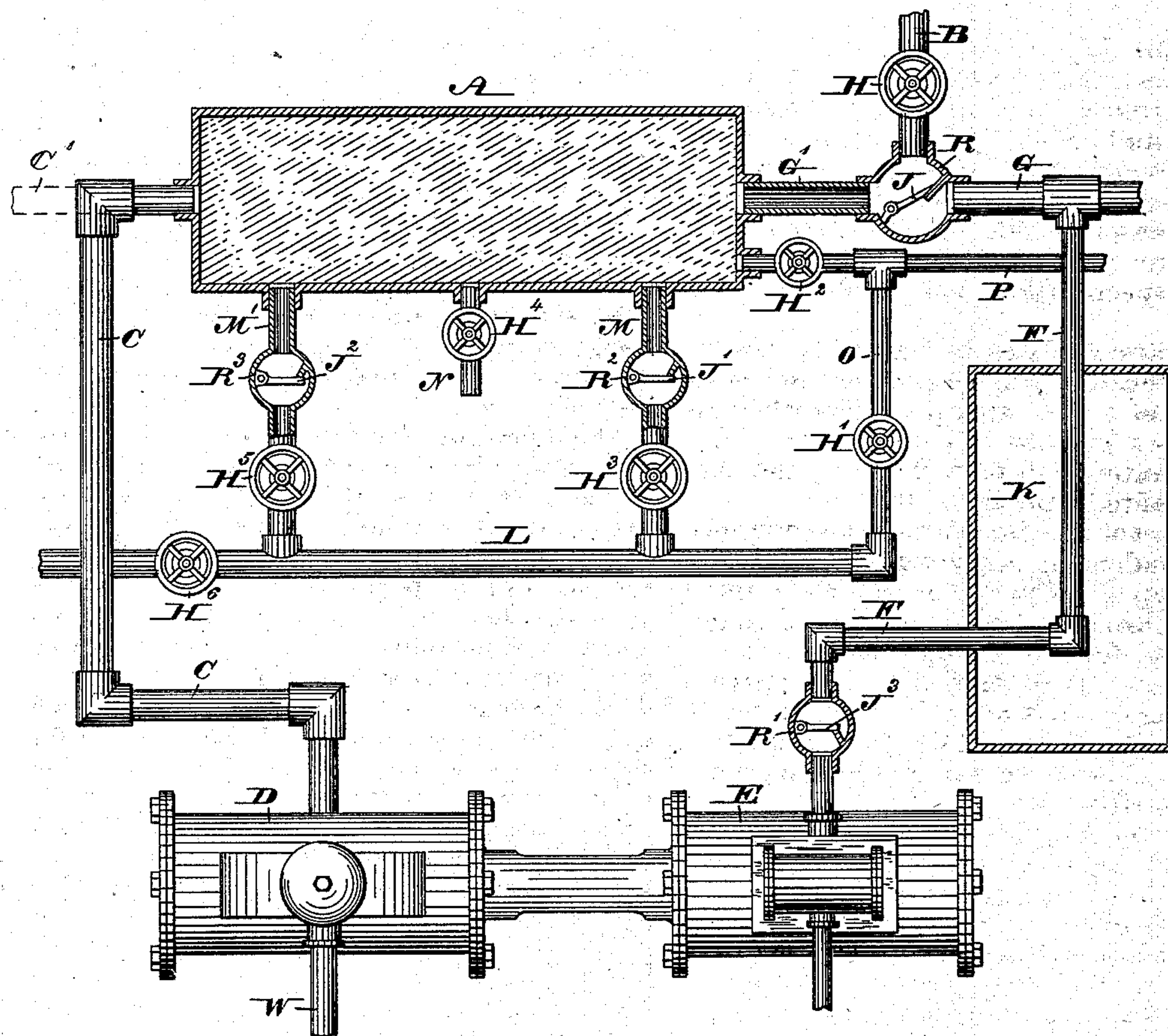


(No Model.)

A. DE BEAUMONT.  
FEED WATER HEATER.

No. 410,139.

Patented Aug. 27 1889.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

ALEXANDRE DE BEAUMONT, OF PHILADELPHIA, PENNSYLVANIA.

## FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 410,139, dated August 27, 1889.

Application filed July 14, 1887. Renewed June 26, 1889. Serial No. 315,592. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDRE DE BEAUMONT, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Feed-Water Heaters and Condensers with Filter Attachment, which improvement is fully set forth in the following specification and accompanying drawing.

My invention relates to improvements in feed-water heaters and condensers, and is an improvement on the apparatus described in prior patents granted to me, as follows: No. 187,825, granted February 27, 1877, and No. 199,038, granted January 7, 1878.

