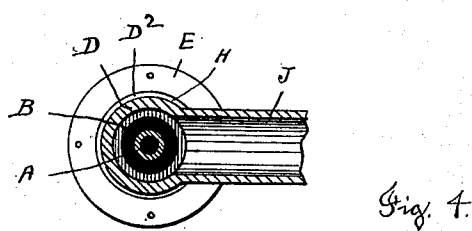
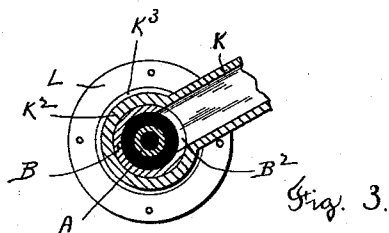
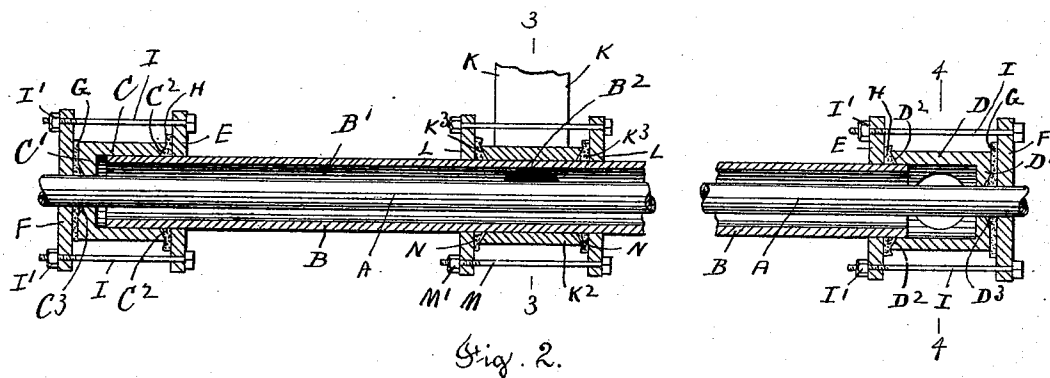
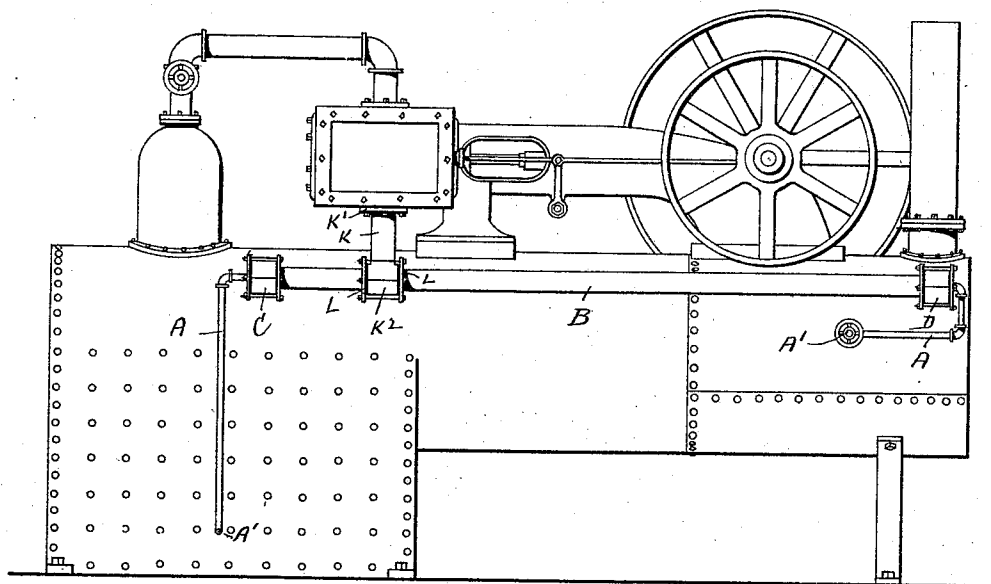


(No Model.)

A. BURLINGAME.
FEED WATER HEATER.

No. 534,629.

