(No Model.)

J. F. McELROY.

WATER HEATER.

No. 452,145. Patented May 12, 1891.

Fig 2

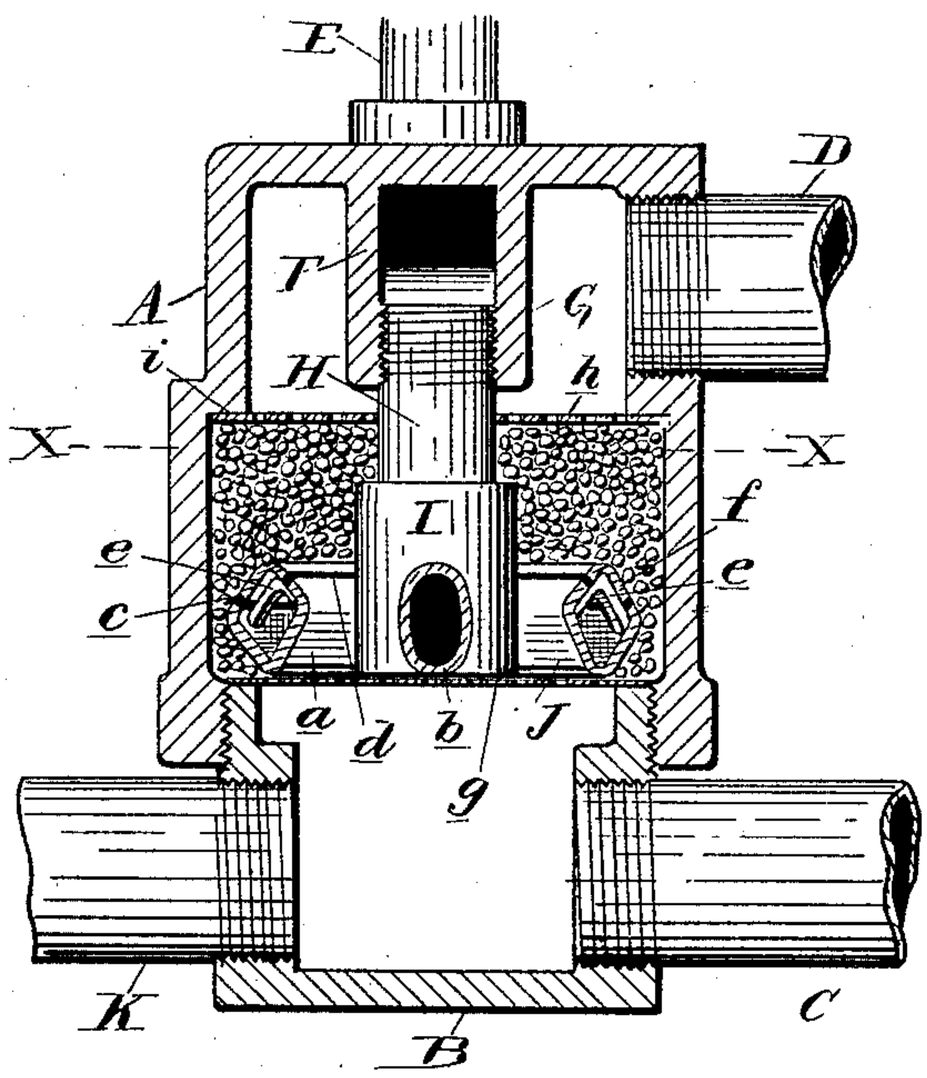


Fig. 1.

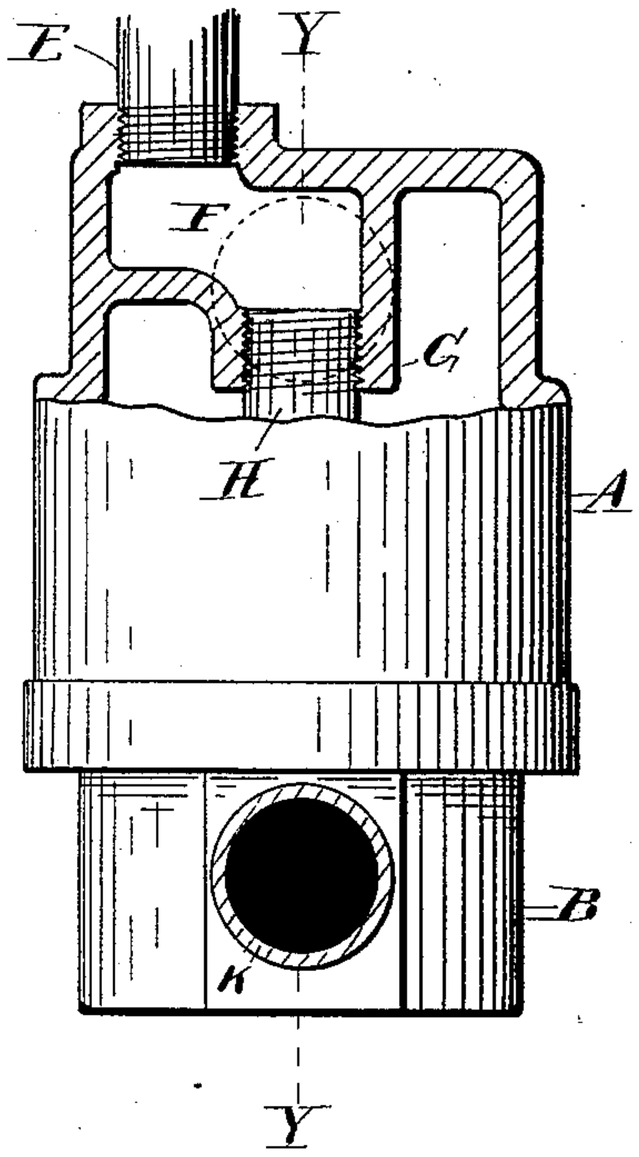
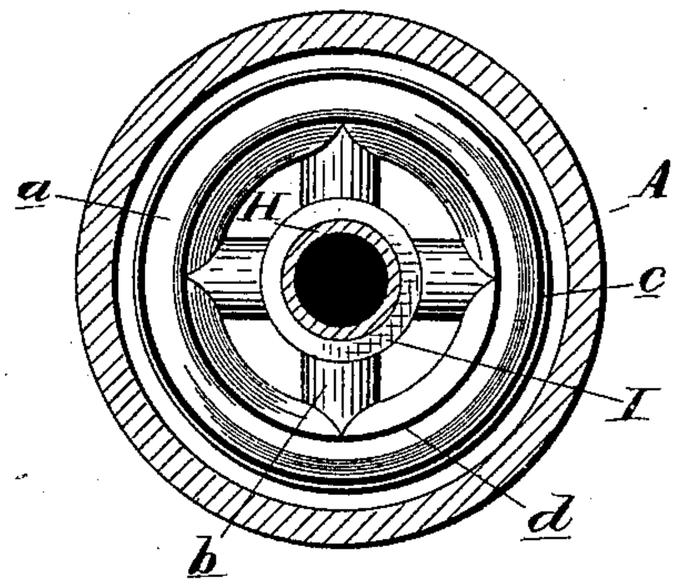


