No. 769,682. PATENTED SEPT. 6, 1904.

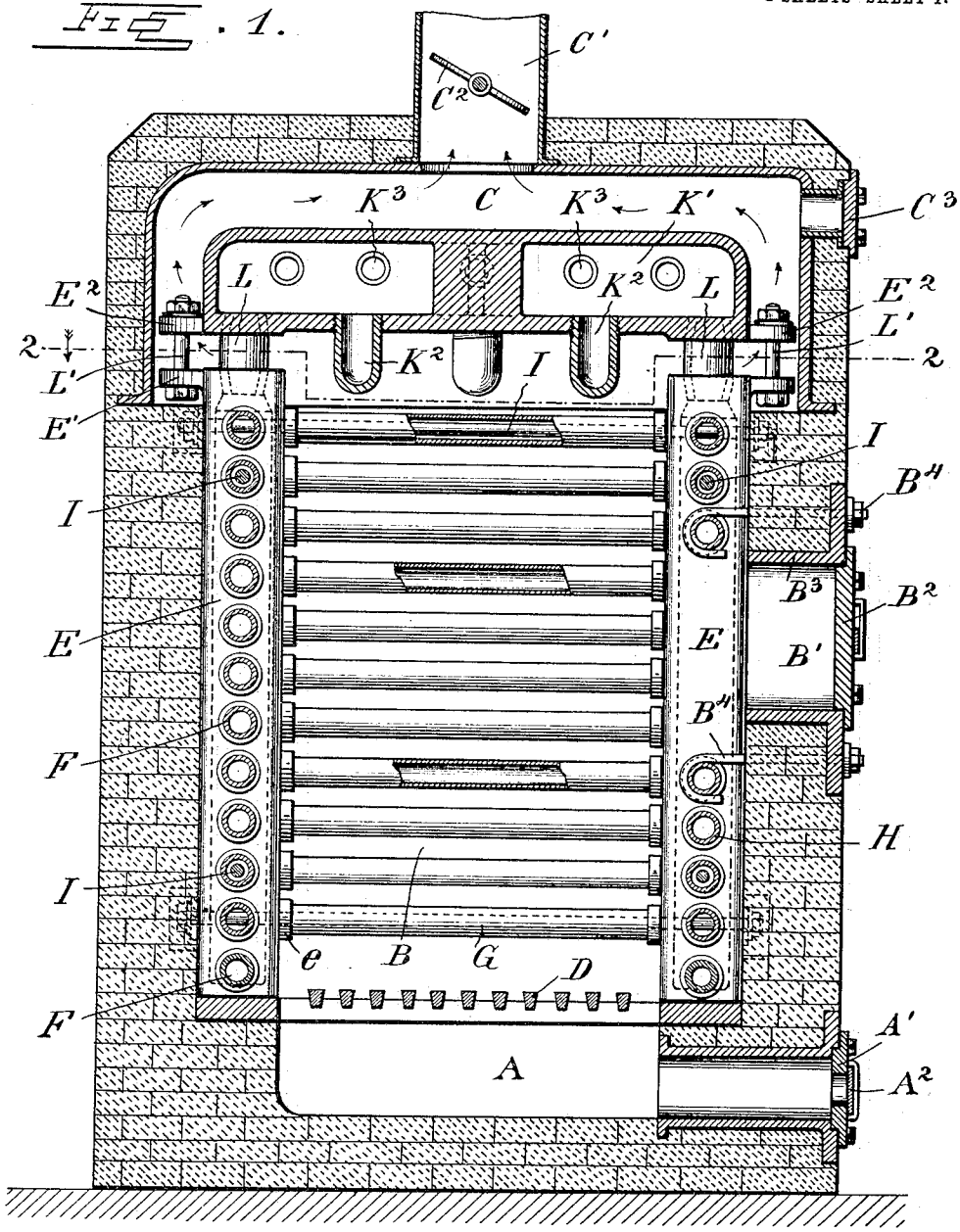
J. A. COPPRIDGE.

HOT WATER HEATER.

APPLICATION FILED MAR. 21, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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Percy B. Turpin.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

