

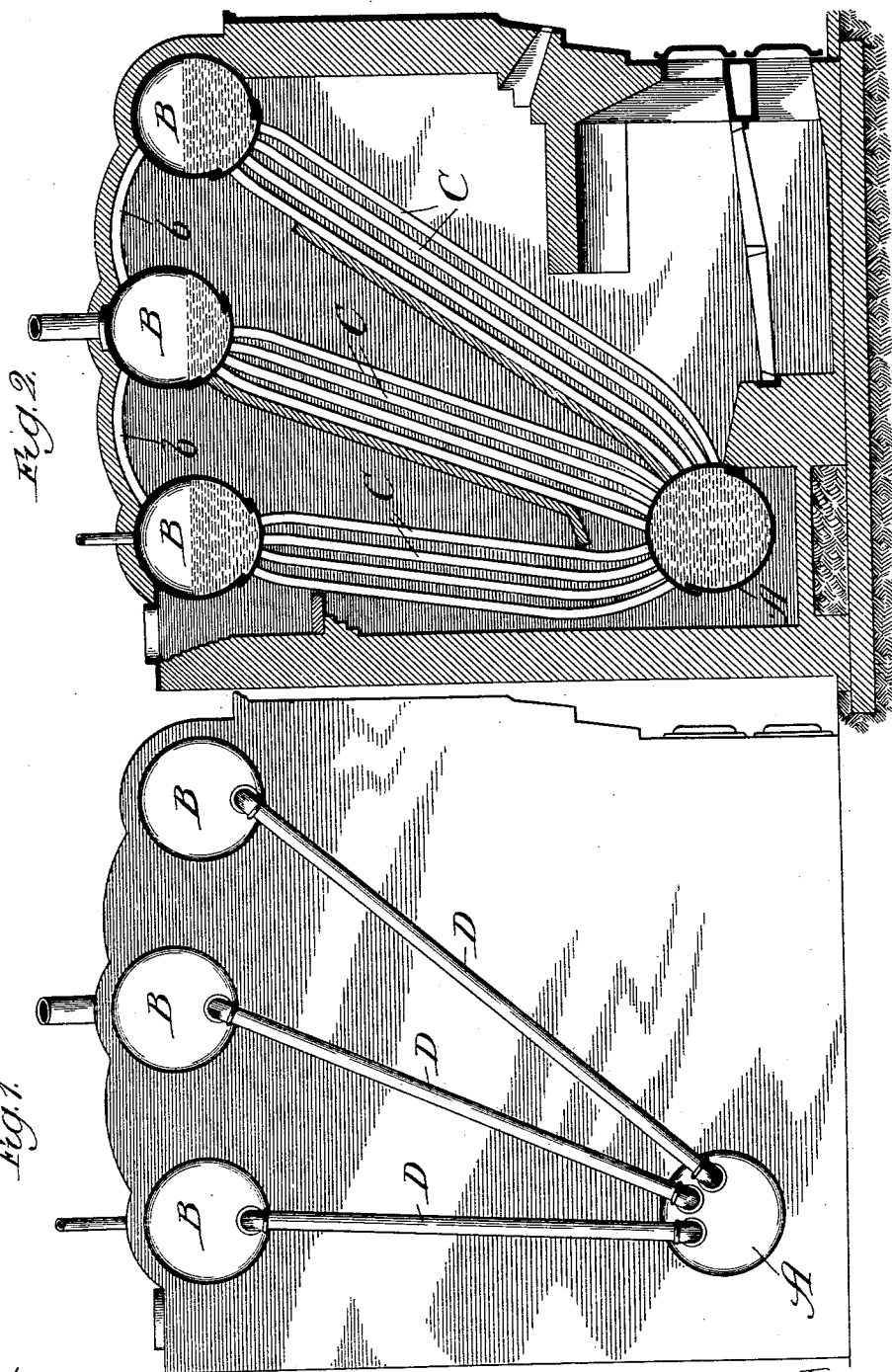
(No Model.)

2 Sheets—Sheet 1.

E. R. STETTINIUS.
WATER TUBE BOILER.

No. 580,200.

Patented Apr. 6, 1897.



Witnesses:
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Inventor:
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

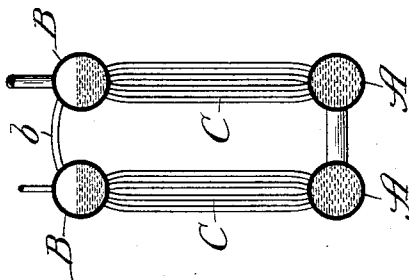


Fig. 4.

