

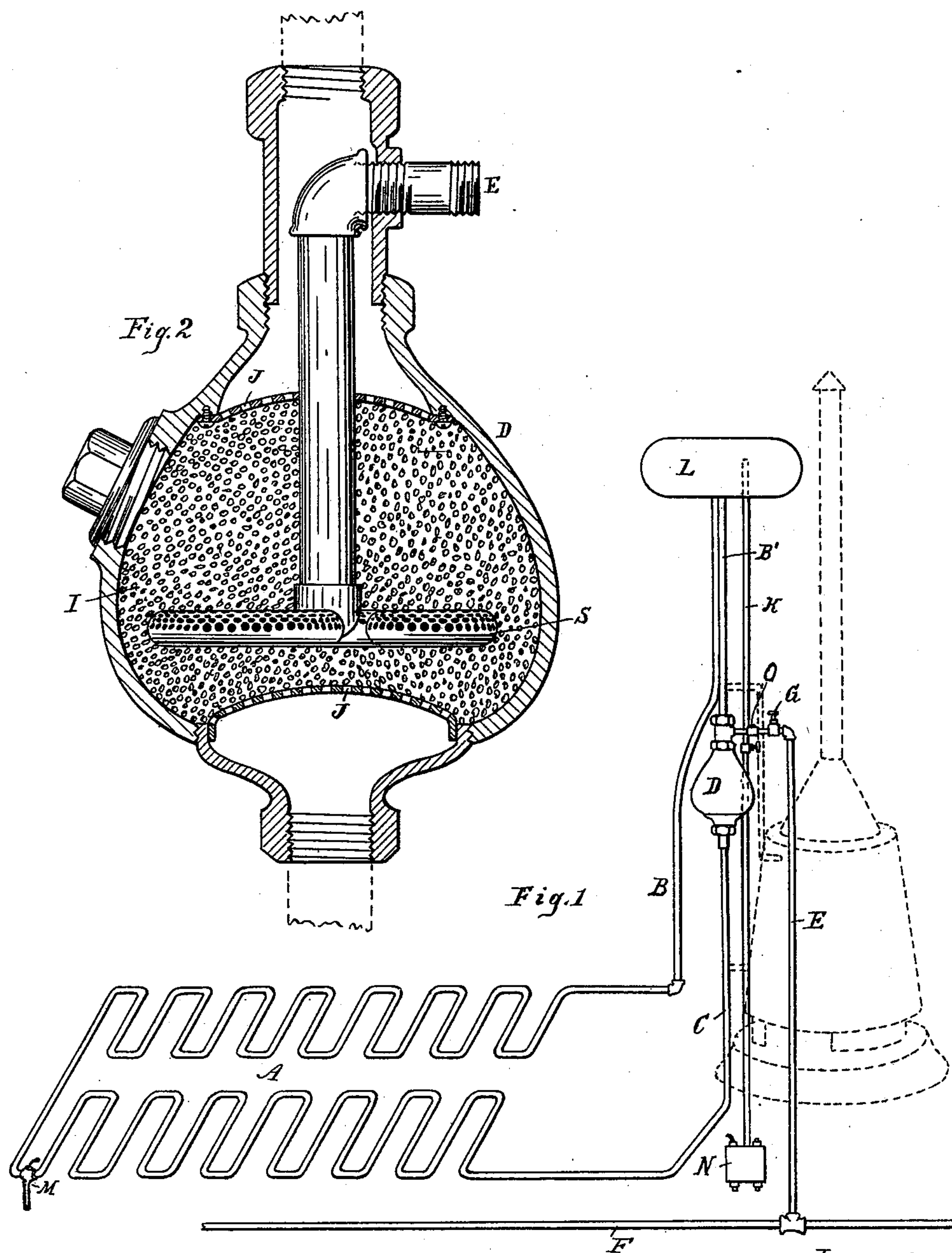
(No Model.)

J. F. McELROY.

HEATING SYSTEM.

No. 391,326.

Patented Oct. 16, 1888.



Attest:

John Schuman.
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Inventor:

James F. McElroy.
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Att'y.

UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF LANSING, ASSIGNOR TO THE McELROY CAR HEATING COMPANY, OF DETROIT, MICHIGAN.

HEATING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 391,326, dated October 16, 1888.

Application filed January 3, 1888. Serial No. 259,626. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McELROY, a citizen of the United States, residing at Lansing, in the county of Ingham and State of Michigan, have invented certain new and useful Improvements in Heating Systems, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in heating systems, especially designed to be applied to the cars of railway-trains; and the invention consists in the novel construction and arrangement of a heating apparatus, whereby steam applied to the cars from the locomotive or other source of supply may be used in two ways, one way being by direct radiation and the other way by converting the steam into water, and using such water as a circulating medium to distribute the heat derived from the steam through the cars.

