

(No Model.)

J. D. CAMPBELL.

CAR HEATER.

No. 383,513.

Patented May 29, 1888.

Fig. 1.

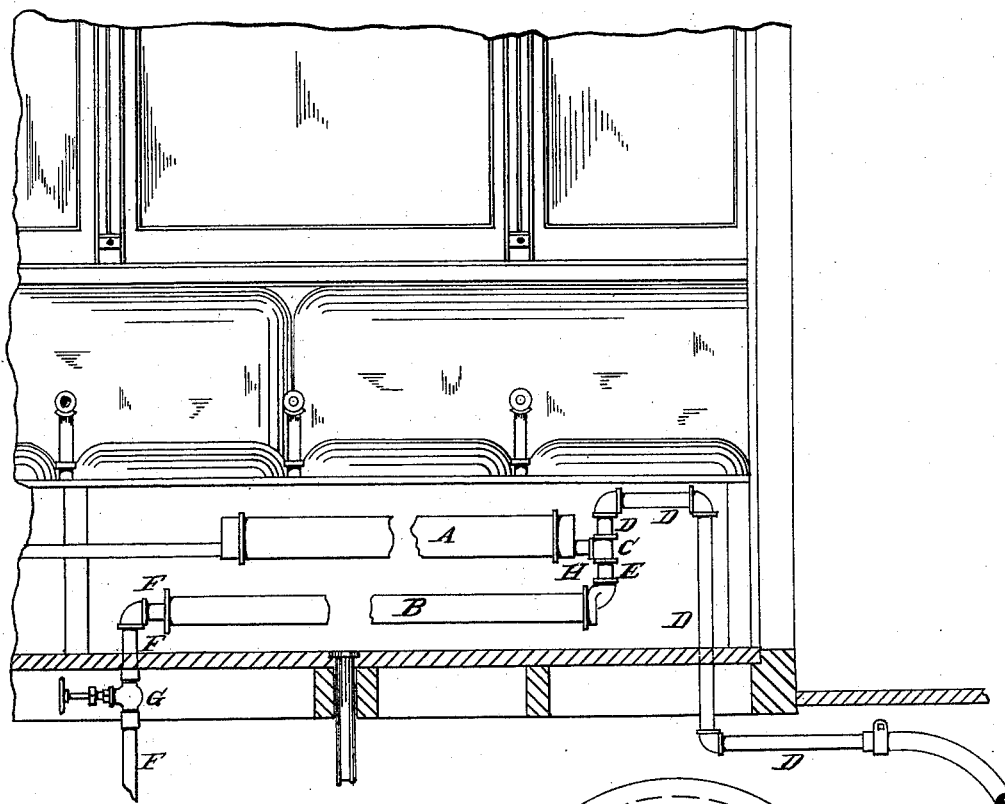
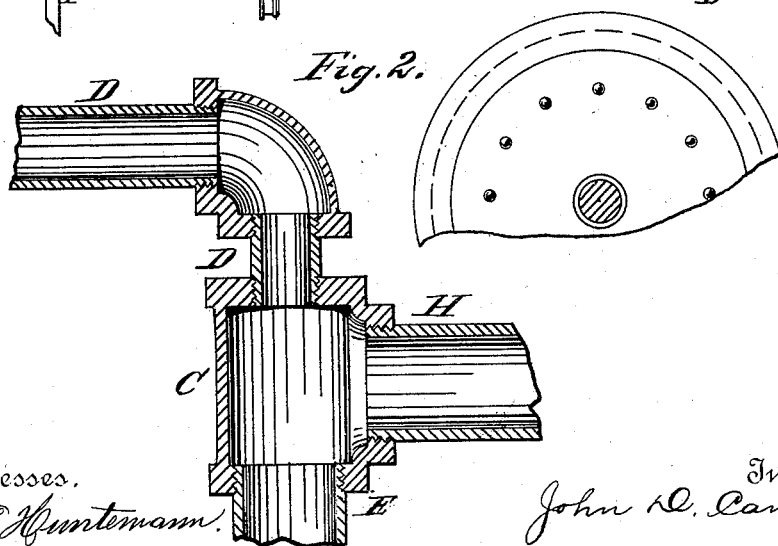


Fig. 2.



Witnesses.
Wm. D. Huntemann.
Jos. A. Ryan.

Inventor.
John D. Campbell,
By his Attorneys
Whittlesey & Wright.

UNITED STATES PATENT OFFICE.

JOHN D. CAMPBELL, OF NEW YORK, N. Y.

CAR-HEATER.

SPECIFICATION forming part of Letters Patent No. 383,513, dated May 29, 1888.

