

(No Model.)

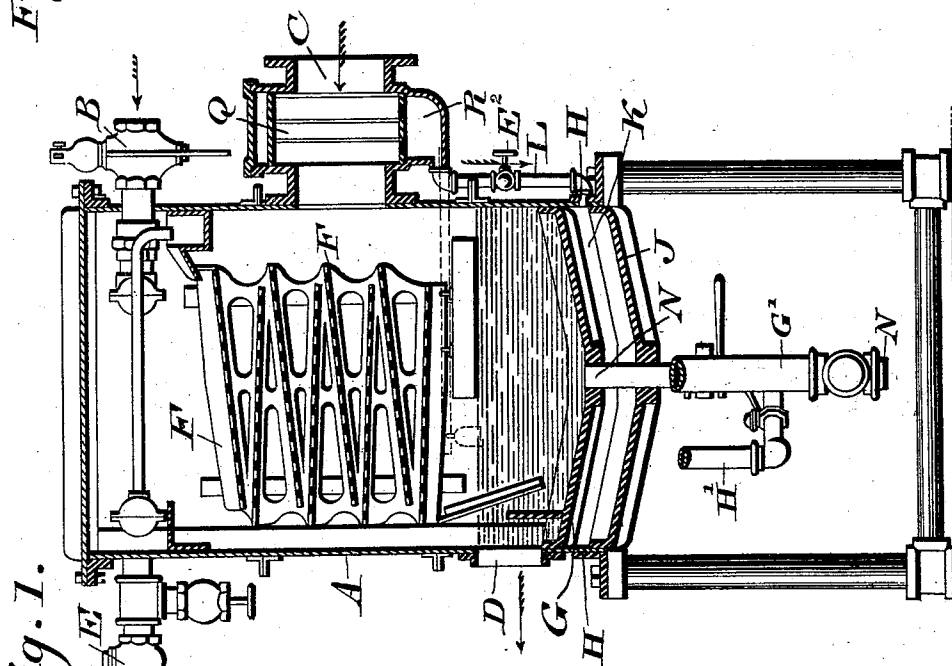
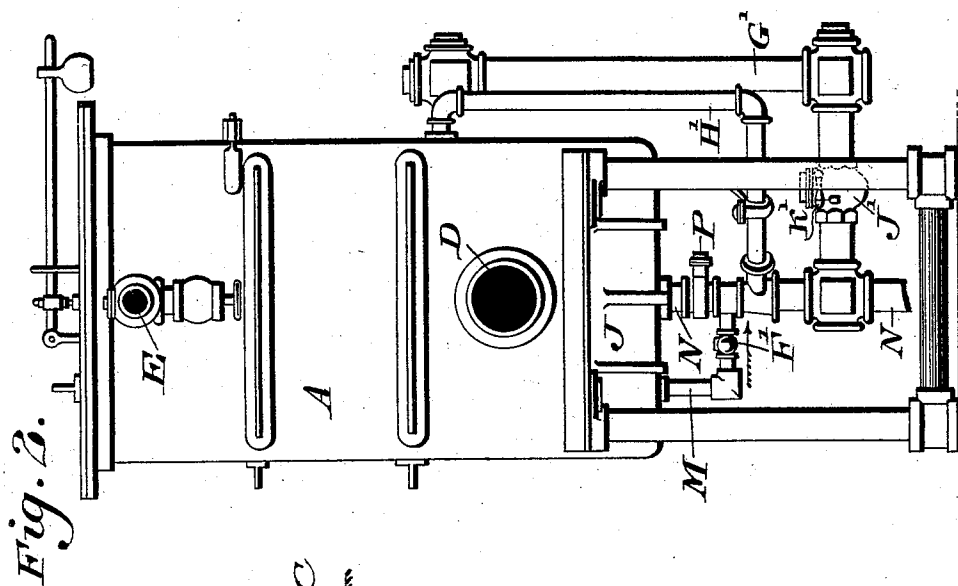
2 Sheets—Sheet 1.

