(No Model.)

W. T. DAVIS.

STEAM BOILER.

No. 344,253. Patented June 22, 1886.

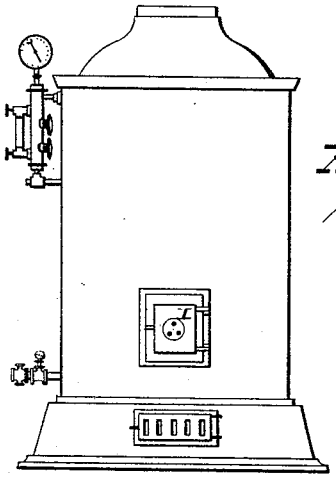


Fig. 1.

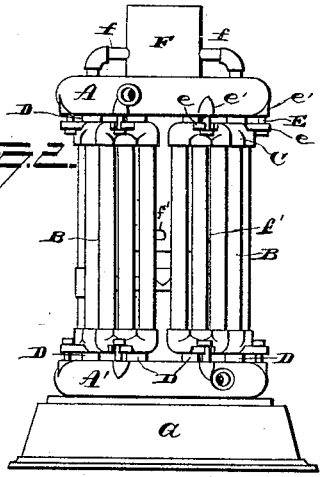


Fig. 2.

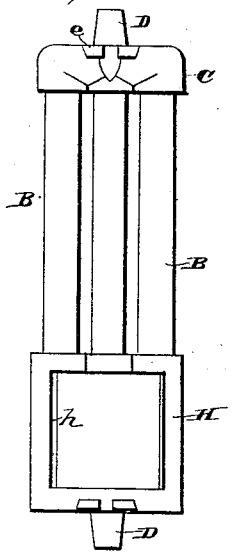


Fig. 3.

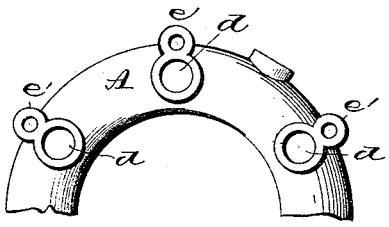
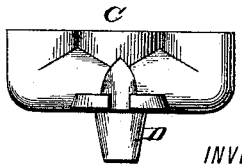


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM T. DAVIS, OF BATTLE CREEK, MICHIGAN.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 344,253, dated June 22, 1886.

Application filed October 22, 1885. Serial No. 180,602. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. DAVIS, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in steam-boilers. The object is to provide a boiler in which there shall be a great area of exposed water-heating surface in proportion to the amount of water capacity, and which will afford a rapid circulation of water throughout its entire capacity, thereby securing economy in fuel, and at the same time be capable of generating steam quickly. A further object is to provide a boiler which shall be capable of being taken apart and set up with little trouble, and which shall be quite inexpensive and durable.

With these ends in view my invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a front view of the boiler as it appears in use. Fig. 2 is a view with casing removed. Fig. 3 is a view of the tube-section in which the door is located, and Fig. 4 is an enlarged detached view of a portion of one of the rings and the coupling for uniting a set of tubes thereto.

A and A′ represent, respectively, an upper and a lower hollow ring, connected by a series of upright tubes, B. The tubes B are connected by end couplings, C, into groups of two or more, and are attached to the rings A A′ by means of tapering nipples or tenons D, which are adapted to enter sockets *d*, formed in the rings. The couplings C are further secured to the rings by means of screw-bolts E, which extend through perforated lugs *e* on the couplings and perforated lugs *e′* on the rings. The nipples D might also be formed separately, and be provided with right and left hand screw-threads adapted to engage threaded sockets in both the rings and couplings; but it is found preferable to construct them as above stated, especially so since it is both cheaper and admits of the use of a flexible washer being inserted between the coupling and the ring, which, in conjunction with flexible packing on the bolt E, would admit of a slight expansion and contraction of the parts without straining or warping them.

F is a cylindrical-shaped steam-dome and water-chamber located centrally within the upper ring, A, its upper end extending above the ring, and its lower end extending downwardly to a point at or near the top of the fire-pot; or it may be constructed to form the top of the fire-pot. The upper portion of the cylinder F is connected with the upper ring, A, by means of branch pipes *f*, and the lower portion of said cylinder is connected with one or more of the tubes B by branch pipes *f′*.

The fire-pot is located within the lower ring, A′, the grate resting upon suitable supports in or nearly in a plane with the upper face of the base G.

The door which opens to the fire-pot is provided for as follows: A section consisting of three of the tubes B (more or less) is constructed with a drum, H, at its base, the middle portion of which is provided with an opening, *h*, preferably rectangular-shaped to receive a door, I. The tubes B, which form a part of the section in which the door is formed, are cut short and enter the upper portion of the drum, to which they are firmly secured. The water has a free circulation entirely around the opening for the door, and the lower end of the door-section is connected with the lower ring, A′, by a nipple or tenon, D, in the same manner as the other tube-sections are.

It will be observed that the above construction admits of a perfect circulation from the central water-chamber throughout the series of tubes and the rings, that the tubes, rings, and central chamber are exposed to the heat and flame which surrounds them in its upward passage, and that the whole is of simple construction and capable of being readily taken apart for cleaning or for packing. The tubes may, however, be permanently secured to the rings, if such construction is for any purpose found desirable, and other slight changes might be resorted to in the form and arrangement of the several parts described without departing from the spirit and scope of my in-

vention. Hence I do not wish to limit myself strictly to the construction herein set forth; but,

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

1. In a steam-boiler, the combination, with the hollow rings connected by a series of upright tubes, of a steam-dome and water-chamber located centrally within the upper ring and series of tubes, substantially as set forth.

2. In a steam-boiler, the combination, with the hollow rings connected by a series of upright tubes, of the steam-dome and water-chamber located within the upper ring and the series of tubes, and connected at its upper end with the upper ring and at its lower end with the tubes, substantially as set forth.

3. The combination, with an upper and a lower hollow ring, of a series of tubes connecting the rings, the tubes being united into sections of two or more by end couplings, means for securing the couplings to the rings in removable adjustment, and a steam-dome located centrally within the ring and series of tubes, substantially as set forth.

4. The combination, with the hollow rings and the tubes, of tube-couplings provided with tapering nipples or tenons adapted to enter sockets in the rings, and bolts adapted to engage perforated lugs on the couplings and on the rings, for securing the tubes and rings together, substantially as set forth.

5. The combination, with the hollow rings, the tubes coupled in sections of two or more and connecting the rings in a serial form around the fire-pot, and the steam-dome and water-chamber located centrally within the upper ring and series of tubes, of a drum adapted to form the lower portion of one of the tube-sections, and provided with an opening for gaining access to the fire-pot, substantially as set forth.

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

WILLIAM T. DAVIS.

Witnesses:
W. F. BAXTER,
C. C. PEAVEY.