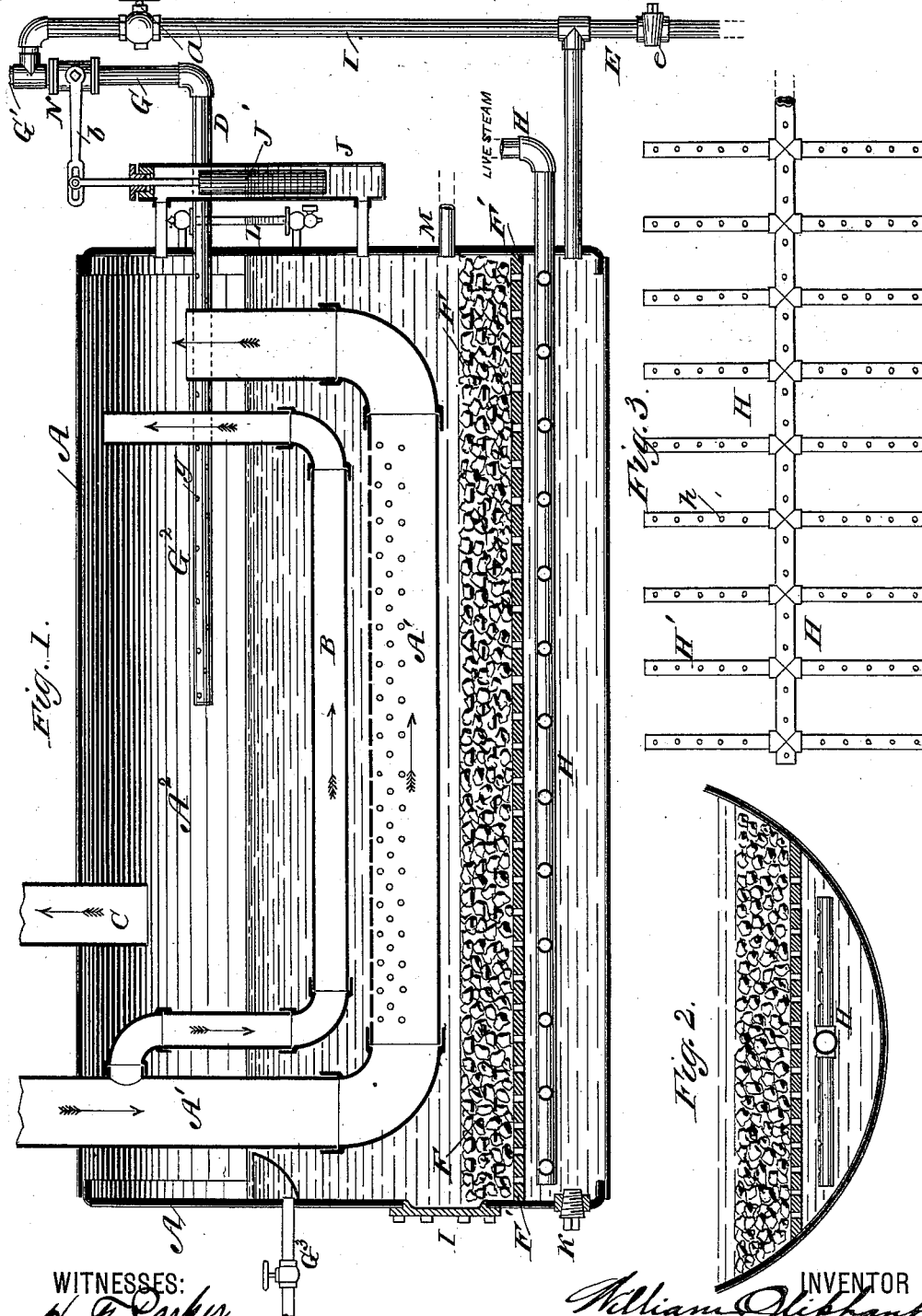


(No Model.)

W. OLIPHANT.
FEED WATER HEATER.

No. 384,538.

Patented June 12, 1888.



WITNESSES:
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WILLIAM OLIPHANT, OF PATERSON, NEW JERSEY.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 384,538, dated June 12, 1888.