Application filed August 13, 1886. Serial No. 210,836. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. CAMPBELL, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Car-Heaters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to that class of car-heaters in which steam (either live or exhaust) is conducted from the locomotive through pipes to the cars. Its object is to prevent the loss of steam and the dripping of the water of condensation upon the track, to remove this water from the pipes, and thus obviate the danger of their freezing in cold weather.

In some of the car-heaters now in use it is necessary to allow the steam to escape constantly at the rear of the train in order to keep up a circulation, owing to the obstruction of the pipes by the condensed steam. In the case of trains on the elevated roads this is a continual source of annoyance from the dripping of the condensed steam upon the track and into the street below.

My invention aims to overcome these objections and to insure a sufficient circulation of steam by completely removing the condensed steam from the heating-pipes without requiring an escape-cock to be left open.

To this end it consists in the combinations and arrangements of parts hereinafter described, and particularly pointed out in the claims.

Referring now to the accompanying drawings, Figure 1 is a longitudinal sectional elevation of one end of a car having my invention applied thereto. Fig. 2 is an enlarged sectional view of the pipe-connections.

Similar letters of reference indicate like parts in both views.

A is a heater of any desired construction, placed within the car. As shown in the drawings, it consists of a steam-pipe surrounded by a drum, the annular space between them being packed with some heat-retaining substance,

as sand. At each end of the car the steam-pipe is provided with flexible coupling-pipes to connect it with the pipes in the adjoining cars.

Below the heater A is the trap or reservoir B, for the water of condensation. The steam-pipe D enters the car in an upward direction, then doubles back on itself and enters the coupling C from above. The pipe D is preferably contracted slightly just above the coupling C. The pipe E enters said coupling from below directly in line with the steam-pipe D and connects with the outer end of the reservoir B. The pipe E is of greater diameter than the steam-pipe D, for a purpose which will be stated hereinafter. From the coupling C the steam passes through the short large pipe H into the heating-drum A. At the inner end of the reservoir B is an escape-pipe, F, provided with a valve, G. All these devices may be duplicated at the other end of the car, or at any convenient place therein, all being connected with the steam-pipe D, so as to give an uninterrupted passage for the steam through the train. The reservoirs B, however, do not form any part of the steam-circuit, but serve as traps to collect the condensed steam, being located at one side of the steam-pipe and connected with it by a single pipe at one end. Fig. 2 shows, on an enlarged scale, the relative sizes and arrangement of the coupling C and pipes D, E, and H as they would appear at the other end of the car.

The operation of this apparatus is as follows: The greatest condensation of steam takes place in the exposed length of pipe between the cars. The water forming there is carried by the steam up through the pipe D and down to the coupling C, through which it falls into the pipe E and passes into the reservoir B. The contraction in the steam-pipe just above the coupling C checks the flow of steam and allows the water to fall more readily. The contraction also gives the steam a higher velocity as it enters the coupling and imparts a greater momentum to the water that enters with the steam, so that it is driven across the coupling into the pipe E, and is thereby prevented from entering the pipe H, that leads to the heater, said pipe H lying out of line with the steam-pipe D where it joins the coupling.

The object of making the pipes E and H comparatively large is to provide for the escape of the air in the reservoir B, which is displaced by the water, and which passes up into the heater A along with the steam. The water of condensation is thus removed from the steam as it enters the car, and as there is but little condensation in the pipes within the car a good circulation of steam is insured.

10 Any water that may form within the car is carried along until it falls into the reservoir B at the rear end of the car, or is taken over into the next car and is received in one of its reservoirs.

15 The reservoirs may be placed below the floor, if desired, but are preferably located inside the car, as shown, in order that the heat of the hot water collecting in them may be utilized to assist in warming the car. At the proper place and time the valves G may be opened and the water in the reservoirs discharged.

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

1. In a car-heating system, a steam-supply pipe, a heater, and a reservoir for the condensed steam, all connected with a coupling, the connection with the heater being out of line with the steam-pipe, and the steam-pipe being contracted at the point where it enters the coupling, substantially as described.

2. The combination, with heater A, reservoir B, lying outside of the steam-circuit, and coupling C, of a steam-pipe, D, rising vertically from said coupling, a pipe, E, of larger area than steam-pipe D, connecting said reservoir with the lower side of said coupling and located in line with the steam-pipe D, and a pipe, H, also of larger area than steam-pipe D, connecting said coupling with the heater A, substantially as and for the purpose set forth.

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

JOHN D. CAMPBELL.

Witnesses:

JOSEPH OSOBA,
WM. T. PRICE.