

(No Model.)

S. E. BABCOCK.  
Steam Radiator.

No. 230,219.

Patented July 20, 1880.

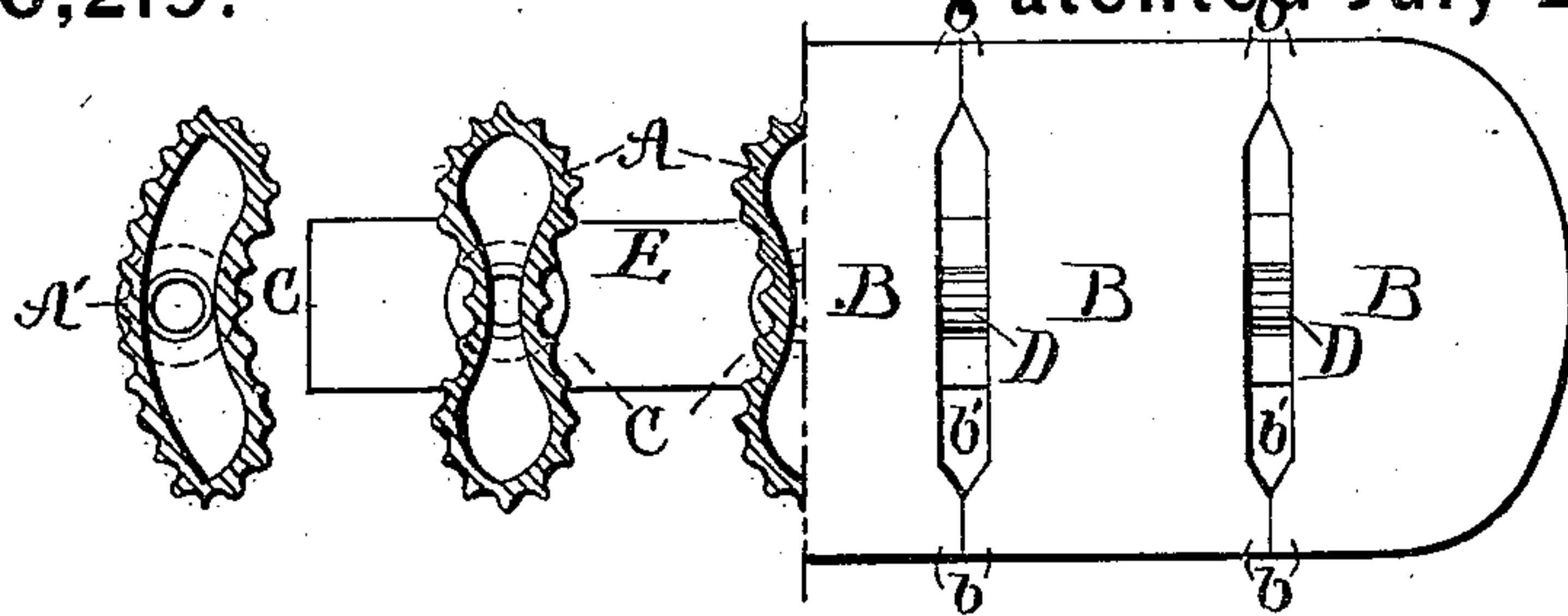


FIG. 1.

