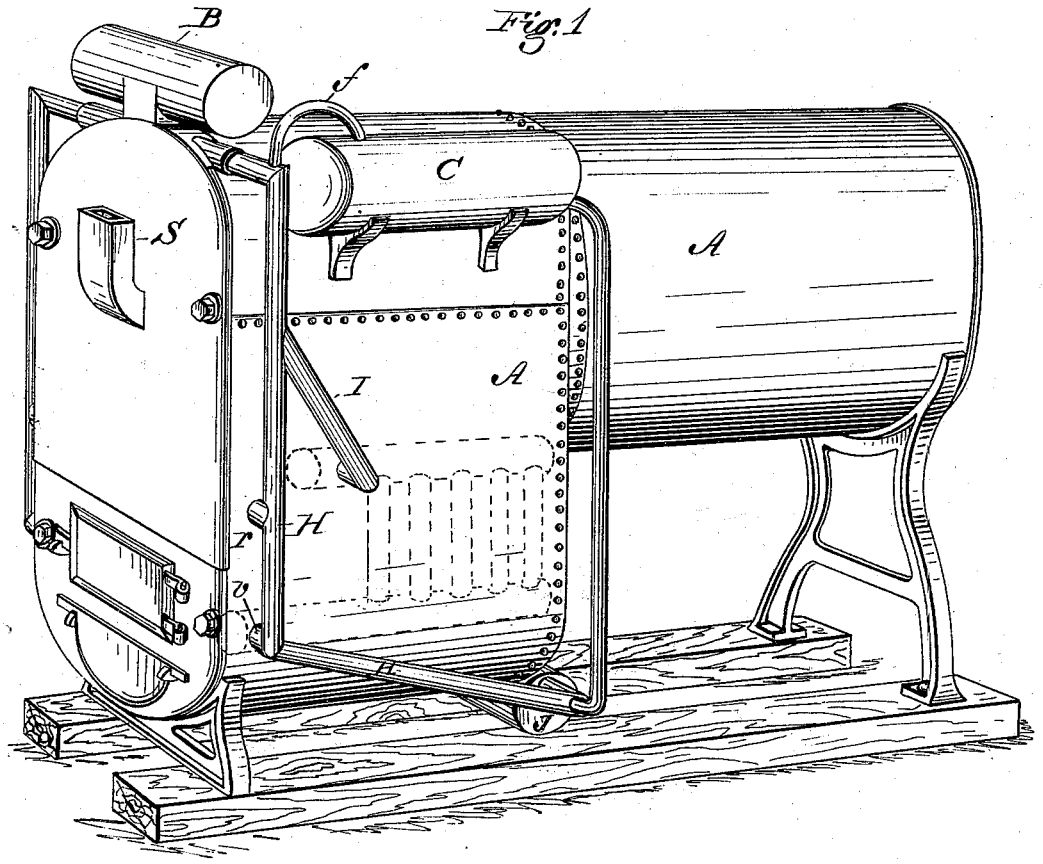
2 Sheets—Sheet 1.

V. D. ANDERSON.

SECTIONAL STEAM-BOILER.

No. 169,758. Patented Nov. 9, 1875.

Fig. 1



WITNESSES:
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2 Sheets—Sheet 2

V. D. ANDERSON.

SECTIONAL STEAM-BOILER.

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Fig. 2.

