

J. A. & L. H. LONG.  
CAR HEATER.

Patented June 21, 1898.



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# UNITED STATES PATENT OFFICE.

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## CAR-HEATER.

SPECIFICATION forming part of Letters Patent No. 606,066, dated June 21, 1898.

Application filed April 21, 1897. Serial No. 633,135. (No model.)

*To all whom it may concern:*

Be it known that we, JOSEPH A. LONG and LOWMAN HAWES LONG, citizens of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Car-Heaters, of which the following is a specification.

The object of the present invention is to provide a heater especially adapted to the cars upon city railways wherein there is no opportunity to obtain steam heat, as from a locomotive, and in which the space sometimes occupied by a stove is valuable.

In the present invention the heater is placed beneath the seat and is adapted to warm the car without lessening the space provided for the passengers, and two or more heaters may be provided in the same car, especially in those cars of large dimensions.

Artificial fuels are known and in use which smoulder or burn without flame or smoke and which give out a considerable heat and do not burn up rapidly. The present invention is adapted to artificial fuels of this character, and it may also be used with charcoal or other fuel that burns slowly and does not produce smoke.

We provide a fire-pot with a tight cover at the upper end, by the removal of which the fuel can be inserted into the fire-pot, and within the fire-pot there is a removable basket of woven wire or similar material, into which the fuel is inserted and it is consumed gradually, and at the bottom of the fire-pot there is an ash-drawer into which any earthy materials may be received and into which an inflammable torch is inserted for igniting the fuel, and there are openings in the lower part of the fire-pot, through which air is admitted and through which any waste products of combustion, such as carbonic acid, may pass away, and around the fire-pot is a casing into which air is allowed to pass from the bottom, so as to become heated, and a sheet-metal box surrounds the casing and fire-pot and is adapted to set beneath the car-seat and to open through the floor, and there are lateral openings for the escape of the warm air from this box into the car. The whole apparatus is portable and can be easily placed in the car or removed therefrom, and when the car is laid up at night the fuel can be lifted out from the fire-

pot by the open-work basket, so as to be emptied or to be used in some other car, thereby avoiding the risk of fire even when the car is not in use.

In the drawings, Figure 1 is a vertical cross-section of the apparatus, and Fig. 2 is a vertical section longitudinally through the inclosing box. In Fig. 1 the fire-pot is shown without the basket.

The fire-pot A is usually conical except at the bottom 2, which is advantageously made square, with a lip 3 to retain the movable ash-drawer B, which sits in behind such lip, so as to be retained by the same and lessen the risk of the drawer falling out, and there is an opening 20 for the admission of atmospheric air between the top of the ash-drawer and the lower edge of the fire-pot, at the opening through which such ash-drawer is inserted, and there are also holes 4 through the sheet metal of the fire-pot at the lower portion of the fire-chamber.

The basket C is preferably of wire and of a shape corresponding to the interior of the fire-pot, and there is a cross-bar or handle C', by which the basket can be lifted out or replaced, and the stopper or cover D fits closely into the fire-pot above the basket C, so as effectually to prevent the escape of gases.

The case E is of sheet metal, surrounding the fire-pot A and at a sufficient distance from the same for the atmosphere to circulate freely between the fire-pot and the case, such atmosphere being admitted at the bottom through openings at 14 and rising in consequence of the action of the heat and passing out at the top end of the case E and below the top F' of the box F, which box has openings 6, preferably through the end portions, for the escape of the heated air into the car, and the top of the fire-pot A passes through the top F' of the box F, and the parts are secured together at this place, and there is a cover or lid G applied at this point to form an additional closure to the upper end of the fire-pot, and this lid may be hinged, and it can be opened or closed down, and at the bottom of the box F there is a ring or skirt 8, passing through an opening in the bottom of the car, and this ring or skirt is a continuation of the case E, and the lower end of the fire-pot also passes through the bottom of the

car and projects lower down than the bottom of the ring or skirt, and the cylindrical shield 15 surrounds the lower part of the fire-pot near the hole 4.