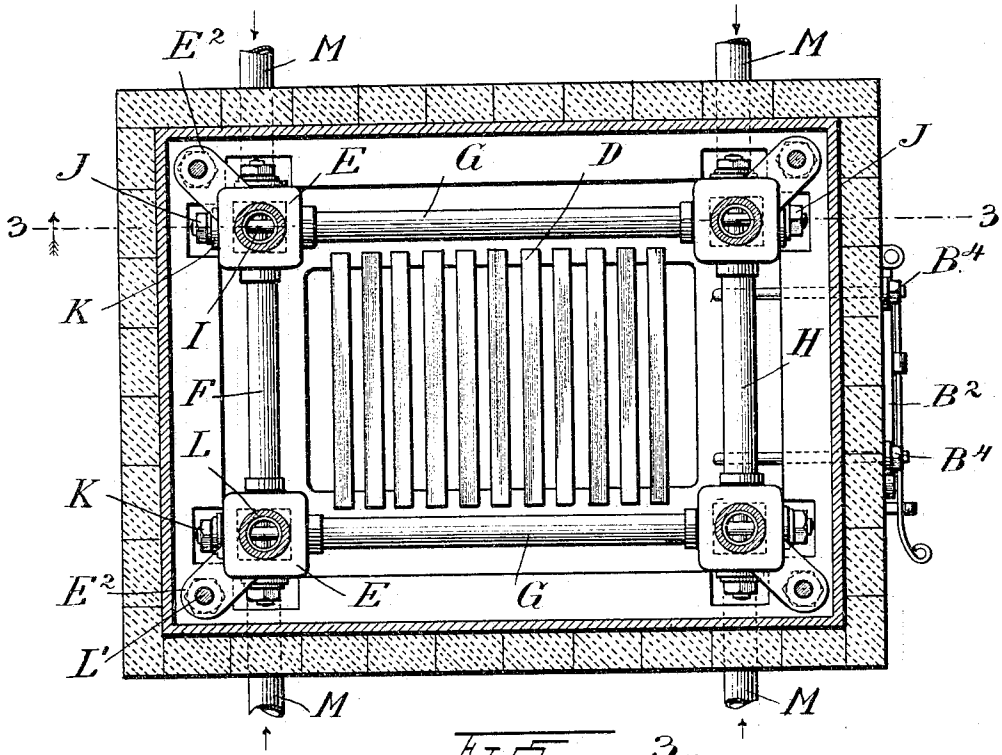
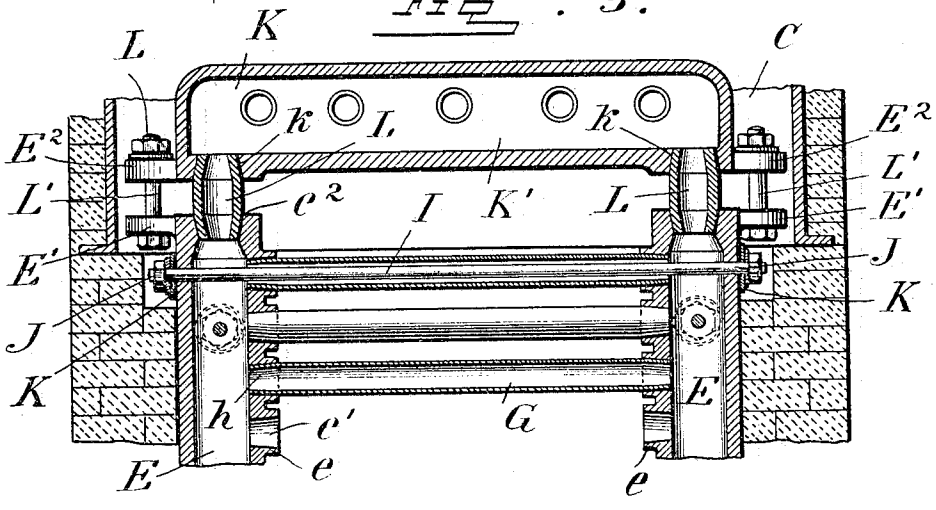


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOEL A. COPPRIDGE, OF ROANOKE, VIRGINIA, ASSIGNOR OF THREE-FOURTHS TO PERRY WILLIAMSON, OF ROANOKE, VIRGINIA.

HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 769,682, dated September 6, 1904.

Application filed March 21, 1904. Serial No. 199,163. (No model.)

To all whom it may concern:

Be it known that I, JOEL A. COPPRIDGE, a citizen of the United States, residing at Roanoke, in the county of Roanoke and State of Virginia, have made certain new and useful Improvements in Hot-Water Heaters, of which the following is a specification.

My invention is an improvement in hot-water heaters; and it consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a vertical longitudinal section of a heater embodying my invention. Fig. 2 is a cross-sectional view on about line 2 2 of Fig. 1. Fig. 3 is a detail vertical section on about line 3 3 of Fig. 2.

In the construction shown my heater is formed with the ash-pit A, the fire-box B, and the smoke-arch C. The fire-box B is arranged above the grate D and includes the corner-posts or stand-pipes E, the rear connecting-pipes F, the side connecting-pipes G, and the front connecting-pipes H, extending between their respective stand-pipes E, as shown in Figs. 1 and 2. The stand-pipes may be of suitable dimensions in cross-section and are provided with projecting bosses e, having the tapered sockets e' leading to their interiors and in which the tapered ends h of the connecting-pipes H fit and are drawn tightly by the tie-rods I, which latter extend through suitable ones of the connecting-tubes, thence through their respective stand-pipes, and receive at their ends the nuts J, which turn up against soft-metal packing K, so a tight joint may be secured between the connecting-pipes and the stand-pipes and the basket or fire-box formed by the stand-pipes and the connecting-pipes may be held securely in place as desired.

The ash-pit A has a door A′ provided with a sliding damper A^2, and the fire-box has a doorway B′, controlled by the door B^2, supported in the frame B^3, the latter being held in place by the hooked rods B^4, secured at their outer ends, preferably by threading them to receive the nuts, as shown, to the door-frame B^3 and provided at their inner ends with hooks engaging the connecting-pipes H immediately above and below the doorway B′. This construction is simple, easily applied, and enables me to readily secure the door-frame in place so it can be removed whenever necessary.