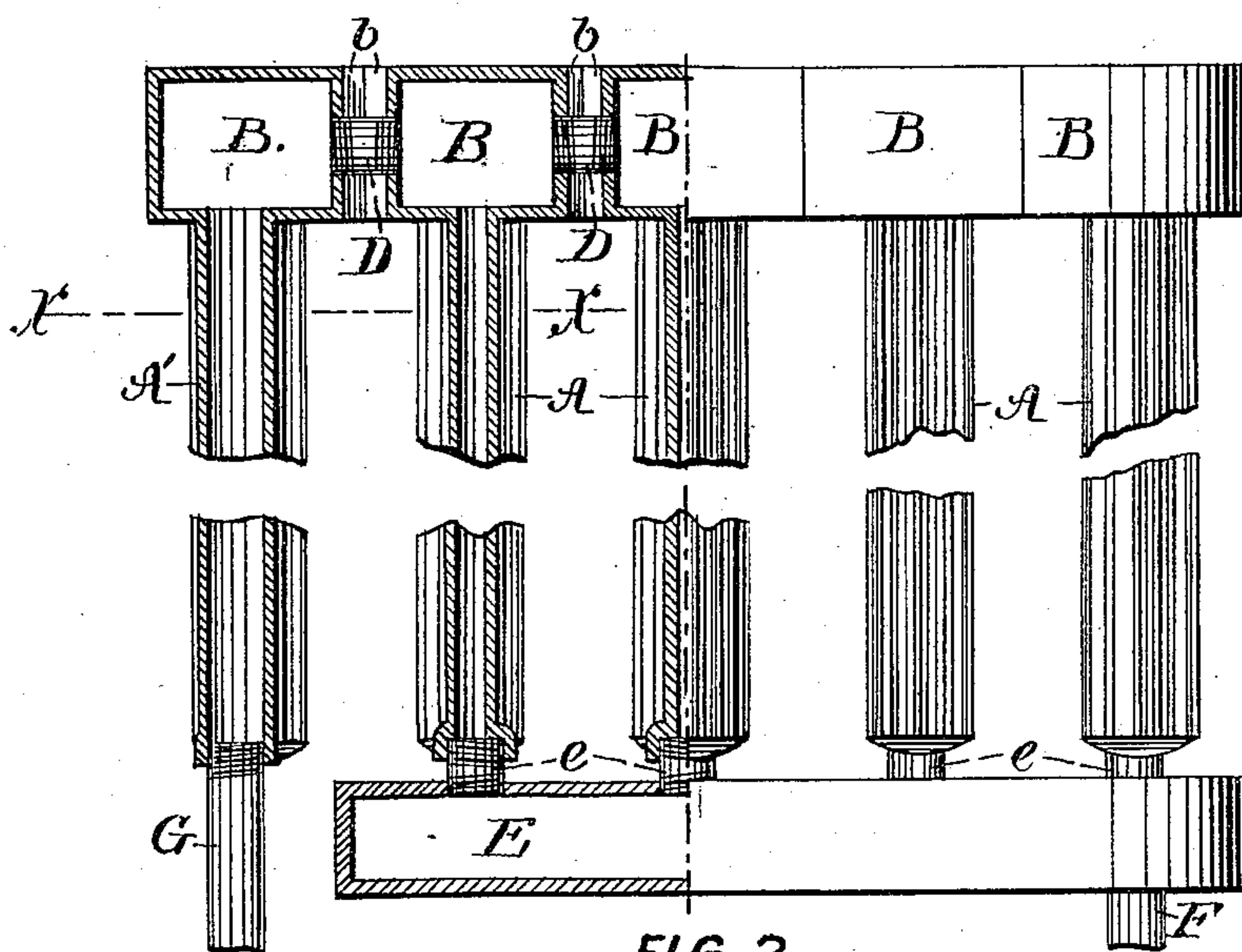


FIG. 2.

