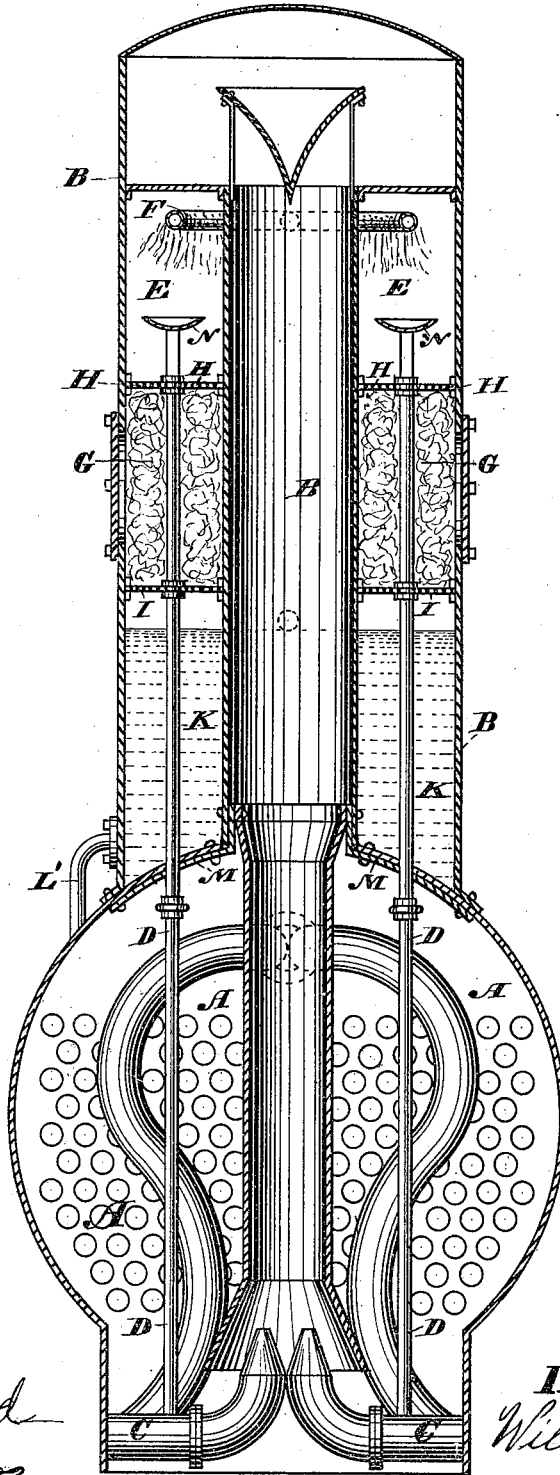


W. J. AUSTIN.

FEED-WATER HEATERS AND FILTERS.

No. 193,843.

Patented Aug. 7, 1877.



Attest
F. J. Seybold
W. J. Bakers

INVENTOR
William J. Austin

UNITED STATES PATENT OFFICE.

WILLIAM J. AUSTIN, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN FEED-WATER HEATERS AND FILTERS.

Specification forming part of Letters Patent No. **193,843**, dated August 7, 1877; application filed February 7, 1877.

To all whom it may concern:

Be it known that I, WILLIAM J. AUSTIN, of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Feed-Water Heaters and Filters for Locomotives and Engines, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

In the drawing, A represents the smoke-box of a locomotive or engine. B is the smoke-stack of an engine or locomotive. C are the exhaust-steam pipes leading from the cylinders of the engine or locomotive, exhausting the steam out into smoke-stack B. D are pipes tapping the exhaust-steam pipe C, and convey a portion of the exhaust-steam into the spray-water chamber E. E is a chamber, into which the supply-water from the water-tank on the tender is supplied through the perforated circular or annular pipe F, from which the supply-water, which is to be heated and filtered, sprays into the chamber E, where it is heated by the exhaust-steam let into the chamber E by the pipes D. The heated water then falls onto the diaphragm L, which consists of the perforated plates H I and filtering material G, through which it passes, the lime and other foreign deposits being separated from the water and retained in the filtering material in the diaphragm L. This fil-

tering material may consist of hay, straw, excelsior, shavings, charcoal, sawdust, or any other suitable material desired. K is a heated filtered-water chamber, which holds the water falling into it from the diaphragm L. When this chamber K is full of water the overflow is carried off by a pipe back into the water-tank on the tender. The hot filtered water can be let into the engine-boiler from either the filtered-water chambers K, through the pipe L, or from the water-tank on the tender. M is a saddle, riveted onto the inside of smoke-box A. The smoke-stack B rests on and is supported by this saddle M.

The diaphragm L as here arranged is something of an improvement on my patented invention No. 169,332, patented November 2, 1875.

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

The diaphragm L, in combination with the exhaust-steam pipes C, the exhaust-steam pipes D, the circular or annular perforated supply-water pipe F, the spray-water chamber E, the hot filtered-water chamber K, and the smoke-stack B, as shown and described, and for the purpose set forth.

WILLIAM J. AUSTIN.

Witnesses:

F. J. SEYBOLD,
HENRY C. STRONG.