(No Model.) 2 Sheets—Sheet 1.

G. A. BEACH.

STREET CAR WARMER.

No. 390,154. Patented Sept. 25, 1888.

Fig. 1.

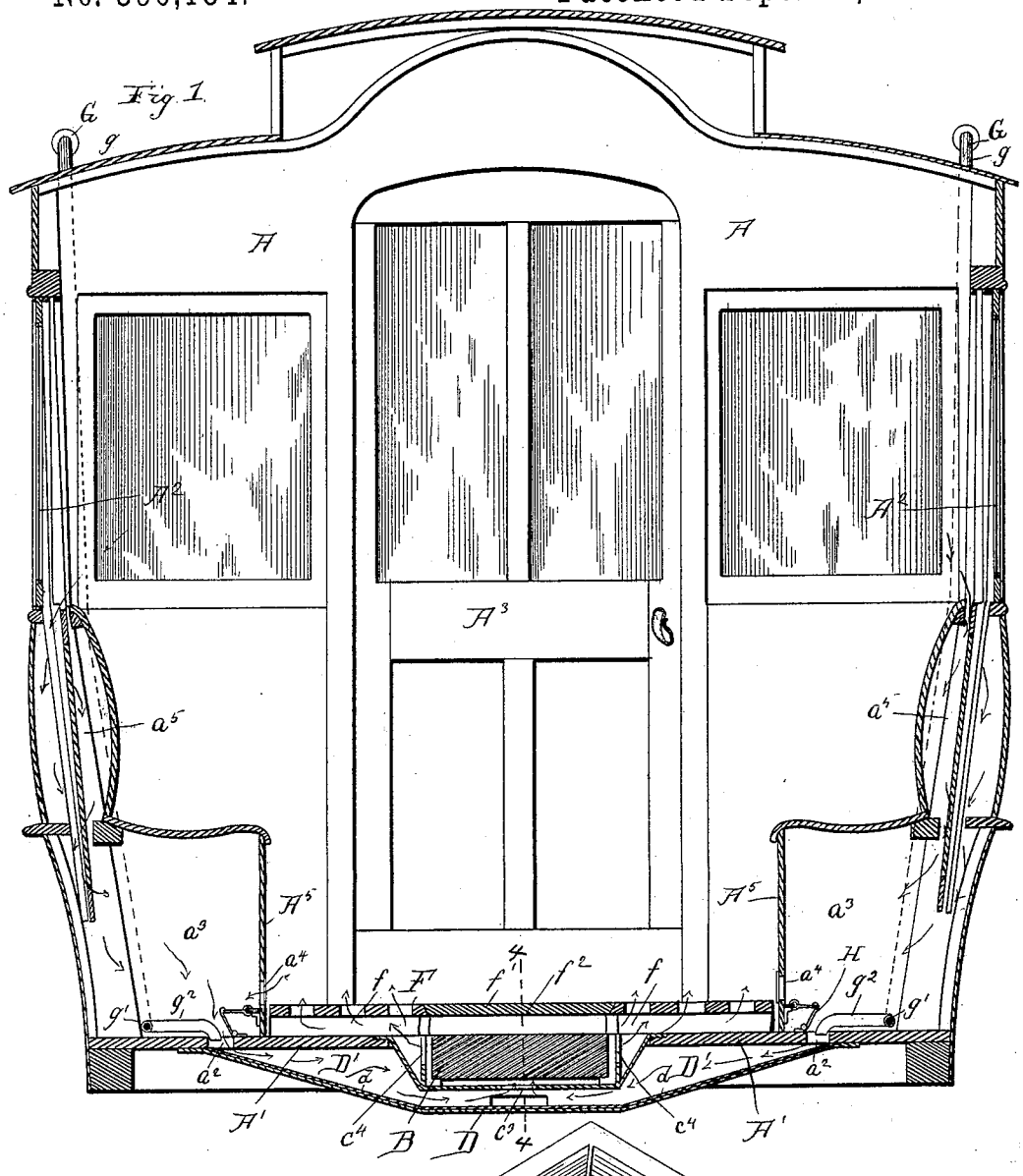
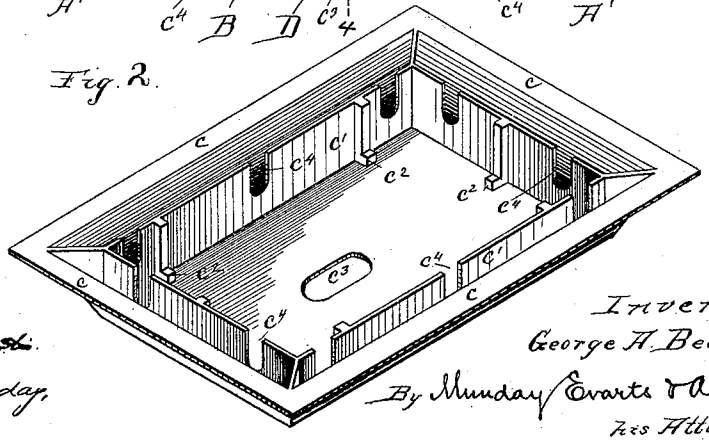


