

(No Model.)

2 Sheets—Sheet 1.

J. A. LONG.
HEATING AND VENTILATING APPARATUS FOR STREET RAILWAY CARS.
No. 511,961.
Patented Jan. 2, 1894.

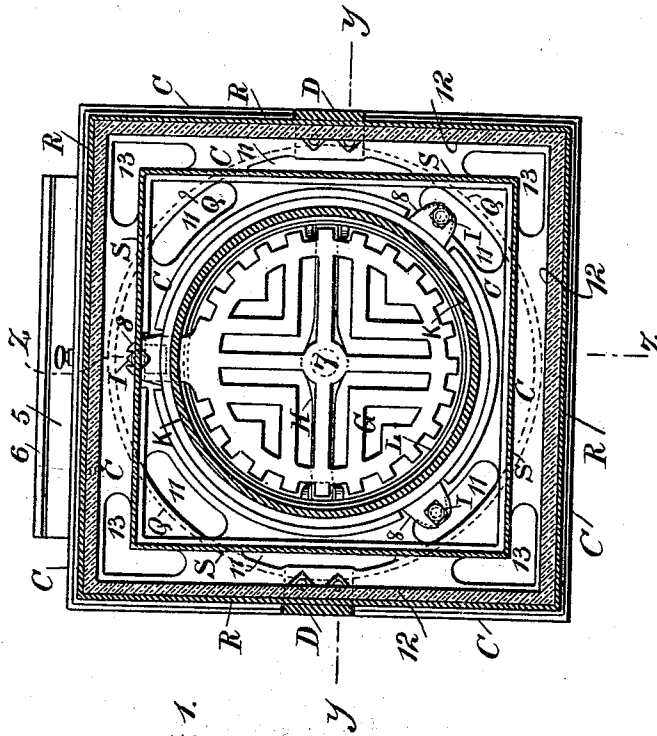


Fig. 1.

Witnesses

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J. Hail

Inventor

Joseph A. Long
per Samuel W. Serrell
Atty

(No Model.)

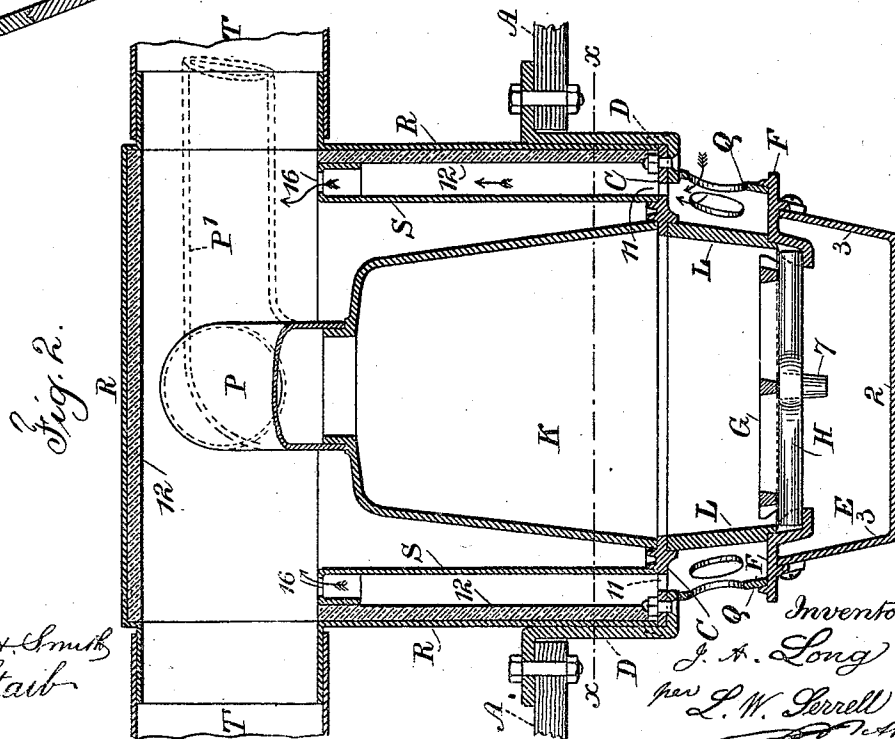
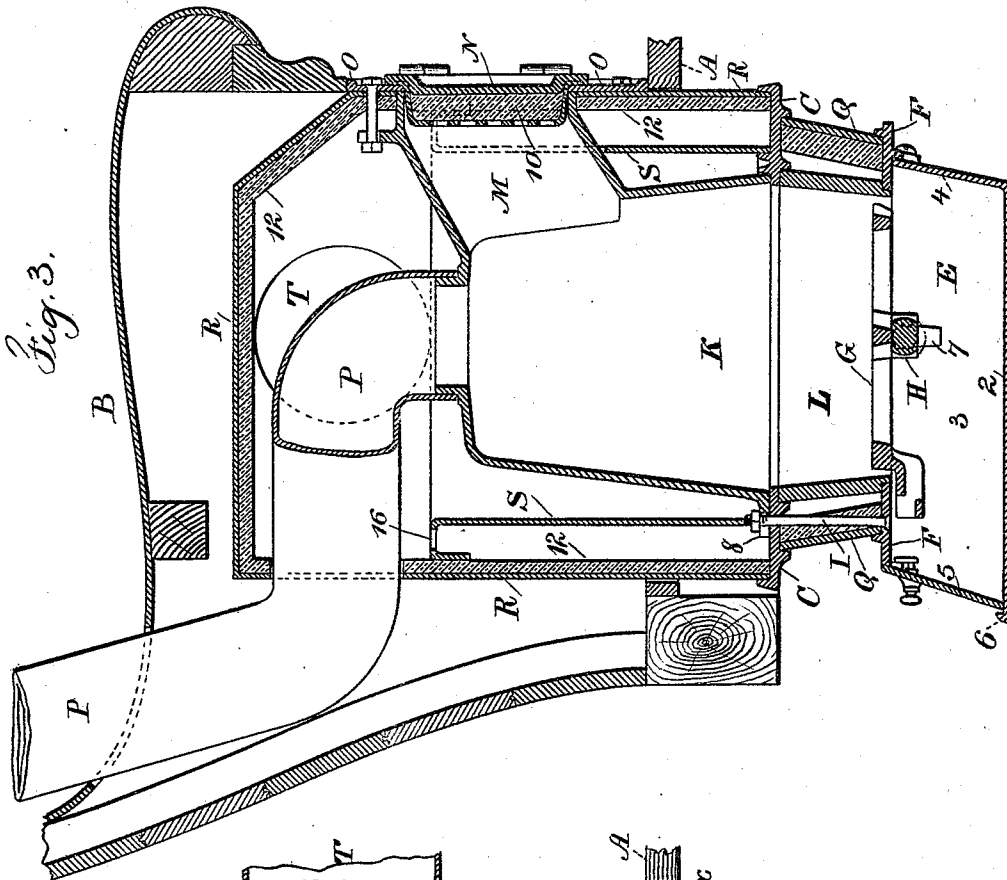
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HEATING AND VENTILATING APPARATUS FOR STREET RAILWAY CARS.

