(No Model.)

E. S. MANNY.

HOT WATER BOILER.

No. 382,313. Patented May 8, 1888.

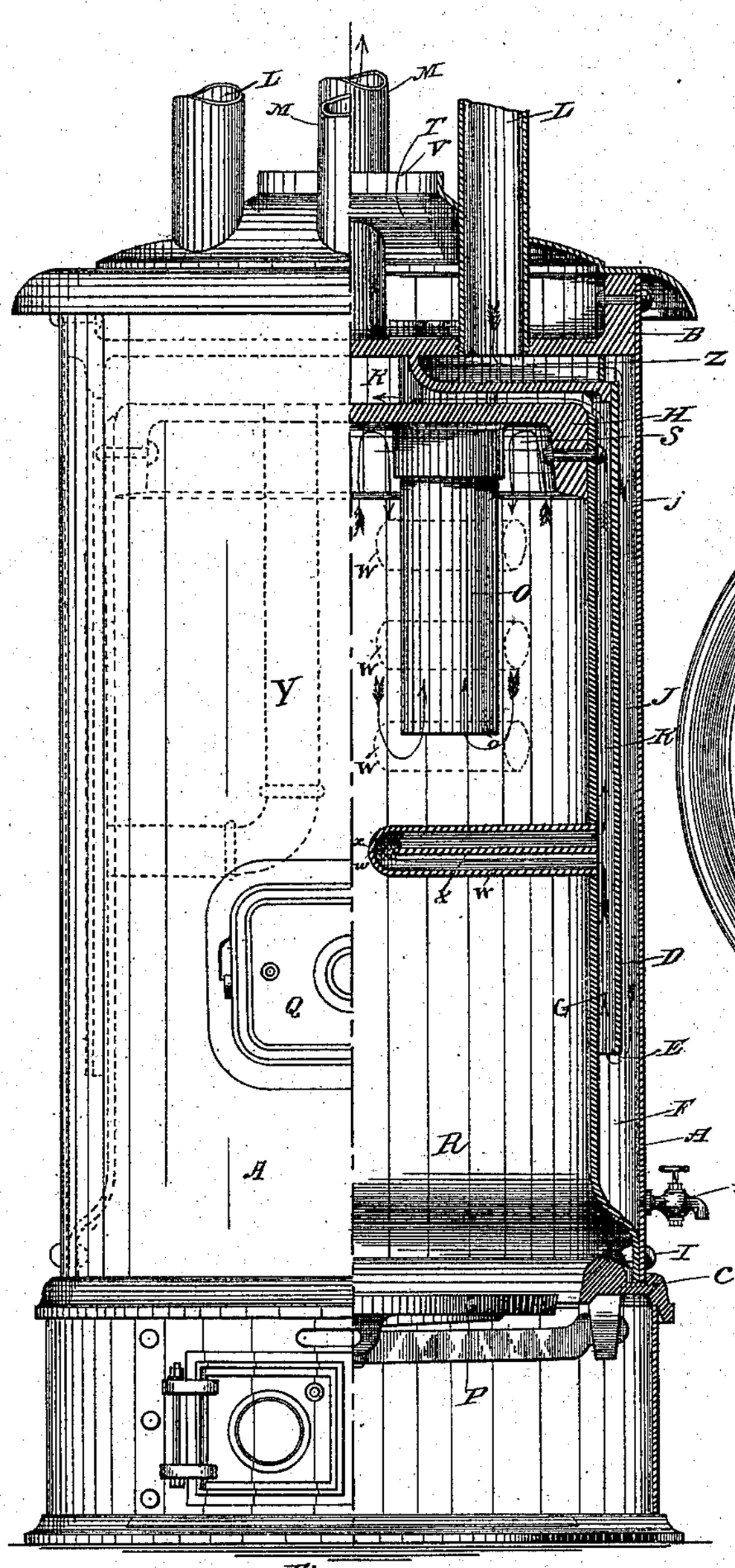

Fig. 1.