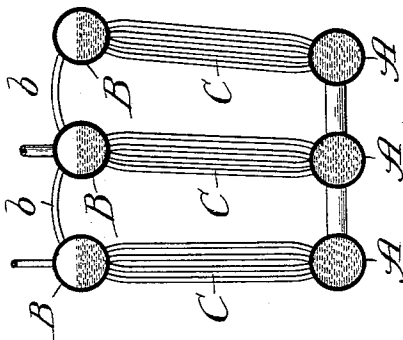
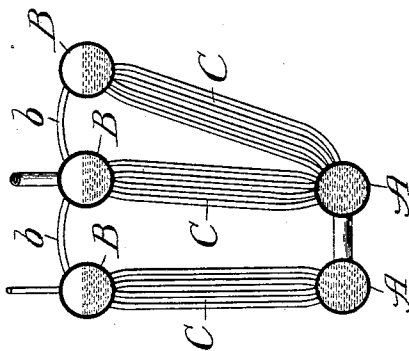


Fig. 5.



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UNITED STATES PATENT OFFICE.

EDWARD R. STETTINIUS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE
STIRLING COMPANY, OF SAME PLACE.

WATER-TUBE BOILER.

SPECIFICATION forming part of Letters Patent No. 580,200, dated April 6, 1897.

Application filed March 17, 1896. Serial No. 583,516. (No model.)

To all whom it may concern:

Be it known that I, EDWARD R. STETTINIUS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Water-Tube Boilers, of which the following is a specification.

The object of my invention is to improve the Stirling type of boiler; and the invention consists in the features and combinations hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a Stirling boiler provided with my improvements; Fig. 2, a vertical longitudinal sectional view of the same, showing modified forms; and Figs. 3, 4, and 5, diagrammatic views, in vertical section, similar to Fig. 2, showing modified forms.

A is the lower mud drum or drums, B the elevated steam and water-drums, and *b* pipes connecting the steam-spaces thereof; C, banks of tubes connecting the lower mud drum or drums with the elevated steam and water drums, and D circulating-pipes connecting the lower mud drum or drums with the elevated steam and water drums, respectively.

In constructing my improved boiler I make a lower mud drum or drums, elevated steam and water drums, banks of tubes, fire-brick arches and partitions, and various other features in the way usual in an ordinary Stirling boiler with or without the Pell improvements, except that the elevated steam and water drums have no direct communication between their water-spaces.

In order to provide for a proper circulation of water, I extend circulating-pipes from the elevated steam and water drums to the lower mud drum or drums, these pipes being outside the brickwork and therefore cooler than the banks of tubes inside the furnace or brickwork. There may be only one of these outside circulating-pipes between each elevated steam and water drum and the lower mud-drum, or there may be two, one at each end of the drums or side of the boiler. Additional pipes may also be used, if desired. As will be noticed, each of the elevated drums has its own circulating-pipe extending down to the

mud drum or drums, so that there is no direct water communication between the elevated drums.

I prefer to use the outside circulating-pipes between each of the elevated steam and water drums and the lower mud drum or drums; but as these pipes are simply intended to permit such a downflow of water as may be necessary to a proper circulation in the boiler it will of course be understood that they may be omitted in that part of the boiler in which there is but little circulation, as, for instance, between the rear elevated steam and water drums and the lower mud drum or drums.

In operation water is introduced at any convenient point, preferably in the rear upper drum, after which it passes down into the lower mud-drum and up into the elevated steam and water drums, respectively, and the course of circulation from the mud-drum is up through the banks of tubes inside the furnace or brickwork to the elevated steam and water drums, down through the outside circulating-pipes to the lower mud drum or drums, and so on continuously. There is no direct circulation, however, from one elevated steam and water drum to another, as in the case of an ordinary Stirling boiler.

The modifications illustrated in Figs. 3 to 5 will be readily understood. Stated generally, this modification consists in the use of multiple mud-drums communicating with each other so as to form substantially one mud-drum, each having its own bank of tubes communicating with an elevated steam and water drum, and an outside circulating-pipe extending down therefrom, so as to provide for the circulation above described. In this way water may be brought down from each of the elevated steam and water drums to one of the lower mud-drums, and thus enabled to mingle with other water in the general circulation of the boiler.

I claim—

In a water-tube boiler, the combination of elevated steam and water drums having their water-spaces disconnected, a lower mud-drum or communicating mud-drums, a bank of tubes entering each of the elevated drums below the

center line thereof and connecting the same with the lower mud drum or drums, and an outside circulating-pipe extending down from each elevated steam and water drum in the forward part of the boiler to the lower mud drum or drums, whereby water may circulate between said steam and water drums and the lower mud drum or drums, substantially as described.

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