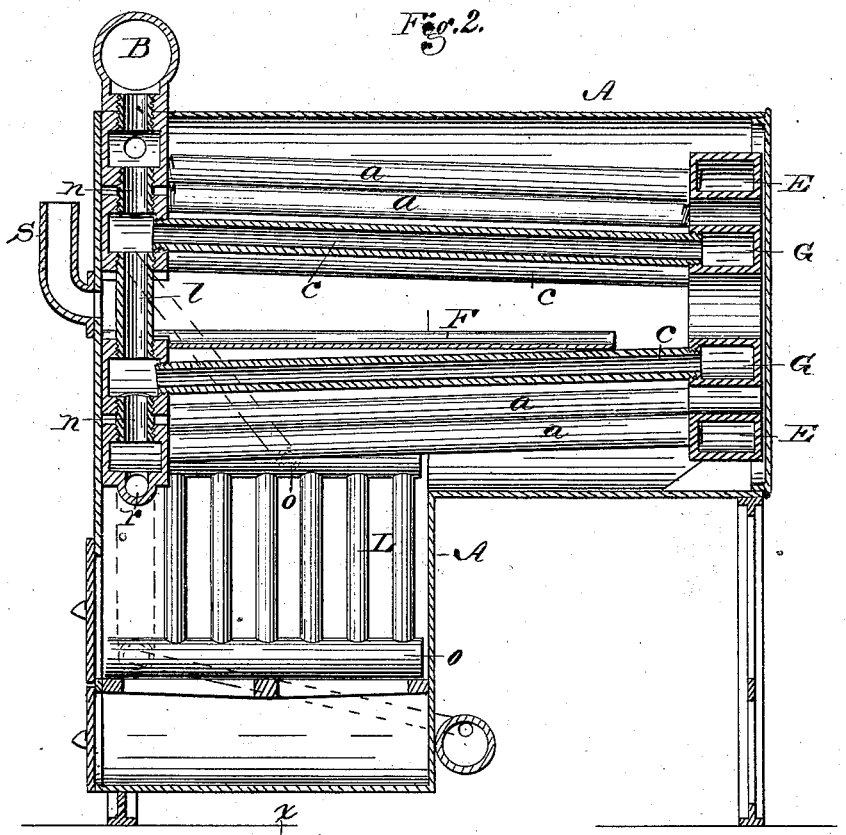


Fig. 3.

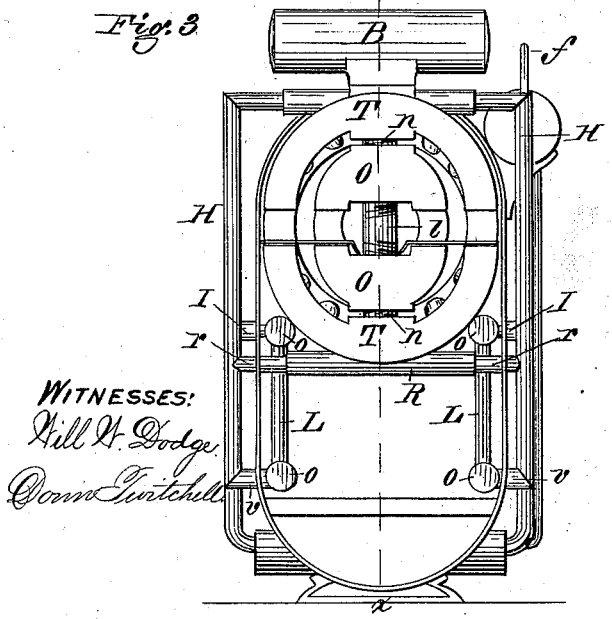
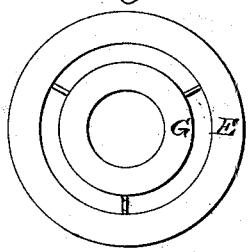


Fig. 4.



WITNESSES:
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INVENTOR:
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UNITED STATES PATENT OFFICE.

VALERIUS D. ANDERSON, OF SPRINGFIELD, OHIO.

IMPROVEMENT IN SECTIONAL STEAM-BOILERS.

Specification forming part of Letters Patent No. **169,758**, dated November 9, 1875; application filed October 20, 1875.

To all whom it may concern:

Be it known that I, VALERIUS D. ANDERSON, of Springfield, in the county of Clarke and State of Ohio, have invented certain Improvements in Steam-Boilers, of which the following is a specification:

My invention consists of a steam-boiler composed of two or more concentric rows of wrought-iron tubes of a small size, screwed at their rear ends into separate and concentric hollow cast-iron rings or heads, and at their front end into semicircular concentric heads connected to each other by short tubes; and, in connection with the above, it further consists in an arrangement of water-pipes at the sides of the fire-chamber, all as hereinafter more fully set forth.

