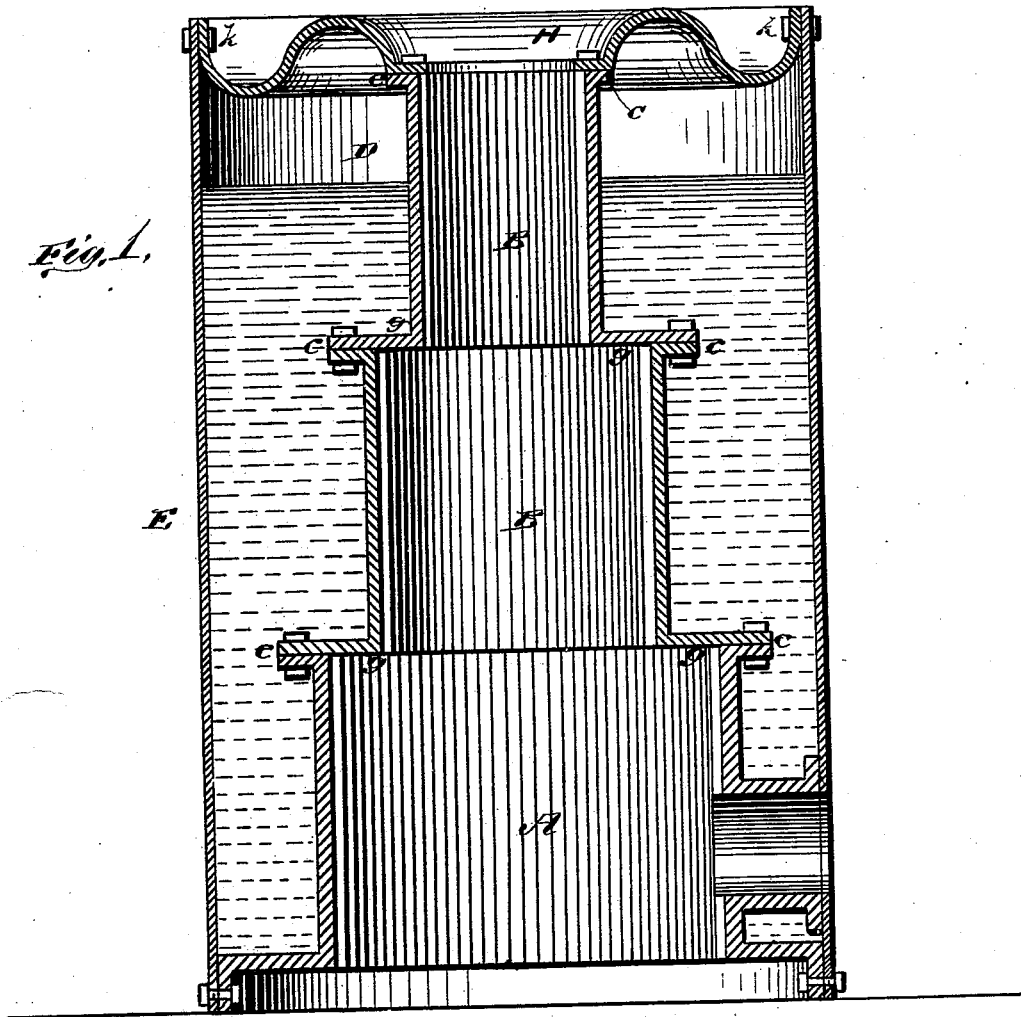


J. W. BOOKWALTER.
Steam-Generators.

No. 204,792.

Patented June 11, 1878.



