(No Model.)

J. L. BOYER.

STEAM HEATER.

No. 303,912. Patented Aug. 19, 1884.

Fig. 1.

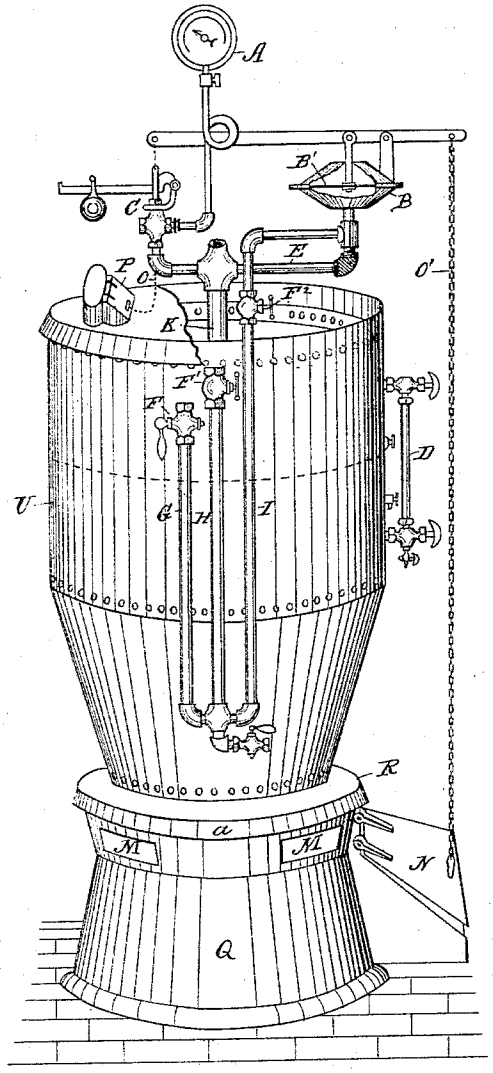
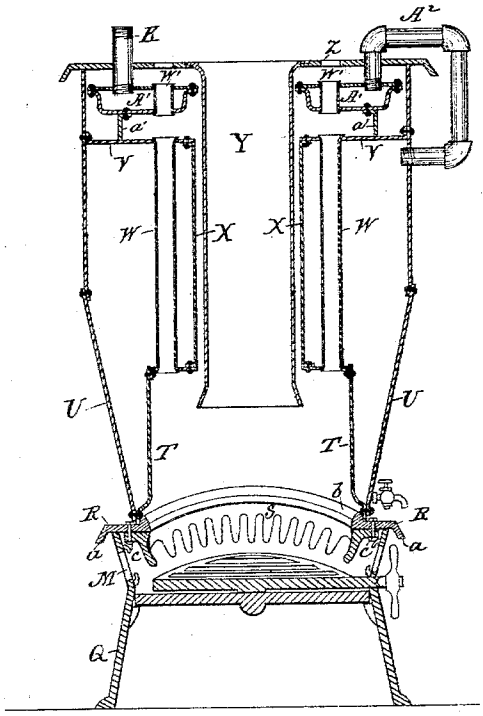


Fig. 2.



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JEROME L. BOYER, OF COLUMBIA, PENNSYLVANIA.

STEAM-HEATER.

SPECIFICATION forming part of Letters Patent No. 303,912, dated August 19, 1884.

Application filed February 16, 1884. (No model.)

To all whom it may concern:

Be it known that I, JEROME L. BOYER, a citizen of the United States, residing at Columbia, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Heaters, of which the following is a description.

Figure 1 is a perspective view, and Fig. 2 a vertical section of my improved steam-heater.

My invention relates to that class of steam-heaters which are employed for generating and circulating a body of steam through a system of pipes in continuous circuit for heating coils or radiators in the several rooms of a building.

My invention relates more particularly to that class of steam-heaters which have a central magazine above the fire-pot, with an annular boiler around the latter; and it consists in the peculiar construction of the castings forming the bottom of the heater, in the peculiar construction and arrangement of an annular superheating steam-chamber located in the hot-air and smoke space in the upper part of the heater, and in the disposition of the outlet and return pipes, all as hereinafter more fully described.

In the drawings, Q represents a circular cast-metal base of a double conical shape, having at its point of least diameter, or near its middle, a shaking and dumping grate.

