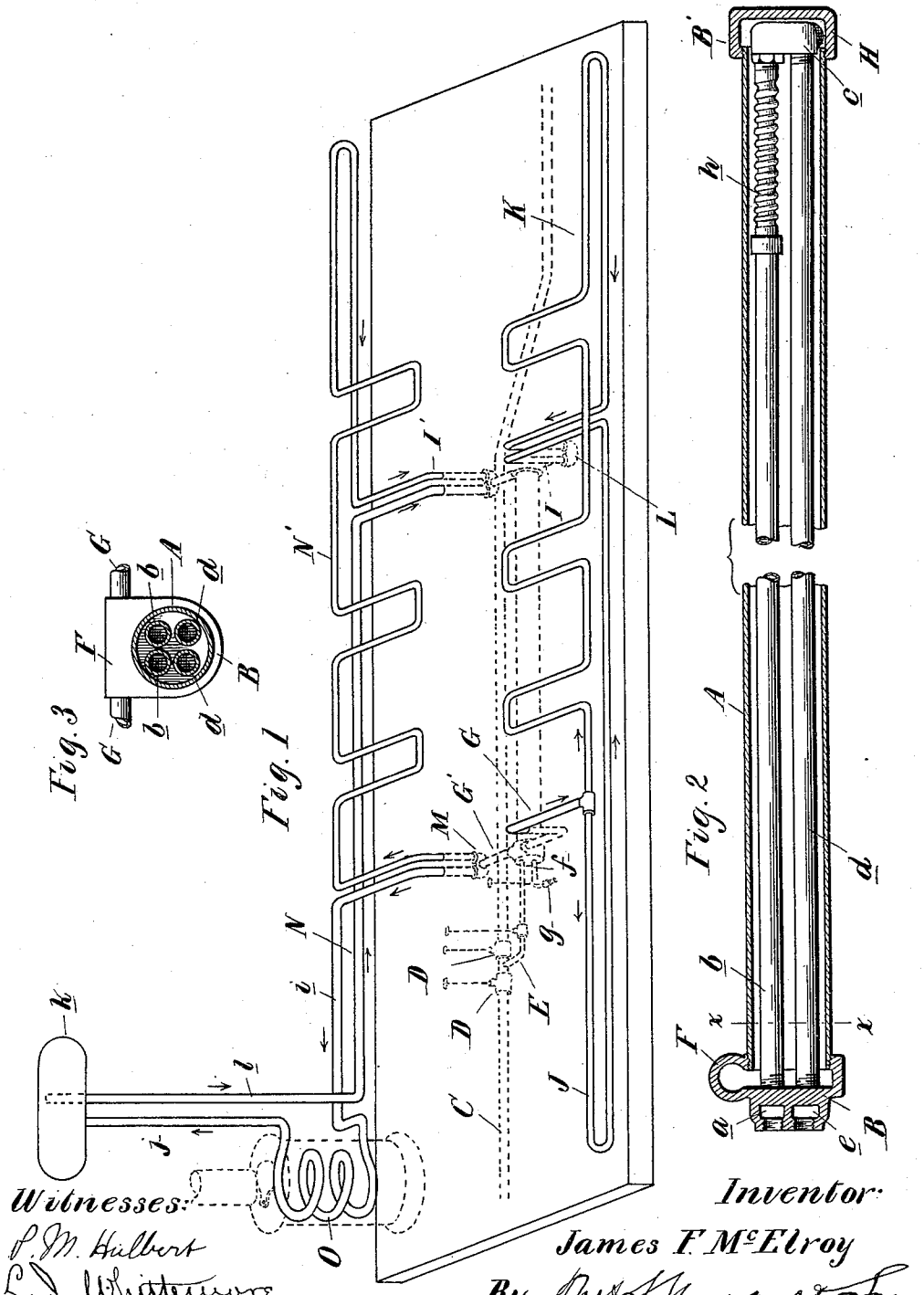
(No Model.)

J. F. McELROY.

HOT WATER HEATING APPARATUS FOR RAILWAY CARS.

No. 469,864. Patented Mar. 1, 1892.



UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO THE CONSOLIDATED CAR HEATING COMPANY, OF WHEELING, WEST VIRGINIA.

HOT-WATER HEATING APPARATUS FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 469,864, dated March 1, 1892.

Application filed July 13, 1891. Serial No. 399,354. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McELROY, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Hot-Water Heating Apparatus for Railway-Cars, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in a hot-water heating apparatus for railway-cars; and the invention consists in the peculiar construction and arrangement of a main heater located at the lowest point of the system, a series of circuits extending therefrom, and a secondary heater in one of said circuits having its outgoing pipe connected to the lowest point of the main heater.

The invention further consists in the peculiar construction, arrangement, and combination of the various parts.

In the drawings, Figure 1 is a perspective view of my improved circulating apparatus as applied to the floor of the car. Fig. 2 is an enlarged longitudinal section through the heating drum or chamber. Fig. 3 is a cross-section on line *x x*, Fig. 2.

