J. C. STEAD.

Feed Water Heater.

No. 198,428. Patented Dec. 18, 1877.

Fig. 1.

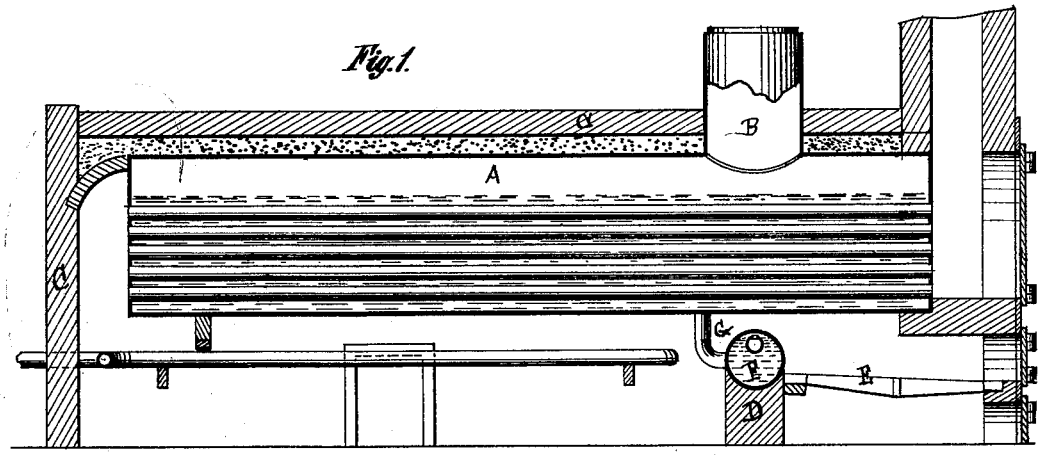


Fig 2.

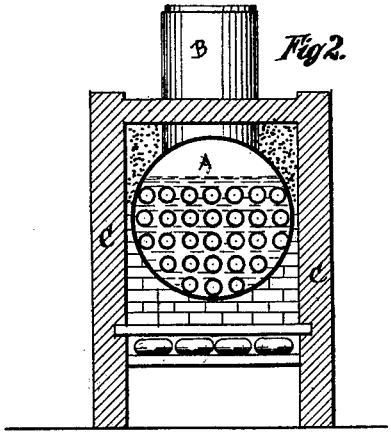
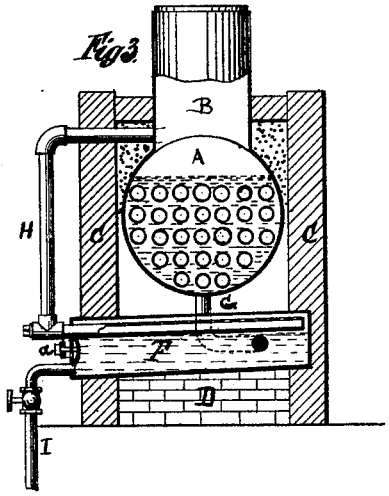


Fig 3.



Witnesses:

Linard V. Giegerich

Mortimer Clarke.

James Curtis Stead Inventor,

by atty, J. C. Clayton.

UNITED STATES PATENT OFFICE.

JAMES C. STEAD, OF GREEN POINT, NEW YORK.

IMPROVEMENT IN FEED-WATER HEATERS.

Specification forming part of Letters Patent No. **198,428**, dated December 18, 1877; application filed November 19, 1877.

To all whom it may concern:

Be it known that I, JAMES CURTIS STEAD, of Green Point, Kings county, State of New York, have invented a certain new and useful Bridge-Wall Steam Generator and Circulator for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification.

This invention is in the nature of an improvement upon the invention described in my Letters Patent dated March 21, 1876.

This invention is intended to be used either with or without the coil of pipes and construction described in my above-named Letters Patent.

There are many different ways in which my invention may be applied. The drawings illustrate one mode of its construction, which I have found to be of great value.

In the drawings, Figure 1 is a longitudinal section of an ordinary steam-boiler, with my invention applied in one simple practical manner, the "drum" being shown in cross-section, resting on the bridge-wall. Fig. 2 is a cross-section of the rear of the boiler. Fig. 3 is a cross-section of boiler and brick-work, showing a longitudinal section of the drum and its connections to the boiler.

A is the ordinary steam-boiler, having the usual steam-dome B; C, the masonry surrounding and supporting the boiler; D, the bridge-wall; E, the grate-bars; F, the drum or cylinder, which may be about one-fifth to one-fourth the diameter of the boiler. It should be placed under and transversely to the boiler, on or near the bridge-wall, and virtually forming the bridge-wall just at the end of the grate-bars, so as to get the full benefit of the heat as it passes to the rear.

One end of the drum may be lower than the other to allow drainage; but this is not essential. The drum is here shown built into the side walls of the masonry; but it may be otherwise arranged.

The drawings are intended to show a drum about fifteen inches in diameter, used in connection with a boiler about four feet in diameter.

a is a hand-hole at one end of the drum, so that it may be readily cleaned out. G is a pipe from the bottom of the boiler into the drum F, and is the water-way between the drum and boiler. Its diameter in this drawing is about one and one-half inch, and should be sufficient to make a good water-circulation between the boiler and the drum. H is the steam-pipe, about two inches in diameter, one end of which discharges steam into the steam-space of the boiler. The other end of pipe H enters at or near one end of the drum F, and extends through to its other end, being about an inch or two only from the upper surface of the drum. The whole upper surface of that part of this pipe H which is contained within the drum is provided with a series of holes for the escape of steam from the upper part of the drum, through pipe H, into steam-space of the boiler. I is the blow-off pipe.

In operating my invention, water is pumped into the boiler, and passes, through pipe G, into the drum F. The action of the fire heats, more or less, the water both in the boiler and in the drum; but as the drum is so much more exposed to the fire, its water is much more rapidly heated and converted into steam than the water of the boiler, so that when the apparatus is at work steam will rapidly form in the upper part of the drum, and enter the pipe H through its perforations, the whole length of the same, and pass as live steam into the steam-space of the boiler, to mingle with the steam produced in the same.

This construction insures a constant circulation through the boiler, drum, and pipes, the water passing downward from the boiler into the drum, and the steam passing upward from the drum, through pipe H, into the dome B or steam-space of boiler.

Experience has demonstrated that this construction enables one to generate steam much quicker, and at less expense of fuel, than by any other construction known to me. The drum F also serves to collect the dirt and scale

from the boiler, which is torn off or loosened by the rapid circulation, and is then more easily cleaned than the boiler.

I do not claim, broadly, a drum connected under a boiler by a water-pipe, for that is old; but

What I do claim is—

The drum F, connected to the bottom of the boiler by pipe G, and connected to the steam-space of the boiler by perforated pipe H, partly located within said drum, constructed and operating in combination with a steam-boiler, substantially as set forth.

JAMES C. STEAD.

Witnesses:
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ROBT. SEAMAN.