Figure 1 is a perspective view of a portable boiler complete, ready for use. Fig. 2 is a longitudinal vertical section of the same; Fig. 3, a front-end view, with the case removed at the front; and Fig. 4 is a front elevation of the rear cast-iron heads, shown detached.

In constructing my improved boiler I provide two cast-iron rings or heads, G and E, (shown detached in Fig. 4,) they being made of such a size as to fit one within the other, with a space between, as shown. I then provide two pairs of semicircular heads, T and O, of somewhat larger size, as shown in Fig. 3, both sets of heads being provided on one face with screw-holes to receive the ends of the small wrought-iron tubes *a* and *c*, which are provided with a right-hand thread at one end, and a left-hand thread at their opposite end, and are screwed therein, as shown in Fig. 2, these tubes thus forming two concentric rows, placed equidistant all around. The front heads O are united to each other by a central tube, *l*, and to the outer heads T by a short tube, *n*, both above and below, as represented in Figs. 2 and 3. As the front heads form circles somewhat larger than those at the rear, the tubes *a* and *c* are somewhat inclined, as shown in Fig. 2, thus facilitating the circulation of the water, and the disengagement of the steam therefrom. A steam-chest, B, is arranged over the front, and is connected to the front head T, so as to receive the steam therefrom. Within the fire-chamber, at each side, I arrange a series of perpendicular tubes, L, which are connected at top and bottom with a horizontal tube, *o*, as represented in Figs. 2 and 3, and by dotted lines in Fig. 1. The lower tube *o* is connected by a short pipe, *v*, which extends out through the case to the feed-pipes H, to admit the water, while the upper pipe *o* is connected by an inclined pipe, I, to the upper portion of pipe H, to permit the steam to ascend into the upper front head T, as shown in Fig. 1. As shown in Fig. 3, the lower front head T has a tube, R, cast thereon, and which is connected by tubes *r* at each side to the feed-pipes H. C represents the tank containing the feed-water, from which it is fed automatically through the mud-drum J, and from thence, through pipes H, into the boiler, the flow of the water being regulated by the admission of steam through pipe *f*, this feed-water apparatus being more fully described in my Patent No. 168,077, dated September 28, 1875.

The boiler thus constructed is provided with a case, A, as shown in Fig. 1, which has a smoke-flue, S, opening out at its front end, as shown in Figs. 1 and 2. Within the boiler I arrange a diaphragm, F, as shown in Fig. 2, which extends from side to side, and reaches from the front to near the rear end, thus causing the flame and heat, as it ascends from the fire-chamber, to pass backward along and among the lower half of the tubes, and thence up around and along the upper half of the tubes, and finally escaping at the smoke-flue S at the front.

By this method of construction I am enabled to make a very simple, efficient, and compact boiler—one that generates steam with great rapidity, and in which the fuel is utilized to great advantage.

The cast-iron heads may be made very strong without materially detracting from its steam-generating capacity, as the great bulk of the boiler is composed of the wrought-iron tubes, which, being small in diameter, present a large heating-surface in proportion to the amount of water they contain, and as these tubes are very strong, there is little or no danger of bursting.

It is obvious that more than two sets of

heads and tubes may be thus arranged, if desired, and that the tubes may be of any desired length.

Having thus described my invention, what I claim is—

1. A steam-boiler composed of a series of wrought-iron tubes, united at their opposite ends to concentric cast-iron heads, substantially as shown and described.

2. In combination with the circularly-arranged series of tubes and their heads, as described, the series of tubes L O, arranged at opposite sides of the fire-chamber, as set forth.

3. The semicircular cast-iron heads T O, united by the tubes *l n*, for use in steam-boilers, as set forth.

4. The circular and concentric heads G E, two or more in number, for use in boilers, as described.

VALERIUS D. ANDERSON.

Witnesses:
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W. S. GRIM.