A is a casing, preferably circular, provided at its ends with suitable caps B B′. This casing forms the main heater in my apparatus, and is secured beneath the floor of the car, preferably at or near the center thereof.

C is the main supply-pipe from the locomotive or other suitable source, and D is the valve controlling this pipe.

E is a branch pipe leading from this train-pipe to one end of the casing A, where it enters into the inlet-chamber *a*, formed in the cap.

b are pipes connected into the chamber *a* and extending the entire length of the heating-chamber, where they are connected into the return-bends *c*, which are connected to return-pipes *d*, entering the outlet-chamber *e* in the cap B.

f is an exit-pipe connected with the chamber *e*, and *g* is a suitable trap or trap-valve at the end of said exit-pipe for controlling the discharge of the water of condensation.

Intermediate of the ends of the pipes *b* and *d* I provide a section of flexible tubing *h* to take up the expansion and contraction of the heating-pipes. I preferably use corrugated copper tubing, as shown in the drawings.

The cap B is provided at its top with the circular lug F, apertured at both sides to receive the outgoing pipes G and G′ of the circulation. The cap B′ is provided at its lower edge with the extension H apertured to receive the return-pipes I I′ of said circuits. The pipe G extends into the car, where it connects with circuits J and K. The circuit J extends to one end of the car and returns to the opposite end of the heater, while the circuit K extends to the opposite end of the car and returns to the same point, connecting into the return-pipe I. I preferably connect the return-pipes J and K into the return-bends L, into which the return-pipe I is connected, for the sake of reducing the fitting to be done.

The outgoing pipe G′ connects into the bend M, where the circulation divides into the circuits N N′. The outgoing pipe *i* of the circuit N connects to the bottom of the stove or heater O, through which it circulates, passing through the riser *j*, the expansion-drum *k*, and return-pipe *l*, which connects in turn with the return-pipe I′, entering into the lowest point of the cap B′ of the main heater.

It will be observed from this description that the heater O is included in one of the circuits which I form, and that the outgoing pipe from said heater connects into the lowest point of the main heater. When the main heater (that is, the steam-heater A) is in operation, the hot water will naturally find exit from the upper opening in the casing and will pass out through the outgoing pipes G and G′ through the short circuits and back through the return-pipes I I′ into the bottom of the heater.

When the stove is used to heat the water of circulation, the heated water will flow into the stove through the pipe *i*, be heated in the coil in the stove, and will return to the main heater beneath the car through the pipes *j*, *l*, *i*, and I′, which latter discharges the heated water into the bottom of the main heater A, from which it will be distributed through the other short circuits in the same manner as if steam were in the heating-pipes

in the casing A. Thus, instead of having the friction of the piping of the entire system to be overcome by the difference in temperature at the top and bottom of the stove, I have simply to overcome the friction in the short circuit in which the stove is located. By discharging this hot water into the bottom of the heater A at the lowest point of the system a circulation is established from that heater through all the short circuits independently of the stove. The circulation through these circuits N′, J, and K will be established and maintained by the difference in temperature between water passing out through the exit-pipe G′ and that returning through the return-pipe I, these being located at the top and bottom of the heater, respectively, in opposite ends thereof. By subdividing the work in this manner I am enabled to operate my system with very low pressure, and, indeed, the pressure will be so low that, if desired, the expansion-drum can be left open, obviating any danger of bursting, and enabling me to use pipes of very much lighter weight, besides obtaining a quicker circulation and distributing the heat through the car more evenly.

I preferably make the circuit N of larger pipe than the other circuits, so that a sufficient volume of water will pass therethrough and be heated to be redistributed through the heater A through the other circuits of the car.

What I claim as my invention is—

1. In a hot-water heating apparatus for railway-cars, the combination of a main heater at the lowest point of the system, a series of circuits connecting therewith, and a secondary heater in one of said circuits, substantially as described.

2. In a hot-water heating apparatus for railway-cars, the combination of a main heater at the lowest point of the system, a series of circuits connecting therewith, having the inlet and outlet pipes at bottom and top, respectively, and at opposite ends, and a secondary heater in one of said circuits, the outgoing pipe from the secondary heater forming a return-pipe to the main heater, substantially as described.

3. In a hot-water heating apparatus for railway-cars, a heater comprising the casing A, heads B B′, the steam-pipes *b d*, and the yielding section *h*, substantially as described.

4. In a hot-water heating apparatus for railway-cars, the combination, with a main heater, of a series of circuits communicating therewith at points beyond the radiating portion thereof, and a secondary heater in one of said circuits.

5. In a hot-water heating apparatus for railway-cars, the combination, with the main heater, of a series of circuits connected therewith, one of the circuits being of larger diameter than the others, and a secondary heater in the larger circuit, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES F. McELROY.

Witnesses:
EDWIN A. SMITH,
HOMER J. NODINE.