No. 59,768. PATENTED NOV. 20, 1866.

A. T. HAY.

PREVENTING INCRUSTATION OF STEAM BOILERS.

Fig:1.

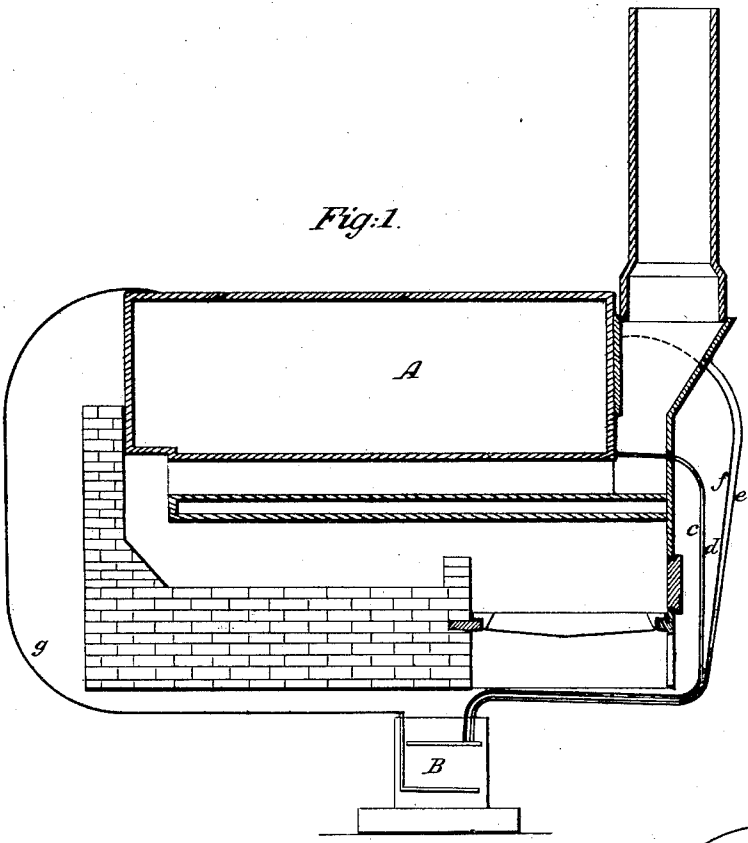
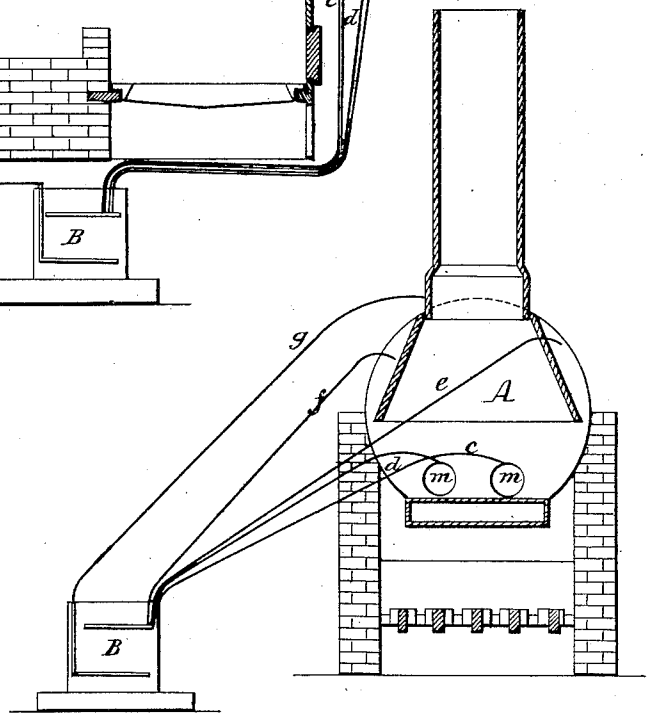


Fig:2.



Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

U. S. Patent Office.

IMPROVEMENT IN PREVENTING THE INCRUSTATION OF STEAM BOILERS.

A. T. HAY, OF BURLINGTON, IOWA.

Letters Patent No. 59,768, *dated November* 20, 1866.

SPECIFICATION.

Be it known that I, A. T. HAY, of Burlington, in the State of Iowa, have invented a new and useful Improvement in the mode of Preventing Incrustation in Steam Boilers, and I do hereby declare the following to be a full and exact description of the same, which will be better understood by reference to the accompanying drawings, in which

Fig. 1 represents a longitudinal section of a steam boiler through one of the flues thereof, and

Fig. 2 a cross section thereof.

Both these figures represent a battery, B, with its connections, which will be hereafter explained and their uses described.

It is well known that one of the greatest difficulties in the practical application of steam as a motive power grows out of the fact that, owing to the impurities generally found in the feed water in a state of solution, the boilers and pipes connected therewith usually become rapidly encrusted with a stony substance or "scale," which prevents the transmission of heat to the water in the boiler to an extent proportionate to the thickness of the "scale," and when allowed to become very thick renders the boiler liable to burst.

This scale, when once fairly formed, is removed with very considerable labor and difficulty, to obviate which many efforts have been made to prevent the formation of this incrustation. An effectual method of effecting this result is the subject-matter of my present application.

In the accompanying drawings A represents a steam boiler with its flues, *m* and *n*. B is a galvanic battery, from one of the poles of which conducting wires, *c*, *d*, *e*, *f*, communicate with one end of the boiler, and from the other end of the boiler a conducting wire, *g*, effects a connection with the other pole of the battery.

From the positive pole I make several connections with different parts of the boiler. This may not be strictly necessary, but is, I think, preferable. With the negative pole one single connecting wire is all I deem necessary or desirable. In fact I believe better results are obtained by one than by many.

I do not intend to confine myself to the arrangement above suggested. The number of conducting wires connecting with the negative pole may be equal to those connecting with the positive pole, or may even exceed them in number, without departing from the principle of my invention.

In order to fully protect the steam pipes from all danger of incrustation I generally connect each of them with the positive pole of the battery by means of a conducting wire substantially in the manner hereinbefore shown.

I am aware that galvanic circuits have been produced within a steam boiler by the use of two metals of different degrees of oxydizability with a view of preventing incrustation, but this I do not claim as part of my invention.

But what I do claim, and desire to secure by Letters Patent, is—

The use of a galvanic battery or its equivalent placed outside of the boiler of a steam engine, the two poles of which battery are connected respectively with the opposite ends of the boiler, substantially as and for the purpose above set forth.

A. T. HAY.

Witnesses:

N. P. SUNDERLAND,

LYMAN COOK.