S. W. FRANCE.

Feed-Water Heater for Steam-Boilers.

No. 164,826. Patented June 22, 1875.

Fig. 1.

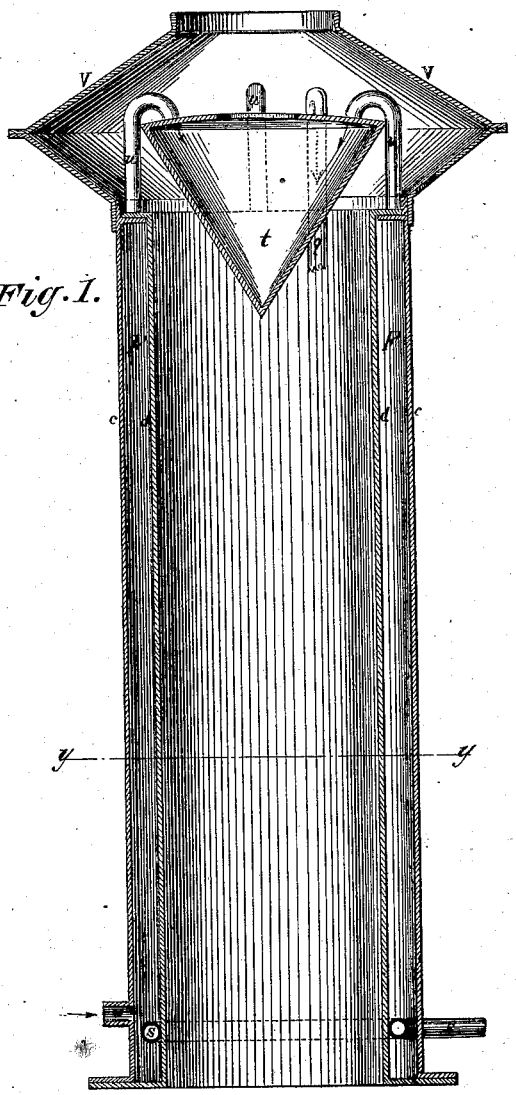
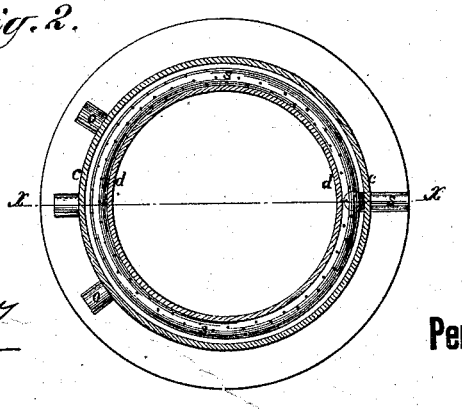


Fig. 2.



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UNITED STATES PATENT OFFICE.

SIMON W. FRANCE, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN FEED-WATER HEATERS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **164,826**, dated June 22, 1875; application filed August 27, 1873.

To all whom it may concern:

Be it known that I, SIMON W. FRANCE, of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Feed-Water Heaters for Steam-Boilers, for the purpose of economizing water and fuel; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing.

This invention relates to certain improvements in feed-water heaters for steam-boilers, its objects being to economize the waste heat escaping with the products of combustion from the furnace, and to separate the impurities that may collect or be deposited in the same from the water previously to conducting it to the boiler.

The invention consists, first, in a casing of boiler-iron or other material fitting over the smoke-stack of the furnace, and connected to the same at the bottom and top in such a manner as to form an annular water-jacket, which is connected with the water-supply reservoir at the bottom, and an inverted conical heater set over the top of the smoke-stack, from which the feed-water is conducted to the boiler by a suitable pipe, as hereinafter described; and, second, in the combination, with the annular water-jacket, of a perforated annular blow-off pipe, through which the sediment may be discharged from the said jacket by means of the pressure of the steam therein, as hereinafter more fully set forth.

In the drawing, Figure 1 represents a vertical section of my invention, and Fig. 2 a horizontal section of the same through line *y y* of Fig. 1.

The letter *d* represents the smoke-stack, and *c* the annular casing on the outside of the same, formed of boiler-iron or other material capable of resisting the pressure from within. Said stack *d* and casing *c* are united at the top and bottom by flanges, forming an annular water-jacket, F, into which the feed-water is admitted through the pipes *o o*.

Over the top of the smoke-stack *d*, and communicating with the annular chamber F by means of the pipes U U, is set an inverted conical heater, *t*, communicating with the boiler by means of a pipe, *q*. Said heater sets within the bonnet or hood V of the smoke-stack, and is elevated sufficiently above the end of said smoke-stack to leave an annular space for the escape of the products of combustion.

The pipe *q* is preferably extended on its way to the boiler through the smoke-stack *d*, for the purpose of economizing heat, although it may be extended down the outside of the same, if desired.

In the bottom of the annular space F is arranged a perforated annular pipe, S, extending through the outer wall *c*, and provided with a suitable valve or cock which may be opened to blow off any impurities or sediment that may collect in the bottom of the space F.

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

1. The combination of the casing *c* with the smoke-stack *d*, forming the feed-water space F, and the inverted conical heater *t*, setting over the end of the said smoke-stack in the bonnet or hood of the same, and communicating with the boiler by means of the pipe *q*, substantially as and for the purpose described.

2. In combination with the annular chamber F of the feed-water heater, the perforated pipe S, for the purpose of blowing off impurities or sediment, substantially as herein described.

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