E. B. BENNETT.

Feed-Water Heater.

No. 161,587. Patented April 6, 1875.

Fig. 1.

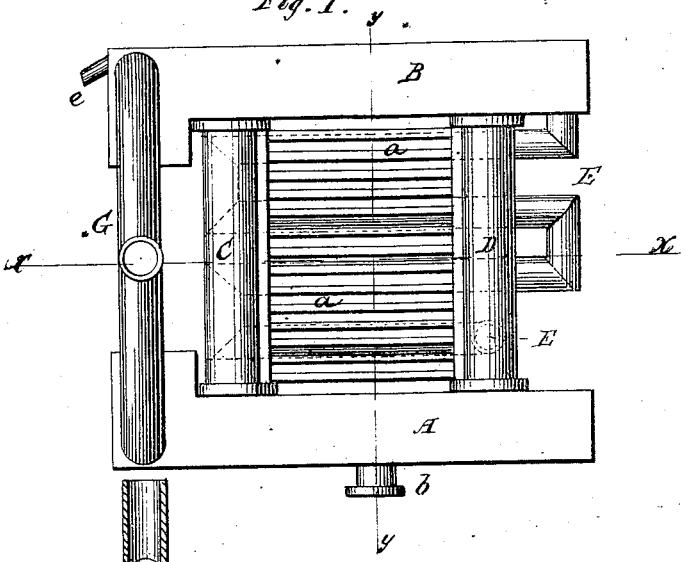


Fig. 2.

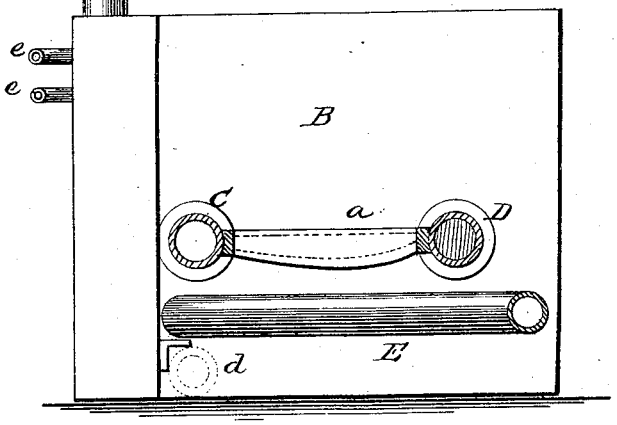
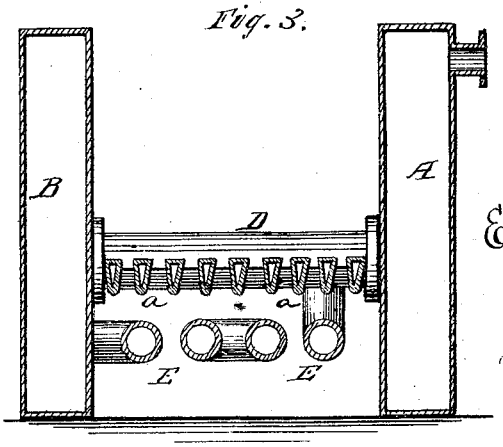


Fig. 3.



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UNITED STATES PATENT OFFICE.

EZRA B. BENNETT, OF ST. JOHNSBURY, VERMONT.

IMPROVEMENT IN FEED-WATER HEATERS.

Specification forming part of Letters Patent No. **161,587**, dated April 6, 1875; application filed March 3, 1875.

To all whom it may concern:

Be it known that I, EZRA B. BENNETT, of St. Johnsbury, in the county of Caledonia and State of Vermont, have invented certain new and useful Improvements in Feed-Water Heaters; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains 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 my invention consists in the construction and arrangement of a feed-water heater for stationary steam-boilers to supply the boiler with hot water at a great saving of fuel, as will be hereinafter more fully set forth.

In the annexed drawing, Figure 1 is a plan view of a device embodying my invention. Fig. 2 is a vertical section on line *x x*, Fig. 1; and Fig. 3 is a section on line *y y* of Fig. 1.

A represents the right-side wall and B the left-side wall of the heater, both being made hollow and of any suitable dimensions. Between these two walls, and firmly attached thereto, are two hollow pipes, C and D, connected by means of hollow grate-bars *a a*. The rear pipe D is closed at both ends; or, in other words, does not communicate with the interior of either side wall. The front pipe C communicates with the right-side wall A, but not with the left wall B. From the rear pipe D, near the wall A, a pipe, E, extends downward into the ash-pit for a suitable distance, and then runs forward and backward, forming a tortuous pipe the entire length and width of the ash-pit, and at last communicates with the left-side wall B at the bottom, near the rear end. The water enters the right-side wall A through a pipe, *b*, near the top, and passes, after rising a certain height, into the pipe C, and from thence, through the hollow grate-bars *a a*, into the pipe D; and from this latter pipe it passes through the tortuous pipe E into the left-side wall B. From this side wall it is pumped into the boiler through a pipe attached at *d*. The water during its passage, as described, being exposed to the large heating-surface, becomes hot, so that a less amount of fuel is required to convert it into steam, the same fuel being used as for heating the water, as the heater sits under the boiler, and is inclosed by suitable brick-work. In the front of the left-side wall B are pipes *e e* for the attachment of a water-gage or gage-cocks. The two side walls are connected at or near the front by a pipe, G, which runs perpendicularly up from one wall, then horizontally across and perpendicularly down to the other side wall, forming a safety-pipe to equalize any pressure that might come in the walls by the generation of steam therein, said pipe G being, in the center, provided with a safety-valve for that purpose.

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

The combination of the hollow side walls A B, connecting-pipe C, closed at one end, connecting-pipe D, closed at both ends, and the hollow grate-bars *a a*, connecting the two pipes C D, substantially as herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

EZRA B. BENNETT.

Witnesses:

JOSEPH W. WEBSTER,

A. M. COOK.