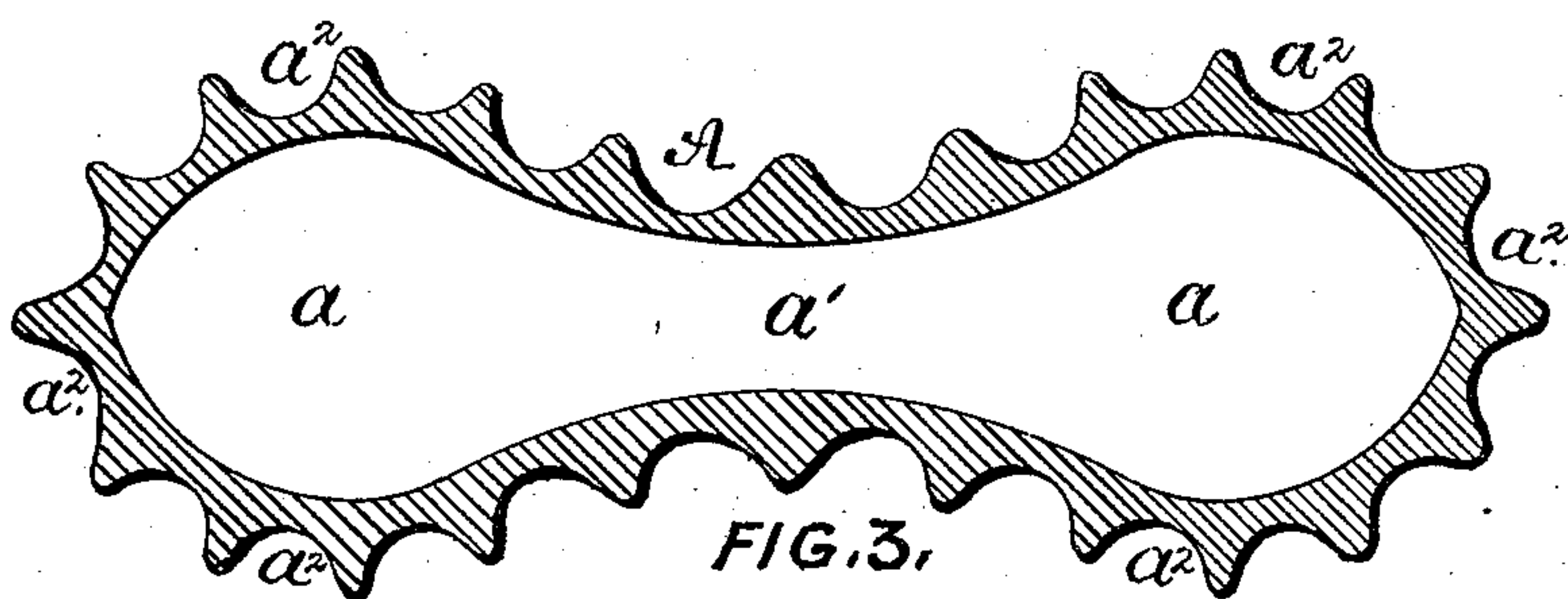


FIG. 3.

Witnesses:

Lincoln Hill.

B. J. Mattison

Inventor:

STEPHEN E. BABCOCK,

by

William H. Low,

Attorney.



# UNITED STATES PATENT OFFICE.

STEPHEN E. BABCOCK, OF TROY, NEW YORK, ASSIGNOR OF TWO-THIRDS OF HIS RIGHT TO JESSE B. ANTHONY AND THEODORE E. HASLEHURST, OF SAME PLACE.

## STEAM-RADIATOR.

SPECIFICATION forming part of Letters Patent No. 230,219, dated July 20, 1880.

Application filed March 25, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN E. BABCOCK, of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Radiators for Steam-Heating, &c., of which the following is a specification.

My invention relates to radiators composed of cast sections that are joined together by suitable connections to produce a circulation of steam through the entire structure; and it consists of a radiator composed of cast sections having bodies whose cross-sectional form is in the shape of an ellipse, whose sides are bent in toward each other to form a contracted opening at the middle and enlarged openings at each end of the figure, each of said sections being provided with a head, which forms an integral part of the section, made of rectangular form, and having projections which, when the sections are connected together, form an unbroken surface at the sides of the top of the radiator and openings for the free upward circulation of the heated air from the vertical chambers formed by and between the bodies of two contiguous sections, the heads of the several sections being connected together by means of horizontal pipes or nipples in such manner that a free steam-communication from end to end of the radiator will be formed to effect the freest circulation of the steam in the upper part of the radiator; and, in combination with said upper connection, it consists in connecting the lower end of each section (except one, at one end of the radiator, which is used for conveying the steam to the upper part of the structure) to a drip-box wherein the water formed by the condensation of the steam is collected and conducted to the outlet or waste pipe. The exterior surface of the body of said sections is provided with vertical corrugations, for the purpose of greatly increasing the radiating-surface of the pipe, and so that the rays of heat therefrom will be discharged at many different angles, thereby producing the highest degree of efficiency with the least material.