5 It is advantageous to apply this heater beneath the car-seat and either in the middle portion of the car or toward one or both ends, and over the heater a part of the seat is made removable as a section sufficiently large to  
10 give access freely to the cover or lid G, and this portion H of the seat can be hinged in position, so as to be turned down for completing the seat of the car and thereby not lessening the seating capacity. It is now to  
15 be understood that the seat H is raised, the cover or lid G removed, the stopper D lifted out, and fuel inserted into the basket C, and this may be ignited in any suitable manner. We have represented a torch I, of asbestos or  
20 other equivalent refractory material, contained within an open-work casing and of a size adapted to being placed in the ash-drawer B, and this torch may be saturated with alcohol, benzin, or similar material, and the same  
25 is ignited to set fire to the fuel within the open-work basket C. The stopper D is now placed into the conical fire-pot above the basket and the cover or lid G shut down to place, so as to make the top part of the fire-cham-  
30 ber air-tight and prevent the escape of any gases or products of combustion, and there is sufficient air passing into the fire-pot through the holes 4 and above the ash-drawer for maintaining the fuel in combustion, and any prod-  
35 ucts of combustion may escape downward from the fire-pot, so as not to pass into the car, and the heat of the fire-pot is given off to the atmospheric air, which circulates upward between the case E and the exterior of  
40 the fire-pot, and such heated air passes into the box F and away by the opening 6 into the car to warm the same. In this manner the car can be easily heated, and sufficient fuel can be put into the basket at one time to re-  
45 main in combustion during the time that the car is making a trip of ordinary length, and when desired the cover G can be lifted and the stopper D removed for the insertion of fresh fuel or for the withdrawal of the basket  
50 and its contents when the car is put out of use at night, and we find that with fuel of the character mentioned there is not any smoke, and the gases that may be generated do not escape into the car.

55 If desired, the cover G and the stopper D can be connected, as shown, so as to be moved together.

The front and back part of the box may be provided with a lining of asbestos cloth or  
60 similar material, as at 10, and there may also be a similar lining on the bottom and top, as at 11, so as to prevent the radiation or conduction of heat by the metal of the box.

Any hot air above the stopper D may pass  
65 out into the box through openings 12 in the upper part of the fire-pot.

We are aware that car-heaters have in some

instances been placed beneath the car-seat, as in Patent No. 511,961, and that air has been admitted to pass around the heater and  
70 up into the car.

In our present invention the skirt 8 below the bottom of the box F and passing through the floor of the car effectually protects the woodwork of the car from injury by the heat, and the shield 15 within the skirt 8 and  
75 extending down farther lessens the risk of any gases or smell of burning fuel passing into the car, because all such materials are confined within the fire-pot and the shield and  
80 will be passed away to the external atmosphere without the risk of such materials passing up with the currents of air outside the shield 15 and within the skirt 8. It is also  
85 apparent that the case E within the box F aids in heating the air by keeping such air closely in contact with the exterior of the fire-chamber. In consequence of the stopper D fitting the fire-pot tightly and there being an  
90 air-space between the top of this stopper D and the cover G said cover is not liable to become heated, and the escape of products of combustion into the car is effectually pre-  
95 vented by the stopper D, and the circulation of air through the holes 12 prevents the lid G becoming heated by radiation. These parts acting together insure the passage of the heat into the car without admixture of deleterious  
100 gases, and there being no escape-flue to this heating apparatus, there is nothing in the car to occupy space or to detract from the general appearance of such car.

We claim as our invention—

1. The combination with the air-box having an opening at the bottom for admitting  
105 air, of a fire-pot with tightly-fitting covers at the upper end and air-inlets at the lower end, the lower end of such fire-pot projecting below the bottom of the car, and a shield 15  
110 surrounding the fire-pot and closely connected to the same at the upper end to prevent any gases passing into the air-box, substantially as specified.

2. The combination with the conical fire-pot having tightly-fitting covers at its upper  
115 end, of a box with air-inlets at the bottom around the fire-pot, and a case E within the box and surrounding the air-inlets and open at the top, for directing the air against the  
120 outside of the fire-pot as it passes into the box, substantially as specified.

3. The combination with the conical fire-pot having tightly-fitting covers at its upper  
125 end, of a box with air-inlets at the bottom around the fire-pot, and a case E within the box and surrounding the air-inlets and open at the top, for directing the air against the outside of the fire-pot and a shield 15 surrounding the lower part of the fire-pot and the openings thereinto, and extending below  
130 the openings that admit air into the case E, substantially as specified.

4. The combination with the conical fire-pot having tightly-fitting covers at its upper

end, of a box with air-inlets at the bottom  
around the fire-pot, and a case E within the  
box and surrounding the air-inlets and open  
at the top for directing the air against the  
5 outside of the fire-pot, a skirt 8 extending be-  
low the bottom of the car, and a shield 15  
within the same and surrounding the lower  
part of the fire-pot and its openings and ex-

tending below the openings that admit air  
into the case E, substantially as specified.

Signed by us this 15th day of April, 1897.

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