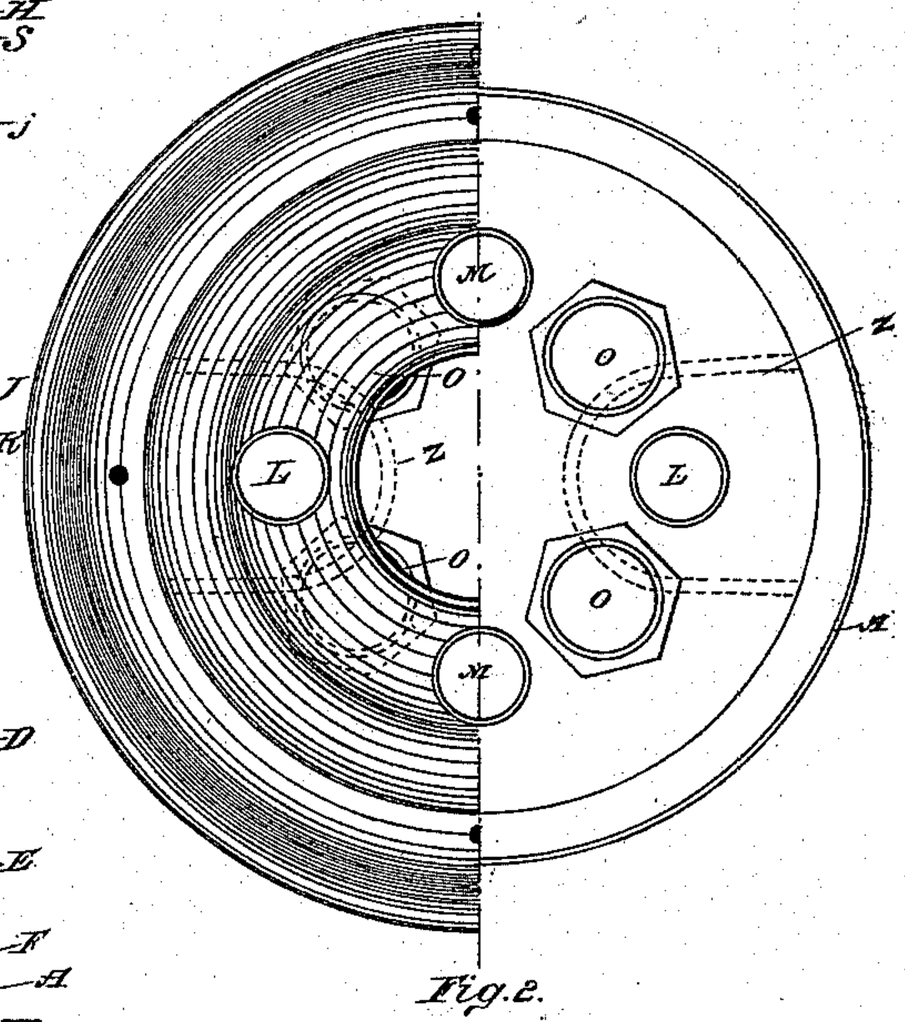

Fig. 2.

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UNITED STATES PATENT OFFICE.

EUGÈNE S. MANNY, OF MONTREAL, QUEBEC, CANADA.

HOT-WATER BOILER.

SPECIFICATION forming part of Letters Patent No. 382,313, dated May 8, 1888.

Application filed September 13, 1887. Serial No. 249,550. (No model.)

To all whom it may concern:

Be it known that I, EUGÈNE SOLOMON MANNY, a citizen of the Dominion of Canada, residing in the city and district of Montreal, and Province of Quebec, Canada, have invented certain new and useful Improvements in Hot-Water Boilers; and I do hereby declare that the following is a full and clear description of the same, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has reference to a hot-water boiler having its returning pipes tapping the heater at the top instead of at the bottom, and, moreover, not having the inconvenience of making the room containing the heater excessively hot, as is generally the case at present.

Referring to drawings, similar letters refer to similar parts throughout the several views.

Figure 1 shows an elevation of my boiler, the right-hand half of it being shown in section. Fig. 2 is a plan view of the same with the right-hand half of the top casting or covering removed, thus showing the inside of my boiler.

My heater is composed of three envelopes, the first one being A, which extends from the top casting, B, to the lower one, C. The second envelope, D, is joined at the top also to casting B; but at its lower end, E, it is left free and not joined to anything, so that there is a space, F, under it to allow free circulation of water. The third envelope or inner one is G. It is joined at its upper end to casting H and at its lower end to the first envelope, A, by means of rivets I, so that the said three envelopes D E G will provide for the two concentric spaces J and K, communicating by means of space F, the space K also extending between crown-castings B and H.

The main feature of my invention is that, instead of the cold water being returned to the heater at its lower end—that is, to the one closest the fire-box—it is returned at the upper end and will come down between the envelopes D and E, and thus cool down the outer one, D.

In Fig. 1 pipes L L are the return-pipes, and the pipes M M the exit-pipes, for the heated water. The number of these pipes is multiplied at will, according to the size of the heater.

In Fig. 1, P is the grate; Q, the fire-box door; R, the fire-box, and O the smoke-flues, which in this case are large and not joined together at their lower extremities by means of a flue-sheet, but left free, so that the hot gases rise to the top S, and consequently have time to get partly consumed and cede a large proportion of their heat to the surrounding envelope, encircled by water, before they can escape into the chimney. Moreover, to reach the latter they must return along flues O in the manner shown by arrows at S and then enter flues O, as shown by arrows at *o*. From thence the smoke gets into the smoke-box T, having its outlet at V. The number and size of flues O can be augmented or diminished to suit size of furnace. On the other hand, to increase again the heating-surface, I employ two methods, according as the heater is small or large. For a small heater I make use of the cul-de-sac pipes W, which are provided with the plates X, placed in them so as to divide the tube into two parts, leaving the communication *x* between the upper and lower half at the extremity *w*.

In the larger heaters I make use of the pipes Y. (Shown on the left of Fig. 1 in dotted lines.) The number of the pipes W or Y can be augmented or diminished, according to the size of the heater.

The way in which the circulation takes place is the following: The cold water returning through pipes L L enters space J, as shown by arrows at *j*. The crown-casting B having the pockets *z* cast with it to permit the communication between pipes L L and space J, the cold water then proceeds downward in space J until it reaches F, where it then begins ascending space K, as shown by arrow at F. In this space it gets heated to the required temperature, so that when it reaches the space between the crown-castings B and H it ascends through the pipes M M, the said pipes M communicating directly with the said space K. However, to augment the heating-surface, I make use, as aforesaid, of the pipes W and Y. The water in pipes W first enters them in their under half and then passes into the upper half

through the passage *x*, from whence it returns to the space K, as shown by arrow. As for pipes Y, the water merely enters their lower extremity and rises as it is heated to the space K between the crown-castings B and H.

To let the water run out of the furnace, it is provided with a valve, *m*, situated at the bottom of space F, so that in cold weather, when the water would be apt to freeze when the heater would not be in use, or for any other reason should the water be wanted out, the valve *m* would effectively drain all the water off.

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

In a hot-water boiler of the class described, the combination, with the three concentric envelopes D E G, of the top returning pipes, L, bringing the cold water along the outer envelope, D, to cool it down, casting B, pocket Z, and exit-pipes M M, as above described, and for the purposes set forth.

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