J. Q. ADAMS.

FEED-WATER HEATERS FOR STEAM-BOILERS.

No. 184,129. Patented Nov. 7, 1876.

Fig. 1.

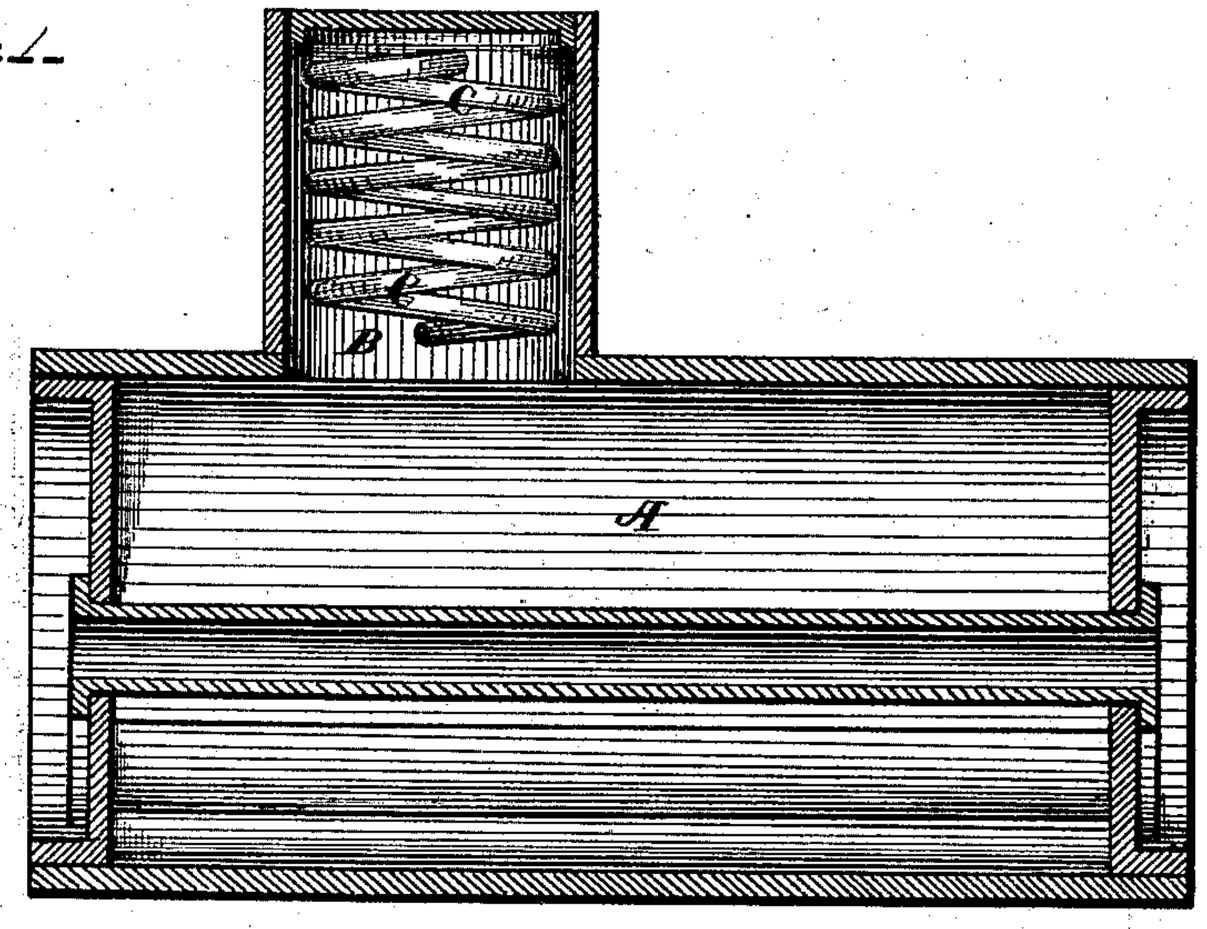
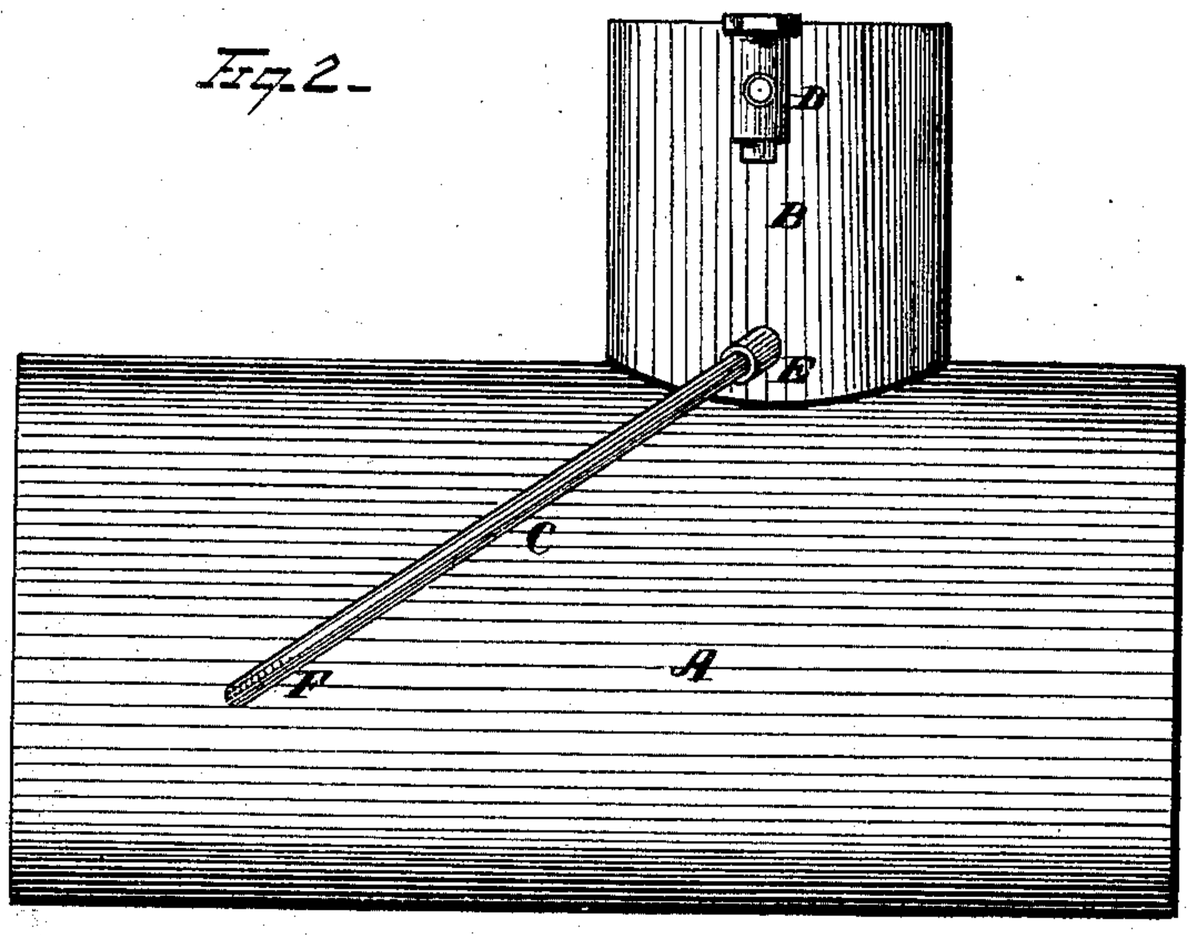


