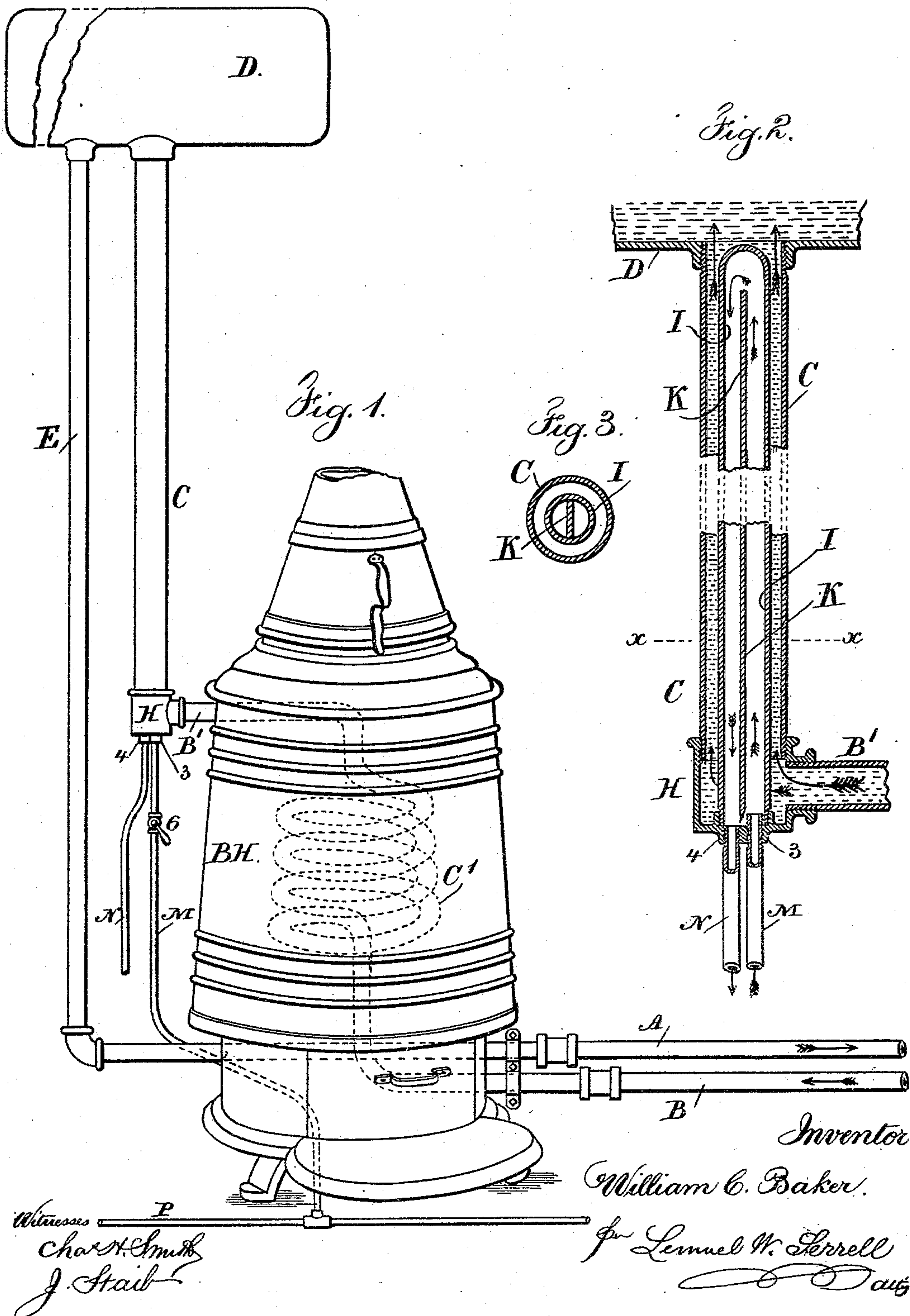


(No Model.)

W. C. BAKER.
HEATING APPARATUS FOR RAILWAY CARS.

No. 411,915.

Patented Oct. 1, 1889.



UNITED STATES PATENT OFFICE.

WILLIAM C. BAKER, OF NEW YORK, N. Y., ASSIGNOR TO THE BAKER HEATER COMPANY, OF SAME PLACE.

HEATING APPARATUS FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 411,915, dated October 1, 1889.

Application filed December 10, 1888. Serial No. 293,120. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. BAKER, of the city and State of New York, have invented an Improvement in Heating Apparatus for Railway-Cars, of which the following is a specification.

The object of this invention is to adapt the heating apparatus usually known as the "Baker Car Heater" to steam supplied from the locomotive, so that the car may be heated in the ordinary manner when detached from the locomotive, or it may be heated by either live or exhaust steam from the locomotive led through pipes along the train.

In the drawings, Figure 1 is a partial elevation of the expansion-vessel and heating apparatus. Fig. 2 is a section in larger size of the rising pipe, and Fig. 3 is a sectional plan at the line *x x* of Fig. 2.

In the heating apparatus largely made use of in railway-cars a system of heating-pipes passes along and around the car and contains water that is heated and circulated, such water usually being saturated with salt. At A and B, I have represented the end portions of these heating-pipes, and in the usual Baker heater B H there is a coil of pipe C' within the fire-chamber, to which the pipe B is connected, and the upper end of this coil passes out by the branch B' to the rising pipe C, that leads to the expansion-vessel D, and there is a downward circulating-pipe E, united to the end A of the heating-pipes.