Application filed August 1, 1887. Serial No. 245,818. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM OLIPHANT, a citizen of the United States, residing at Paterson, county of Passaic, and State of New Jersey, have invented certain new and useful Improvements in Feed-Water Heaters and Filters for Steam-Boilers, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal sectional view of an apparatus embodying the features of my invention; Fig. 2, a transverse partial section; and Fig. 3 a plan view of a part of the apparatus.

The invention relates to combined exhaust-steam heaters and filters used for heating and purifying feed-water prior to its introduction to steam-boilers, and comprises certain improved accessories employed to promote the management and control of the apparatus.

To enable others skilled in the art to which my invention appertains to understand and use the same, I will proceed to describe certain novel features of its construction and operation, and subsequently point out in the appended claim the distinctive characteristics of said invention.

The improvements embrace a device for cleaning the filter-diaphragm by the mechanical force of live steam when the water is discharged for such purpose, a device for automatically maintaining the proper supply of water contained in the apparatus during operation, means for the removal of scum accumulations from the surface of the heated water, and a device for spraying the feed-water into the steam-chamber of the apparatus.

Referring to the drawings, A A represent the shell of the heater, preferably of the cylindrical horizontal pattern; A' A', the exhaust-steam induction-pipe; B, the supplemental induction-pipe; C, the exhaust-steam induction-pipe; F, the filtering material, such as pulverized charcoal; and F' the perforated filter-diaphragm, such parts corresponding with those which I have described in another application, filed January 4, 1887, Serial No. 223,352, pertaining to this class of apparatus.

G is the feed-water pipe from the feed-pump, the latter communicating at G'; E, the feed-delivery pipe to the boiler. The branch

pipe I, having a cock, *a*, is designed to afford direct delivery to the boiler from the pump, but is normally closed. Circulation thereby takes effect downward from the steam-chamber A² to and through the filter-diaphragm F, thence to the boiler.

J is a vertical external float-chamber, cylindrical in form, having end connections above and beneath the desired water-level, as shown. The float J', consisting of solid light material, such as wood or the like, or otherwise consisting of a hollow metallic vessel, is connected with its piston, packed through a suitable gland, with the valve-lever *b* of the regulating-valve N, the latter being of any well-known type of construction which will be balanced and be actuated readily by specific gravity of the float. The object of this construction of the float mechanism is to obviate the liability of collapse, as in the case of employing the usual hollow metallic ball-float under the pressure, which is considerable in the practice of the apparatus, and the object is also to permit easy access to the float mechanism for the purpose of repairs or for purposes of adjustment.

The interior section, G², of the feed-pipe is extended at considerable length within the steam-chamber above the water-level, and is provided with perforations *g*, the terminus of said pipe being closed. The incoming feed-water is thereby injected in sprays and more effectually diffused in contact with the exhaust-steam than by a concentrated arrangement of perforations.

K is a scum pan or trough open at the top, having its edges located immediately below the normal water-level, and provided with a scum blow-off pipe and cock, G³, so that the opening of said cock will produce a surface-current carrying the scum with it. The pan K preferably extends throughout the breadth of the shell A, and may be also continued about the sides of the chamber, if desired.

The filter-cleaning or blow-out pipe H is connected, preferably, to a live-steam source, and extends longitudinally and centrally the length of the diaphragm F, and transversely thereto by means of the branches H', the whole lying immediately beneath said diaphragm, and having perforations provided on the up-

per sides opposite the diaphragm-surface. The injection of steam through these perforations will clear the perforations of the diaphragm and the bed of filtering material of deposits of sediment at times when the heater is discharged of water for the purpose of cleaning. The steam and deposits are discharged through the pipe M, furnished with a suitable cock.

10 I claim as my invention—

A feed-water heating and filtering vessel constructed with main and exhaust steam and

water chambers having a feed-water supply-pipe with a regulating cock or valve, an exhaust-steam induction-pipe, an exhaust-steam 15 eduction-pipe, a filter-diaphragm, and a terminally-closed branched and perforated blowing-out pipe, the latter being located beneath said diaphragm and the steam-eduction pipe above, substantially as shown.

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Witnesses:

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