W. WEBSTER.

STEAM JACKET ATTACHMENT FOR FEED WATER HEATERS.

No. 537,325.

Patented Apr. 9, 1895.



Witnesses
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(No Model.)

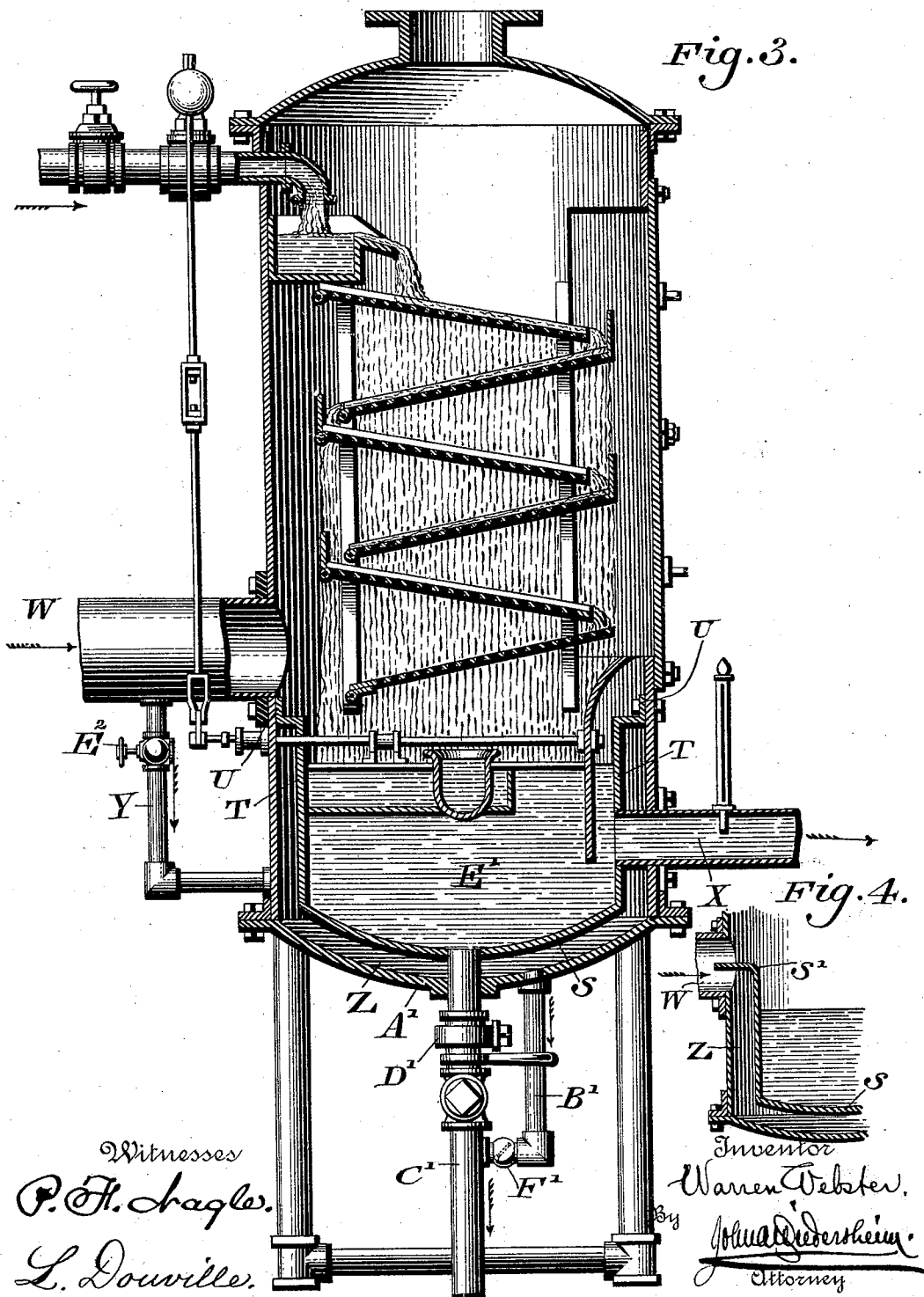
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UNITED STATES PATENT OFFICE.

