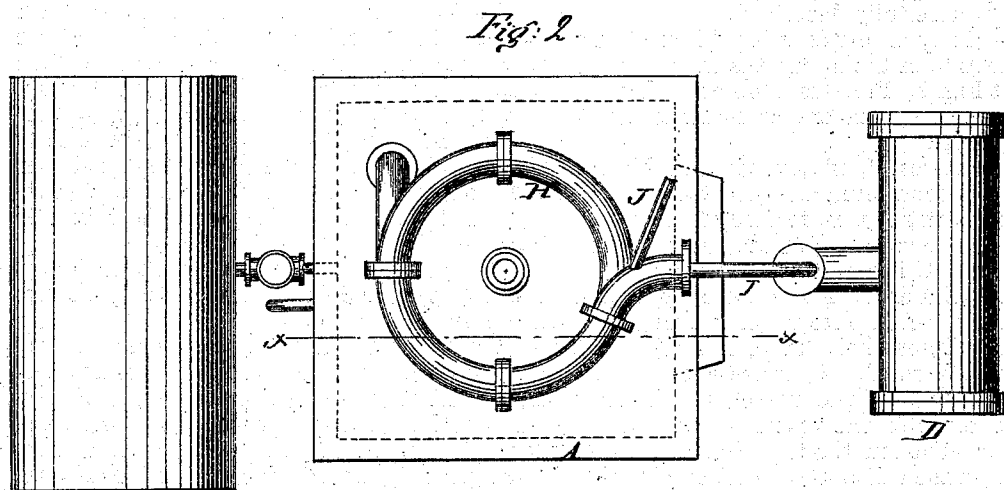
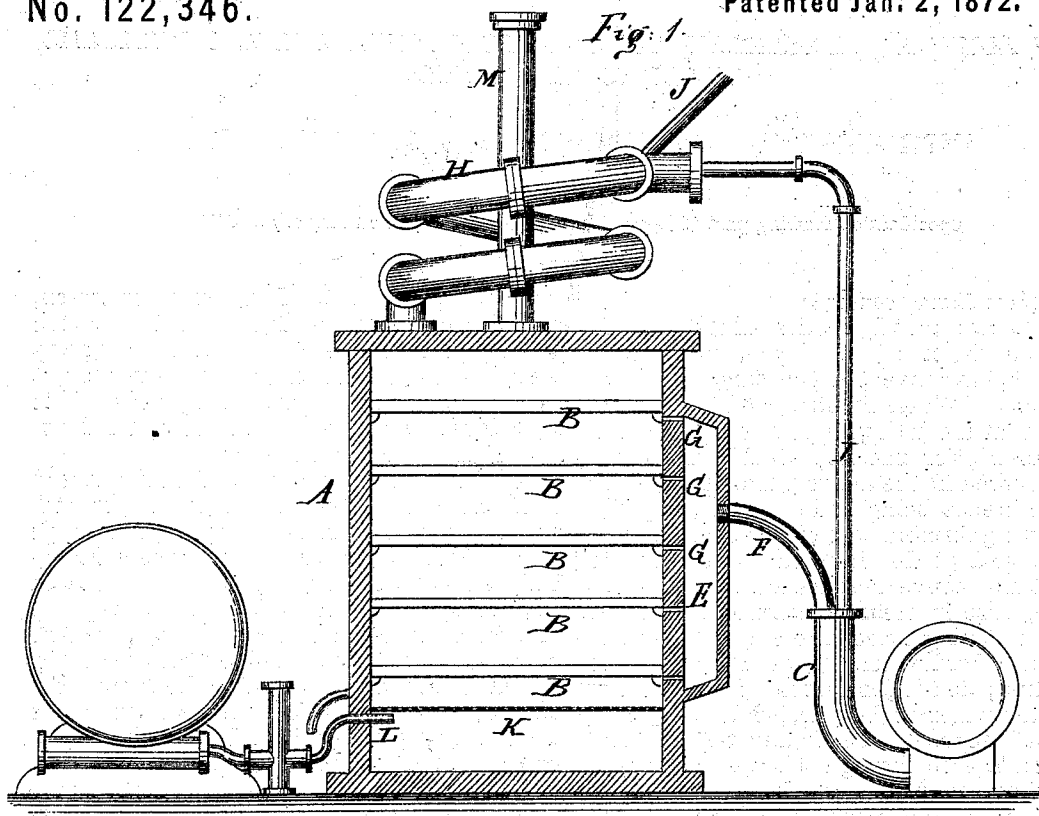


P. Almy's Water Purifier.

No. 122,346.

