

D. COUGHLIN.

Heaters for Steam-Boilers.

No. 145,095.

Patented Dec. 2, 1873.

Fig. 1.

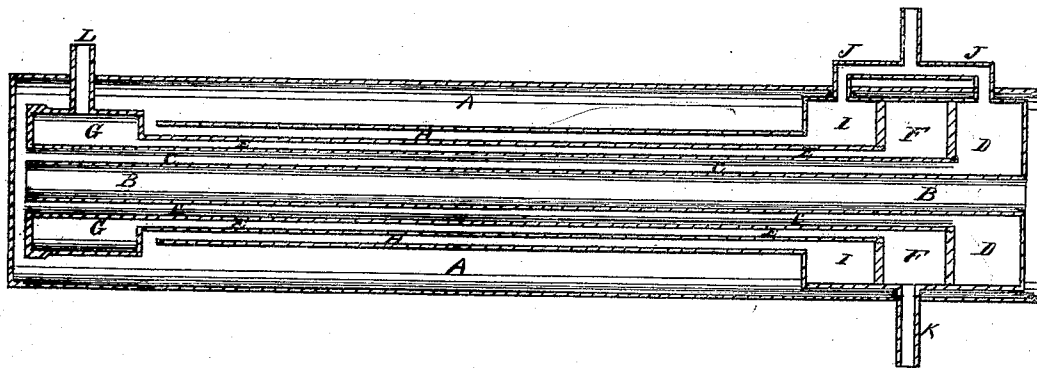
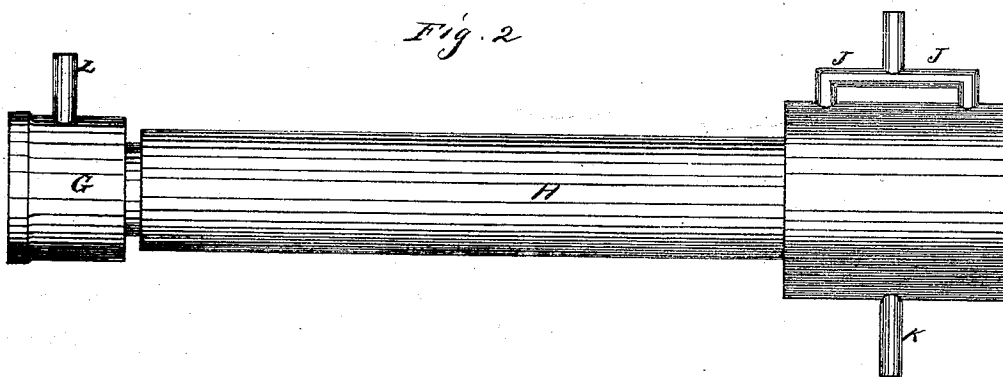


Fig. 2.



Witnesses-

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UNITED STATES PATENT OFFICE.

DAVID COUGHLIN, OF FALL RIVER, MASSACHUSETTS.

IMPROVEMENT IN HEATERS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **145,095**, dated December 2, 1873; application filed July 23, 1873.

To all whom it may concern:

Be it known that I, DAVID COUGHLIN, of Fall River, county of Bristol and State of Massachusetts, have invented an Improved Heater; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

The object of my invention is to provide an improved heater for water to be used in steam-boilers, and it is more especially valuable when employed upon small portable engines, or upon tug-boats, and in connection with all engines which are so located that it is impossible to employ a bulky apparatus. My invention consists in the employment of concentric tubes and chambers, into one of which the water is received and passes between two tubes in a thin sheet. The tubes upon each side of this water-space are filled with exhaust steam from the engine, and outside and inside of these steam-spaces are formed other steam-spaces, also filled with the exhaust steam, which serves to jacket the whole and prevent the loss of heat. An inclosing-vessel serves to contain the whole apparatus, which can be suspended against a wall, or over the boiler, or otherwise suitably placed.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a longitudinal section of my heater. Fig. 2 is an outside view of the apparatus with the outer case removed.

A is the outer casing, which may be made of sheet or thin boiler iron, and contains the tubes and chambers forming the heater. The inner tube, B, passes entirely through both of the enlarged heads, which are situated at the ends of the tubes, and this is surrounded by a tube, C. This tube passes through one of the heads, but opens into an enlarged chamber, D, in the other. These two tubes and the chamber D receive exhaust steam, and are

situated within the water-tube E. This tube connects with the enlarged chamber F in one head, and thence passes into the chamber G in the other. Outside of this tube is the steam-tube H, which also receives exhaust steam from a chamber, I. This chamber and the chamber D receive each a branch of the exhaust-pipe J, and are thus furnished with steam. The steam from the tube H and C is received directly from the exhaust-pipe, and passes out through their open ends, thence returning through the inner tube and around the outer tube within the casing A to a suitable exit-pipe. The water is admitted through the pipe K into the chamber F, thence passing into the tube E, where it surrounds, and is in turn surrounded by, steam, so that it is subjected to the heat while in the form of a thin sheet. Passing through the tube E, it enters the head or chamber G, from which it is discharged through the pipe L, to be taken to the point where it is to be used. The secondary envelop of steam contained within the tube B and surrounding the tube H in the chamber A prevents a too rapid radiation of heat from the inner steam-tubes, and also assist in heating the water.

The whole device is economical, both in construction and in the space occupied.

Having thus described my invention, I desire to secure by Letters Patent—

A heater, consisting of the water tube or space, E, having the enlarged chambers F and G, and concentrically surrounding and surrounded by the steam-passages C and H with their chambers D and I, these again surrounding and surrounded by the steam-passage B and the casing A, when the whole is constructed to operate substantially as herein described.

In witness whereof I hereunto set my hand and seal.

DAVID COUGHLIN. [L. S.]

Witnesses:—

JOHN L. BOONE,
C. M. RICHARDSON.