WARREN WEBSTER, OF MERCHANTVILLE, NEW JERSEY.

STEAM-JACKET ATTACHMENT FOR FEED-WATER HEATERS.

SPECIFICATION forming part of Letters Patent No. 537,325, dated April 9, 1895.

Application filed January 4, 1895. Serial No. 533,818. (No model.)

To all whom it may concern:

Be it known that I, WARREN WEBSTER, a citizen of the United States, residing at Merchantville, in the county of Camden and State of New Jersey, have invented a new and useful Improvement in Steam-Jacket Attachments for Feed-Water Heaters, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a novel construction of steam jacket attachment for feed water heaters, which is capable of general adaptation, but is especially applicable to that class of feed water heating devices termed "open" heaters, in which a body of water is caused to fall upon a series of trays inclosed in a suitable casing, said water being heated to the requisite temperature by a current of steam which is injected thereinto, a portion of said water afterward accumulating in the bottom of the heater; the office of said steam jacket attachment, which may surround both the sides and bottom, or only the bottom of said heater, interiorly or exteriorly being not only to prevent the loss of heat through radiation from the lower portion of the apparatus, but also to furnish a source of heat to enable the feed water to be maintained at a high temperature, prior to its removal to the boiler, or elsewhere.

It further consists of novel details of construction, all as will be hereinafter set forth.

Figure 1 represents a vertical sectional view of a steam jacket attachment for feed water heaters embodying my invention. Fig. 2 represents a side elevation of the same. Fig. 3 represents a modified form of said attachment. Fig. 4 represents a further modification.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings: A designates the casing of a feed water heater, having the water inlet B, the steam inlet C, the water outlet D, and the combined vent and air inlet pipe E, and the inclined trays F, reference being had to Figs. 1 and 2, all of which above parts may be constructed in accordance with a prior patent granted to me October 9, 1888, No. 390,927, as well as other of my patents in the same class of invention, and form no part of the present invention.

The jacket attachment for the lower portion of the heater may be formed in a variety of ways, and may be applied to the sides and bottom of the heater, or to the bottom alone, interiorly or exteriorly. In Fig. 1, the attachment is shown as applied to the bottom, G designating the bottom wall of the heater proper, which latter has its sides H extended below said wall or head G. J designates a suitable head or closure, which is secured to said sides in any suitable manner. The space K between the heads G and J forms an independent heating chamber, and has a communication by means of the pipe L, with a suitable portion of the steam inlet pipe C. M designates a drip pipe for said jacket K, which is to be preferably smaller than the pipe L, and discharges into the drain pipe N, at a suitable point below the valve P in the latter, said drain pipe passing through the steam jacket into the interior of the heater, but having no communication with said jacket, as is evident.

When the heater is in operation, a portion of the incoming steam will be conducted from the inlet C by the pipe L, into the jacket K, and it will thus be seen that the storage feed water in the lower portion of the heater, which rests on the head or wall G, is subjected to the same temperature above and below, and that all loss of heat by radiation or cooling of said bottom wall of the apparatus is consequently prevented, since the metal is heated to the same temperature as the steam, and the efficiency of the heater is thereby increased to a high degree.

If desired, I may interpose a suitable separator Q, between the steam inlet C, and the casing A of the heater, the function of said separator being to extract the oil and other extraneous matter from the incoming steam before it enters the heater, the connection from the jacket K to the said separator being made through the drip chamber R, located at the lower portion of said separator.