No. 511,961.

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Witnesses
Chas. H. Smith
J. Stair

 Inventor
J. A. Long
per L. W. Perrell


UNITED STATES PATENT OFFICE.

JOSEPH A. LONG, OF BROOKLYN, NEW YORK, ASSIGNOR TO AARON H. EASTMOND, OF SAME PLACE.

HEATING AND VENTILATING APPARATUS FOR STREET-RAILWAY CARS.

SPECIFICATION forming part of Letters Patent No. 511,961, dated January 2, 1894.

Application filed September 29, 1893. Serial No. 486,775. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. LONG, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Heating and Ventilating Apparatus for Street-Railway Cars, of which the following is a specification.

Difficulty has heretofore been experienced in applying a heater to a street railway car in such a manner as not to interfere with the seating capacity of the car, and usually difficulty is experienced in warming the ends of the car and in producing a sufficient circulation of atmosphere through the car for the purposes of ventilation.

My improved heater is made with reference to occupying but a small space within the car and to the introduction of fresh air in a warm condition for the purposes of ventilation. I suspend below the floor of the car a fire-pot and ash-pit and surround the fire-pot with a guard through which air is admitted to pass up into a chamber around the fire dome, and a double asbestos-lined casing is provided to form an air chamber within which air is heated and passed by conduits toward the respective ends of the car, and the entire heater is beneath the seat and in such a position that it does not interfere with the seat being occupied by passengers.

In the drawings, Figure 1 is a sectional plan at the line *x, x*, of Fig. 2. Fig. 2 is a vertical section at the line *y, y*, of Fig. 1. Fig. 3 is a vertical section at the line *z, z*, of Fig. 1.

In the floor A of the car and below the seat B an opening is provided adapted to receive the casting C that is in the form of a frame, and this is supported by hangers D that rest upon the surface of the floor and pass in below the frame C and are bolted thereto so as to support this frame C reliably from the floor of the car.

The ash-pit E is preferably made of a casting with a bottom 2, sides 3, back 4 and a removable door at 5 which is received within the ledge or flange 6 and lies against the inclined ends of the sides 3, and the door is suitably secured so as to be opened when necessary, and upon the top of the ash-pit is a casting F in the form of a ring with down-

wardly projecting flanges to fit upon the top of the ash-pit E, and upon this ring F there is a fire-pot L, and the grate G rests upon a bearer or cross bar H that has an opening for the reception of the central pivot 7 of the grate, and the grate is adapted to receive a lever handle by which the grate can be shaken when the door 5 is opened.

There are bolts I passing down through the frame C, the ash-pit ring F and to the ash-pit E, so as to connect the parts firmly together and suspend them from the frame C; and it is advantageous also to have the heads of the bolts I above the lugs at the base of the fire dome K so as to bind together the ash-ring, the fire-pot, the frame and the fire dome, and to allow for these parts being easily separated for repairs whenever necessary.