WITNESSES
E. H. Bates
F. J. Massie

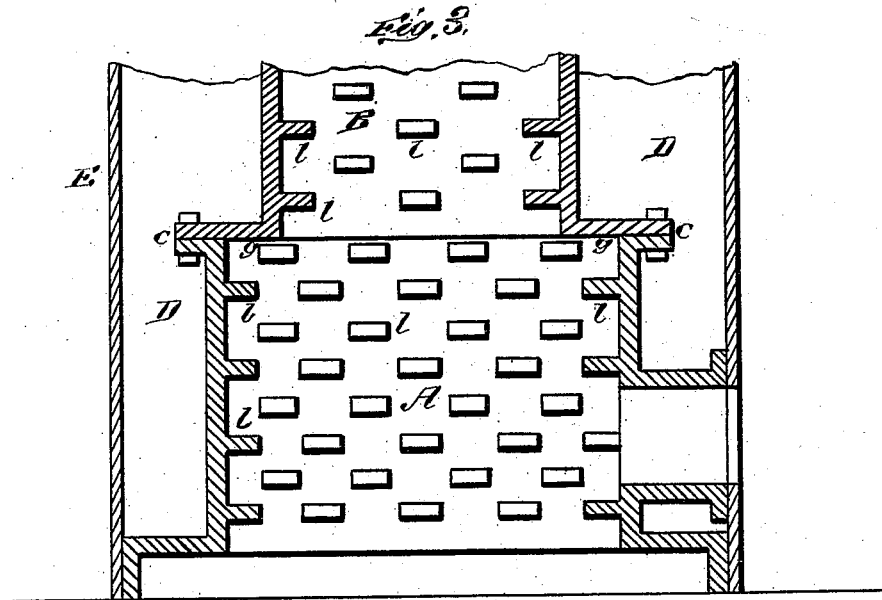
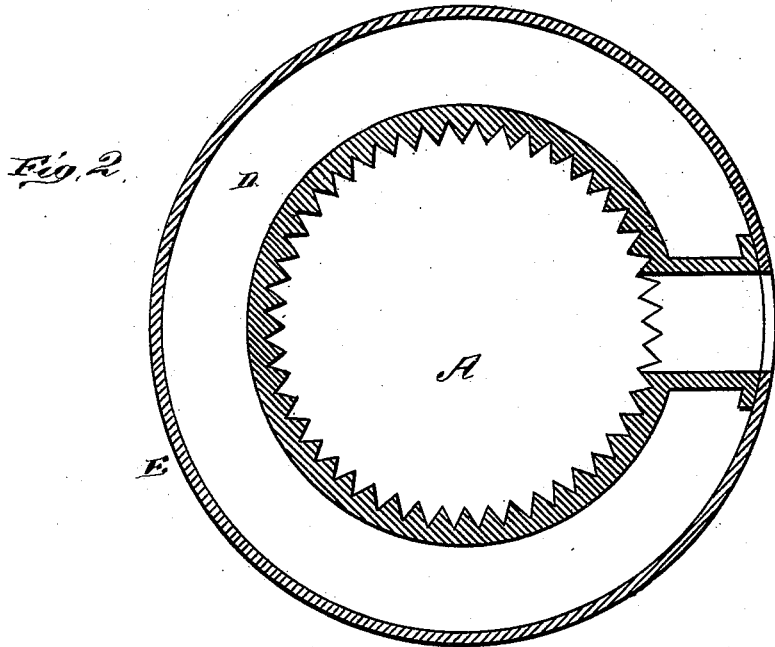
INVENTOR
John W. Bookwalter,
by E. W. Anderson
ATTORNEY

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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. **204,792**, dated June 11, 1878; application filed February 16, 1878.

To all whom it may concern:

Be it known that I, JOHN W. BOOKWALTER, of Springfield, in the county of Clarke and State of Ohio, have invented a new and valuable Improvement in Steam-Generators; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a vertical central section of this invention. Fig. 2 is a horizontal section, and Fig. 3 is a detail view, showing projections of the interior or fire wall.

This invention has relation to boilers or steam-generators; and it consists in the construction and novel arrangement of metallic rings or sections of gradually-decreasing size from below upward, bolted or otherwise joined together, forming the interior or fire surface, and, in connection therewith, a wrought-iron shell, forming the exterior portion of the boiler, and connected to the annular cast-iron sections by a wrought-iron corrugated cap, as hereinafter shown and described.

The object of this invention is to provide a boiler with an interior fire-chamber, decreasing in diameter vertically, so as to concentrate the heated products of combustion or cause them to impinge upon its wall, while the capacity of the boiler increases with its height in such a manner that while the circle of water around the lower portion of the fire-chamber is comparatively of little depth the masses above increase in horizontal thickness, thereby providing, with a comparatively small diameter of boiler, a large cubic capacity, both for water and steam, in the neighborhood of the water-line or upper portion of the boiler, the entire boiler being of the most compact form to secure the greatest economy of space, material, and heat. At the same time it is designed to provide a boiler which can be readily constructed, and which will have great strength and durability.

In the accompanying drawings, the letter A designates the interior or fire chamber of this boiler or steam-generator, the walls of which are formed by the interior surfaces of

successive rings B B, of metal, cast or otherwise formed in annular shape, with flanges *c* *c* at their upper and lower edges, whereby they are bolted or riveted together. These flanges are preferably extended outward from the annular walls, so as to be within the water-space D of the boiler. A tight joint is thus effected between the rings as their ends are brought solidly together, having been previously turned true. The lowest of these annular sections B is the largest in diameter, and its bottom flange extends outward sufficiently to form the bottom of the water-chamber D, and to serve for the attachment of the lower edge of the wrought-iron shell or outer casing E. Above this lower section the rings or sections successively decrease in size, as shown, overhanging offsets *g* being formed by their lower flanges, which are adapted to catch and gather the heated currents of the fire-chamber, so as to secure the most intimate contact thereof with the wall of said chamber.

To the upper flange of the upper section is secured the annular steam-dome or cap-plate H, the outer edge *k* of which is flanged for the attachment of the upper edge of the exterior wrought-iron wall E of the water-chamber or boiler proper.

For the purpose of affording a still greater heating-surface, the walls of the annular sections B may be corrugated or provided with internal ribs or projections, as indicated at *l*. This construction is chiefly applicable to vertical boilers, because of its great strength when formed with a series of sections of decreasing diameter in the fire-space. The water capacity at the same time increases with the height, and a large steam-space is provided. Sometimes, however, it may be found advisable to employ sections of equal diameter, and the construction may be applied to horizontal boilers.

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

1. The combination, with the internal annular sections of successively-decreasing size from below upwardly, and the corrugated steam-cap, of the exterior wrought-iron wall, forming a connection between the cast-iron sections and the wrought-iron casing of a steam-boiler, substantially as specified.

2. The combination, with the boiler-sections of gradually-decreasing size from below upward, joined horizontally together to form the wall of the fire-chamber, and having ribs or projections to increase its heating-surface, of the exterior wrought-iron case and the steam-top or cap-plate, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JOHN W. BOOKWALTER.

Witnesses:

FRANK J. MASI,
WALTER C. MASI.