I do not change the heating apparatus heretofore made use of, except by making the ascending pipe C considerably larger in diameter than heretofore usual, and upon the bottom end of such pipe C, I screw the head H, and within this head H is a second socket and screw-thread receiving the lower end of the vertical pipe I, and this vertical pipe I extends up into or near the expansion-vessel D, and the upper end thereof is closed steam-tight, preferably by welding the metal together at the upper end of such pipe I, and I insert into this pipe I a vertical partition K, preferably of galvanized sheet-iron, and the bottom end of this partition K rests against the inner surface of the head H, and the upper end of the partition is at a suitable dis-

tance below the closed upper end of the pipe I.

Upon the under side of the head H are screw-sockets 3 and 4, with holes opening through the head H into the pipe I at opposite sides of the partition K, and there is a steam-pipe M and cock 6 connecting with the socket 3, and a discharge-pipe N connected with the socket 4, and this discharge-pipe N may be provided with an air-valve or a blow-off valve or trap, or it may return into the main steam-pipe P, that runs longitudinally of the car and is connected at the end of the train with the locomotive, so that steam from the boiler or from the exhaust can be passed into this pipe P, and such steam travels from end to end of the train and passes by the pipe M into the tube I of the heating apparatus in each car, and the steam displaces the air within the pipe I, driving the same up and over the top of the partition K and down and out through the pipe N, and any water of condensation can run out from the pipe N, it being preferable to provide a small notch in the lower end of the partition K, so that the water of condensation within the pipe I and at each side of the partition K can pass away by this pipe N.

It will now be apparent that when the car is not connected with the locomotive a fire can be built within the heater, and that the water will be circulated through the heating apparatus of the car in the ordinary manner, and that steam heat may be used in addition to the heat from the heater, or the steam heat alone may be made use of, because the heat received by the pipe I from the steam causes a rapid circulation of the water upwardly within the pipe C and around the pipe I, and in so doing the entire column of water filling the heating-pipes is set in motion, and I find in practice that it is very important that the heat be applied to the vertical or rising column leading to the expansion-vessel, otherwise there is not sufficient difference of weight in the rising column C and the descending column E to produce a rapid circulation and overcome the resistance consequent upon the bends of the heating-pipe and the depression of such pipe or coil where

the same passes down to the floor or below the floor of the car.

I do not in this application lay claim to the two sources of heat applied to the water circulating through the heating-pipes within the car, as the same is set forth in previous applications made by me. In consequence of the heating-pipe I being closed at the upper end and connected to the other parts at its lower end only, such pipe is free to expand and contract by changes of temperature without any risk of injury or leakage at any place, thus avoiding difficulties heretofore experienced in apparatus of this general character.

In some instances where steam heat has been applied to the circulating water in the heating-pipes in addition to or separate from fire heat applied to a coil in a heater difficulty has arisen from the use of cocks or valves that required to be manipulated by hand to direct the circulating water, or else the steam-heating device occupied valuable space in the car, or else it became necessary to take the heater as now in general use apart, at the risk of such injuries as would render an entirely new heater necessary. My steam-heating apparatus being applied above the coil and fire-chamber, and in a part of the car where there is usually ample room, does not necessitate any change, except the removal of the ordinary rising pipe, which is easily accessible, and the substitution of my steam-heater in place thereof, and the circulating water is compelled to pass in the usual manner through all the other pipes, whether acted upon by heat from the steam or fire, or both, and the heater itself, if already in the car, remains undisturbed.

I claim as my invention—

1. The combination, with the expansion-vessel D, pipe E, and the heating-pipes within the car through which the water circulates, of the vertical pipe C below the expansion-vessel, the tube I within the pipe C, the head H, that closes the lower end of the pipe C and to which the pipe I is connected, the pipe M, for supplying steam, and the pipe N, for the water of condensation, and a partition within the pipe I for promoting the circulation of

the steam within such pipe I, substantially as set forth.

2. The expansion-vessel D, descending pipe E, heating-pipes within the car, the end A of which is connected to the pipe E, a heater having a fire-chamber, and a coil of pipe within the fire-chamber, the lower end of which is connected to the pipe B of the heating-pipe, a vertical pipe C, connected at its upper end to the expansion-vessel and at the lower part to the upper end of the coil within the heater, the head H, for closing the lower end of the pipe C, the vertical steam-heating pipe I within the pipe C and connected at its lower end to the head H, and the pipes M and N, connected to such head and opening into the pipe I for supplying steam to such pipe I and taking off the water of condensation, substantially as set forth.

3. The combination, in a car-heating apparatus, of the heating-coil within the fire-chamber of the heater, an ascending pipe C, expansion-drum, descending pipe E, and heating-pipes within the car for the circulating hot water, and a steam-heating pipe within the vertical pipe C for imparting heat to the water within such pipe C and causing the same to circulate up into the expansion-vessel and thence through the heating-pipes of the car, substantially as set forth.

4. The combination, with the heater and the coil within the fire-chamber thereof, the heating-pipes within the car for circulating hot water, and an elevated expansion-vessel, of a rising pipe for the circulating water extending from the upper end of the coil to the expansion-vessel, and a steam-supply pipe and heater acting upon the water in the rising pipe and entirely above the coil in the fire-chamber of the heater, substantially as specified.

Signed by me this 8th day of December, 1888.

WILLIAM C. BAKER.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.