E. T. GIFFORD & S. W. PYLE.

Steam Boiler and Heater.

No. 203,725. Patented May 14, 1878.

Fig. 1.

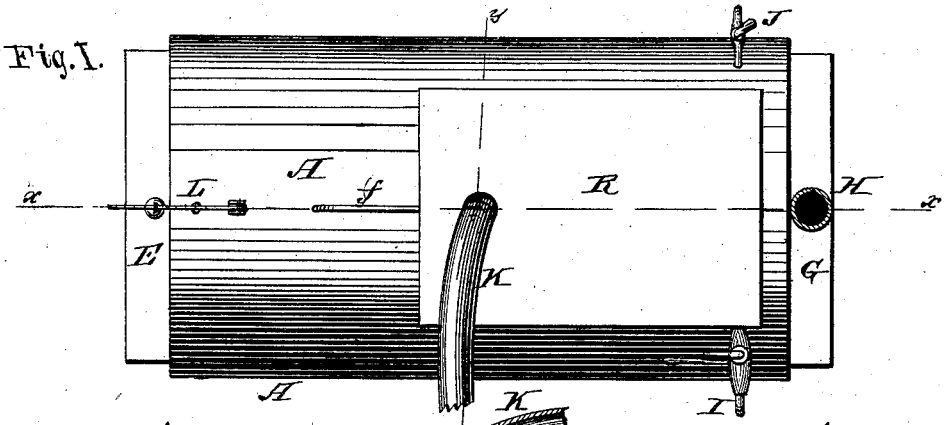


Fig. 2.

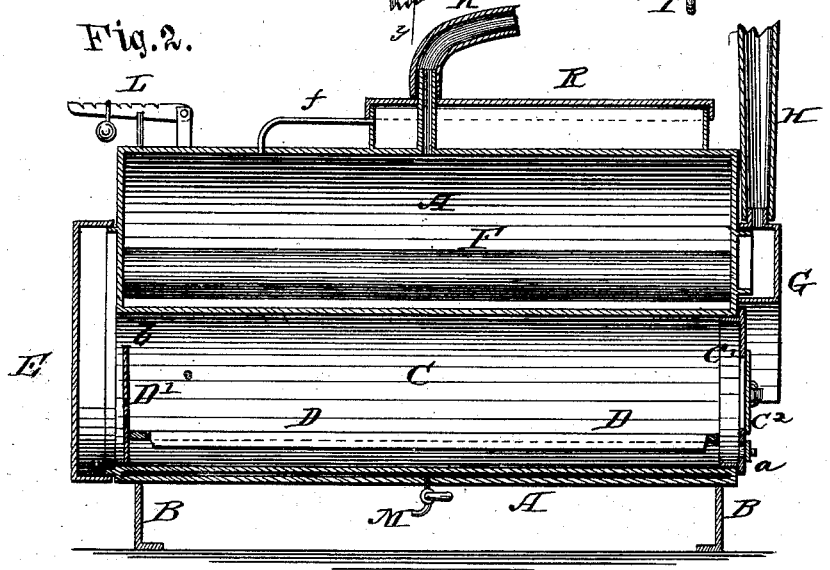


Fig. 3.

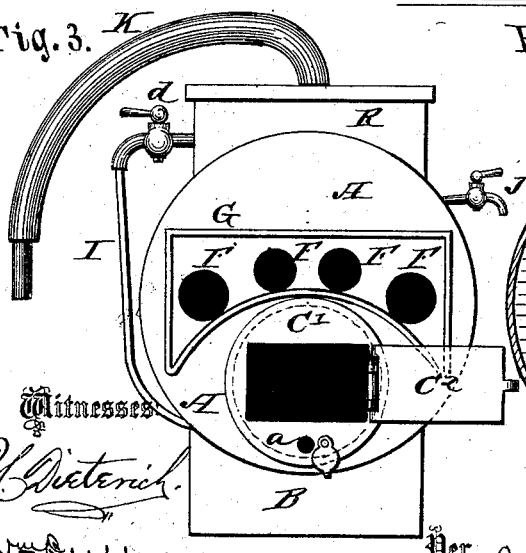
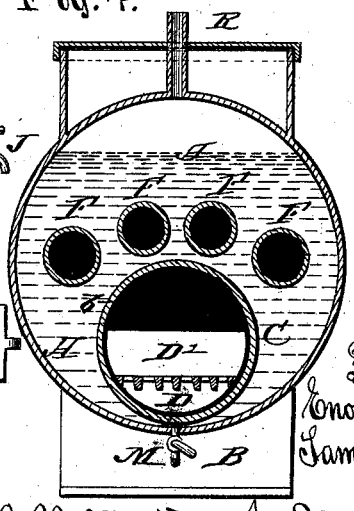


