

Loader & Child,

Feed Water Heater.

No. 103,902.

Patented June 7, 1870.

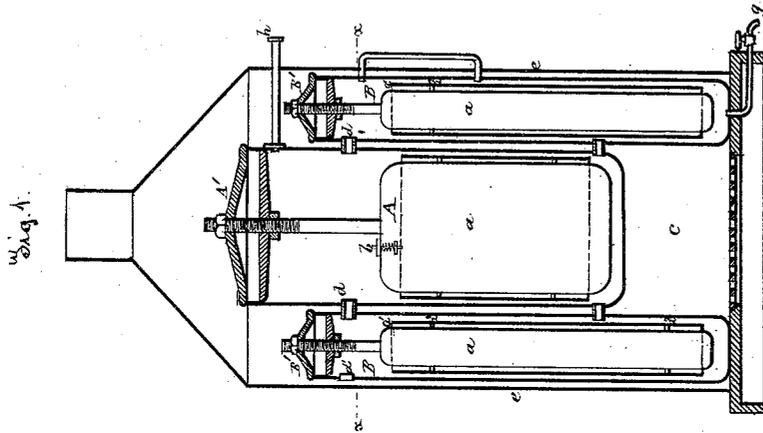
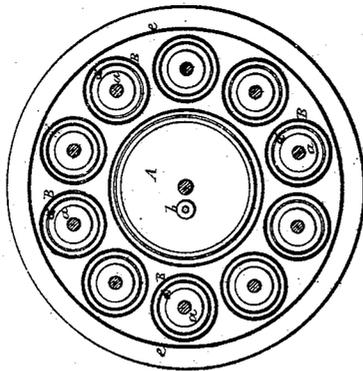


Fig. 2.



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Witnesses
H. E. Ponce
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United States Patent Office.

JOHN LOADER AND WILLIAM HENRY CHILD, OF LONDON, ENGLAND, ASSIGNORS FOR ONE-THIRD THEIR RIGHT TO AARON WHITE COOK WILLIAMS, OF SAME PLACE.

Letters Patent No. 103,902, dated June 7, 1870.

IMPROVEMENT IN STEAM-GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same.

We, JOHN LOADER and WILLIAM HENRY CHILD, both of London, England, have invented certain Improvements in Steam-Boilers, of which the following is a specification.

The invention has for its object the construction of a steam-boiler, wherein steam may be more rapidly generated, and a more thorough circulation of the water maintained than has heretofore been practicable.

For this purpose, we place in the interior of the boiler hollow "displacers," that is to say, hollow bodies, which occupy a large portion of the space and leave comparatively thin water-spaces.

Around the said displacers we place tubes, or, instead of tubes entirely surrounding the displacers, we may use plates, extending partially around the same, the lower end of such tubes or plates being within a short distance of the bottom of the boiler, and the top opening into the upper part of the water-space.

By this arrangement we obtain an effective circulation of the water in the boiler, with great facilities for the convenient introduction and removal, adjustment, cleaning, repairs, &c., of all the apparatus.

Description of the Drawing.

Figure 1 is a vertical section of an upright boiler, constructed according to our invention.

Figure 2 is a horizontal section on the line *xx*, fig. 1. Like letters indicate the same parts in both of the figures.

A is a central steam-generating vessel.

BB are smaller vessels or tubes, which are connected with the said central vessel.

The displacer *a* is preferably made of boiler-plate or wrought-iron tubing, but it may be made of any suitable material.

The provisions for promoting circulation are carried on the displacers, and are raised and lowered therewith by means of the screws and nuts represented in the tops of the several sections, A and B, of the boiler.

There is a jacket, *a'*, of thin metal, held at a little distance from each displacer by stays *a''*, as represented, and the spaces thus cut off or separated from the general contents of the boiler, by being inclosed between the displacers and the respective jackets, are open at the top and bottom, as shown.

When a displacer is lowered into the water, the circulating-jacket is lowered with it, and a provision is thus made for the constant descent of a current of the water, which has been dragged upward by the steam.

When a displacer is taken out for any purpose, the corresponding circulator comes with it, and may be

afterward detached, exchanged, cleaned, altered, and adjusted at will, ready to be again inserted with the displacer.

In applying our invention to an upright boiler, we prefer that the same should be as shown in the drawing, that is to say, it should consist of a series of steam-generating vessels, the central one being the largest, and surrounded by a number of smaller vessels, all of which, at their lower ends, communicate with each other, or with a water-space surrounding a central fire-box *c*, while at their upper ends the steam-spaces of all the boilers are connected together through the short connecting-pieces *d*, which also serve to secure the vessels together.

To allow these connections *d* to be readily inserted or removed, we form an aperture on the other side of the vessel, which aperture is closed by a screw-plug, *d'*.

A' B' are the covers or top of the sections of the boiler. They may be retained in the manner shown, or in any other ordinary or suitable manner, but we esteem it important that they be readily removable, to allow the removal of the displacers, when desired, and prefer the construction shown.

The boiler is provided with a feed and blow-off pipe, *g*, and steam-pipe *h*, in the usual manner.

The steam-generating vessels are inclosed within a case or cover, *e*, of sheet-iron or other suitable material. The furnace-door is attached to this cover.

The said invention, with very slight modifications, is also applicable to various forms and descriptions of boilers besides that which we have shown in the drawing, as will be readily understood by persons skilled in the manufacture of steam-boilers.

We are aware that it has previously been proposed to employ displacers, analogous to those herein described.

We do not claim such displacers as new in themselves; but

We claim one or more adjustable displacers, constructed substantially as described, and arranged within a boiler, in combination with circulators *a'* attached thereto, so as to be introduced and removed therewith, substantially as and for the purposes herein set forth.

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