Patented Feb. 26, 1895.



Witnesses

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Inventor

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ABRAHAM BURLINGAME, OF WORCESTER, MASSACHUSETTS.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 534,629, dated February 26, 1895.

Application filed December 13, 1894. Serial No. 531,744. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM BURLINGAME, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Feed-Water Heaters for Heating the Water Fed to Steam-Boilers, of which the following is a specification, accompanied by drawings representing a feed-water heater embodying my invention, in which—

Figure 1 is a side view of a steam boiler having one of my improved heaters connected therewith. Fig. 2 is a central longitudinal sectional view of the heater shown in side view in Fig. 1. Fig. 3 is a transverse sectional view of the heater on line 3, Fig. 2, and Fig. 4 is a transverse sectional view on line 4, 4, Fig. 2.

Similar letters refer to similar parts in the different figures.

My present invention relates to certain improvements in that class of heaters which consist of an external shell or jacket for containing the steam and having a feed water pipe which is inclosed by the shell, or jacket, forming an inclosed annular steam chamber around the water pipe and it consists in certain features of construction as hereinafter described and specifically pointed out in the annexed claim.

In the accompanying drawings where I have represented one of my improved heaters as connected with a portable steam engine and boiler, A denotes the feed water pipe leading from a pump, injector, or other source of water supply and entering the boiler at A'.

B denotes the shell, or jacket, inclosing the water pipe A and forming a concentric annular chamber B' around the water pipe A. The shell B consists of a cylindrical metal pipe, open at its opposite ends and provided with a hole B² through which steam is received to the annular chamber B'. The ends of the shell B are provided with the sleeves C and D which inclose the ends of the shell B and are provided with internal flanges C' and D' loosely fitting the water pipe A. The edges

of the sleeves C and D are beveled, as at C² and D², and the edges of the flanges C' and D' are likewise beveled, as at C³ and D³. Annular collars E and F are placed upon the water pipe A and shell B at opposite ends of the sleeves C and D and between the ends of the sleeves and the annular collars E and F are placed the packing gaskets G and H. Bolts I and nuts I' draw the annular collars E and F together and compress the gaskets G and H, pressing them against the beveled edges C², D², C³, D³ and crowding the gaskets toward the surfaces of the pipe A and shell B so as to securely pack the joint between the sleeves C and D, and the pipe A and shell B, thereby closing the ends of the annular chamber B' against the escape of steam.

The sleeve D has a pipe J formed integrally with the sleeve and extending laterally therefrom entering the smoke chamber of the boiler through which the steam escapes from the shell B.

The shell B is supplied with steam through the hole B² by means of a pipe K preferably made of cast metal and having a flange K' at one end by which the pipe K is connected with the exhaust chamber of the steam chest of an engine or other convenient source of steam supply. The opposite end of the steam pipe K is provided with a sleeve K² cast integrally with the pipe and loosely fitting the shell B with the hole B² in the shell B communicating with the pipe K. The ends of the sleeve K² are beveled, as at K³, K³, and annular collars L, L are placed upon the shell B at opposite ends of the sleeve K² and drawn together by bolts M, M and nuts M', M'.

Between the annular collars L, L and the ends of the sleeve K² are placed the gaskets N, N, which, as the collars are drawn together are crowded by the beveled edges K³ against the surface of the shell B forming a steam tight joint.

What I claim as my invention, and desire to secure by Letters Patent, is—

In a feed water heater for steam boilers, the combination of a water pipe A, an inclosing shell or jacket B consisting of a pipe

open at its ends and provided with a hole
for the admission of steam, sleeves C and D
provided with internal flanges C' and D', said
sleeves and flanges having beveled edges, an-
5 nular collars E and F, clamping bolts I and
nuts I', said sleeve D having a laterally pro-
jecting pipe J, pipe K having a flange K'
and sleeve K², annular collars L, bolts M and

nuts M' and gaskets G, H and N, substan-
tially as described.

Dated this 5th day of December, 1894.

ABRAHAM BURLINGAME.

Witnesses:

RUFUS B. FOWLER,
EMMA KESTER.