Fig. 2.



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Inventor:
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(No Model.) 2 Sheets—Sheet 2.

G. A. BEACH.

STREET CAR WARMER.

No. 390,154. Patented Sept. 25, 1888.

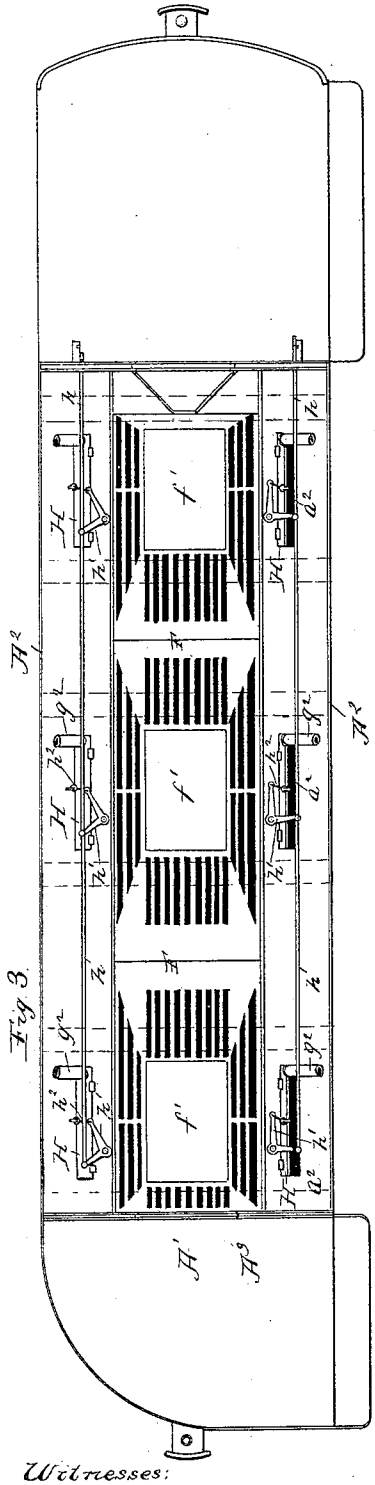


Fig. 3.

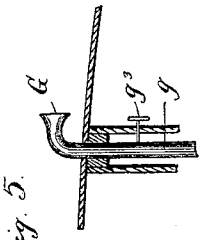


Fig. 5.

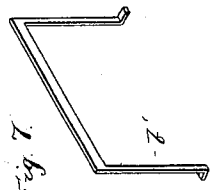


Fig. 7.

