2 Sheets—Sheet 1

J. J. RALYA.
Feed-Water Heater.

No. 206,133. **Patented July 16, 1878.**

Fig. 1.

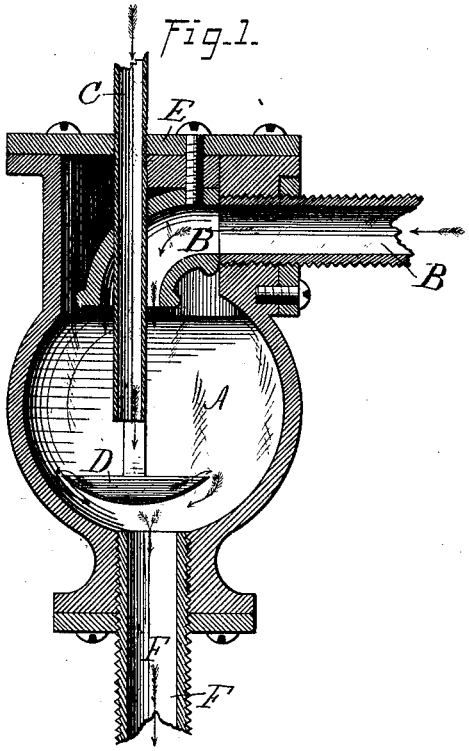
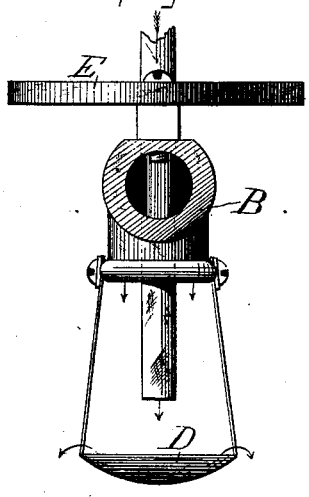


Fig. 2.



WITNESSES:
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Jenn. Halsted

INVENTOR.
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by John J. Halsted
his Atty.

2 Sheets—Sheet 2.

J. J. RALYA.

Feed-Water Heater.

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Fig. 3.

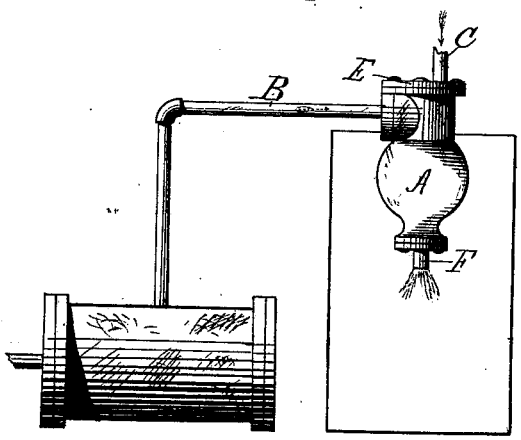


Fig. 4.

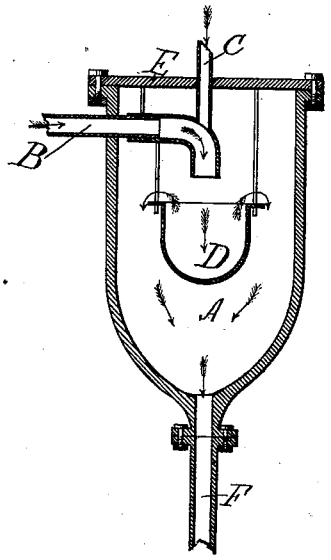
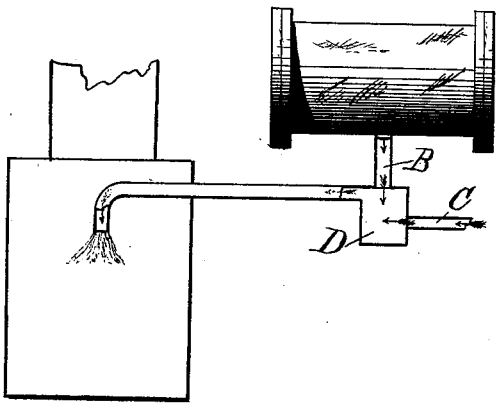


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN J. RALYA, OF CLEVELAND, OHIO.

IMPROVEMENT IN FEED-WATER HEATERS.

Specification forming part of Letters Patent No. **206,133**, dated July 16, 1878; application filed June 17, 1878.

To all whom it may concern:

Be it known that I, JOHN J. RALYA, of Cleveland, in the county of Cuyahoga and State of Ohio, 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My present invention is an improvement upon that shown in the Patent No. 203,646, granted to me May 14, 1878.

