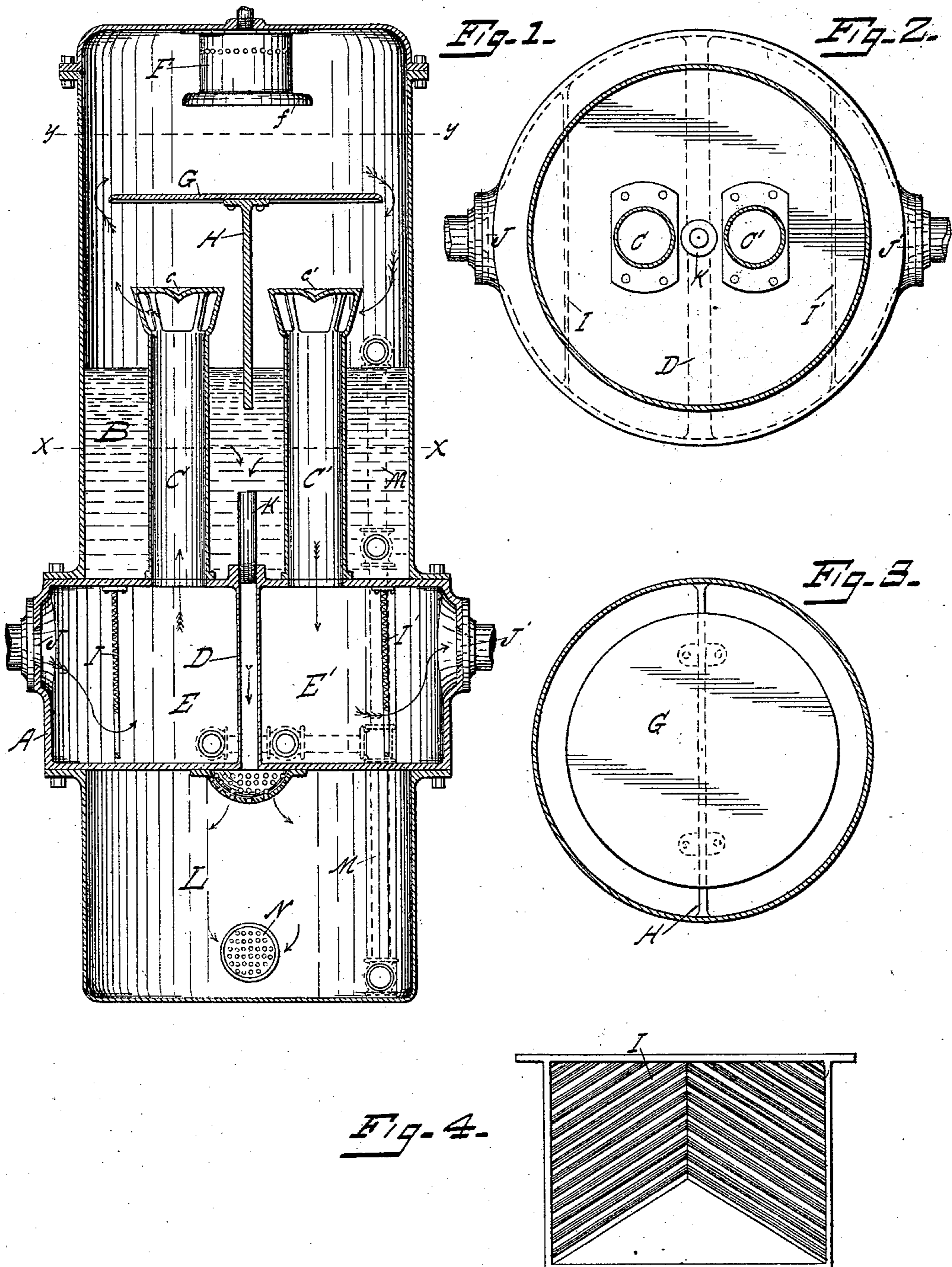


(No Model.)

T. J. COOKSON.
FEED WATER HEATER AND PURIFIER.

No. 542,331.

Patented July 9, 1895.



WITNESSES.

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UNITED STATES PATENT OFFICE.

THOMAS J. COOKSON, OF CHICAGO, ILLINOIS.

FEED-WATER HEATER AND PURIFIER.

SPECIFICATION forming part of Letters Patent No. 542,331, dated July 9, 1895.

Application filed May 13, 1895. Serial No. 549,121. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. COOKSON, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have
5 invented a new and useful Improvement in Feed-Water Heaters and Purifiers, of which the following is a specification.

The object of my invention is to provide a heater and purifier for the feed-water of
10 steam-boilers, or other similar purposes, in which the heat of the exhaust-steam is utilized to heat and purify the water in the most efficient manner, the steam at the same time being itself purified and dried, and which is
15 equally operative with the steam passing through it in either direction.