In the accompanying drawings, which form part of this specification, and to which refer-

ence is herein made, Figure 1 represents a top view of a radiator containing my improvements, the right side of the figure showing a plan view, and the left side a horizontal section at the line X X. Fig. 2 shows at its right side a front elevation of my radiator, and at the left side a longitudinal section of same; and Fig. 3 is an enlarged cross-sectional view of one of the sections of my radiator, showing the peculiar form of the pipe.

The sections A of the radiator I preferably make of cast-iron. At the upper end of each there is a chamber or box, B, that is substantially rectangular in form, and is provided with projections *b*, which, when the sections are connected, abut against the same projections on the adjoining sections and produce an unbroken exterior surface at the sides of the head of the radiator, and an opening, *b'*, between the chambers.

The radiating portion of the section, as illustrated in Fig. 3, has in its cross-section the figure of an ellipse with its sides, at its inner diameter, bent inward, thereby giving to the figure an enlarged area, *a*, at each end and a contracted area, *a'*, at the middle. This form, when the sections are joined together, produces between the sections an enlarged chamber, C, in which the heat radiating from the flattened sides of the sections accumulates before passing upward and out through the openings *b'*. The outer surface of the radiating portion of each section is also made in vertical corrugations *a<sup>2</sup>*, whereby the radiating-surface is greatly increased, and by reason of the great number of angles at which the rays are emitted the heat is greatly augmented.

The end sections of each radiator I preferably make rounded on their outer sides, for the purpose of producing a more pleasing outline at those points. One of the end sections (marked A' on the drawings) I utilize as a supply-pipe for feeding the chambers B of the other sections with steam.

The several sections are connected together at their upper ends by means of the horizontal pipe-nipples D, which are screwed into the boxes B, and form a continuous communica-



tion for the circulation of steam through the top part of the radiator. The lower end of each section A is connected to the drip-box E by the pipe-nipples *e*, and the said drip-box is provided with a waste-pipe, F, for carrying off the water produced by condensation.

The end section, A', (which has no direct connection with the drip-box E,) is provided at its lower end with a supply-pipe, G, through which steam is admitted to the radiator.

The supply-pipe G and waste-pipe F should each be provided with the valves commonly used for governing the supply of steam and wastage of water.

The operation of the steam in my radiator is as follows: After passing up through the end section, A', it fills the chambers B of all the sections, thereby producing the first circulation of steam in the radiator at the upper part thereof. From the chambers B it passes downward, filling each section A and the drip-box E. As fast as the steam condenses, the water, by reason of its greater gravity, falls down through the sections and into the drip-box, from whence it is discharged through the waste-pipe F.

By first circulating the steam through the upper portion of the radiator, and then pass-

ing it downward, I avoid the action of opposing the falling drops to the resistance of the rising currents of steam observable in radiators having the first circulation of the steam in the lower part of the structure, and which is always productive of an excessive and disagreeable noise. The operation of my radiator is entirely noiseless.

I claim as my invention—

1. The combination, in a steam-radiator, of the sections A and A', provided with heads B, having projections *b*, and connected together by the nipples D to form the openings *b'*, with the drip-box E, connected to the lower ends of the sections, as herein described, and waste-pipe F, as specified.

2. The combination, in a steam-radiator, of the sections A and A', having rectangular heads B, connected, as herein described, with the vertical heat-chambers C, formed, as herein set forth, between two contiguous sections, and the openings *b'*, as and for the purpose specified.

STEPHEN E. BABCOCK.

Witnesses:

WM. H. LOW,  
LINCOLN HILL.