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

ENOCH T. GIFFORD AND SAMUEL W. PYLE, OF IOWA FALLS, IOWA.

IMPROVEMENT IN STEAM BOILERS AND HEATERS.

Specification forming part of Letters Patent No. **203,725**, dated May 14, 1878; application filed March 6, 1878.

To all whom it may concern:

Be it known that we, ENOCH T. GIFFORD and SAMUEL W. PYLE, of Iowa Falls, in the county of Hardin and State of Iowa, have invented certain new and useful Improvements in Steam Boilers and Heaters; and we do hereby declare that the following is a full, clear, and exact description of our invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The nature of our invention consists in the construction and arrangement of a steam-boiler and feed-water heater, as will be hereinafter more fully set forth.

In the annexed drawing, which fully illustrates our invention, Figure 1 is a plan view of our invention. Fig. 2 is a longitudinal vertical section of the same through the line *x x*, Fig. 1. Fig. 3 is a front elevation thereof; and Fig. 4 is a transverse vertical section through the line *y y*, Fig. 1.

A represents the boiler, made in cylindrical form, and supported in horizontal position by feet B B, or other suitable or convenient means.

Within the boiler is the cylindrical fire-box C, extending the entire length of the boiler, and opening through the heads of the boiler. The fire-box is so arranged as to be entirely surrounded by water. At the front end it is provided with a head, C^1, having a door, C^2, and a draft-register, *a*.

D is the grate, extending the entire length of the fire-box, and provided at its rear end with a plate, D′, extending upward and leaving only a small aperture, *b*, at the top. Through this aperture the smoke and heat pass into a chamber, E, at the rear end of the boiler, and from this chamber they pass, through a series of flues, F, through the entire length of the boiler to a chamber, G, at the front end thereof, and from this latter chamber out through the smoke-pipe H.

By having the fire-box entirely surrounded by water, and the return-flues F combined therewith, a very great amount of heating-surface is obtained, thus enabling the boiler to generate steam very quickly and with the smallest possible amount of fuel.

On top of the boiler is a reservoir, R, the bottom of which forms the top of the boiler, or vice versa, and connected by a pipe, I, with stop-cock *d*, with the bottom of the boiler. This reservoir is first filled by removing the cap, or by means of a force-pump. The boiler is then filled from the reservoir by opening the stop-cock *d* in the feed-pipe I, the water entering the boiler at the bottom near the front end, and is allowed to rise to the lower water-gage J.

Steam is used through rubber hose or pipe K, passing through the water-reservoir into any tank or vessel, or to any engine which may be attached. A small jet of steam is thrown through a pipe, *f*, into the top of the reservoir, to balance the pressure of steam in the boiler and make an even feed into the boiler.

L is a safety-valve; and M, blow-off cock.

In a full-sized boiler the reservoir R will be made to surround the smoke-pipe H, so as to utilize the heat from the same, also to heat the water in the reservoir.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The combination of a steam-boiler provided with a furnace and flame-chamber its entire length, and with return smoke boxes and flues, with a feed-water heater resting upon the top of the boiler, so that the top of the boiler forms the bottom of the heater, with its accompanying pipes, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

ENOCH T. GIFFORD.
SAMUEL W. PYLE.

Witnesses:
O. W. GARRISON,
I. BIGGS.