

J. W. BOOKWALTER.

Steam-Generators.

No. 134,635.

Patented Jan. 7, 1873.

Fig. 1.

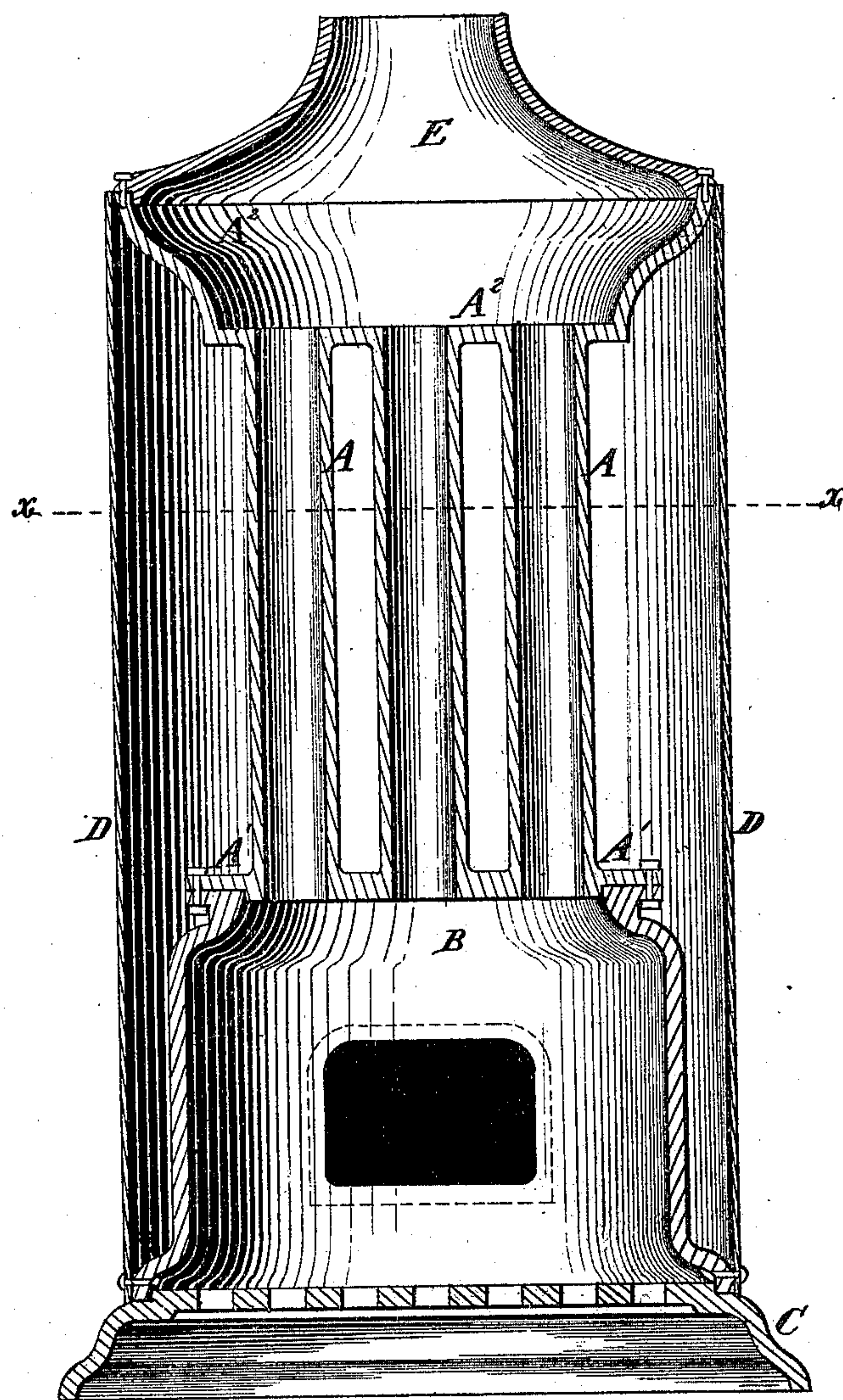
