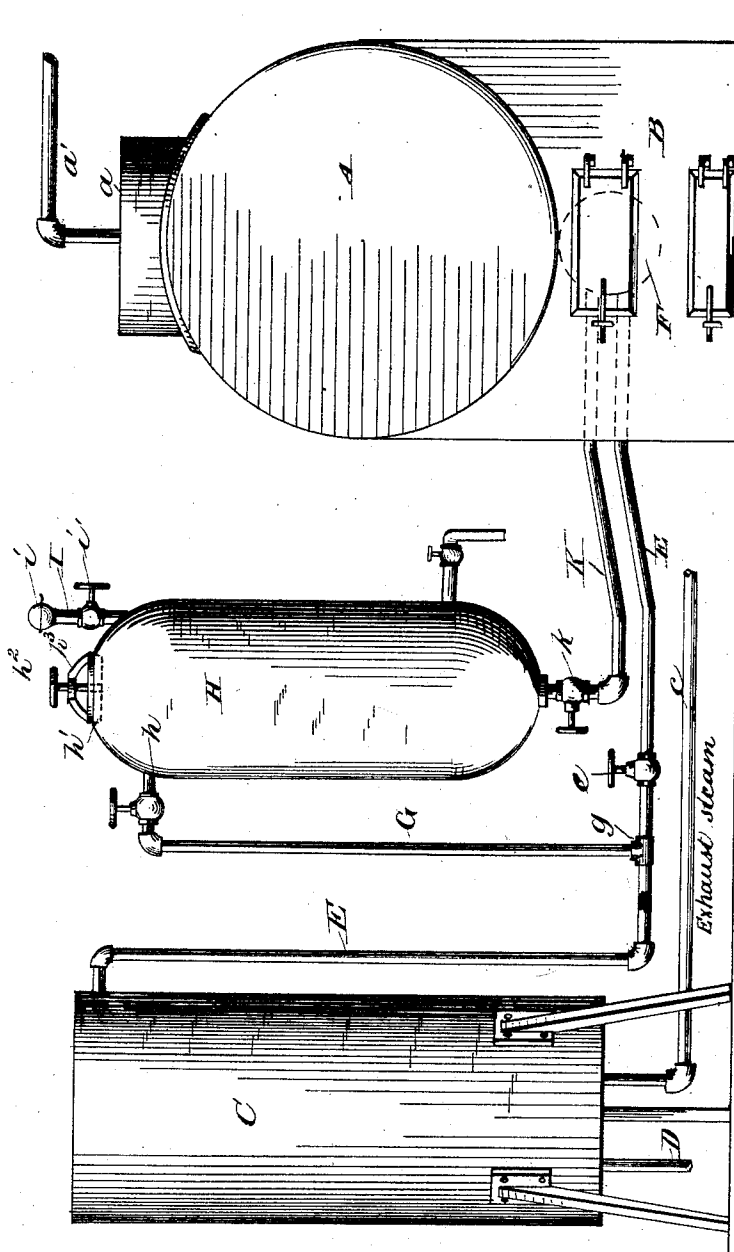


(No Model.)

F. TROWBRIDGE.
FEED WATER CLEANER.

No. 320,511.

Patented June 23, 1885.



attest:

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Frank Trowbridge
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UNITED STATES PATENT OFFICE.

FRANK TROWBRIDGE, OF FOND DU LAC, WISCONSIN.

FEED-WATER CLEANER.

SPECIFICATION forming part of Letters Patent No. 320,511, dated June 23, 1885.

Application filed February 25, 1885. (No model.)

To all whom it may concern:

Be it known that I, FRANK TROWBRIDGE, a citizen of the United States, residing at Fond du Lac, in the county of Fond du Lac and State of Wisconsin, have invented certain new and useful Improvements in Feed-Water Cleaners, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to feed-water cleaners for steam-boilers, or devices whereby different compounds may be introduced into a steam-boiler with the feed-water thereof, for the purpose of cleansing the same from deposits of dirt, &c., from the feed-water. To this end it contemplates the employment of a receptacle or vessel interposed between the feed-water heater and the boiler and means whereby the feed-water may be caused to flow from the heater through the interposed vessel and its contained cleansing compound on its way to the boiler, or may be caused to flow directly from the heater to the boiler without passing through said vessel, at the will of the operator.

