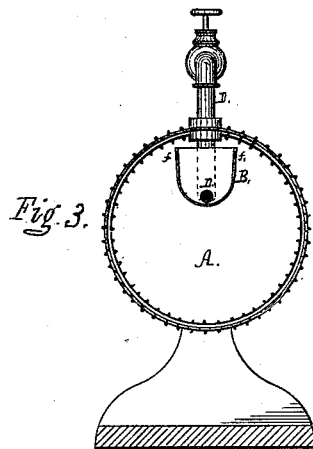
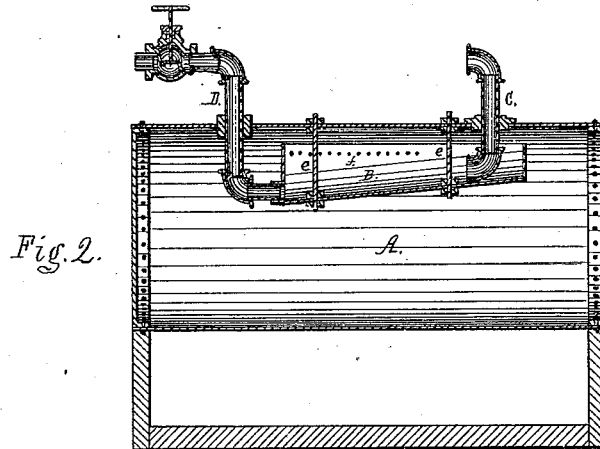
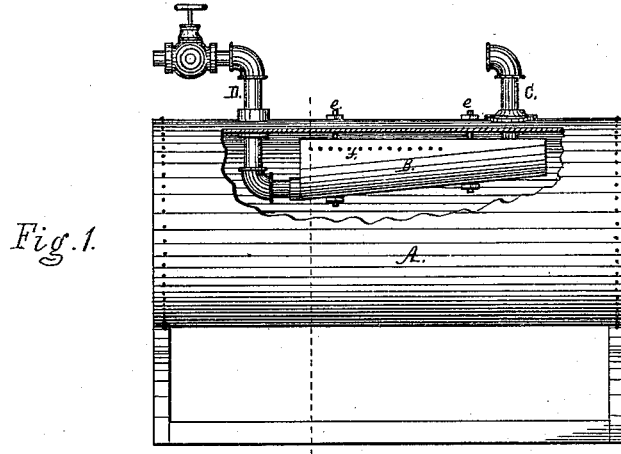


J. A. McCORMICK.  
Water-Heaters for Steam-Boilers.

No. 208,479.

Patented Oct. 1, 1878.



Witnesses  
*A. G. Davis*  
*James Johnston*

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# UNITED STATES PATENT OFFICE.

JUNIUS A. McCORMICK, OF PITTSBURG, PENNSYLVANIA.

## IMPROVEMENT IN WATER-HEATERS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **208,479**, dated October 1, 1878; application filed March 6, 1878.

*To all whom it may concern:*

Be it known that I, JUNIUS A. McCORMICK, of Pittsburg, in the county of Allegheny, State of Pennsylvania, have invented a new and useful Improvement in Water-Heaters for Steam-Boilers; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention relates to an improvement in water-heaters for steam-boilers; and consists in placing within the boiler, above the water-line, an open chamber, provided with a water-supply pipe and a "blow-off pipe," the upper edges of said chamber being provided with a series of small openings; the whole being so arranged that the water is heated, a large percentage of the gross matter commonly found in the water separated therefrom and collected in the bottom of said chamber, which at suitable intervals may be discharged through the blow-off pipe. The water thus purified and heated is distributed in the boiler through the steam in very fine streams or spray.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 is a side elevation of a boiler provided with my improvement. Fig. 2 is a vertical section of a boiler and my improved water-heater. Fig. 3 is a transverse section of the boiler and water-heater.

In the drawings, A represents the steam-boiler, which may be of the ordinary construction, and provided with the appendages common to steam-boilers. I place within the steam-boiler a water-heater, B, the construction of which is clearly shown in the several figures of the accompanying drawing. This heater is suspended in the boiler above the water-line through the medium of the bolts *e*, or by any other suitable means which the skilled mechanic may deem best. The upper edges of the heater B are provided with small perforations *f*. The heater is also provided

with a blow-off pipe, as indicated at D, and with a water-supply pipe, as indicated at C. The blow-off pipe is provided with the usual valve or valves, and the water-supply pipe may be connected with an injector or the ordinary force-pump.

The operation of my improvement is as follows: The water is forced into the chamber B through pipe C, the chamber being immersed in the steam of the boiler. The water becomes rapidly heated, the sediment and foreign matter in the water rapidly sink to the bottom of the chamber B, and the water thus purified flows out through the perforations *f* in small streams or jets, and striking the steam is distributed in the form of a spray, which sinks through the steam and commingles with the water in the boiler. At suitable intervals the sediment and foreign matter collected in the chamber B may be blown off through the blow-off pipe D.

The advantage of my improvement consists in supplying the boiler with heated water, purified, or partially purified, and providing the heater with a suitable instrumentality for discharging from it the impurities of the water at the will of the operator. By the use of such a heater as herein described the danger of cracking the boiler, forming incrustations in the boiler, and the liability of burning the boiler are obviated.

Having thus described my improvement, what I claim is—

1. A steam-boiler provided with an open water-heater suspended above the water-line within the boiler, and furnished with a supply-pipe and blow-off pipe, substantially as herein described.

2. A steam-boiler provided with an open water-heater suspended above the water-line within the boiler, the upper edges of said heater furnished with perforations, substantially as herein described, and for the purpose set forth.

JUNIUS A. McCORMICK.

Witnesses:

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