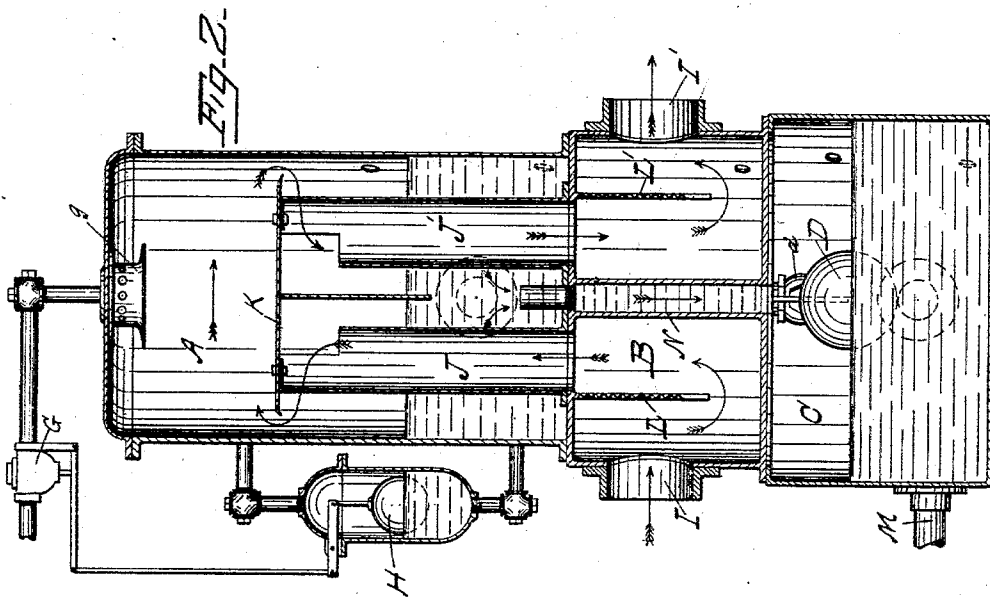
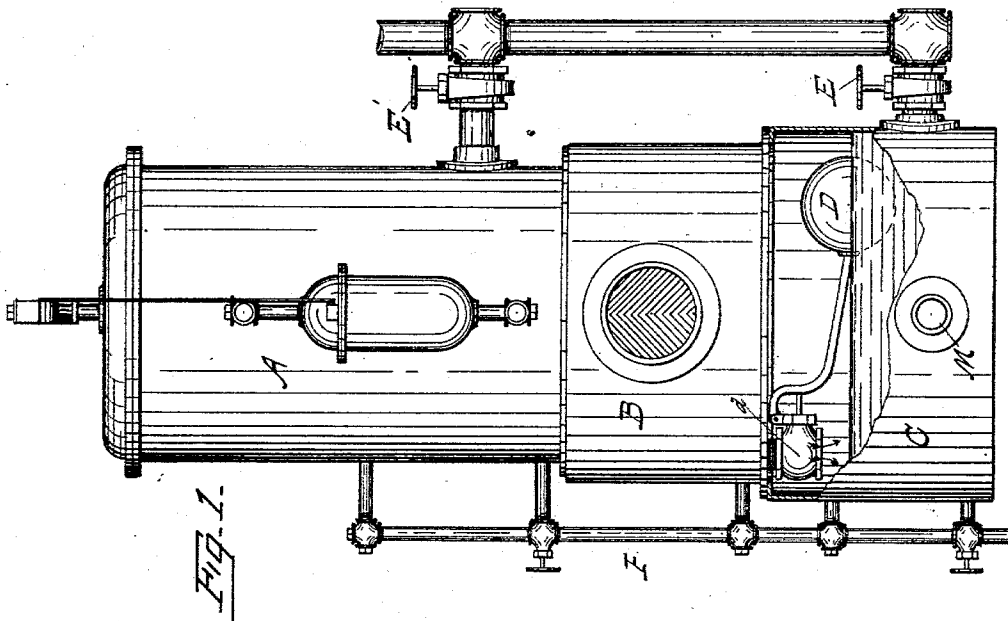


(No Model.)

T. J. COOKSON.
FEED WATER HEATER.

No. 562,888.

Patented June 30, 1896.



WITNESSES.
John Fraser.
B. J. Reddyne

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UNITED STATES PATENT OFFICE.

THOMAS J. COOKSON, OF CHICAGO, ILLINOIS.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 562,888, dated June 30, 1896.

