

(No Model.)

J. F. McELROY.

WATER HEATER.

No. 414,157.

Patented Oct. 29, 1889.

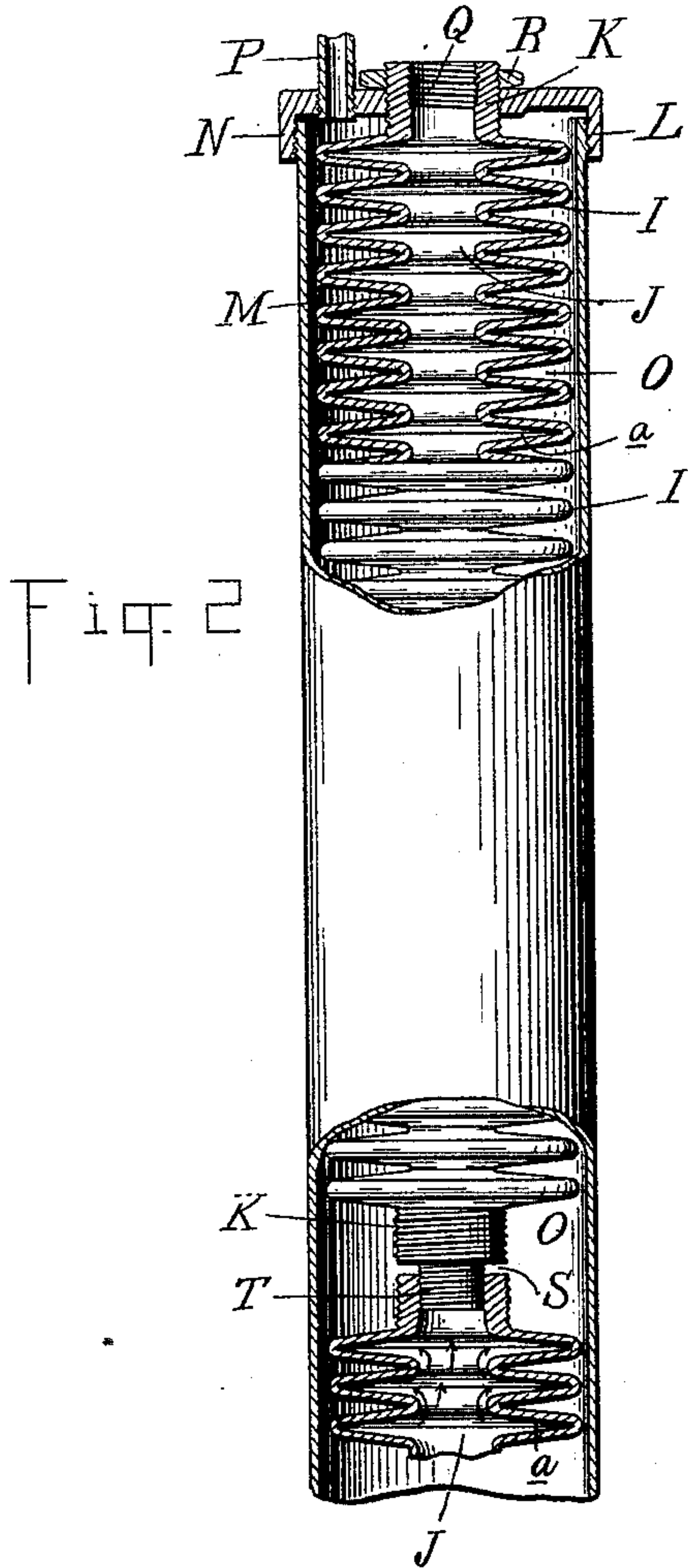


Fig 2

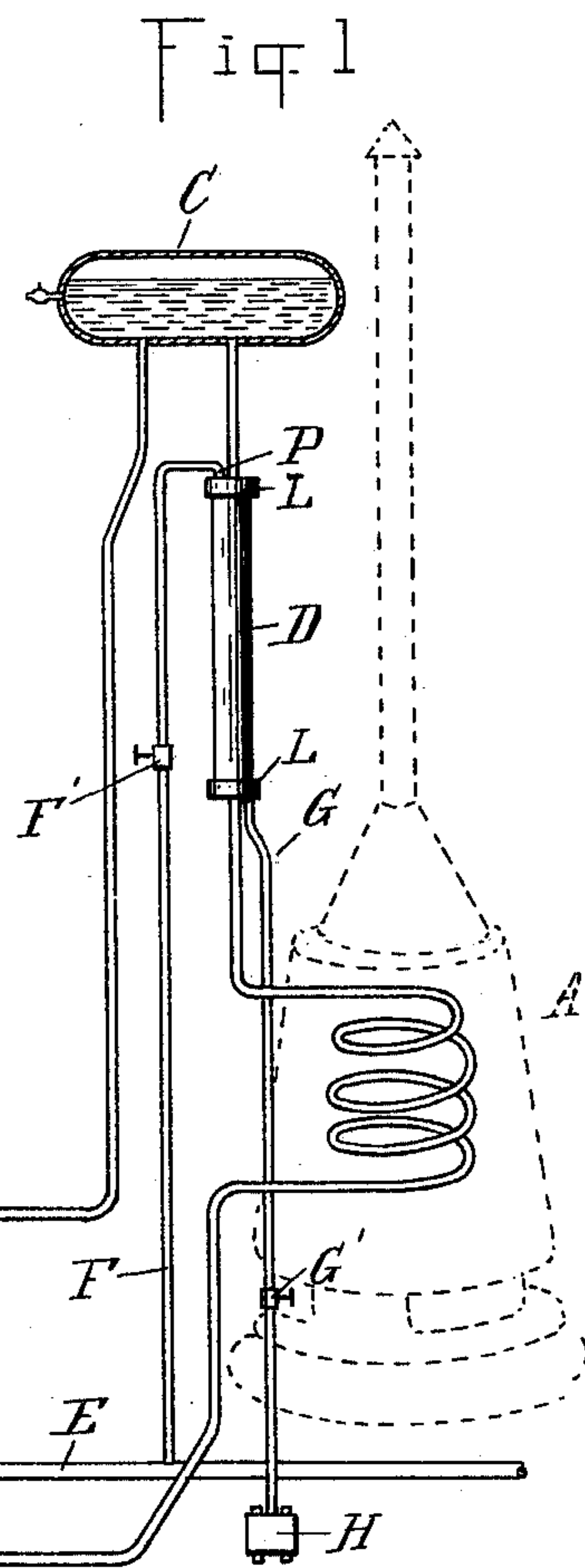


Fig 1

Witnesses:
P. M. Hulbert
Edw. M. Breary

Inventor:
James F. McElroy
By Thos. Sprague & Son
Att'y.

UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO THE McELROY CAR HEATING COMPANY, OF SAME PLACE.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 414,157, dated October 29, 1889.

Application filed July 1, 1889. Serial No. 316,246. (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 especially designed to be used for car-heating and to be applied as an auxiliary to the present system of hot-water-circulating apparatus, having a stove as the source of heat, as now in use; and the invention consists in the peculiar construction of the heater, whereby the least possible friction is obtained in the passage of the water through the heater, and at the same time a large amount of heating-surface is had, together with economy of manufacture and simplicity of operation.

In the drawings which accompany this specification, Figure 1 is a perspective view of a circulating hot-water apparatus applied to a car to which my heater is attached. Fig. 2 is a vertical central section through my heater, partly in elevation.

A is the stove. B are the hot-water-circulating pipes connected therewith.

C is the expansion-drum of a hot-water heater of known construction, to which my improvement is applied.

D is my improved heater applied in the riser between the stove and the expansion-drum.

E is the main steam-supply pipe from the locomotive or other source of steam-supply.

F is the branch steam-supply pipe, controlled by a suitable valve F' and connected at the top with my heater, and G is the outlet-pipe for the water of condensation, controlled by the valve G', having at its lower end a suitable trap H, of any desired construction.

My heater consists of a series of hollow annular plates I, having a central opening J and axially arranged. These rings I preferably cast together in a suitable series, and at each end nipples K are provided, suitably

screw-threaded exteriorly to engage with the caps L at top and bottom.

M is an outer casing engaging with the caps by means of a suitably screw-threaded flange N, the space O being formed between the disks and the outer casing. The caps are provided with suitable steam-passages P—one at the top and one at the bottom. The water-pipe engages with the interior screw-thread Q of the nipples K, a suitable jam-nut R being provided to screw over the nipples against the caps. The steam-supply pipe F connects with the upper steam-passage P, and the outlet-pipe G connects with the lower steam-passage.