It is well known to those skilled in the art to which my invention appertains that earth and other foreign substances held in solution in the feed-water accumulates in the boilers into which water is passed directly from a reservoir, river, or pond, such deposits of foreign matter as are indigenous to the water of a particular locality serving to damage the boiler by causing rust, frothing, &c., therein. It is also known to be an almost impossible task to wholly filter the feed-water of its impurities, which necessitates the introduction of various compounds into the boiler for the purpose of "cutting" or disintegrating the deposits to facilitate their removal.

The invention therefore consists in the construction, arrangement, and combination of parts whereby cleaning compounds may be intermixed with the feed-water as it flows into a boiler, substantially as hereinafter described and claimed.

The drawing represents an elevation of my device in connection with a boiler and the feed-water heater thereof.

Referring to the drawing, A designates a steam-boiler in position upon a suitable furnace, B, and provided with steam-drum *a* and steam feed-pipe *a'*.

C designates the feed-water heater, preferably provided with an interior steam-heating coil, connected by a pipe, *c*, with the exhaust-port of the steam-engine. If desired, however, water in the heater may receive heat from any source other than that above described.

D designates the feed-pipe of the heater C, through which water is introduced in any desired manner to said heater.

E designates the boiler feed-pipe extending from the top of the heater C to the mud-drum F (shown by dotted lines) of the boiler A. The feed-pipe E is provided with a valve, *e*, for a purpose hereinafter explained, and a check-valve located between said valve *e* and the heater C.

G designates a pipe connecting at *g* with the pipe E, and extending thence to the top of and entering a vessel, H, interposed between the feed-water heater C and the boiler A. The pipe G is provided near its top with a valve, *h*, the purpose of which is hereinafter described. The vessel H is provided at its top with a hand-hole, closed in the usual manner—viz., by a plate, *h'*, (shown by dotted lines,) held in position by a hand-screw, *h''*, and bridge *h'''*.

I designates a pipe projecting upward from the vessel H, and provided upon its top with a cup, *i*, and at its middle with a valve, *i'*.

K designates a pipe connecting the vessel H with the mud-drum F of the boiler, and having a pipe, K, provided with a valve, *k*, the purpose of which will presently appear.

L designates a discharge-pipe having one end communicating with the vessel H, near the lower end thereof, and provided with a valve, *l*.

When it is desired to introduce cleansing compounds into the boiler with the feed-water thereof, said compounds, if in liquid form or in the form of powder, are placed in the cup, the valve of which is now opened and the compound allowed to pass to the interior of the vessel H, after which the valve *h* of the pipe G is opened, thereby admitting water through the pipes E and G to the vessel H, from whence, after being thoroughly mixed with the compound in said vessel H, it is, by the opening of the valve *k* in the pipe K, allowed to flow through said pipe to the boiler.

When the cleansing compounds consist of

large articles—as, for instance, potatoes—they are introduced to the vessel through the hand-hole, after which the above-described operation is repeated.

5 When it is desired to have water pass directly from the heater C to the boiler A without passing through the vessel H, the valves *h* and *k* of the pipes G and K are closed, and the valve *e* of the pipe E opened.

10 It will be understood that the pipes K and E may connect directly with the boiler A, instead of the mud-drum F.

Modifications in details of construction above described may be made without departing from the spirit of or sacrificing the advantages of my invention. I would therefore have it understood that I reserve the right to make such changes in the construction which I have shown and described as an embodiment of my invention as fairly fall within the scope thereof.

20 What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a feed-water cleaner, the combination, with the feed-water heater C, a boiler, A, supply-pipe E, having valves *e e'*, vessel H, interposed between said boiler and heater, pipe G, connecting said pipe E with the vessel H, and pipe K, connecting the vessel H directly with the boiler A, all constructed and arranged substantially as shown and described. 25 30

2. In a feed-water cleaner, the combination of the following elements, viz: a boiler, a mud-drum, supply-pipes K, E, and G, and their valves, compound receiving-vessel having hand-hole and plate, hand-screw, bridge, and pipe I, the latter having a cup and valve, and water-heater having a feed-pipe, substantially as described. 35

In testimony whereof I affix my signature 40 in presence of two witnesses.

FRANK TROWBRIDGE.

Witnesses:

JOS. W. HINER,

C. A. TROWBRIDGE.