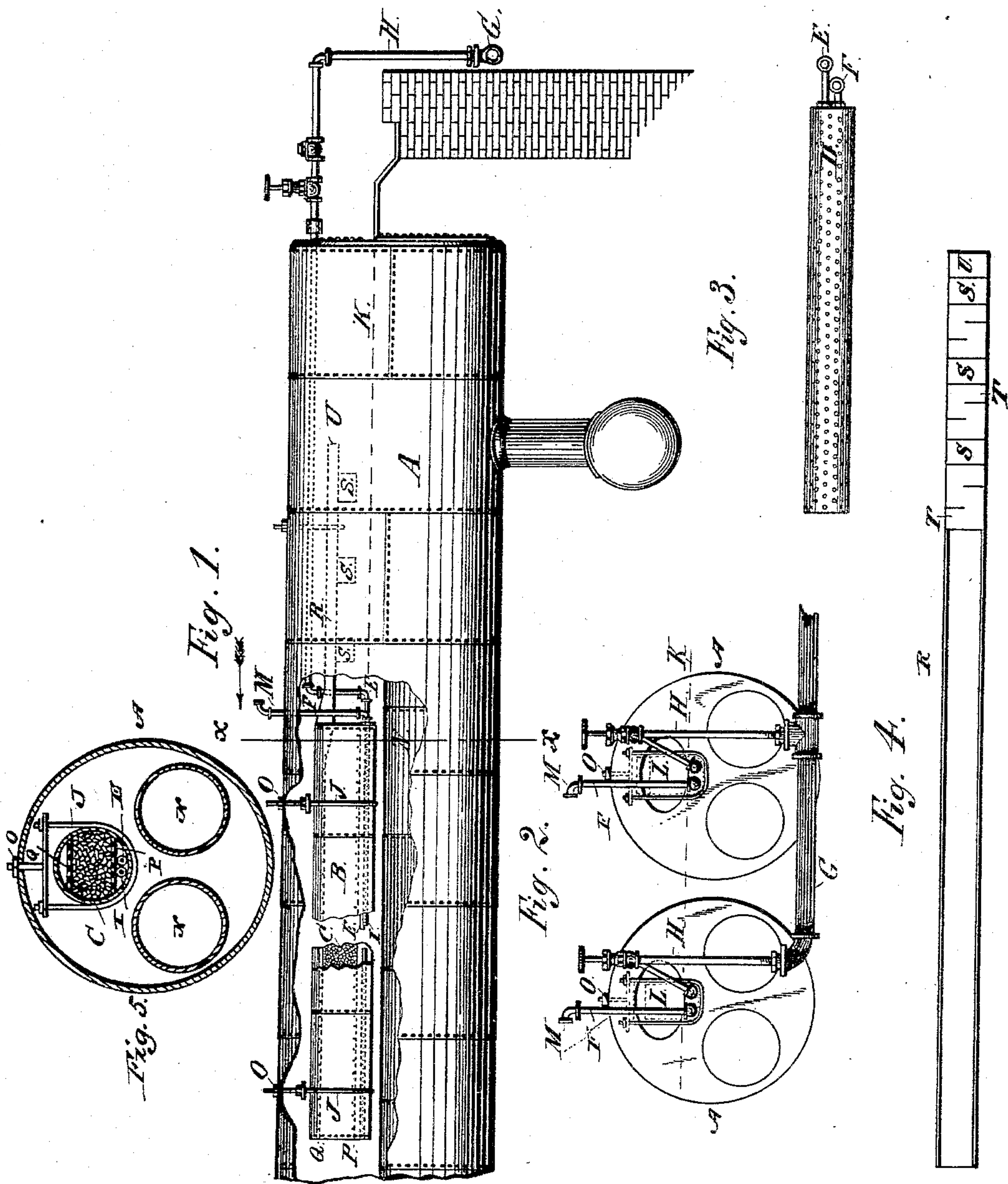


(No Model.)

J. D. SULLIVAN.
FEED WATER HEATER AND FILTER.

No. 412,137.

Patented Oct. 1, 1889.



WITNESSES,

Helmut Holtz
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TO WILLIAM W. SUTCLIFFE, OF SAME PLACE.