At their upper ends the stand-pipes E are provided with tapered openings e^2, and above the fire-box I support the hollow crown-sheet or dome K′, which is provided in its under side with openings k, coinciding with the openings e^2 in the upper ends of the stand-pipes. The upper ends of the stand-pipes and the hollow crown or dome K′ are connected by the tubes L, tapered at their upper and lower ends to fit in the coincident openings k and e^2, as will be understood from Figs. 1 and 3 of the drawings, lugs E′ and E^2 being provided on the stand-pipes and crown or dome and connected by the bolts L′, which may be tightened in order to press the connecting-tubes L firmly into connection with the stand-pipes and the hollow crown or dome, as best shown in Fig. 3 of the drawings.

The hollow crown K′ is preferably provided on its under side with a number of depending tubes K^2, which hang directly over the fire in the fire-box, so that the coldest water in the crown-sheet or dome will fall in such tubes and become heated to a high degree before it is discharged from the crown or dome to the pipes leading to the radiators. In Fig. 2 I show the pipes M leading to the lower ends of the stand-pipes for conducting the cool water returned from the radiators into the lower ends of the stand-pipes, pipes being connected at K^3 with the crown or dome to carry the hot water off to the radiators of the system with which the heater is employed. It may be desirable to employ separate pipes connecting each radiator directly with the heater, and for this purpose it will be noticed that I have provided several connections at K^3 for the outgoing hot water and several connections M for the incoming cold water. It will be noticed that the several stand-pipes and connecting-tubes are directly in contact with the fire and are also so disposed that the heat may circulate around them in order to extract heat units to raise the temperature of the water. It will further be noticed that the connecting-

pipes being level or horizontal the water will circulate by variation in temperature, the water passing from one corner-post or stand-pipe into pipes at one end and thence to the opposite stand-pipe, thence to the pipe above, and so on, rising gradually as it increases in temperature until it is discharged into the crown or dome, whence it may be taken to the radiators. In the operation or circulation of the water the feed-water entering from the pipes M at the lower ends of the opposite stand-pipes enters with equal force or pressure and passes into the lower cross-pipes to a point at about the middle thereof, where, becoming heated, it rises and flows thence in opposite directions toward the ends of such pipes to the stand-pipes, thence up in the stand-pipes and into the next upper cross or connecting pipes, circulating along the lower side of the latter to about the middle thereof, thence rising and flowing in the reverse direction toward the ends of such connecting-pipe, thence up to the next connecting-pipe, and so on, the cooler water flowing from the ends of the connecting-pipes inwardly toward the middles thereof, thence up and in the reverse direction toward the ends of such pipe, the heat meanwhile circulating entirely around the connecting-pipe, as will be understood from the drawings. It will be noticed that the crown or dome is exposed on its under side to the heat from the fire-box, and the heat and products of combustion will circulate around the said crown at the sides thereof, passing to the smoke-box C and thence out the uptake C′, which latter may be controlled by a damper C^2, as shown.

A door C^3 is provided leading to the smoke-box, so the same may be cleaned out whenever required.

The heater may be bricked in, as illustrated in the drawings.

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

1. The improvement in heaters herein described, comprising the corner stand-pipes, provided in their upper ends with tapered openings, the connecting-tubes extending between the said stand-pipes, the hollow crown or dome above the stand-pipes, and provided in its under side with tapered openings coinciding with those in the upper ends of the stand-pipes, the tubes tapered at their opposite ends and fitting in the coincident openings of the crown-sheet or dome and the stand-pipes, bolts connecting the dome and stand-pipes, the door-frame, the hooked rods connected with the door-frame and engaging with the front connecting-pipes, and the tie-rods extending through the connecting-pipes and the opposite stand-pipes and secured substantially as and for the purposes set forth.

2. The combination of the stand-pipes, connecting-pipes between the opposite stand-pipes and ranging in vertical tiers, the hollow crown or dome above the stand-pipes, connecting-tubes between the upper ends of the stand-pipes and the hollow crown or dome, and connections between the stand-pipes and the dome for drawing the same together, substantially as set forth.

3. The combination of stand-pipes provided at their upper ends with lugs and having tapered openings in said ends, the dome above the stand-pipes and provided with lugs and with tapered openings in coincidence with those in the stand-pipes, the connecting-tubes tapered at their ends and fitting at such ends in the coincident openings in the dome and stand-pipes, bolts connecting the lugs of the stand-pipes with those of the dome, the connecting-pipes between the opposite stand-pipes, and the tie-rods passing through said connecting-pipes and stand-pipes and secured, substantially as set forth.

4. A heater substantially as described, comprising a fire-box having stand-pipes, connecting-pipes extending between the stand-pipes and feed-pipes leading to the lower ends of the opposite stand-pipes, whereby water may enter the opposite ends of the connecting-pipes at equal pressure, substantially as set forth.

JOEL A. COPPRIDGE.

Witnesses:
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PERRY B. TURPIN.