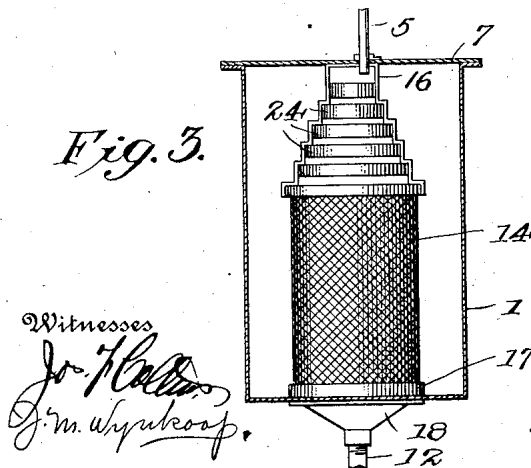
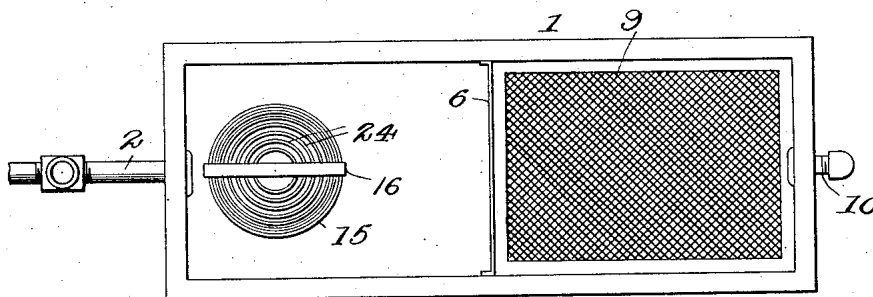
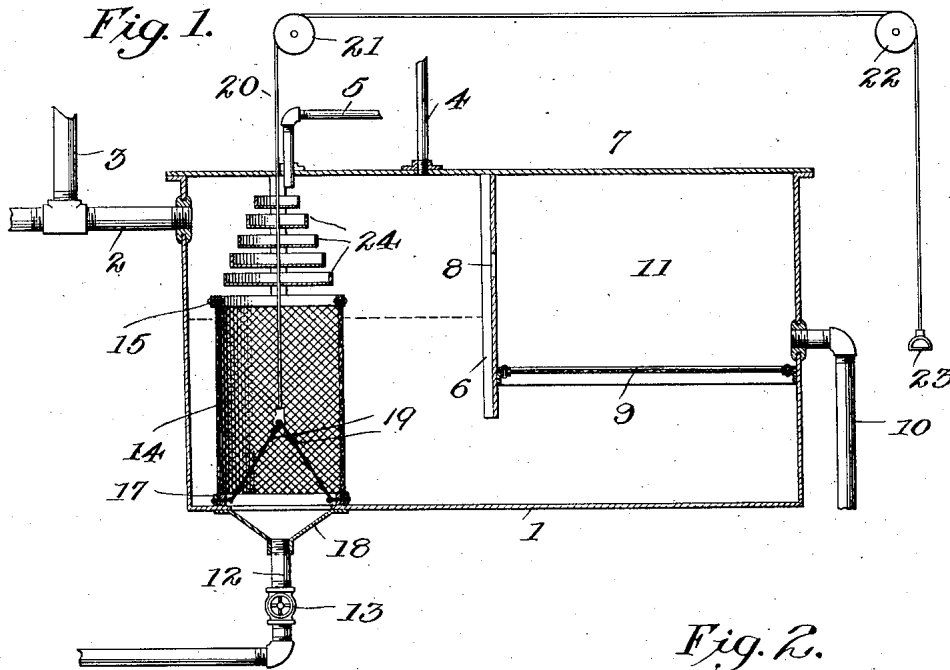


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 FEED WATER HEATER AND PURIFIER.  
 APPLICATION FILED JUNE 17, 1912.

1,063,132.

Patented May 27, 1913.



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# UNITED STATES PATENT OFFICE.

DONALD McDONALD, OF LOUISVILLE, KENTUCKY.

FEED-WATER HEATER AND PURIFIER.

1,063,132.

Specification of Letters Patent.

Patented May 27, 1913.

Application filed June 17, 1912. Serial No. 704,153.

*To all whom it may concern:*

Be it known that I, DONALD McDONALD, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Feed-Water Heaters and Purifiers, of which the following is a specification.

This invention relates to that class of heaters by which feed water is heated with steam and afterward filtered to take out the impurities which are liberated by the heat and by any chemical that may be added.

In the drawing, Figure 1 is a vertical central section of a feed water heater and purifier embodying my invention; Fig. 2 is a top plan view of the same, and Fig. 3 is a transverse section.

