(No Model.)

G. M. COLLIER & R. T. DETLEFS.

APPARATUS FOR ELECTRICALLY PURIFYING WATER.

No. 540,608. Patented June 4, 1895.

Fig. 1.

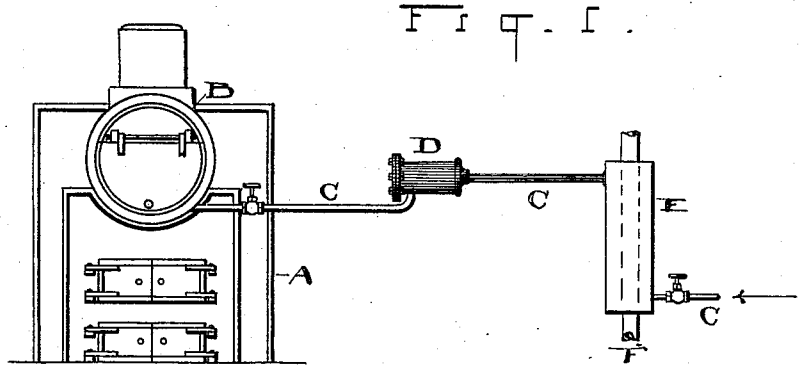


Fig. 2.

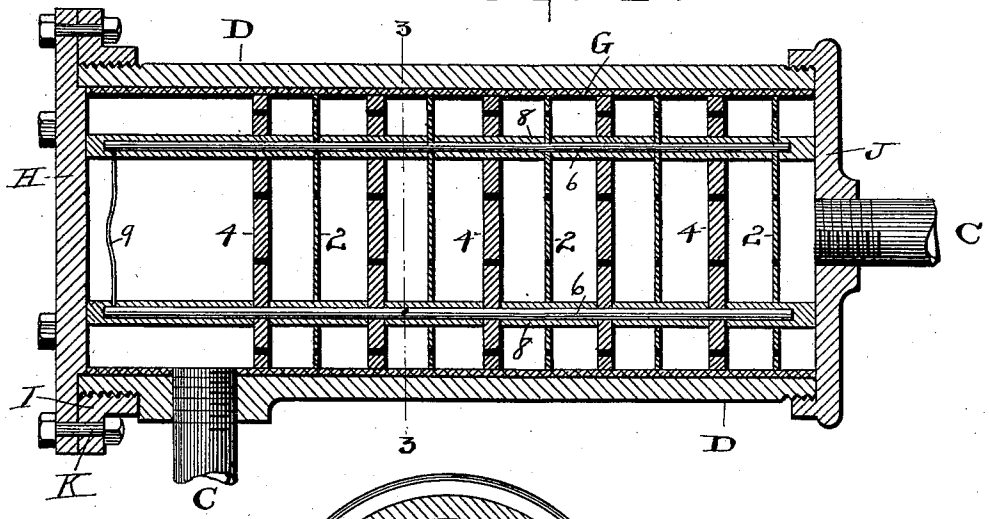
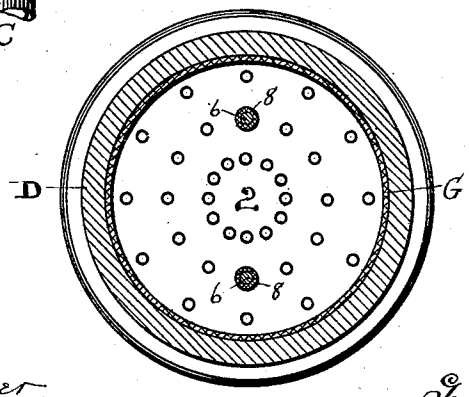


Fig. 3.



ATTEST

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GEORGE M. COLLIER AND RICHARD T. DETLEFS, OF CLEVELAND, OHIO.

APPARATUS FOR ELECTRICALLY PURIFYING WATER.

SPECIFICATION forming part of Letters Patent No. 540,608, dated June 4, 1895.

Application filed November 10, 1894. Serial No. 528,374. (No model.)

To all whom it may concern:

Be it known that we, GEORGE M. COLLIER and RICHARD T. DETLEFS, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Apparatus for Electrically Purifying Water for Steam-Boilers; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an apparatus for electrically purifying water for steam boilers, and the invention consists in means for first heating the water and then before it enters the boiler passing the heated water through a suitably constructed and arranged electrical battery and eliminating the elements which combine and form the incrustation on the boiler known as "scale."

In the accompanying drawings, Figure 1 is a plain elevation of a common boiler-front and a side elevation of a water-heater and battery-cylinder in the line of water-supply to the boiler after the manner of our invention. Fig. 2 is an enlarged longitudinal sectional elevation of the battery-cylinder and battery; and Fig. 3 is a cross-section thereof on line 3 3, Fig. 2.

A represents any suitable furnace and boiler front with boiler B set therein. C is the fresh water supply pipe having the electrical battery D built therein, and E is the water heater. This heater E is shown here as a cylinder or tube having the water pipe C connected or coupled with the ends thereof and passing on from the other end toward the boiler. A steam pipe F, which ordinarily is the exhaust pipe from the engine, passes through the heater E and heats the water therein sufficiently for the purposes of this invention. The cylinder D is shown here as having an inclosing cylinder in which are arranged alternately the positive and negative elements of the battery, consisting of the plates —2— which are of copper, carbon, or their equivalent, and the plates —4— of zinc. The inclosing cylinder G is a plain tube of any suitable non-conducting material such as rubber, gutta percha or the like slipped into the cylinder D, and the elements 2 and 4 are of a size to fit in the same. The said elements are united and supported by means of two metal rods, 6 connected by means of suitable electric connection 9, said rods passing through said elements and non-conducting sleeves —8— made of rubber or other like material on the rods separate the elements, and shield the said rods at their ends against contact with the metal heads H and J of cylinder D. The head, H, is secured or clamped to one end of the cylinder, D, by means of an interiorly screw threaded ring, I, and bolts and nuts, K, and the head, J, is secured to the opposite end by being screwed thereon. This construction enables us bodily to draw out the frame work including the elements and their rod and sleeve supports to replace or repair the elements as occasion may require. The circuit is completed through the water pipe connections. Both elements —2— and —4— are perforated to provide passages for the water, and the water travels or flows through the battery from end to end and through the perforations in the elements.

By this construction and arrangement of parts the water is divested of scale producing substances before it reaches the boiler, and at the same time we are enabled to supply the boiler with previously heated water as before; also by placing the battery in the line of water supply we have it in such position that it can be readily inspected and repaired and this is a great advantage.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The construction of water purifier described, consisting of the outer cylinder having inlet and outlet pipes, and the inner cylinder of non-conducting material forming a lining for the outer cylinder, in combination with the positive and negative disks having numerous perforations for the passage of the water to be purified, the supporting rods electrically connected together at one end, one of said rods connecting all the positive disks and the other rod all the negative disks, the non-conducting sleeves on said rods, the elements and rods being removable, substantially as described.

Witness our hands to the foregoing specification, this 1st day of November, 1894.

GEORGE M. COLLIER.
RICHARD T. DETLEFS.

Witnesses:
H. T. FISHER,
GEORGIA SCHAEFFER.