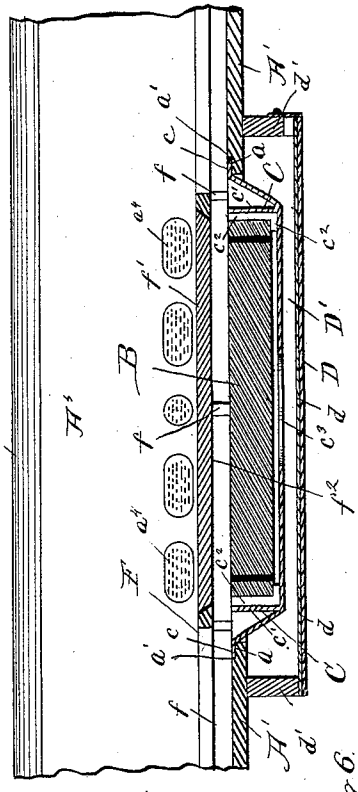


Fig. 4.

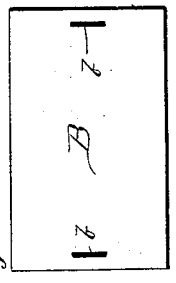


Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE A. BEACH, OF CHICAGO, ILLINOIS, ASSIGNOR TO EDWIN E. WISE, OF SAME PLACE.

STREET-CAR WARMER.

SPECIFICATION forming part of Letters Patent No. 390,154, dated September 25, 1888.

Application filed October 14, 1887. Serial No. 252,330. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. BEACH, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Street-Car Warmers, of which the following is a specification.

My invention relates to devices for warming street-cars.

The object of my invention is to provide an efficient and practical means, of a simple, cheap, and durable construction, for warming street-cars, which will heat the cars uniformly from end to end, offer no obstruction to getting on or off or through the cars when the same are crowded, and which will not diminish or interfere with the seating or carrying capacity of the cars.

To this end my invention consists in a street-car furnished with its usual floor or bottom, a perforated or open floor above the same with a space between, and a third or non-conducting floor or bottom with a space between it and the car-floor, the car-floor being furnished with a central opening or socket to receive and support the soapstone-heater holder. The soapstone-holder consists of a cast-iron box or receptacle, having side and bottom ledges to support the heater-stone and leave a space for the circulation of air between the stone and the bottom and side walls of the holder. The holder has a horizontally-projecting flange, which rests in the socket or rabbeted edge of the car-floor surrounding the opening formed therein. The heater-stone holder has a vertical wall inside its marginal inclined wall, and through this vertical wall a series of openings are provided for the passage of the hot air from the stone up through the car. The bottom of the stone-holder is also furnished with a central opening for the admission of the air to the heater. Openings for the passage of air are provided through the vertical wall of the car-seats, near the bottom thereof, and also down between the back of the seats and the outer wall of the car, which openings communicate with openings for the passage of air through the car floor, thus leading the air into the space between the lower or non-conducting floor. Fresh air is led from outside air-injectors, at the top of the car, down through tubes which communicate with the air-space between the car-floor and the lower non-conducting floor. The openings through the car-floor, which lead the air from the interior of the car down to the heater, are provided with valves or dampers operated by a rod extending horizontally through the car under the seats and projecting through to the platform, so that the driver or conductor may close or regulate the same when desired. By closing these valves or dampers fresh air only from the outside of the car will be supplied to the heater. The fresh-air pipes are also supplied with valves or dampers, so that they may be closed or partially closed when desired, thus enabling the temperature of the car to be governed as desired. The perforated or slatted floor above the car-floor and the heater is made removable, or with removable sections, through which the soapstone heaters are lifted out at the end of each trip and replaced by hot stones taken from the heating-furnace. The size and number of the heater-stones and heater-holders may be varied as desired, according to the size of the car and the length of the trip.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, Figure 1 is a vertical cross-section of a device embodying my invention. Fig. 2 is a detail perspective view of one of the heater-stone holders. Fig. 3 is a plan view looking down from a point within the car, and made on a smaller scale. Fig. 4 is a partial vertical section on line 4 4 of Fig. 1, and Fig. 5 is a vertical sectional view showing one of the air-injectors at the roof of the car. Fig. 6 is a plan view of the heater-block, and Fig. 7 a perspective view of a lifting tool or implement.

