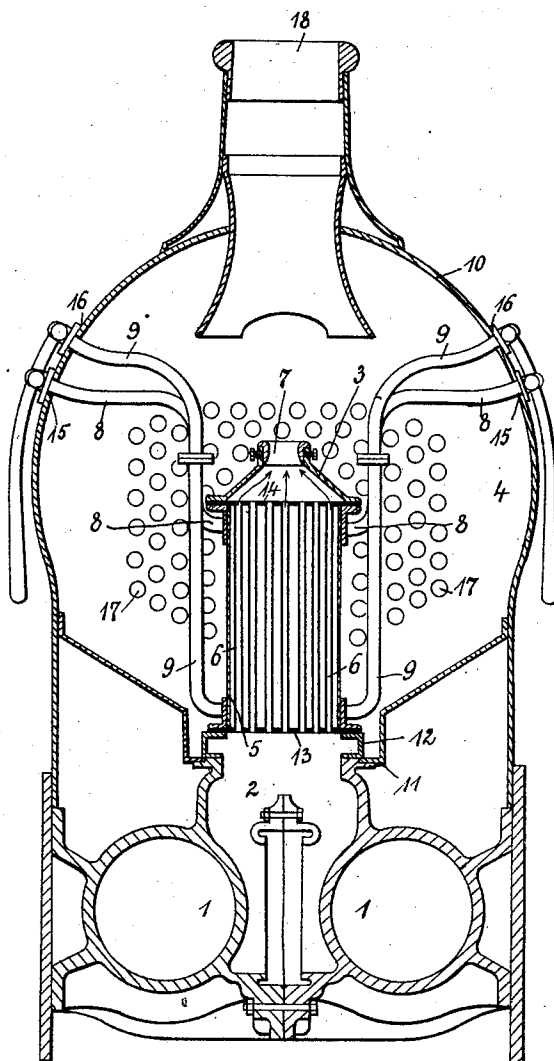


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 FEED WATER HEATER FOR LOCOMOTIVE BOILERS.
 APPLICATION FILED DEC. 9, 1911.

1,049,819.

Patented Jan. 7, 1913.



Witnesses
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UNITED STATES PATENT OFFICE.

ALFREDO DENNETT AND CIRILO DIDIER, OF SANTIAGO DE CHILE, CHILE.

FEED-WATER HEATER FOR LOCOMOTIVE-BOILERS.

1,049,819.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed December 9, 1911. Serial No. 664,905.

To all whom it may concern:

Be it known that we, ALFREDO DENNETT and CIRILO DIDIER, both citizens of the Republic of Chile, and residents of Santiago de Chile, in the Republic of Chile, have invented a new and useful Feed-Water Heater for Locomotive-Boilers, of which the following is a specification.

Our invention consists of a cylindrical feed-water heater for locomotives, which heater is disposed in the smoke box directly above the passage for the exhaust steam from the cylinders and is provided with a number of vertical tubes through which the exhaust steam is made to pass. On the top this heater is provided with a concentric conical hood for collecting the exhaust steam, which hood has a mouthpiece serving as a blast-pipe.

We will now proceed to describe our invention with reference to the accompanying drawing, which represents a vertical cross section through the smoke box, the chimney and the steam cylinders of a locomotive and shows the new feed-water heater in longitudinal section.

The two steam cylinders 1, 1 of any known construction have a common exhaust steam passage 2, which is disposed beneath the smoke box 4 of the locomotive in the vertical axis of the chimney 18. On the flange 11 of the exhaust steam passage 2 is disposed the new feed-water heater, which is shown to consist of a base 12, a flanged cylindrical vessel 5 with tube plates 13, 14 below and above and a number of vertical tubes 6, 6, and also of a concentric conical hood 3. The vessel 5 is to be connected in any known manner with two inlet tubes 8, 8 above and two outlet tubes 9, 9 below. The four tubes 8, 9 pass through suitable holes 15, 16 in the walls of the smoke box 4 and are fastened thereon by means of flanges shown. The outer portions of the two inlet tubes 8, 8 are to be connected with the respective injectors on the driver's stand (not shown), while the outer portions of the two outlet tubes 9, 9 are to be connected with the boiler 10 of the locomotive. Then the injectors will be enabled to severally

force the feed-water through the inlet tubes 8, 8 into the space between the vessel 5 and the vertical tubes 6, 6 and from this space through the outlet tubes 9, 9 into the boiler 10. Preferably any known devices (not shown) should be provided on the outside of the locomotive, so as to enable the feed-water to pass from the outer portions of the inlet-tubes 8, 8 directly through the outer portions of the outlet tubes 9, 9 to the boiler 10, in case the feed-water heater should become out of order.

The conical hood 3 is provided with an exchangeable mouthpiece 7 serving as a blast-pipe. By exchanging the mouthpiece 7 for another one its area and consequently the draft of the locomotive can be adjusted.

From the drawing it will be evident, that the outside of the feed-water heater is heated by the fire gases passing out from the smoke tubes 17, 17 through the smoke box 4 and that the tubes 6, 6 of the heater are internally heated by the exhaust steam passing through them from the passage 2 to the mouthpiece 7. The feed-water entering the vessel 5 through the inlet tubes 8, 8 passes downward, that is in a direction opposite to that of the exhaust steam, so that it can be gradually heated by the exhaust steam before it leaves the vessel 5 through the outlet tubes 9, 9. In this manner the exhaust steam is well utilized for heating the feed-water and the heat of the escaping fire gases is further utilized for heating the heater.

As the vertical tubes 6, 6 are straight and as the feed-water heater is disposed immediately above the exhaust steam passage 2 and the mouthpiece 7 serving as a blast-pipe is directly above the upper tube plate 14, it follows, that the counter-pressure produced in the engine cylinders by the exhaust steam is reduced to a minimum.

The feed-water heater can be varied without departing from the spirit of our invention.

We claim:

A feed water heater for locomotives, comprising a closed casing having an inlet at its upper end and outlet at lower end, a series of vertical tubes disposed throughout

the whole area of the casing and having their ends opening through the ends of the casing, a conical hood on the upper end of the casing and having a central opening and
5 an exchangeable mouth piece in the opening of the head, and serving as a blast pipe, the whole being adapted to be arranged in the smoke box over the exhaust and below the smoke stack.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
