(No Model.)

E. F. ROBERTS.

CAR HEATING APPARATUS.

No. 483,698. Patented Oct. 4, 1892.

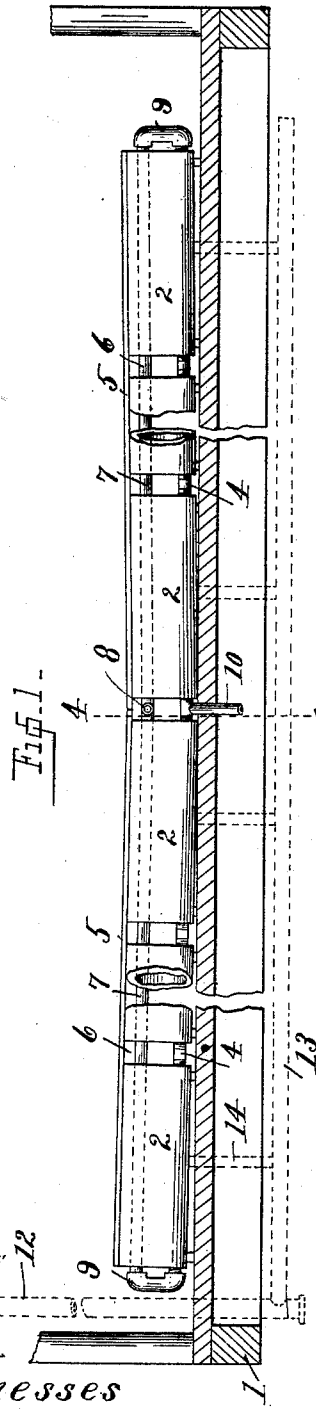

Fig. 1.

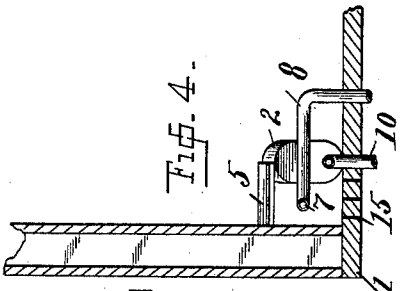

Fig. 4.

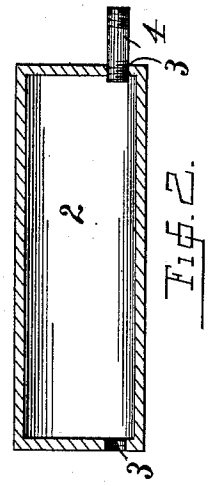

Fig. 2.

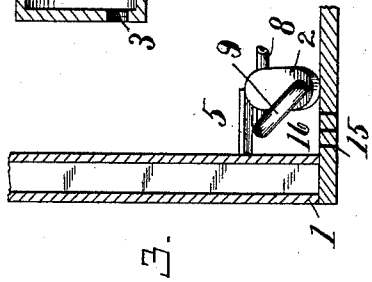

Fig. 3.

Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWARD F. ROBERTS, OF COLUMBUS, OHIO, ASSIGNOR TO THE ROBERTS MANUFACTURING COMPANY, OF SAME PLACE.

CAR-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 483,698, dated October 4, 1892.

Application filed February 24, 1892. Serial No. 422,720. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. ROBERTS, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Car-Heating Apparatus; and I do hereby 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.

My invention relates to the heating of cars by steam; and its object is the production of a simple, cheap, and effective apparatus for the complete transfer of the heat of the steam supplied from the train-pipe to the interior of the car and the proper ventilation of said interior.

In the drawings, Figure 1 is a side view of the heater, parts being broken away, and a portion of the car-body being shown in section. Fig. 2 is a longitudinal section of one of the hollow castings forming the main part of the heater. Fig. 3 is an end view of the heater, showing its arrangement in the car. Fig. 4 is a section on line 4 4 of Fig. 1.

My invention is essentially an improved construction to carry out the principle of heating described in my pending application, Serial No. 419,850.

Referring to the drawings, 1 is the car-body.

2 are a number of hollow metal sections, preferably of an approximately oval cross-section. These I propose to cast, as they can be most cheaply produced in that manner. 3 3 are openings in the ends of these castings, tapped out to receive the threaded nipples or short connecting-pipes 4, which connect the castings together in a series of steam-chambers forming a continuous heater, as shown in Fig. 1. For convenience the pipe connections 4 should be equipped with right and left hand threads. The row of castings is placed near the floor and near the side of the car-body, leaving a space 16 between the inner walls of the castings and the side of the car. The space is roofed over by the horizontal partition 5, so as to form an air-chamber. This partition may be a shelf built out from the side of the car, or it may be composed of a number of plates resting on the top of the castings. The drip connection 10 leads from the lowest point of the heater to the drip. (Not shown.) The steam-pipe 7 is filled with steam from the train-pipe (not shown) by the connection 8. This pipe runs through the air-chamber 16, helping to heat the same, and is connected by the elbows 9 9 to the casting at either end of the row. As the connections 4 between the various castings 2 are of much smaller cross-section than the said castings, large openings 6 are left between the adjacent ends of said castings, forming outlets from the air-chamber 16. The ends of said chamber are also preferably left open, as shown in Fig. 3.

The fresh air is supplied through openings 15 in the bottom of the car or through the branches 14 of the cold-air pipe 13, which is supplied through pipe 12 with air collected by hood 11 when the car is in motion.

The mode of operation of my invention is clear from the above description. The steam coming through pipe 8 passes along through the pipe 7, giving up a portion of its heat to the air in the chamber 16. It then works its way back through the castings 2, whose outer walls will radiate heat directly to the interior of the car, while their inner walls will help to heat the air passing through chamber 16. The water of condensation collects at the lowest point of the system and passes off through connection 10 to the drip. If desirable, pipe 7 could be led back and forth several times in the chamber 16, so as to give up more of the heat of the steam before it enters the radiator proper. The fresh cold air enters the air-chamber 16 through the openings 15 or through the pipes 14, and after being heated escapes through openings 6 or at the ends of the chamber into the car.

The advantages of the construction are its simplicity and cheapness. The simple cored-out castings 2 is the only thing that requires a special pattern. The pipe connections can all be made of standard sizes of piping, and the partition 5 can be made of a piece of sheet-iron.

Having therefore described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. In a car-heating apparatus, the combina-

tion of the car-body, two or more hollow castings arranged near the floor and near the side of said car-body so as to have open spaces between the adjacent ends of said castings, steam connections between said hollow castings, and connections to the train pipe and drip, together with the horizontal partition extending from the side of the car-body to the top of the hollow castings, whereby a hot-air chamber is formed behind said castings, and a number of fresh-air inlets to said chamber, substantially as described.

2. In a car-heating apparatus, the combination of the car-body, a number of hollow castings arranged in rows near the floor and near either side of said car-body so as to leave spaces between the adjacent ends of said castings, steam-tight connections between said hollow castings, of much smaller cross-section than the castings, a steam-supply pipe which runs between the hollow castings and the side of the car-body and connects with the casting at either end of the row, the outlet from the center of the row to the drip, and the horizontal partition extending from the side of the car-body to the top of the row of hollow castings, whereby a hot-air chamber is formed behind said castings, substantially as described.

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

EDWARD F. ROBERTS.

Witnesses:
A. L. RALSTON,
C. D. WILLIAMSON.