FEED-WATER HEATER AND FILTER.

SPECIFICATION forming part of Letters Patent No. 412,137, dated October 1, 1889.

Application filed March 29, 1889. Serial No. 305,333. (No model.)

To all whom it may concern:

Be it known that I, JOHN DENNIS SULLIVAN, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in a Feed-Water Heater and Filter; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in a feed-water-heater filter, in which a filter placed within the boiler is made to filter the water and separate the mineral; and the objects of my improvements are to provide a device whereby water may be filtered within the boiler. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side sectional view. Fig. 2 is a front end view of boilers; Fig. 3, a top view of perforated plate of filter. Fig. 4 is a top view of water-trough, showing partitions and mineral-chambers. Fig. 5 is a cross-sectional view taken in the plane indicated by the dotted line *x x* on Fig. 1.

Similar letters refer to similar parts throughout the several views.

In constructing my invention I form a U-shaped filtering-compartment—say one-half the length of the boiler. Within this filtering-compartment I place two perforated plates, which form upper and lower filtering-plates. Between these perforated plates I place coke or other filtering material. I then construct a trough, as shown in Fig. 4, with partitions, as shown by T, also mineral-chambers, as shown by S. When the space between my perforated plates within filtering-compartments have been filled with filtering material, I then place my trough and filter within boiler by introducing same through the man-hole of boiler, and which is held in position by means of stirrups J. At the back end of the boiler I introduce my feed-water pipe E, and carry same forward within boiler until it comes in close proximity to blow-off pipe F, which is in a vertical position within boiler A. The feed-water pipe is carried into my filtering compartment or chamber until it

extends, say, one-half the length of the filter-chamber B, running parallel with a perforated pipe I, which is within chamber B, said perforated pipe being attached to blow-off pipe F.

C shows coke within filtering-compartment.

D is perforated plate.

G is a manifold-pipe, which comes from feed-pump, H being branch pipes.

L is an end view of cleaner or filter.

M are elbows on blow-off pipe F.

N shows portion of flue of boiler.

O are bolts or nuts on stirrups J.

K is a water-line within boiler.

P and Q show position of perforated plates in cleaner or filter-chamber B.

R is an extension-trough leading feed-water back to mud-drum leg, showing deposit-chambers S and partitions T, which cause the water to take a sinuous course down the trough to the point of discharge U.

The blow-off pipe F has valves and connections to discharge outside. Each branch pipe H has stop-valves and check-valves, as shown.

In practice I admit water through feed-pipe E, which is carried midway within cleaner or filter B. The feed-water, being confined within B, flows upward through coke C, or other filtering material, and percolates through perforated plate Q, and after being cleaned or filtered is carried into feed-water trough R, and as it flows through said trough comes in contact with partitions, and should there be any mineral left in water said mineral is deposited in chambers S, and water flows into boiler at the point of discharge U. The perforated pipe I extends—say nine feet—the entire length of cleaner or filter and under lower perforated plate, and all mud or sediment deposited under said plate is carried off by means of blow-off pipe F, as water is partially evaporated as it passes through trough R, and the water being filtered within the boiler the deposit of sediment in the mud-drum, if any, is small in comparison to the old method.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a feed-water heater and filter such as

described, the combination of a boiler with a filter placed therein, the perforated plates in said filter, and the perforated pipe running under filtering-plate and connecting with
5 blow-off pipe F, for the purpose set forth.

2. In a feed-water heater and filter such as described, the combination of a boiler with a filter placed therein, the perforated plates in said filter, and the feed-water pipe leading
10 under filtering-plate and connecting with perforated pipe attached to blow-off pipe, for the purpose set forth.

3. In a feed-water heater and filter such as described, the combination of a boiler with a
15 filter placed therein, the perforated plates in

said filter; and the feed-water trough, for the purpose set forth.

4. In a feed-water heater and filter such as described, the combination of a boiler with a filter placed therein, the perforated plates in
20 said filter, the water-trough with partitions, and mineral-chambers therein, for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN D. SULLIVAN.

Witnesses:

ZACHERY T. HEAP,
HELMUTH HOLTZ.