Patented Jan. 2, 1872.



Witnesses:

Chas. Nide,
Wm. H. C. Smirn.

Inventor:

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PER

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UNITED STATES PATENT OFFICE.

PERRY ALMY, OF WILLIAMSON, ASSIGNOR TO HIMSELF AND A. B. WILLIAMS,
OF SODUS, NEW YORK.

IMPROVEMENT IN WATER-HEATERS AND PURIFIERS.

Specification forming part of Letters Patent No. 122,346, dated January 2, 1872.

To all whom it may concern:

Be it known that I, PERRY ALMY, of Williamson, in the county of Wayne, and State of New York, have invented a new and useful Improvement in Water-Purifier; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

The object of this invention is to provide efficient and convenient means for purifying water for use in steam-boilers and for other purposes, having especial reference to what is known as "hard water," or water holding lime in solution; and it consists in an apparatus in which the water to be purified is heated by means of steam, to the boiling temperature, and then filtered through successive layers or beds of oyster-shells, or similar material or substance, the apparatus being constructed as hereinafter more fully described.

In the accompanying drawing, Figure 1 is a vertical section of the apparatus taken on the line *x x* of Fig. 2. Fig. 2 is a top or plan view.

Similar letters of reference indicate corresponding parts.

A is a tight vessel, of any size suitable for the purpose, containing a series of horizontal shelves or partitions, B, formed of slats, and more or less in number, arranged as seen in the drawing. C is a crotch exhaust-pipe from the steam-cylinder D. E is a chamber, on one side of the vessel A, into which (through the branch-pipe F) one half (more or less) of the steam is exhausted. G represents orifices through the wall of the vessel, which allow the steam to enter the vessel A. H is a coil of pipe, placed upon the top of the vessel A. The outer branch I of the exhaust-pipe discharges the other portion of the steam into the coil. J is a pipe, through which cold water is discharged into the coil. The quantity of cold water thus introduced is designed to be sufficient to supply the boiler with feed-water. On each of the shelves B a bed of oyster-shells (four inches, more or less, in thickness,) is placed, leaving an open space of four inches, more or

less, above each bed. K is a sieve or screen, placed beneath the lower shelf, but above the pump-pipe L, for the purpose of catching any piece of shell or other solid matter which might work down through the filtering-beds. M is an exhaust-pipe, on top of the vessel, for allowing steam to escape therefrom.

The feed-water which enters the coil is raised to the boiling temperature, as it mingles with and absorbs heat from the steam, and drops down by its own gravity through the filtering-beds to the lower portion of the vessel, beneath the screen, from whence it is taken by the pump and forced into the boiler. The temperature of the water is maintained by the steam discharged between the filtering-beds from the chamber E. Lime is held in solution in the cold water by the presence of carbonic acid. The heat imparted to the water expels the carbonic acid; the lime is precipitated and adheres to the oyster-shells, having a greater affinity therefor, or being attracted thereto with greater force than to metallic or other surfaces or objects which contain no carbonate of lime in their composition. I do not, however, confine myself strictly to oyster-shells, as a filtering and cleansing medium, as other articles or substances may be made to form a nucleus for the particles of lime to adhere to; but so far as I have experimented I prefer them for this purpose.

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

The tight vessel A, having a series of slatted partitions, B, covered with shells, steam-chest E, induction-ports G, exhaust-pipe M, and water-pipe H, arranged as specified, combined with the pipes I F, proceeding from the exhaust-pipe C, to form an improved feed-water heater and purifier for boilers, by which the water is first heated and the carbonic acid expelled, and then passed through heated shells, on which the lime is precipitated, before being pumped into the boiler.

Witnesses:

PERRY ALMY.

A. M. WINCHESTER,
CHAS. D. GAYLORD.

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