Fig. 2.



WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

JOHN Q. ADAMS, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF HIS RIGHT TO CYRUS P. DRYDEN, OF SAME PLACE.

IMPROVEMENT IN FEED-WATER HEATERS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **184,129**, dated November 7, 1876; application filed April 12, 1876.

To all whom it may concern:

Be it known that I, JOHN Q. ADAMS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Feed-Water Heaters for Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in feed-water heaters; and consists in passing the said water through a coil or length of pipe folded or coiled within the steam-dome of the boiler, and passing it thence through a conduit leading down either to the mud-pipe or to some point below the surface of the water in the boiler, and, preferably, to a point below the flues, though it may be admitted above the surface of the water in the boiler, if desired.

In the drawings, Figure 1 is a longitudinal central section of a boiler having the feed-water heater which is the subject of my invention. Fig. 2 is an external view of the boiler, showing the conduit-pipe leading from the heater to the point of admission to the boiler.

A is a boiler of any ordinary construction, the peculiar construction of the boiler forming no essential part of my invention. B is the steam-dome, from which the steam is fed over from the boiler to the engine. C is a pipe, through which the feed-water is fed to the boiler. This pipe leads from the water-supply, wherever it may be—whether that source be a reservoir or the ordinary service water-pipes of the city water-works, or any other source, matters not, and is not essential. The pipe passes into the steam-dome B, and is there coiled or folded or otherwise formed into considerable of a length, so as that the water, in passing through it, may become well heated while passing through the said pipe-coil in the steam-dome. This coil or worm is so located in the steam-dome that it shall not materially obstruct the passage of the steam through the dome to the cylinder, and so that the steam shall have perfectly free access to and contact with the said pipe. The lower end of the said pipe is then passed out of the steam-dome, and the feed-water is conducted down to the proper point for admission to the boiler. I prefer, if there is a mud-pipe attached to the boiler, to pass the end of this feed-water pipe into the end of the mud-pipe, so that any sediment or mineral impurities continued in the feed-water, and precipitated by the heat in passing through the steam-dome, may be deposited right in the mud-pipe, where it can be readily blown out through the mud-valve.

Of course it is not essential that the water should be admitted to the boiler as above, for it may be admitted at any point whatever, but preferably at some point below the water-line, and preferably below the flues. So, also, it is apparent that the method of coiling the pipe in the steam-dome may be varied to any extent, the object being to secure a considerable length in the steam-dome, so that the water shall become thoroughly heated. It is apparent, also, that the coil may be made separately, if desired, and be connected with the outside portions by suitable joints D and E. At D, or at E or at F, when the water is fed into the boiler, may be any suitable check-valve opening against the pressure from the boiler, so that the water from the boiler may be prevented from setting back through the feed-pipe C, and the water may be forced into the boiler in any of the usual ways, as, for instance, by a force-pump, or by the injector, or in any other way, these minor features forming no essential features of my invention, which consists, broadly, in the feed-water heater, consisting of a coil or length of feed-pipe located within the steam-dome, through which the water is passed and heated in the passage through the said steam-dome.

If, after long use, any stopper, by reason of sediment or incrustation, should occur in the coil, it can be very quickly removed and replaced at very slight expense. I find by experiment that the said pipe, in passing through and occupying a space within the steam-dome, does not by condensation cause any appreciable reduction of pressure in the boiler, the pumping of cold water through the said pipe

for several hours having caused no impression on the steam-gage. By this device the water is very quickly and thoroughly heated, and is delivered into the boiler at near the boiling temperature. It is apparent that the same means, by simply tapping the pipe C below the dome B, may serve to carry heated water to any place for use for any purpose, domestic or other, and the heat is imparted so rapidly, and without detriment to the pressure in the boiler, that the heater may be employed very economically for supplying heated water in large quantities where required for use. I propose, also, instead of coiling a pipe within the dome B, to employ instead thereof a casting in the form of a conduit, and exposing a great surface, similar to the surface exposure of a pipe, and connecting this in the same way with the outside pipes, as the coil is connected. It is apparent that such castings can be made simpler and with less expense than the pipe-coil can be made, but either style may be employed.

I am aware that it is not new to encircle a locomotive stack with feed-water pipes, and also to pass such pipes through the steam-space of a boiler; hence I do not claim, broadly, the combination of feed-water pipes with the steam-space of a boiler; but

What I claim is—

The combination of boiler A, dome B, and coiled pipe C, the whole constituting a device for heating feed-water and conveying it to a boiler, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN Q. ADAMS.

Witnesses:

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