In that patent a perforated tube was employed, and through these perforations cold water was discharged in fine streams into the exhaust-steam pipe for the purpose of condensing the steam, the steam at the same time heating the water thus intermingled with it, and thus affording a supply of heated feed-water for the boiler.

In my present construction, instead of using a tube having a closed end, and with numerous fine orifices in such end or sides, or both, I employ an ordinary open-ended tube for the water, and produce a complete breaking up of this stream of water into infinitely small particles by blowing it into very fine spray and thoroughly intermingling it with the steam, by means of the powerful blast of the exhaust-steam, in the manner and by means which I shall now proceed to describe.

In the drawings, Figure 1 is a vertical section of an apparatus embodying my invention; Fig. 2, an elevation showing the cover and the parts attached thereto. Fig. 3 shows the improvement applied to a tank, placed in an elevated position instead of below the engine.

A is a chamber, into which both the exhaust-pipe B and the cold-water pipe C discharge, both these pipes being entirely open at their exit ends or mouths, and the pipe C is much the smaller in its bore, and enters the pipe B, and may, as seen in figure, project beyond it within the chamber.

Directly opposite the discharging-mouth of the exhaust-steam pipe is a pocket or cup, D, into or against the wall or body of which the steam strikes directly with all its force, and in so doing it has the effect to drive the water outwardly in every direction into the smallest possible particles, thus heating it thoroughly.

In this respect the action differs essentially from all other modes known to me, and in which the water has been, by means of the perforations in the water-pipe, first divided or formed into a sort of spray, or into a limited number of small streams, before coming into contact with the exhaust-steam, while in my present mode the stream is not divided at all until it is acted upon by the exhaust-current.

It will be seen that both currents—viz., the steam and the water currents—are suddenly and positively arrested by the pocket, and that there is no escape from a close intermingling, and that there is a rebound to each upon its striking the pocket, while the superior force and greater velocity of the steam must drive the water in every direction in which its course is not positively impeded by some solid barrier.

The pocket may be of various forms and applied in any convenient manner, and may, in some instances, form a part of the chamber into which the pipes discharge.

In the construction shown in Figs. 1 and 2 it is shaped somewhat like a saucer; but it may be deeper or more concave, as desired; and I have shown it as hung upon arms connected to the outlet end of the exhaust-pipe; but it may be suspended on rods or stays fastened to the cap E of the chamber A.

I have also shown the construction to be such that when the cap E is removed the pocket and the water-pipe and exhaust-pipe, or those portions of them which are connected to the cap, shall come out with it, thus affording the greatest facility for any repairs, adjustments, or cleansing that may be needed.

It will now be observed that I entirely avoid all small holes, which are constantly liable to get clogged or filled up, and therefore to lessen proportionately the efficiency of the apparatus, and which, when so clogged, are not likely to be brought to the notice of the attendant, as they are beyond his vision; and if discovered, it would be quite impracticable to keep them continually unobstructed, as very slight impurities in the water must constantly tend to close them up again.

The apparatus is very simple, and in practice is found to be exceedingly effective and most thorough in its work.

It will be understood that the outlet-passage F from the chamber is for the purpose of conveying the commingled steam and water toward the cistern or tank provided for it.

It is found that in many localities it is not convenient to sink cisterns and water-purifying apparatus below the level of the ground, in connection with feed-water heaters, as the same have heretofore been constructed; but my present invention can be readily applied to any existing exhaust-pipe, and any kind of a tank can be used, located anywhere, and lower or higher than the engine, as may be convenient, the point or position in the exhaust-pipe at which the device is to be attached being determined by the attendant circumstances.

While, as a rule, it is better to locate it near the engine, yet my device will render almost as good service even if located twenty or thirty feet distant from it.

If the tank or cistern be below the level of the engine, it can be set ordinarily next to the cylinder, and if the tank be placed in an elevated position, then it can be located near the exit end of the exhaust, where it enters the tank, as shown in Fig. 3.

Figs. 4 and 5 show modifications in the form of the pocket and in the relative positions of the pipes.

By my invention the cold water is heated exceedingly hot, and at the same time just as much condensation takes place as with a perforated tube and its spray.

I claim—

1. In combination with the exhaust-steam pipe B, the open-ended water-supply pipe C, passing through the said exhaust-pipe, the chamber, and the cup or pocket D, constructed and arranged substantially as and for the purpose set forth.

2. The cover or cap E, having connected therewith portions of the exhaust-pipe B and of the water-pipe C, entering into the exhaust-pipe, and also the cup or pocket D, and whereby all these parts may be removed together, when constructed and arranged substantially as shown and described.

JOHN J. RALYA.

Witnesses:
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