1 is a receptacle having a steam inlet pipe 2, said pipe being provided with a pipe 3 to carry off the surplus steam.

4 is an outlet to reduce pressure in the chamber 1, whereby the entrance of the steam into the chamber is facilitated. This pipe 4 acts as a vent pipe.

5 is a pipe through which water enters the chamber 1.

6 is a solid partition within the chamber 1, depending from the top 7 of the chamber and provided with a port 8.

9 is a filter cloth tightly stretched between the walls of the chamber 1 and the partition 6.

10 is an outlet pipe leading from the filter chamber 11.

12 is a drain pipe leading from the bottom of the chamber 1 and controlled by a blow-off valve 13.

The matter thus far described is old.

My invention consists in installing in the receptacle 1, a perforated collapsible bag or cylinder 14 made preferably of filter cloth, above the upper end of which are secured iron trays 15 supported in any suitable manner by the top or sides 7 of the receptacle 1, as for instance by a strap 16. The strap 16 is preferably secured to the top 7, so that it may be readily removed therefrom.

The lower end of the collapsible bag 14 is secured to a heavy iron ring 17, which is of such weight that it holds the lower end of the bag 14 in close contact with the bottom of the receptacle 1. The bottom of the receptacle 1 is provided with a funnel-shaped depression or attachment 18, to which the drain pipe 12 is connected. The iron ring 17

at the bottom of the bag 14 is provided with links 19, to which a cable 20 is connected, said cable passing over sheaves 21 and 22 and provided with a pull 23. A series of trays 24 are secured to the strap 16 and superimposed over the bag 14 and immediately under the water supply pipe 5. These trays, as will be seen from the drawing, are of gradually increasing diameter from the top toward the bottom.

Water after flowing from the pipe 5 over the trays 24 and being subjected to the action of the heat of the steam from the pipe 2 and the action of any desired chemical that may be introduced in the trays, drops into the bag 14 and filters outward therefrom in every direction into the receptacle 1. From actual experience, I find that the filtering bag will be coated on the inside in about four hours in such a way as to obstruct the outward flow of the water. When this occurs, the valve 13 is opened and the muddy water allowed to flow out through the drain pipe 12. This causes the level of the water in the receptacle 1 to sink below the level of the water in the perforated bag 14 and produces a backward flow of the water through the filtering bag, which backward flow loosens the scale on the inside of the filtering bag and causes it to fall to the bottom and be carried out through the drain pipe 12. As stated, the bottom of the filtering bag is fastened to a heavy iron ring 17, which by means of its weight makes a close joint with the bottom of the receptacle 1.

By means of the cable 20, the bottom of the bag 14 with the ring 17 can be easily raised up, thus permitting the sediment in the bottom of the receptacle 1 to pass out through the drain pipe 12. In pulling the heavy ring 17 upward, the perforated bag 14 is more or less distorted, bent or wrinkled, whereby its inner face is to a certain extent scrubbed, thus loosening any scale which may have adhered to the inner face too closely to allow it to be loosened by the backward pressure of the water when the valve 13 is opened. The filtered water passing from the chamber 14 flows up through the filtering cloth 9, thence through the pipe 10 to the boiler.

I claim:—

1. In a filter, the combination with a receptacle, of a perforated collapsible chamber suspended from the top of the receptacle

and having a loose connection at its bottom with the bottom of the chamber, and means to collapse the chamber.

2. In a filter, the combination with a receptacle, of a filter cloth chamber suspended from the top of said receptacle, a weight secured to the lower end of said chamber to hold it in close contact with the bottom of the receptacle.

3. In a filter, the combination with a receptacle, of a filter cloth chamber suspended from the top of said receptacle, a weight secured to the lower end of said chamber to hold it in close contact with the bottom of the receptacle, and means to elevate said weight, thereby disengaging the bottom of the chamber with the bottom of the receptacle.

4. In a filter, the combination with a receptacle, of a chamber made of filter cloth and suspended from the top of said receptacle with its lower end positioned around a drain pipe opening in the bottom of the receptacle and having close contact with the bottom of said receptacle, a heavy ring

secured to the bottom of the wire cloth chamber to hold it in close contact with the bottom of the receptacle, and a cable connected to said ring whereby it may be raised and thus collapse the walls of the filter cloth chamber.

5. In a filter, the combination with a receptacle, a supplemental filter chamber within the receptacle having a solid partition and a filter cloth bottom below which the lower end of the solid partition extends, a discharge opening above the filter cloth bottom of a primary filtering chamber comprising a cylinder made of filter cloth having a tight joint with the bottom of the receptacle, and means to collapse said primary filtering chamber.

The foregoing specification signed at Louisville, Kentucky, this 27th day of May, 1912.

DONALD McDONALD.

In presence of—

WM. H. CRUTCHER,

F. H. MILLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."