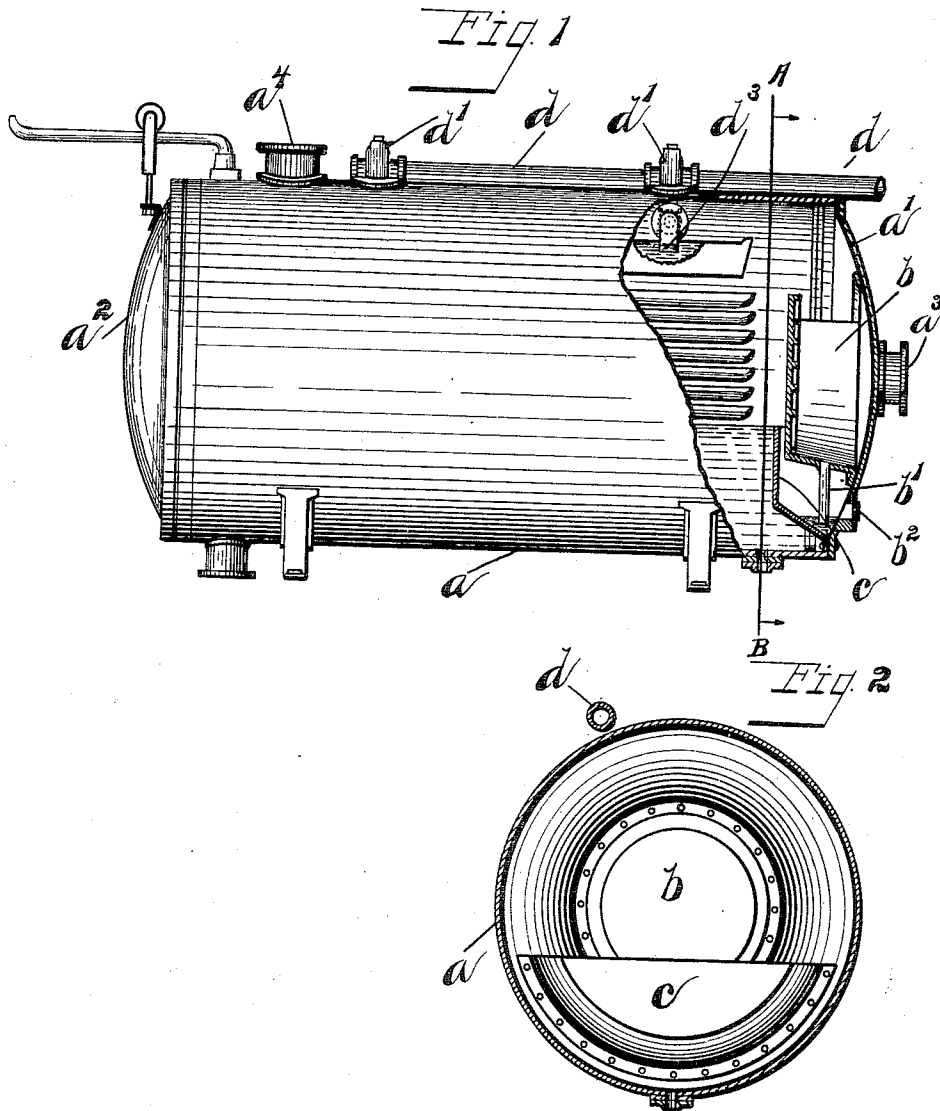


J. J. HOPPE.
 FEED WATER HEATER.
 APPLICATION FILED JULY 20, 1908.

995,349.

Patented June 13, 1911.



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Witnesses.

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FEED-WATER HEATER.

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To all whom it may concern:

Be it known that I, JOHN J. HOPPEs, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Feed-Water Heaters, of which the following is a specification.

This invention relates to improvements in feed-water heaters for steam boilers and particularly to that class of feed-water heaters in which the exhaust steam comes in direct contact with the feed-water and which are generally known as open feed-water heaters. In heaters of this class there is usually provided an oil separator for the purpose of separating the oil from the exhaust steam as it enters the heater or just before it enters the heater so as to prevent the oil from mixing with the feed water. This oil separator is sometimes located just within the heater in close proximity to the exhaust steam inlet and sometimes on the exterior of the heater. In the operation of these devices, however, it sometimes happens that the exhaust steam will carry some of the oil up over the top of the separator when it is located within the heater or in through the exhaust steam inlet when the separator is on the exterior of the heater.

The object of my invention is to provide means for preventing any such oil as may thus be carried with the exhaust steam from coming in contact with the feed water.

The invention consists in the constructions and combinations of parts hereinafter described and set forth in the claims.

In the accompanying drawings, Figure 1 is a side elevation, partly broken away and shown in section at one end, of a device embodying my invention. Fig. 2 is a vertical section on the line A—B of Fig. 1.