In the drawings which accompany this specification, Figure 1 is a diagram elevation illustrating my system, and Fig. 2 is a vertical central section through the device for introducing the steam.

A represents the radiating pipes; B and C, the outgoing and return connections, respectively; and L, the expansion-drum, all these parts being arranged to operate as in the apparatus for circulating-hot-water systems for railway-cars as in common use, or substantially so. At any convenient point in this system I place a drum, D, into which I introduce a steam-pipe, E, which connects with a source of steam-supply—for instance, with the train-pipe F, which is intended to convey the steam from the locomotive to the cars. This pipe E is controlled by the valve G, and provided, preferably, with the check-valve O. It terminates within the vessel D in a rose or other steam-nozzle, S, from which the steam is discharged in an upward direction through a series of small openings or perforations. This nozzle I surround with a suitable medium, I, such as gravel, shot, metal shavings, &c., adapted to form a large number of small channels for the steam to pass through, and this medium is held between perforated partitions or screens J, which leave the openings on top and bottom of the drum unobstructed.

The outgoing-connection B communicates with the expansion-drum L, and this latter is connected by a pipe, B', with the drum D. An overflow-pipe, K, is connected with the system at any convenient point, preferably with the expansion-drum, and so arranged as to retain the water up to a certain height or level within the system, as will appear more fully hereinafter. At the lowest point or points of the system I arrange a suitable valve or drip-cock, M.

In practice let us suppose the system to be filled with atmospheric air and the drip-cock M opened. Now, if it is desired to heat the car, steam being available from the train-pipe F, by opening the valve G in the steam-pipe E steam will be admitted into the drum, and from there it will pass through the whole system, the atmospheric air being driven out through the drip-cock M. In this condition the apparatus operates as a steam system, and it may be operated in this manner as long as desired. Now if the cock is closed it is evident that the steam being retained the condensation will accumulate and gradually fill up the system, and as soon as the system is thus filled up above the top of the outgoing-connection B a hot-water circulation within the apparatus is established and maintained therein by the continued inflow of the steam, which also acts mechanically to force the water through the apparatus, thereby giving greatly increased efficiency over the ordinary circulation caused by a fire in the stove. The surplus water of condensation is carried off by the overflow-pipe K to any suitable point of discharge, and through a suitable trap, N, which prevents the escape of steam. In this condition the apparatus forms a very effective hot-water-circulating system and may be maintained as long as the cars are running and connected with the steam-supply. Should, however, the contingency arise of the car being disconnected and obliged to be side-tracked in cold weather, where the liability of freezing the water in the pipes may occur, the drip-cock M may be opened and the water of circulation let out.

The alternative nature of my system is devised by me for the purpose of heating the car at the starting-time of the train in the shortest possible interval, so as to make it possible to

avoid the use of the car stove altogether, and this can best be accomplished by direct radiation from steam, and, further, that I may secure the well-known advantages of a hot-water-circulating system without the danger of freezing when the cars are not in use, unless a fire is kept in the stove.

With the present system of indirect heating with steam or heating by hot-water circulation it requires a comparatively long time to heat up the cars. On the other hand, in heating the cars exclusively by direct steam-heat during all the time they are running the great advantage of comfort and economy of regulation afforded by a hot-water-circulating system would be altogether missed; and therefore I claim that my alternative system of heating meets the best exigencies of the case in a more perfect way than any other system.

My system is primarily designed to be applied to the ordinary hot-water-circulating systems as now in use in cars, and the stove may be kept disconnected from the system, or retained, if desired, as there may arise necessities for use of the stove to heat the cars in case of accident or short waits on side track. The expansion-drum may be dispensed with and the drum D arranged in its place, if desired.

I do not claim the drum D, as the only essential part thereof is a steam-pipe leading into and discharging into the circuit.

I do not claim to be the inventor of a heater consisting of a continuous and unbroken circuit of pipes, through which the circulating medium is to be impelled, and a steam-jet pipe extending within the pipes of the circuit, the said circuit of pipes having a suitable escape or relief opening.

What I claim as my invention is—

In a car-heating apparatus, the combination of a circulating system of pipes provided with an expansion-drum, a steam-pipe discharging into said system, a valve or drip-cock in the lowest point or points of said system, an overflow-pipe communicating freely with said system, and a steam-trap connected to said overflow, all arranged to operate substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 24th day of December, 1887.

JAMES F. McELROY.

Witnesses:

E. O. KELLEY,
J. CORNELL.