Heretofore heaters have been constructed so as to bring the feed upon one side and the exhaust upon the other, making it necessary
20 that they be set up in a certain position relative to the boiler or engine. My heater is adaptable to both positions by being made reversible in operation—that is, the steam may be passed through it in either direction, the
25 feed becoming the exhaust and the exhaust the feed, and the results the same in both cases.

It consists of a heater divided into two practically similar members, either one of
30 which may become the feed or exhaust in turn, as desired, each having a steam-chamber, a water-chamber, and a baffle-plate, all similarly located.

It further consists of details hereinafter
35 more fully described and particularly pointed out in the claims.

Figure 1 is a longitudinal section of my heater. Fig. 2 is a cross-section of same on
40 lines *xx*, Fig. 1. Fig. 3 is a cross-section of same on lines *yy*, Fig. 1. Fig. 4 is plan view of the baffle-plate.

A represents the steam-chamber; B, the water-chamber; C C', the pipes leading from
45 one to the other; D, the hollow partition dividing A into two compartments E and E'; F, the water-inlet; G, the table upon which the water falls; H, the partition by which the steam is prevented from passing directly from C into C'; I I', the baffle-plates; J J', the feed
50 and exhaust ports; K, the water-outlet pipe; L, the filtering-chamber; M, the overflow or waste pipe, and N the water-outlet.

The operation of my invention is as follows: The steam passing through in the direction of the arrows first strikes upon the
55 baffle-plate I, where it is deflected downward and the oil and water precipitated into the compartment E, thence up through C into the water-chamber, where it comes in contact with the spray from the water-inlet, thence
60 down through C' into E', where it strikes the baffle-plate I', which further purifies and dries the steam and then exhausts through J'. The water entering at F is sprayed into the chamber B, where it comes in contact with the
65 steam, and, falling upon the table G, spreads out and runs over its edges, where it is again mixed with the ascending and descending flow of steam and thoroughly heated. The sprinkler F has a pan or collar *f* upon its
70 lower edge to spread the water into a thin sheet. The table G extends out over the top of the pipes C C' in order to prevent the water running down them. C and C' are also
75 provided with caps *c c'* for the same purpose. The partition H extends from the table G down to a point below the water level, which seals the lower edge of it to the passage of the steam, compelling the steam to go
80 up and around the table G. The outlet-pipe K draws the water off from B at a point a short distance below its surface, conducting it into the hollow partition D, and from thence it runs into the filtering or settling chamber L. Thus it will be seen the water is first thor-
85 oughly mixed with the steam and heated in the upper portion of the chamber B. It then settles into the lower portion, where it is further heated by coming in contact with the pipes C C', part of the impurities being pre-
90 cipitated and removed by settling and further heated in the hollow partition D, which is heated to a high temperature by the steam upon both sides of it.

The chamber L is preferably filled with a
95 filtering substance, by which the remaining impurities are removed from the water before it is drawn off at N.

The impurities which have settled in the different chambers B, E, E', and L are drawn
100 off through the waste-pipe M.

I have shown the steam as passing through the heater from the port J to the port J', but it is obvious that from the similarity and

symmetrical disposition of the parts the result will be the same if the direction be reversed. This gives to my heater the advantage of being adapted to be set up upon either
5 side of the boiler or engine, or in various positions, and the connections easily made.

The baffle-plates J J' are corrugated in order to present a larger surface to the steam, and the corrugations extend from a middleline
10 diagonally downward to the edges in order to drain off the water and oil to the sides.

What I claim, and desire to secure by Letters Patent, is—

1. The herein described feed water heater
15 and purifier, consisting of the combination of the chamber A into which the steam enters, divided into two compartments E, E', ports J, J' therein, the baffle plates I, I' opposite said ports, the chamber B into which the wa-
20 ter is fed, and the conduits C, C', connecting the chambers A and B, all substantially as shown and described.

2. The herein described feed water heater and purifier, consisting of the combination of
25 the chamber A into which the steam enters, divided into the compartments E, E', ports J, J' therein, baffle plates I, I' opposite said

ports, the chamber B into which the water is fed, the partition H therein, the conduits C, C' connecting the chambers A and B, all sub- 30
stantially as shown and described.

3. The herein described feed water heater and purifier, consisting of the combination of the chamber A into which the steam enters, divided into two compartments E, E', ports 35
J, J' therein, baffle plates I, I' opposite said ports, the chamber B into which the water is fed, the partition H therein, the conduits C, C' connecting the chambers A and B, the water inlet F and the water outlet K, and the hol- 40
low partition D into which K leads, all substantially as shown and described.

4. The herein described feed water heater, consisting of the combination of the steam chambers E, E', the ports J, J' therein, and 45
baffle plates I, I' having corrugated surfaces, the corrugations extending from a middle line diagonally downward toward the edges, all substantially as shown and described.

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Witnesses:

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