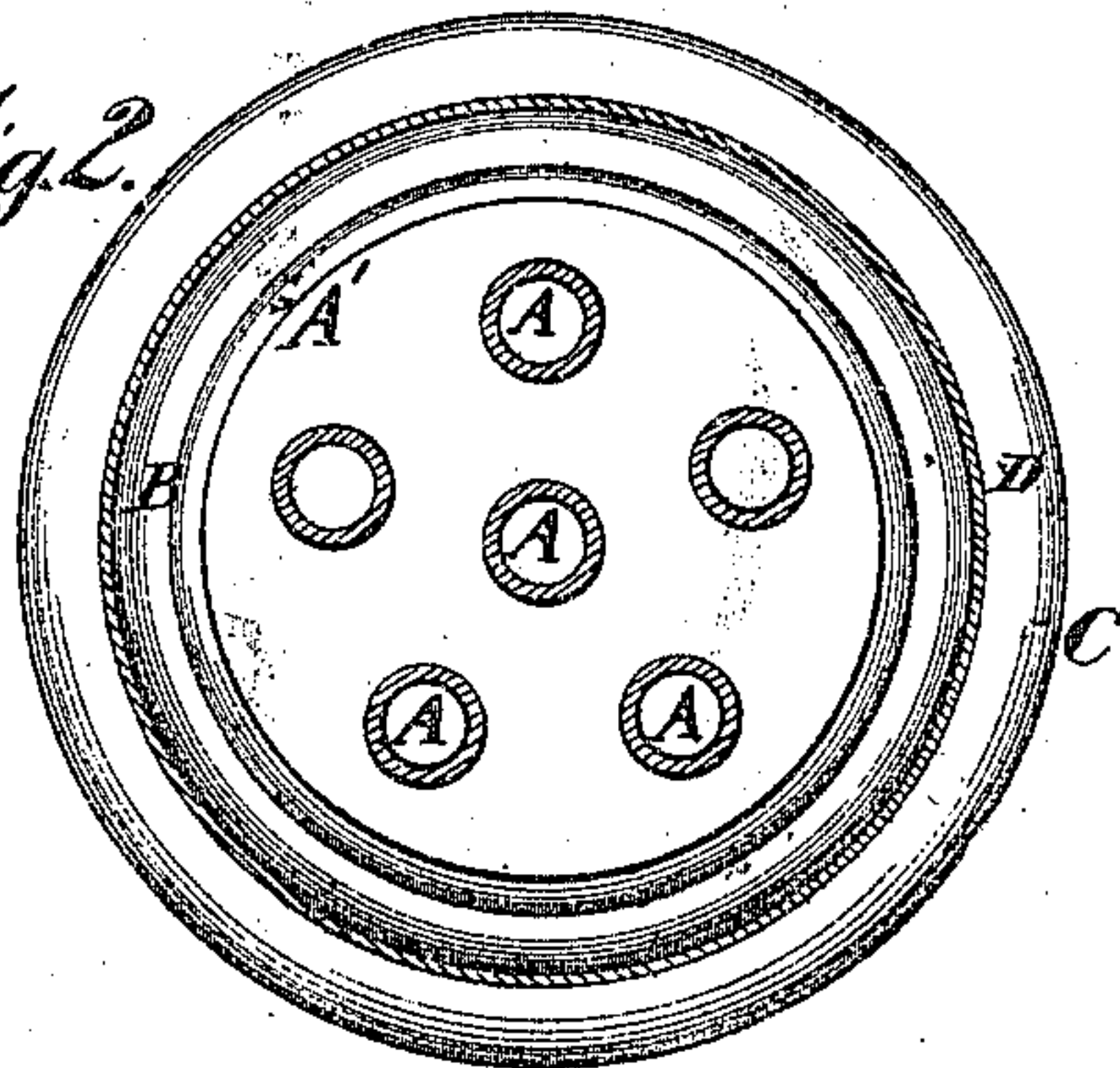


Fig. 2.



Witnesses.
A. Ruppert.
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UNITED STATES PATENT OFFICE.

