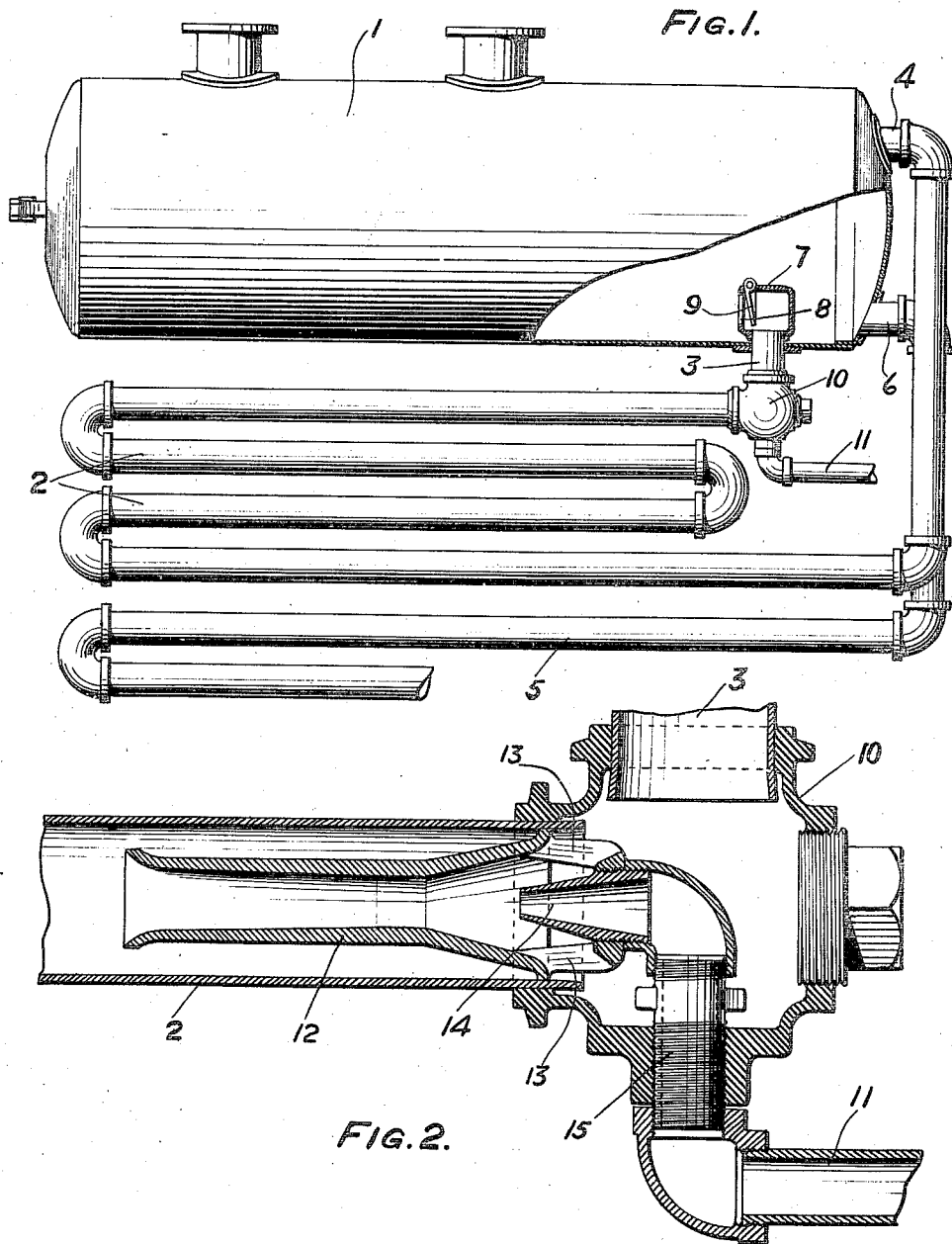


J. C. PARKER.
 FEED WATER HEATER FOR PREVENTING PITTING.
 APPLICATION FILED JAN. 13, 1909.

985,834.

Patented Mar. 7, 1911.



WITNESSES:

Robt. R. Kitchin
Geo. B. Denny Jr

INVENTOR

BY *John C. Parker*
Charles N. Butler
 ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN C. PARKER, OF PHILADELPHIA, PENNSYLVANIA.

FEE-WATER HEATER FOR PREVENTING PITTING.

985,834.

Specification of Letters Patent.

Patented Mar. 7, 1911.

Application filed January 13, 1909. Serial No. 472,058.

