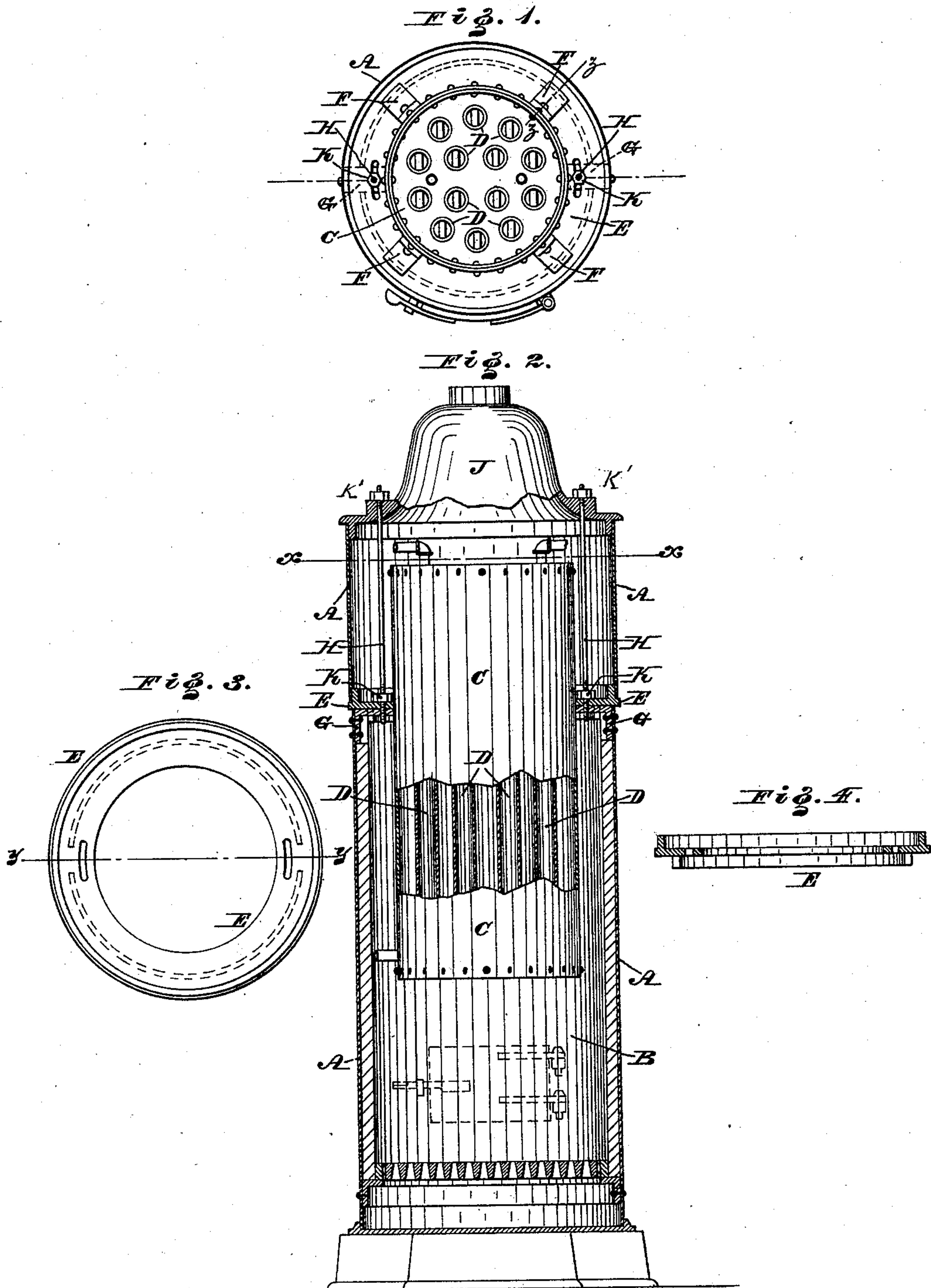


(No Model.)

W. D. RICH.
STEAM BOILER.

No. 361,083.