JOHN W. BOOKWALTER, OF SPRINGFIELD, OHIO.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. 134,635, dated January 7, 1873.

To all whom it may concern:

Be it known that I, JOHN W. BOOKWALTER, of Springfield, in the county of Clark and State of Ohio, have invented a certain Improvement in Steam-Generators, of which the following is a specification:

This invention relates to steam-generators; and it consists in the combination of certain novel parts of which it is composed, as will be more fully described hereinafter.

Figure 1 is a vertical section of my improved generator, showing the fire-box as of cast-iron and cast in one single piece, and the flues or tubes as of cast-iron also and cast in connection with the upper and lower tube-sheets, the whole being bolted to the fire-box, and the shell of the generator as being made of wrought-iron. Fig. 2 is a transverse section on line *xx* of Fig. 1.

Corresponding letters refer to corresponding parts in both figures.

In constructing generators of this type I use for the flues or tubes and heads cast-iron of good quality, said flues or tubes and heads being cast in one piece; as a consequence of which all the labor of forming holes in the heads and all liability of leaking around such tubes are avoided. By adopting this plan I am enabled to make generators of either the horizontal or vertical form.

Having shown one of vertical form to illustrate my invention, I will now proceed to describe it with reference to the drawing, in which—

A A refer to the flues or tubes, and A¹ A² to the flue or tube sheets, the lower one, A¹, being so constructed as to cause a projection upon its lower surface to enter an aperture formed in the upper portion of the fire-box, to which it is secured by bolts or rivets, as preferred. The flues or tubes rise from this sheet, they being in fact a part of it, as they are cast with it, and extend upward for the required distance, at which point the upper head is formed upon said flues or tubes, it also being cast in one piece with the tubes and lower head. The flange upon the upper head projects upward for a considerable distance in order that the space between the ends of the tubes and the upper edge of the head may form a gas and smoke chamber, or a portion

of one; and it also extends outward from the point where it leaves the flat or disk portion, from which the flues extend sufficiently far to cause its diameter to be sufficient to receive the outer or wrought-metal portion of the generator, which is attached to it either by bolts or rivets. B refers to the fire-box, which is also of cast-iron, its diameter at its extreme lower end being such as to cause it to fit the wrought shell of the generator, to which it is secured by bolts or rivets. From this point of greatest diameter upward it is so far reduced in size as to leave a sufficient water-space between it and the outer shell, its upper end being adapted to receive the projection upon the lower surface of head A¹, as above described, and also the bolts which secure said head to it. C refers to a ring of cast metal, which serves as a base for the completed generator to stand upon, and also to sustain the grates and to form an ash-pit or a portion of one. D refers to the shell of the generator, which is to be made of wrought-iron, copper, or any other suitable wrought metal, it being of the proper internal diameter to admit of its being slipped upon the lower portion of the fire-box and the upper portion of the head, as shown in Fig. 1, to both of which it is bolted or riveted, as above described. E refers to a cap or ring which may be placed upon the top of the generator for the purpose of forming a part of a smoke-chamber, and for receiving the uptake or smoke-stack, its upper portion being adapted for that purpose. This generator is to have the usual door for supplying fuel to the fire-box.

I have described a generator the fire-box of which is within the shell of the same, and in which all of the parts are in a vertical position; but I do not intend to limit my invention to such a generator, as it is evident that at least a portion of it is equally applicable to horizontal generators and to those which do not have a fire-box located within them.

One advantage resulting from the use of this kind of generator will be that it can be made of cheaper material than is required for the present forms; and another, and a very important, advantage that it possesses is that it can be made ready for use by the expendi-

ture of a much less amount of labor than is required to be bestowed upon the present forms.

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

The combination, in a steam-generator, of a series of cast-metal tubes and tube-sheets, the latter being also of cast metal and cast in one piece with the tubes, and a wrought-metal

shell, the parts being constructed and arranged substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN W. BOOKWALTER.

Witnesses:

W. A. SCOTT,

THEO. A. WICK.