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

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

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 452,145, dated May 12, 1891.

Application filed May 1, 1890. Serial No. 350,172. (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 Water-Heaters, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in water-heaters; and the invention consists in the peculiar construction, arrangement, and combination of the various parts, all as more fully hereinafter described.

In the drawings, Figure 1 is a side elevation of my improved water-heater, partly in section. Fig. 2 is a vertical section thereof on line *y y*. Fig. 3 is a horizontal section on line *x x* in Fig. 1.

My water-heater is especially designed to be applied to heating the water in a circulating apparatus for car-heating. I have shown a heater especially designed to be applied to heating and circulating the water in a so-called "horizontal coil," although it is adapted to be used in connection with any ordinary hot-water-circulating apparatus. The heater is of the following construction:

A B are two parts of the casing adapted to be screw-threaded together, the part B entering the lower open end of the part A.

C is the return or inlet pipe, and D is the outgoing-pipe for the water of circulation, near the bottom and top, respectively, of the heater.

E is the steam-supply pipe entering the steam-conduit F, formed in the top of the casing. This steam-conduit terminates in the nipple G, suitably screw-threaded to receive the connecting-pipe H, which engages in the screw-threaded nipple I of the steam-distributing nozzle J. This nozzle consists of the hollow ring *a*, connecting with the nipple I by means of the radial connections *b*. The ring *a* is provided with the circular slots *c* and *d*, the former discharging outwardly and upwardly, and the latter, being on a higher level, discharging nearly vertically upward but slightly inwardly.

e are ribs cast within the ring to hold the section *f* between the slots in place.

g is a screen secured upon the upper edge of the section B, and *h* is a screen secured upon the shoulder *i* in the part A of the casing, forming between a "commingling chamber" in which the nozzle is located with a surrounding medium—such as shot, gravel, &c.—for preventing the noise at the point of commingling of water and steam.

K is a drain-pipe at the base of the section B, controlled by a suitable valve (not shown) for drawing the water from the circulating system when placed at the lowest point of the system.

The parts being thus constructed, they are intended to operate as follows: The system being empty, the valve in the drain-pipe is closed, and steam is admitted through the steam-supply pipe and discharges upwardly through the slots in the nozzle, filling the system with steam. The accumulation of the water of condensation will fill the system with water. When this has been accomplished, the steam discharging upwardly into the water within the heater will heat and circulate the water upwardly, the water coming in through the inlet-pipe at the bottom and passing out through the outlet-pipe at the top. It frequently happens that the water which will be left in the ring *a* will freeze. In turning on the steam, however, with the ring constructed as described, the steam will find a ready exit through the upper slot *d* until the ice has been thawed, it being evident that the water cannot stand in the ring at a higher level than the slot *c*. By cutting the slots in the ring instead of perforating it I am enabled to make a nozzle at very much less expense than if it were perforated, and also discharge the same more evenly and with less danger of sediment filling up the steam-discharge apertures than if I use the perforations, as heretofore. I am also enabled to discharge the same in such plane and direction as to most efficiently circulate the water.

What I claim as my invention is—

1. In a water-heater of the kind described, the combination of the parts A B of the casing, screw-threaded together, a screen secured in each part, the commingling-chamber between the side inlet and outlet connections, the drain-connection at the lowest point, the

steam-inlet pipe, and the nozzle, substantially as described.

2. In a water-heater of the kind described, the combination, with the casing and commingling-chamber, of the nozzle having steam-distributing apertures formed by slots cut at different heights in the upper side thereof, and the ribs *e*, substantially as described.

3. In a water-heater of the kind described, the combination, with the casing and commingling-chamber, of the circular nozzle having steam-distributing apertures formed by slots cut at different heights, substantially as described.

4. In a water-heater of the kind described, the combination, with the casing and commingling-chamber, of the nozzle consisting of the nipple I, hollow ring *a*, connections *b* between the nipple and ring, slots *c d* in the ring, arranged on different planes, and ribs *e*, crossing the slots, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 31st day of March, 1890.

JAMES F. McELROY.

Witnesses:
EDWIN A. SMITH,
DANIEL D. SEWALL.