In the drawings, A represents a street-car, which may be of any usual or ordinary construction. The car which, for convenience, I have shown in the drawings, represents a form of cable car having a grip platform or space at one end of the car and an exit and entrance platform at the other end of the car.

A′ represents the car-floor; A^2 A^2, the outer side walls of the car; A^3, the car-door; and A^4, the seats of the car.

B is the heater-block, preferably made of soapstone, and C is the heater-stone holder,

preferably made of cast-iron and having a horizontal supporting-flange, *c*, which rests in a suitable recess or opening, *a*, cut in the car-floor A′. The edges of the car-floor around this opening *a* are rabbeted, as shown at *a′*, so that the flange of the stone-holder may fit flush with the upper surface of the car-floor. The heater-stone holder is furnished with a vertical or upwardly-projecting wall, *c′*, inside the outer inclined wall of the holder, from which vertical wall *c′* project horizontal and vertical ledges c^2 upon which the heater-stone rests, so as to leave an air-space between the stone and the bottom and vertical wall *c′* of the holder. The bottom of the holder is provided with a central opening, c^3, for the admission of cool air to the stone, and the vertical wall *c′* is furnished with a series of openings, c^4, cut therein for the passage of the hot air out laterally from the under side of the heater-stone. The inclined or flaring walls of the stone-holder C deflect the hot air upward as it issues laterally from the openings c^4.

D is the lower or non-conducting floor of the car, secured at its marginal or side edges to the car-floor A′ and supported thereby. This supplemental floor or bottom preferably consists of sheet metal lined with a sheet of mineral wool, asbestus, or other non-conductor, *d*. This supplemental non-conducting floor D affords a close air space, D′, below the car-floor A′ and surrounding the stone-heater holder C.

The non-conducting floor D may, if desired, be made to extend the full length of the car; but it is preferable and cheaper only to extend this supplemental floor the length of the stone-holder C; and I ordinarily provide the car-floor on its under side with downwardly-projecting cross-bars of wood, *d′*, to which the bottom D is secured at its ends. One of these bottoms or floors D is provided for each of the heater-stones B and heater-holders C.

As shown in the drawings, the car is furnished with three heater-stones and heater-holders. The car-floor A′ is provided with openings a^2 under the seats A^4, which lead into the air-space D′, between the supplemental floors D and the car-floor A′. The air is conducted from the interior of the car into the space a^3 beneath the seats through openings a^4 formed in the vertical walls A^5 of the seats near the bottom thereof and just above the upper removable perforated floor, F, of the car. Air from the top portion of the car is also conducted down to and circulated around the heater-stone through air-passages a^5 at the back of the seats, or between the back of the seats and the side wall of the car. Fresh air from the outside of the car is also conducted down to the heater-stone from the air-injectors G at the top of the car through the vertical air-pipes *g*, horizontal air-pipes *g′*, which extend longitudinally of the car under the seats, and the branch pipes g^2, the ends or mouths of which lead into the air-passages a^2 in the car-floor A′. The openings a^2 in the floor A′ may be all closed simultaneously by valves or dampers H, which are operated by a rod, *h*, extending longitudinally of the car under the seats and projecting through the front end wall of the car. Each of the valves H is connected to this rod by a bent lever, *h′*, and link h^2. The fresh-air pipes *g* are furnished with valves or dampers g^3, the handles of which project through the front end wall of the car, so as to be accessible to the driver or conductor on the outside. The upper perforated floor, F, is preferably made of open slat-work, and is supported upon suitable lugs or risers, *f*, between the same and the car-floor A′. The central portion, *f′*, of this slatted or perforated floor F is made solid or closed and lined with zinc f^2 on its under side, so as to prevent the heat from the stone rising directly upward and to deflect the hot air out laterally through the openings in the perforated floor F. The central zinc-lined portion, *f′*, of the upper floor should be made somewhat larger in size than the stone beneath, and is made removable, so that by simply removing or opening this portion *f′* of the floor F the heater-stone may be removed and replaced by another. The part *f′* is preferably hinged at one of its edges to the perforated floor F. The heater-stones B are each furnished with one or more cavities, devices, or projections, *b*, preferably consisting of simple cavities or notches cut in the face or edges of the stone, and by means of which the stone may be readily grasped and carried with suitable lifting tools or devices, *b′*, for this purpose. At the end of each trip, or when cool, the heater-stones B are lifted out of their holders, placed in the furnace to be heated, and the holders refilled with other hot stones taken from the furnace.