The object of this improvement is to supply a simple condensing apparatus in connection with a pump or ejector, so as to draw or force the steam through a heating or drying chamber, or I may force it through with water under pressure. Its further object is to provide pure boiling water; and to this end I force or draw the boiling water and steam through a filtering-chamber with the mechanism hereinafter described.

To these ends my invention consists in the combination and arrangement of the several parts, as herein set forth and claimed.

Referring to the drawing, which represents a diagrammatic or plan view of my apparatus with the filter and valves shown in cross-section, A represents a filter consisting of a chamber containing such filtering materials as are ordinarily used in filters and having an inlet-pipe G' and an outlet-pipe C or C'. The pipe G' leads into the filter-chamber near the top thereof, and the outlet-pipe C from near the bottom, so that the said chamber is readily emptied.

G represents a steam-pipe connected to a steam-boiler, (not shown,) and F represents an exhaust-pipe, running from the pumping steam-engine E, which operates a steam-pump D in a manner well understood.

L represents a mud-pipe designed to clean the filter and having the necessary cocks H' H<sup>6</sup> and connecting-pipes M M', extending to the filter at its lower side, said pipes having cocks H<sup>3</sup> H<sup>5</sup> and check-valves J' J<sup>2</sup> in the valve-chambers R<sup>2</sup> R<sup>3</sup>. Said pipe L also has

a connection with the right-hand end of the filter by a pipe P, which is connected directly to the boiler. (Not shown).

K represents a heating-chamber, and is designed to be heated by the exhaust-steam in pipe F in a manner well understood.

B is the water-main or water-supply pipe, and has the usual hand stop-cock H.

J J' J<sup>2</sup> J<sup>3</sup> are check-valves.

N is a pipe located below the filter, and designed to test the condition of the water in the filter at any time, and is provided with the usual cock H<sup>4</sup>.

The operation of my improved apparatus is as follows: Having turned on the water at the cock H of pipe B, it forces its way into the filter. At the same time steam is turned on in pipe G at a cock near the boiler, (not shown,) and by its force the check-valve J is opened, when the steam passing into the chamber R is condensed, and with the water under pressure from the steam in the rear is forced through the body of the filter. At the same time the steam-pump D is set in motion through the agency of the engine E. This by its pumping action aids the water in its passage through the filter under pressure and causes it to be drawn or forced into pipe C and forced out at the lower end thereof, as at w. As the steam-engine E works, its exhaust passes out by pipe F through the chamber K, which is kept hot by said exhaust, and thus it is utilized for usual heating purposes, and ultimately it passes to the exit-pipe G, where it mingles with and is drawn along through chamber R and valve J with the direct steam. When the steam-pump is not needed, or when the boiler-supply is sufficient from the action of the pressure in pipes B G, the water flows out at the point C' by direct action, a cock being located therein, but not shown. When the filter becomes impregnated with filth, it is cleaned by closing cock H' and opening cocks H<sup>2</sup> and H<sup>3</sup> or H<sup>5</sup>, one or both, and also cock H<sup>6</sup>, and then turning the steam on at a cock near the boiler in pipe P, which will force all the mud and filth out at the left end of pipe L. Water under pressure may be made to clean the mud-pipe L.

I do not wish to be limited to the use of my apparatus or filter with steam heaters and



feeders, as it is obvious it might have a useful application in any filtering apparatus and for any purposes analogous.

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

1. A feed-water heater having a water-inlet, in combination with a steam-pipe leading into said water-inlet, a valve-chamber with check-valve at the junction of said steam-pipe and water-inlet, and an outlet-pipe for said filter, substantially as described.

2. A feed-water heater having a water-inlet, in combination with a steam-pipe leading into said water-inlet, an outlet-pipe from said filter, an engine with pumping device, and an exhaust-pipe leading from said engine to said steam-pipe, substantially as described.

3. A feed-water heater with water-inlet, in combination with steam-pipe leading into said water-inlet, a valve-chamber with check-valve at the junction of said steam-pipe and water-inlet, and an exhaust-steam pipe leading into said steam-pipe, substantially as described.

4. In a feed-water heater and condenser, the combination of a filter-chamber A, having inlet-pipes B G', and with the outlet-pipe C', with the steam-pipe G, the steam-pump D, and exhaust-pipe F, extending into the pipe G, substantially as described.

5. In a feed-water heater, the combination of the inlet and outlet pipes with the steam-pipe G and the cleansing-pipes L, M, M', and P, substantially as described.

6. In a feed-water heater or condenser, the combination of the inlet-pipes G G' B and the exhaust-pipe F with the check-valves J J<sup>3</sup>, substantially as described.

7. In a feed-water heater or condenser, the combination of a water-inlet pipe B, a steam-inlet pipe G, and check-valve J, with the pipe G', substantially as described.

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Witnesses:

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A. P. JENNINGS.