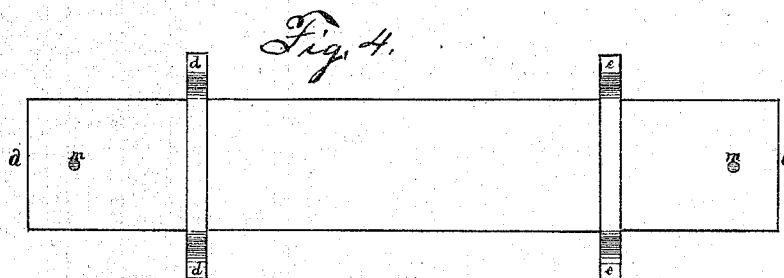
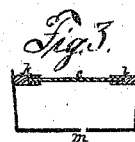
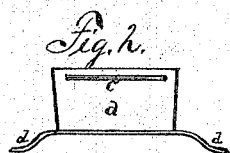
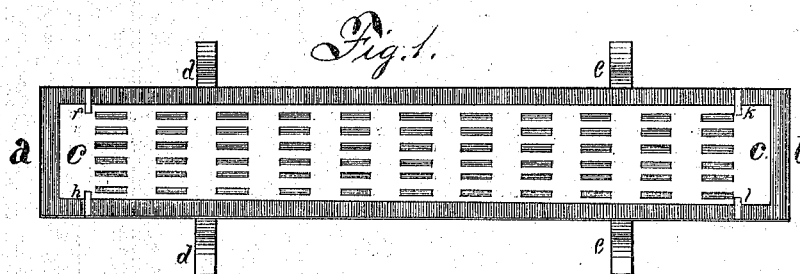


A. J. SIMMONS.

Improvement in Devices for Removing Lime, Dirt, and  
Sediment from Boiling Liquids.

No. 115,367.

Patented May 30, 1871.



Attest  
*Wm. J. Finkler*  
D. C. Dismelland

Alonso J. Simmons inventor  
by *C. E. McDonald*  
his attorney in fact

# UNITED STATES PATENT OFFICE.

ALONZO J. SIMMONS, OF INDIANAPOLIS, INDIANA.

IMPROVEMENT IN DEVICES FOR REMOVING LIME, DIRT, AND SEDIMENT FROM BOILING LIQUIDS.

Specification forming part of Letters Patent No. 115,367, dated May 30, 1871.

I, ALONZO J. SIMMONS, of Indianapolis, in the county of Marion and State of Indiana, have invented certain Improvements in Extracting Lime, Dirt, and Sediment from Boiling Fluids, of which the following is a specification, reference being had to the accompanying drawing and to the letters and figures of reference marked thereon making a part of the same.

The nature of my said invention consists in the construction of such a vessel as will, when it is placed in another vessel containing any impure boiling fluid, by means of its peculiar construction and arrangement, cause that portion of the fluid which it contains to remain so nearly at rest that the motion of the liquid while boiling will deposit therein the precipitated lime, sediment, and dirt light enough to be carried by the thermal currents; said device to be made of any convenient metal, such as iron or brass.

To enable others skilled in the art to make and use my said invention, I will proceed to describe it more particularly, as follows, viz:

Figure No. 1 is a top view of a device suitable for the purposes of my invention; Fig. No. 2, an end view of the same; Fig. No. 3, a transverse section; Fig. No. 4, a bottom view.

*a b* is a rectangular box of any convenient size, mounted on two legs, represented, respectively, by *d* and *e*. In the bottom of this box or vessel are two holes, one at each end, represented, respectively, by *m* and *m* of Figs. 3 and 4, to allow a free flow of the fluid into the vessel so that it will not float. *c c* is an inside lid or bottom, perforated with slots, as represented in Fig. No. 1, and fastened a little below the upper edge of the vessel. For the greater convenience of taking this bottom or lid in and out it is arranged so that it will slide through the slot *c* of Fig. 2, which is in the end of the vessel, and into the forks *f*, *h*, *k*, and *l*. The position in which this lid is held is further represented in section by *e*, and the forks which hold it by *k* and *l* of Fig. 3. Between this lid *c c* and the edge of the vessel is left a convenient open interval, as represented in Fig. 1.

The device here represented is to be used for collecting lime and sediment in horizontal cylindrical steam-boilers. It is to be placed in the boiler at the point of greatest heat, which is usually opposite the bridge-wall of the furnace, where a concentrated flame impinges upon the boiler. The thermal currents

of the water, being generated by the heated metal of the boiler, naturally flow from the bottom to the surface of the water. That portion of these currents generated beneath the bottom of the vessel *a b* will be deflected sideways and flow upward around the sides of the vessel. When they have passed above the edge of the vessel the pressure of the surrounding water will again deflect them toward the center of the vessel, above which they will meet and form an eddy.

Now, if the lid *c c* be of the proper relative proportion to the vessel *a b*, the motion of the eddying thermal currents will be so obstructed as to hold the water inside of the vessel *a b* below the lid *c c* comparatively quiet and still; then the scales, lime, dirt, and sediment which the thermal currents have carried upward and around in the eddies above the vessel *a b* will, partly by their own gravity and partly on account of the downward motion of the eddies, fall through the open intervals in and around the plate *c c* into the still water in the vessel *a b*, where they will remain undisturbed.

As the thermal currents are always shifting around through the boiler all substances light enough for them to carry, they will gradually in this way deposit almost all of the solid impurities of the water in the vessel *a b*.

This vessel can, by opening the boiler, be removed, cleaned, and replaced at pleasure. This vessel will work equally well in other kinds of boilers by constructing it to accommodate their form.

It has been found that in all boiling fluids, such as sirups, oils, dyes, extracts, and the like, the precipitated and solid impurities are readily deposited in a vessel constructed upon the principles here explained, and thereby separated from the fluids.

What I claim, and desire to secure by Letters Patent, is—

A vessel, constructed and used upon the plan and principle herein described, for the purpose of extracting impurities from boiling fluids.

In testimony that I claim the foregoing as mine I have hereto set my hand this 24th day of March, 1871.

ALONZO J. SIMMONS.

Witnesses:

GEO. H. ZIEGLER,  
D. C. DONNELLAN.