The parts being thus constructed and arranged, steam being available from the locomotive and the valves F' and G' being open, steam will enter through the upper steam-passage P and fill the annular space O around the disks. The water-circulating pipes being suitably filled with water, it is evident that the heat of the steam will be imparted to the water within the disks, and it will be thereby circulated in the well-known manner. All the openings J in the disks being in line, the water will have a central passage, through which it will travel with no more friction than it would have in the ordinary pipe. The wedge-shaped hollow portion *a* of the disks and the central opening will be filled with water, and having steam in the space O, the water in the portions *a* will be discharged as it becomes heated into the central current, thereby accelerating the upward motion, and new water from below will take its place, the circulation of the water on the sides being shown by the arrows. The inclination of the inner sides of the portion *a* is such as to assist the water to flow in and out with the least possible friction.

When the steam is shut off and the stove is in use, it is apparent that the friction which the water will have to overcome in passing through my heater will be no greater than if the ordinary piping were used. The great difficulty which has been encountered in such devices has been to overcome the friction of the water in the heaters which has heretofore usually been used in connection with a stove

as the source of heat. This difficulty is overcome by my heater without in any way sacrificing the beneficial results thereof when used with steam. In case a large body of water is desired to be heated and several series of disks are required to be used, I connect them together, as at S in Fig. 2, by means of the close nipple T, engaging with the interior screw-threads on the nipple K of the disks.

10 What I claim as my invention is—

1. In combination with a hot-water-circulating apparatus, a water-heater consisting of a series of hollow annular plates axially arranged, having connections at their inner edges arranged in the line of circulation, an outer casing, and a steam-space between and a suitable steam inlet and exit connection to said steam-space, substantially as described.

2. A water-heater adapted to be used with a hot-water-circulating apparatus, consisting of an outer casing having caps, steam inlet and outlet openings in said caps, and an inner water-chamber having nipples at the ends secured in apertures in the said caps, said water-chambers consisting of a series of hollow annular plates and secured together at their inner edges, with the apertures in line, having the water-spaces *a*, connecting with said central apertures, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 10th day of June, 1889.

JAMES F. McELROY.

Witnesses:

EDWIN A. SMITH,
THOS. C. MURRAY.