Like parts are represented by similar characters of reference in the several views.

In the said drawings, a represents the shell or casing of the heater, which is preferably of cylindrical form and provided at one end with a fixed head, a^1 , and at the other end with a removable head, a^2 , in the usual manner. Located in the fixed head is an inlet, a^3 , for the exhaust steam from the boiler and at the top of the opposite end of the casing is the outlet, a^4 , for the exhaust steam.

b represents the oil separator, located in the present case in the casing adjacent the

inlet, a^3 , so that the exhaust steam will pass through the same and out at the top, the separator acting in the usual way to separate the oil from the exhaust steam. The oil separator has at its bottom a drain-pipe, b^1 , and located in the fixed head near the bottom of this drain-pipe is an outlet, b^2 , to carry off the oil from the separator and also to carry off the excess feed-water in the manner hereinafter more fully described. The bottom of the drain-pipe is located some distance below this outlet, b^2 , to form a water seal to prevent the exhaust steam from escaping at this point.

Riveted to the end of the casing or to the fixed head thereof is an upwardly extending wall or dam, c , the upper edge of which extends up slightly beyond the point where it is desired to carry the feed-water in the heater, which point is preferably just below the lower troughs or pans which are arranged in two or more tiers in the usual way, and is also located a slight distance away from the wall of the oil separator. This dam or wall forms in effect two chambers in the bottom of the casing, a feed-water chamber and an oil chamber. The upper part of the casing is left entirely open from end to end and the outlet from the oil separator is located well in the upper part of the casing so that the circulation of the steam as it leaves the separator will be through the upper part of the casing among the pans and entirely above the oil chamber.

By this construction it will be seen that any oil which is carried up by the exhaust steam and caused to overflow the walls of the separator will run down the outer surface of the separator between it and the dam and thus be effectually prevented from mingling with the feed-water. Further, owing to the fact that the casing is left entirely open from end to end in its upper portion, with the outlet from the oil separator located in this upper portion of the casing, the circulation of the steam will be above the oil chamber and thus prevent the oil from following the circulation of the steam and creeping up the side of the dam and over the top thereof into the feed-water; it being well known that oil, when in the direct circulation of steam, has a tendency to creep up the walls of the chamber in which it is confined and follow the circulation of the steam. This wall or dam will also act to

prevent the feed-water from rising above a certain point in the heater in the event that the usual regulation should fail to operate properly, the over-flow of the water being discharged into the chamber under the separator and out through the outlet, b^2 , carrying with it the oil from the separator.

Having thus described my invention, I claim:

10 1. In a feed-water heater, a main casing, an exhaust steam supply, an oil separator located in said supply, and a dam for the feed-water in proximity to said supply, said dam forming an unobstructed open space or
15 chamber beneath said supply to receive the over-flow oil from said supply, substantially as specified.

2. In a feed-water heater, a main casing, an exhaust steam supply, an oil separator
20 located in said supply, and a dam for the feed-water in proximity to said supply adapted to form with said casing an unobstructed open space or chamber on the overflow side of said dam so that the overflow
25 oil from said supply will be received in said casing on the overflow side of said dam, substantially as specified.

3. In a feed-water heater, a main casing, an exhaust steam supply, an oil separator
30 located in said supply, and a dam for the feed-water extending upwardly from the bottom of said casing in proximity to said supply, said dam forming with said casing an open space or chamber beneath said supply, the top of which is unobstructed so that
35 the over-flow oil entering said supply will be received in said chamber and prevented from mingling with the feed-water, substantially as specified.

40 4. In a feed-water heater, a casing, a dam at one end of said casing extending sub-

stantially to or above the normal water line, an exhaust steam inlet at the dammed end of said casing, an oil separator adjacent said inlet, and an oil chamber in said casing beneath said oil separator formed by said dam and the casing, an unobstructed passageway leading to said chamber on the overflow side of said dam, said oil separator being located entirely on the overflow side of said dam
50 so that the over-flow oil therefrom will be deposited in said chamber and prevented from mingling with the feed-water, substantially as specified.

5. In a feed-water heater, a casing, a feed-water chamber located in the bottom of said casing, an oil chamber also located in the bottom of said casing having an outlet from said casing, and an oil separator open at the top located over said oil chamber and communicating therewith, the division wall between said chambers being removed from said separator to provide a passageway between the same, said wall terminating at substantially the normal water line of the
65 feed-water to permit the excess feed-water to overflow into said oil chamber, substantially as specified.

6. In a feed water heater, an outer casing, an exhaust steam supply, an oil separator
70 located in said supply, and a wall or partition located out of the path of the circulating steam for preventing the over-flow oil from said separator from mingling with the feed water in said casing, substantially as
75 specified.

In testimony whereof, I have hereunto set my hand this 15th day of July, 1908.

JOHN J. HOPPES

Witnesses:

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