At one side of the fire dome K is a fuel hopper M, the outer end of which is closed by a door N supported by a frame O, and the door N is preferably provided with an inner lining with asbestos between the lining and the door so as to prevent the door or the frame O being heated, and this door is sufficiently above the floor A of the car to be accessible from inside the car for supplying the fuel to the fire that rests upon the grate G and is within the fire-pot L.

From the top of the fire dome K a pipe P passes off to convey the products of combustion; it may be inclined backwardly and pass up through a suitable non-conducting inclosure on the inner side of the car between one window and the next, or such pipe may pass off, as indicated by the dotted lines P', to one or both ends of the car and enter a vertical pipe for the discharge of the products of combustion, such pipe in either instance passing through the roof of the car for said gases to escape to the external atmosphere.

Around the fire-pot L and between the same and the frame C is a guard Q, preferably in the form of a conical ring having openings at the opposite sides thereof toward the front and back ends of the car for air to pass into this guard and rise up through the openings 11 in the frame C, and above the frame C is an exterior casing R and an interior casing S. These casings are preferably of sheet metal and the exterior casing R is lined with asbes-

tus-paper or similar material at 12 so as to effectually prevent the warmth passing out directly from the fire dome into the car, and the interior casing S does not extend up to the top of the casing R but terminates near the level of the top of the fire dome K, there being openings 16 through the interior casing for the free passage of air from the space between the exterior and interior casings into the chamber which receives the heat from the fire dome; and I remark that the lower edges of the casings R and S are received into grooves or against flanges upon the upper surface of the frame C, and there are openings at 13 that allow the external atmosphere to pass up between the casings R and S and through the openings at the top of the casing S into the air chamber where the air is heated from the fire dome K.

It will be observed that the exterior casing R is adapted to set beneath the seat B in the car with a free air space between the top of the casing and the underside of the seat, and in consequence of the lining of asbestos at 12, the heat is not communicated to the seat, and this casing R is held between the frame O and the flue hopper M and the parts are properly connected by suitable bolts and but little heat is conducted to the frame O or to the door N in consequence of the non-conducting material or lining 12 of the casing, and the lining of non-conducting material 10 for the door N.

In street cars it is usual to provide panels or other inclosures below the front edge of the seat and between the same and the floor. I avail of this space beneath the seat for the introduction of air pipes T which extend out laterally from the casing R in both directions and either open into the air space under the seat near the ends of the car or else open through registers or other suitable openings in the panels or inclosures under the seat, so that the hot air is conveyed to the ends of the car as these portions are always the most difficult to heat, and the constant inflow of fresh air ventilates the car thoroughly by constantly changing the air inclosed within the car. It will now be observed that when the car is in motion the atmosphere will pass through the openings in the conical guard Q and up through the openings 11 into the air chamber around the fire dome K and that air will also pass up through the openings 13 into the chamber between the exterior casing R and the interior casing S, so that the air will receive the radiated and conducted heat from the fire within the fire-pot and dome, and that the hot air will pass from the casing

through the air pipes T and discharge into the car; and a suitable damper may be provided in the smoke-pipe for regulating the draft and varying the consumption of fuel so as to regulate the temperature of the air passing into the car and thereby maintain the proper heat of the car and ventilate the same by the introduction of the fresh air.

I do not claim a heater within a street car placed below the seat or in an opening provided in the seat at one side of the car.

I claim as my invention—

1. The frame C supported from the floor of the car and having openings therein, the fire-pot and guard below the frame, the ash-pit and its ring below the fire-pot and bolts passing through the respective parts and by which they are suspended from the frame, a fire dome above the frame having a fuel hopper at one side, a casing surrounding the fire dome, and a door having an opening through the casing to the fuel hopper, and lateral air discharge pipes passing beneath the seat, substantially as set forth.

2. The combination in a heater for street cars, of an ash-pit, its ring and grate, a fire-pot above the ring, a guard surrounding the fire-pot and having openings toward the front and rear of the car, a frame with openings, means for supporting the same from the car and bolts for suspending the parts that are below the frame, a fire dome and fuel hopper and a door for the same, an exterior casing having a lining of asbestos and an interior casing extending part way up and having openings at or near the top, whereby the air passing upwardly through the openings in the frame is heated within the casing, air pipes extending laterally and beneath the seat for the discharge of the heated air, and a flue for the escape of the products of combustion, substantially as set forth.

3. The combination in a heater for street cars, of a casing adapted to set beneath the seat of the car and having a lining of asbestos or similar material, and air pipes extending laterally from the same beneath the car seat, a frame having openings and forming the base for the casing, a heater supported by the frame and having an ash-pit below the heater accessible from outside the car, and a fuel hopper and door accessible from within the car, substantially as set forth.

Signed by me this 26th day of September, 1893.

JOSEPH A. LONG.

Witnesses:

GEO. T. PINCKNEY,
A. M. OLIVER.