R is a ring-shaped plate resting upon the upper edge of the base Q. This ring-plate has a pendent flange, *a*, at its outer edge, and an upwardly-projecting flange, *b*, at its inner edge.

To the lower side of the ring-plate R is fastened, by bolts *c*, a ring, S, with downwardly-projecting fingers forming the lower portion of the fire-pot. Against the flange *b* rests the lower edges of the fire-pot wall T and the boiler-shell U, which latter is made conical at its lower end and cylindrical above. It will be seen, therefore, that the ring-plate R and ring S are securely fastened together and rest loosely upon the base Q, whose upper edge fits between the ring S and the pendent flange *a*.

In the upper portion of the base Q are openings M, with sliding doors, through which access may be had to the grate with a poker all around the heater to shake down the ashes and remove clinkers.

V is the crown-sheet of the boiler, between which and the top of the fire-pot there are a number of tubes, W, for the passage of the products of combustion, and X is the inside wall of the boiler, which connects the crown-sheet and fire-box.

Z is the top plate of the heater, which closes in the smoke-space, and sustains the central magazine, Y, through which coal is fed to the fire-pot. This magazine is loosely supported by a lip or flange at its upper edge, so that it can be easily removed, and in diameter it is somewhat less than that of the wall X, so as to leave an annular smoke-flue between.

Between the crown-sheet V and the top cover, Z, there is an annular space in which I locate an annular steam-superheating chamber, A′, which is supported upon legs *a′* on the crown-sheet, and is connected with the steam-space of the boiler by the elbowed pipe A^2, and from which the steam issues through pipe K in its passage to the radiators. This annular chamber is composed of two ring-shaped sections of metal, one much wider than the other, and having its edges bent up to contact with the edges of the smaller section, and bolted thereto, as shown. Through this annular superheating-chamber there are also short tube-sections W′, which are arranged to register with the tubes or flues W below. By means of this annular superheater the steam is not so wet as it passes to the radiators, the condensation in the latter is reduced, and a more rapid circulation of steam and better heating effect are obtained.

From the steam-pipe K there rises a steam-gage, A, and safety-valve C. A pipe, E, also extends from the steam-pipe K, and supports the regulator B, which has within it a flexible diaphragm, B′, of soft rubber or other material. This pipe E, however, does not act as a conduit for steam, but is a blanked pipe plugged to prevent passage of steam, and having only the office of a supporting-bracket.

D is the glass water-gage, and G the feed-water pipe, by which latter the requisite amount of water may be admitted to the boiler when it becomes low, as observed by the gage.

H is the return-water pipe, by which the condensed water or cooled steam returns from the radiators to the boiler, and I is a pipe communicating with the boiler below the water-line, and also with the under side of the diaphragm in the regulator.

F F′ F² are valves in the pipes G H I, which pipes have at their lower end a treble-jointed connection, so that it is only necessary to tap the boiler at one point for all three of these pipes.

P is a damper in the smoke-pipe, and N is a draft-damper for the fire-pot, which are respectively connected by chains O O′ to the opposite ends of a lever connected by a rod or stem with the diaphragm of the regulator. The arrangement of these parts is such that when the fire burns too freely the increased pressure on the diaphragm moves the lever and closes draft-damper N, and opens smoke-pipe damper P, until the heat and pressure are sufficiently reduced, and when this takes place the diaphragm, in falling, opens again the draft-damper N, and closes smoke-pipe damper P, thus securing an automatic and exact regulation of heat and pressure and the most economic use of fuel.

Having thus described my invention, what I claim as new is—

1. The combination, with the supporting-base Q, of the ring-plate R, having downwardly-projecting flange *a* on the outside, and upwardly-projecting flange *b* on the inside, the fire-box sheet T, and boiler-shell U, resting against the flange *b*, and the ring S, with downwardly-projecting fingers bolted to the under side of ring R, inside of the upper edge of the base, substantially as and for the purpose described.

2. The combination, with the steam-heater, having central magazine, Y, boiler U V X, and an annular smoke-space above its annular boiler, of the annular superheating-chamber A′, composed of two ring-shaped pieces of metal of different widths riveted together, as shown, the short flue-sections W′, and legs *a*′, as and for the purpose described.

3. The water-supply pipe G, water-return pipe H, and regulator-pipe I, having a triple connection with each other outside the boiler, in combination with the blow-off cock L, and the boiler, substantially as and for the purpose described.

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