To all whom it may concern:

Be it known that I, JOHN C. PARKER, a citizen of the United States, residing in the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented Improvements in Feed-Water Heaters for Preventing Pitting.

In usual methods of introducing feed water, for the generation of steam, with waters containing certain chemical constituents which combine with iron, the tubes or other parts of the boiler are attacked and "pitted" injuriously. Particularly in the region of feed water heaters where the raw water at comparatively low temperatures is introduced, the pitting action is liable to be active. I have found that certain waters injurious to boilers when introduced in the usual way are not injurious when mixed with water that has been heated. It appears that the injurious constituents of the raw water, either by raising its temperature above a certain critical point or diluting it with water whose chemical constituents have been changed by boiling or by a combination of these conditions, are neutralized, so as to be non-injurious to feed water tubes or other parts of the boiler. Waters such as those of the Delaware River have been found, in my experiments, to be injurious in their "pitting" actions when introduced at a temperature of say less than 200 degrees F. and non-injurious when combined with heated water so that the mixture has a temperature above 240 degrees F.

It is my leading object to prevent the feed water from injuriously affecting the feed water heater or economizer, preferably by mixing with the "raw water," without permitting it to make contact with the metal of the economizer tubes, sufficient heated fluid to render neutral the otherwise injurious chemical constituents. I have satisfactorily accomplished this object by forcing a jet of "raw water" into the feed water tubes and drawing into the jet heated water from the boiler drum.

In practicing my invention I have successfully used the apparatus disclosed in the accompanying drawings and the following description thereof.

In the drawings, Figure 1 represents a sectional side elevation of apparatus embodying my improvements; and Fig. 2 is a sectional elevation representing details thereof.

My improvements, as represented in the drawings, are applied to a steam generator comprising the drum 1, the feed water tubes 2 having the inlet tube 3 and the outlet tube 4 connected with the drum, and the generator tubes 5 having the inlet tube 6 connected with the drum.

The inlet tube 3 has connected therewith, within the drum, a box 7 containing the port 8 and provided with the check valve 9 for preventing reverse flow through the port to the drum.

The junction box 10, which connects the uppermost feed water tube 2 with the inlet tube 3, has connected therewith a pipe 11.

The end of the upper tube 2 connected with the junction box has fitted therein an ejector comprising an outer nozzle 12, passages 13 leading from the passage 3 into the nozzle 12, and an inner nozzle 14 discharging from the pipe 11 into the nozzle 12, the jet from the nozzle 14 being within the fluid drawn into the nozzle 12 from the passages 13.

"Raw water," usually at a temperature of less than 200 degrees F., is forced through the pipe 11, conduit 15, nozzle 14 and nozzle 12 into the tube 2, and heated water at say 350 degrees F. is drawn from the drum through the tube 3, box 10, ports 13 and nozzle 12 into the tube 2, the raw water introduced being surrounded by the heated water from the drum and mingled therewith in the nozzle 12 for the purpose of raising the temperature of and diluting the water introduced to the feed water tubes to the desired degree.

The feed water can thus be brought to a condition such that the gases carried thereby do not attack the tubes while the amount of water drawn from the drum can be regulated by proportioning or setting the ejector so that no more will be used than is necessary.

Having described my invention, I claim:

1. The improvements for heating feed water for steam generators which comprises, in combination with a tube, a nozzle through which heated water is discharged into said tube, a second nozzle by which feed water is discharged into said tube through said nozzle first named, and means for conducting feed water to said second nozzle.

2. The improvements for heating feed water for steam generators which comprises, in combination with a drum and a tube connected therewith, a nozzle through which

heated water is discharged from said drum into said tube, a second nozzle by which feed water is discharged into said tube through said nozzle first named, and means for conducting feed water to said second nozzle.

3. The improvements for heating feed water for steam generators which comprises, in combination with a drum and a set of feed water tubes connected therewith, a nozzle through which water from said drum is discharged into said tubes, a second nozzle through which feed water is discharged into said tubes, one of said nozzles discharging through the other, and means for conducting feed water to said second nozzle.

4. The improvements for heating feed water for steam generators which comprises,

in combination with a steam and water drum and a set of feed water tubes connected therewith, a nozzle through which water from said drum is discharged into said tubes, a check valve for preventing reverse flow from said nozzle to said drum, a second nozzle for discharging feed water into said tubes through said nozzle first named, and means for conducting feed water to said second nozzle.

In witness whereof I have hereunto set my name this 11th day of January, 1909, in the presence of the subscribing witnesses.

JOHN C. PARKER.

Witnesses:

JOS. G. DENNY, Jr.

ROBERT JAMES EARLEY.