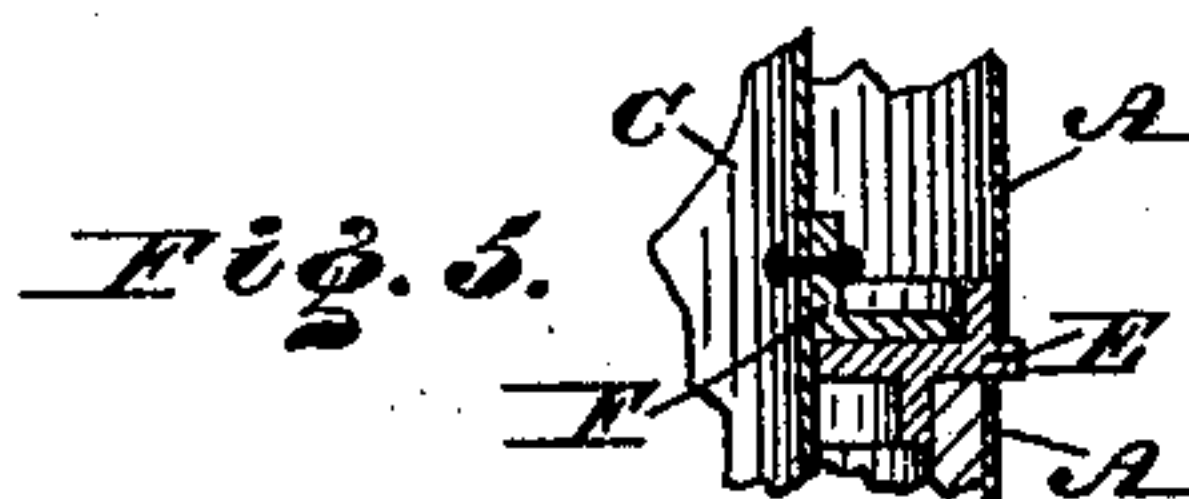
Patented Apr. 12, 1887.



WITNESSES:

A. P. Grant

L. Bouville



BY

INVENTOR:
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UNITED STATES PATENT OFFICE.

WILLIAM D. RICH, OF PHILADELPHIA, PENNSYLVANIA.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 361,083, dated April 12, 1887.

Application filed January 27, 1887. Serial No. 225,633. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. RICH, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Steam-Boilers, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 represents a horizontal section in line *x x*, Fig. 2, of a steam boiler and heater embodying my invention. Fig. 2 represents a vertical section thereof. Fig. 3 represents a top view of an annulus detached. Fig. 4 represents a section in line *y y*, Fig. 3. Fig. 5 represents a section of a portion in line *z z*, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of a combined steam boiler and heater which is of inexpensive, strong, and durable construction, possesses great heating-surface, and is economical in the use of fuel, as will be hereinafter set forth.

Referring to the drawings, A represents the outer casing formed in sections and having the furnace portion B lined with fire-brick and containing the boiler proper, C, which latter is formed of a shell with sheets at top and bottom, and flues D, extending the length of the shell, connected with said sheets, said boiler passing through a diaphragm or annulus, E, which is supported on the top of the lower section of the casing A, it being noticed that the boiler is suspended within the furnace B from said annulus and secured to the latter by knees F, which are riveted or otherwise firmly connected with the annulus and shell of the boiler. If desired, a continuous flanged band may be employed in lieu of the knees F.

The annulus E is secured to the casing by means of knees G, which are riveted to said casing and attached to the annulus by screw-bolts H, which are fitted to the horizontal limbs of said casing and pass through the annulus and are connected with the dome or cap J of the casing, said bolts having jam-nuts K, which may be tightened against the annulus. The dome is secured to the casing by means of the screw-bolts H and the nut K, and thus both dome and casing are firmly connected to the annulus. It is evident that by first unscrewing the nuts K the dome may be readily removed and afterward the casing and annulus, as desired.

It will be seen that the products of combustion pass through the flues D and reach the dome J, from which they are directed to a chimney or elsewhere by a suitable pipe. Some of the products of combustion enter the space between the shell of the boiler and the surrounding fire-brick, and are temporarily detained by the annulus E, which closes the top of the said space, whereby the exterior of the boiler, which is exposed to the products of combustion, is highly heated. This action, with the passage of the products of combustion through the flues D, causes the rapid generation of steam with an economical use of fuel. It will also be seen that the device is strong and durable, and being formed of few parts, is thereby of simple and inexpensive construction.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A combined boiler and heater consisting of an outer metallic casing composed of sections, the lower or furnace portion having a fire-brick lining and the upper portion resting on an annulus, which latter is supported on knees secured to the walls of the lower portion of the casing, all substantially as described.

2. In a combined boiler and heater, the sectional casing A, in combination with annulus E, the dome J, and connecting-bolts H and nuts K, and the boiler C, said boiler being supported by the said annulus, all substantially as described.

3. A combined boiler and heater consisting of the metallic casing A, composed of two sections, the lower one having a fire-brick lining, the boiler C, with tubes D, the annulus E, supporting boiler C, the knees G, secured to the lower or furnace portion of the outer casing and sustaining annulus E, the dome J, and the connecting-rods H, with nuts K K', all of said parts being arranged substantially as described.

4. The boiler C, in combination with the annulus E, the casing A, the knees G, and bolts H, substantially as described.

WILLIAM D. RICH.

Witnesses:

JOHN A. WIEDERSHEIM,
A. P. GRANT.