the hollow sections ribs widened and shaped to form staying-lugs, which serve for keeping the sections apart to a sufficient extent for allowing the entrance of air sideways between the ribs into the air-column ways.

I make no claim to anything shown in the above-mentioned patent; neither do I claim either of the constructions shown in Letters Patent No. 310,981, 195,221, and 91,834, nor any construction of radiator-sections which retards the air between the sections or which interferes with the rapid upward passage of the air which impinges against the surfaces of the radiator-sections.

65 What I claim as my invention is—

1. A steam-radiator formed of a series of connected hollow steam-circulating sections,

the outer sections being provided, respectively, with a pair of straight upright flanges or ribs on their inner faces and the intermediate section or sections, respectively, with corresponding and oppositely-placed ribs on both of their faces, and the flanges or ribs of all the sections extending from the tops to the bottoms thereof and forming continuous, vertical, and uninterrupted air-column ways, into which air from beneath the sections can enter directly in columns or bodies equal in volume to the cross-sectional area of the spaces between the broad surfaces of these sections and their flanges and ascend through spaces of like area to the tops of the sections, substantially as described.

2. A steam-radiator formed of a series of connected hollow steam-circulating sections, the outer sections being respectively provided on their inner faces with a pair of straight upright ribs, and the intermediate section or sections, respectively, with a pair of corresponding straight upright flanges or ribs on each of their broad faces, and all of the sections having on their said faces a series of corresponding intermediate and oppositely-placed ribs or flanges, the flanges or ribs of all the sections extending from the tops to the bottoms thereof, except where interrupted by the steam-connections and bolts, and forming outside of said connections and bolts continuous air-column ways, into which air from beneath the sections can enter directly in columns or bodies equal in volume to the cross-sectional area of the spaces between the broad surfaces of the sections and the ribs or flanges and ascend through spaces of like cross-sectional area to the tops of the sections, substantially as described.

3. A steam-radiator formed of a series of connected hollow steam-circulating sections, the outer sections being provided, respectively, on their inner faces with a pair of straight upright ribs, and the intermediate sections, respectively, with a pair of straight corresponding upright ribs on each of their broad faces, and all of the sections having on their said faces a series of similar intermediate and oppositely-placed ribs or flanges, the ribs or flanges of all the sections extending from the tops to the bottoms thereof, except where interrupted by steam-connections and bolts, and some of the said flanges or ribs being widened to form lugs at points between their tops and bottoms, so as to serve for spacing and staying the sections, and all of the ribs or flanges forming outside of said steam-connections and bolts continuous air-column ways, into which air from beneath the sections can enter directly in columns or bodies equal in volume to the cross-sectional area of the spaces between the broad surfaces of the sections and the ribs or flanges and ascend through spaces of like cross-sectional area to the tops of the sections, while air is free to enter sideways between the sections, substantially as described.

4. A steam-radiator formed of a series of connected hollow steam-circulating sections,

the outer sections being provided, respectively,
on their inner faces with a pair of straight
upright flanges or ribs, and the intermediate
sections, respectively, with a pair of correspond-
5 ing flanges or ribs on each of their broad faces,
and the ribs being widened to form spacing-
lugs at points between their tops and bottoms,
so as to serve for spacing and staying the sec-
tions, and the ribs or flanges extending from
10 top to bottom of the sections and forming
outside of the steam-connections and bolts
continuous air-column ways, into which air

from beneath the sections can enter directly
in columns or bodies equal in volume to the
cross-sectional area of the spaces between the 15
broad faces of the sections and the ribs or
flanges and ascend through spaces of like
area to the tops of the sections, while air is
free to enter sidewise between the sections,
substantially as described.

THADDEUS C. JOY.

Witnesses:

H. S. BATES,

A. B. HOWLAND.