Application filed November 21, 1895. Serial No. 569,607. (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 invented a new and useful Improvement in Feed-Water Heaters and Purifiers, of which the following is a specification.

My invention belongs to that class of heaters, used in heating systems of buildings, which receive the water of condensation from the radiators, steam-coils, &c., in addition to the fresh, cold water which is to be heated and purified.

Its object is to provide a heater which will maintain a low water-level for the water of condensation. In the usual form of heater the water-level is maintained in the upper chamber with a steam-chamber or filtering-chamber, or both, below it.

In my Letters Patent No. 542,331, dated July 9, 1895, I show a heater of this description. The objection to this high water-level is that, in heating systems in which the water of condensation is returned by gravity, it is of course necessary that all radiators or steam-coils be placed above that level. This is often found inconvenient or impossible in the heating systems of low buildings or basements. My invention aims at overcoming this objection.

It consists of a heater of the usual type, provided with a separate receiving-chamber for the water of condensation, located below the other chambers, in which a water-level is preserved separate and independent from the water-level in the fresh-water chamber, and means for connecting one with the other.

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

Figure 1 is a side elevation of my heater with portion of the casing of the lower chamber broken away, showing the water-level and float. Fig. 2 is a longitudinal section of the same.

A represents the fresh-water chamber; B, the steam-chamber; C, the water-of-condensation chamber; D, the float therein; E E', the inlet-valves; F, the blow-off or overflow pipes; G, the fresh-water-inlet valve; H, the float by which the water-level is pre-

served in the upper chamber I I' in steam-inlet and outlet; J J', the pipes connecting the chambers A and B; K, the table upon J J'; L L', the baffle-plates; M, the outlet through which the water is drawn off; N, the hollow partition dividing B into two chambers.

The operation of my heater is as follows: The steam entering through I strikes the baffle-plate L, precipitating the oil and water in it, then passes up through J into the chamber A, where it is thoroughly mixed with the entering water, heating it, then around the table K down through J' and out at I'. The fresh water enters at g, its flow being regulated by the float H, governing the valve G. The heated water is drawn off through the hollow partition N. The process would be complete at this point were the water entering at g the only water received; but in the heating systems of buildings there is a certain quantity of water of condensation from the radiators, &c., which it is desirable to return into the heater. This water is already heated and purified, having passed through the heater before. It is usually returned into the chamber A, entering below the water-level in order to seal the return-pipe and prevent steam backing up the pipe. This, of course, necessitates placing all radiators which drain into the heater above this water-level, either by raising the radiators or lowering the heater into a pit. In order to meet this objection, I make the chamber C, which in my former patent I have shown as a filtering-chamber, into a receiving-chamber for the water of condensation, preserving in it a water-level by means of the float D, which governs the inlet-valve d, through which the water from A enters. The water of condensation enters through the valve E.

During the warm season, when the heating system is not in use, or at any time that the low radiators are not in use, the water of condensation may, if desired, be turned into the upper chamber by opening E' and closing E, and the float D removed, and the chamber C used as a filtering-chamber, as heretofore done; but while the low radiators are in use I can, in the manner described, provide a receiving-tank for the water draining from them having a water-level only a few inches

above the floor, and at the same time the remainder of the heater, excepting the filtering-chamber, in full operation.

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

1. In a feed-water heater and purifier, the combination of the fresh-water chamber A, the steam-chamber B connected therewith, the return-water chamber C below the level of A, and means for maintaining independent water-levels in A and C, all substantially as shown and described.

2. In a feed-water heater and purifier, the combination of the fresh-water chamber A, the steam-chamber B connected therewith, the return-water chamber C, and the floats H and D by which the water-levels in A and C respectively are independently maintained, all substantially as shown and described.

3. In a feed-water heater and purifier, the combination of the fresh-water chamber A,

the steam-chamber B connected therewith, the return-water chamber C, the floats H and D by which the water-levels in A and C respectively are preserved, and the valves E, E' by which the return-water is returned into A or C at will, all substantially as shown and described.

4. In a feed-water heater and purifier, the combination of the fresh-water chamber A, having a water-level maintained therein, the steam-chamber B located below said chamber A and connected therewith, the return-water chamber C, located below said chamber B, and having an independent water-level maintained therein, all substantially as shown and described.

THOMAS J. COOKSON.

Witnesses:

F. J. LE MOYNE,
LOUIS V. LE MOYNE.