In Fig. 3, I have shown a slightly modified construction of the jacket attachment, the exterior of the heater casing being unaltered, while in the lower portion thereof is placed the pan shaped receptacle S, the same having the upright sides T, which terminate below the steam inlet W, extending entirely around the

heater and having the flanges U, by means of which said pan is secured to the interior of the lower portion of the same.

X designates the water outlet pipe, which communicates with the storage water E' in the lower portion of the heater, said pipe having no communication with the steam jacket Z, the latter thus forming an independent heating chamber.

Y designates the pipe which conducts steam to the space Z, between the pan S and the bottom A' of the heater, and B' designates the drip pipe which leads from said jacket Z to the drain pipe C' at a point below the valve

D' in said pipe, the latter having no communication with said jacket Z but passing through the same into the space above the pan S.

The operation is as has already been described, the steam passing into the jacket through the pipe Y, and any water of condensation being removed by the pipe B'.

In the modified construction seen in Fig. 4, the lower portion of the heater remains unchanged, and the general construction of the pan S is the same, except that a lip S' of the latter is extended up into the steam pipe W, into the path of the incoming steam, so as to deflect a portion of the same into the space Z.

In the latter construction, the steam pipe Y for the jacket Z is dispensed with, the drip pipe B' and the drain pipe C' however, as well as the other parts of the apparatus seen in Fig. 3, remaining unchanged.

Suitable cut-off valves E² may be inserted in the pipes L and Y, for regulating the flow of steam to the jacket space, and check valves F' are to be inserted in the drip pipes M and B', said check valves seating in the directions indicated.

I have also shown in Figs. 1 and 2 a scum pipe H', and an overflow pipe G', the upper extremity of each of which communicates with the interior of the heater, at or about the water level, while their lower portions discharge into the drain pipe N, said overflow G' being provided with a valve J', having the weighted handle K'.

It will be obvious that a separator Q may be employed in the constructions seen in Figs. 3 and 4, if desired, as in Fig. 1, and that the steam which may be live or exhaust steam may be conducted to the steam jacket either before or after it enters said separator, and that furthermore, said jacket may be arranged either interiorly or exteriorly of the heater, and other changes may be made by those skilled in the art, which will come within the scope of my invention, and I do not therefore

desire to be limited to the exact constructions I have herein shown and described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a feed water heater, a casing, a steam inlet pipe therefor, a jacket, forming an independent chamber, surrounding the lower portion of said casing, and a separate steam pipe leading into the space between said jacket and the bottom of said casing, said parts being combined substantially as described.

2. In a feed water heater, water and steam inlet pipes, and a discharge water pipe therefor, a jacket forming an independent heating chamber surrounding the lower portion of said casing, a steam supply for said jacket, a drip pipe for the latter, and a drain pipe for the casing, said parts being combined substantially as described.

3. In a feed water heater, a casing, water and steam inlet pipes, and a discharge water pipe therefor, a jacket forming an independent heating chamber, for the lower portion of said casing, a steam supply for said jacket, a drip pipe for the latter, and a drain pipe for said casing, said drain pipe passing through said jacket, substantially as described.

4. In a feed water heater, in which the feed water comes into direct contact with the steam, a steam inlet pipe, a separator interposed between said inlet and the heater, a steam jacket in the lower portion of said heater, a pipe conveying steam to said jacket from the drip chamber of said separator, and suitable drip and drain pipes, substantially as described.

5. In a feed water heater, in which the feed water comes into direct contact with the steam, a steam inlet pipe, a separator for the latter, a steam jacket in the lower portion of the heater, a pipe for conveying steam to said jacket, a drip for the latter, a drain pipe having communication with the interior of the heater, and scum and overflow pipes, substantially as described.

6. In a feed water heater, in which the feed water comes into direct contact with the steam, a pan shaped vessel suitably attached to the lower portion of the same, so as to form a steam jacket, said vessel having a lip projecting toward the steam inlet pipe, whereby steam is conveyed into said jacket, substantially as described.

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Witnesses:

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