I claim—

1. The combination of a street-car, its seats and floor A′, provided with a central recess or opening, *a*, a heater-holder, C, having flange *c* resting in said recess and supported by said floor, heater-block B, resting upon ledges c^2 in said holder C, lower non-conducting floor, D, extending under the seats of the car, with an air-space, D′, between the same and the car-floor, said car-floor A′ being furnished with air passages or openings a^2 through the same beneath the seats, and the air-space beneath the seats communicating with the interior of the car, substantially as specified.

2. The combination of a street-car, its seats and floor A′, provided with a central recess or opening, *a*, a stone-heater holder, C, having flange *c* resting in said recess and supported by said floor, heater-stone B, resting upon ledges c^2 in said holder C, lower non-conducting floor, D, extending under the seats of the car, with an air-space, D′, between the same and the car-floor, said car-floor A′ being furnished with air passages or openings a^2 through the same beneath the seats, the air-space beneath the seats communicating with the interior of the car through openings provided in the vertical wall of the seats, and also through air-passages at the back of the seats

between the same and the side walls of the car, substantially as specified.

3. The combination of a street-car, its seats and floor A′, furnished with a central recess or opening, *a*, a stone-heater holder, C, having flange *c* resting in said recess and supported by said floor, heater-stone B, resting upon ledges c^2 in said holder C, lower non-conducting floor, D, extending under the seats of the car, with an air-space, D′, between the same and the car-floor, said car-floor A′ being furnished with air passages or openings a^2 through the same beneath the seats, the air-space beneath the seats communicating with the interior of the car through openings provided in the vertical wall of the seats, and fresh-air pipes leading from the outside of the car into the air-space between said floors A′ and D, substantially as specified.

4. The combination of a street-car, its seats and floor A′, having recess *a* and air-passages a^2, lower non-conducting floor, D, upper perforated floor, F, heater-stone B, stone-holder C, furnished with an inlet air-opening, c^3, forming a communication between the air-space between said floors A′ D and the air-space between said floors A′ F, said car-seats being furnished with an air-passage back of the same communicating with the interior of the car and leading into the air-space surrounding said heater-holder between said floors A′ and D, substantially as specified.

5. The combination, with a street-car, its seats and floor A′, having recess *a*, of lower non-conducting floor, D, upper perforated floor, F, there being air-spaces between said floors A′, D, and F, stone-heater B, heater-holder C, having an air passage or opening through the same, and fresh-air pipe *g*, leading from the outside of the car and communicating with said heater-holder C, substantially as specified.

6. The combination, with a street-car, its seats and floor A′, having recess *a*, of lower non-conducting floor, D, upper perforated floor, F, there being air-spaces between said floors A′, D, and F, stone-heater B, heater-holder C, having an air passage or opening through the same, and fresh-air pipe *g*, leading from the outside of the car and communicating with said heater-holder C, said fresh-air pipe being furnished with an injector, G, at the top of the car and a valve or damper, g^3, substantially as specified.

7. The combination of a street-car and its floor A′, having recess *a*, lower floor, D, upper perforated floor, F, heater-block B, heater-holder C, there being air-spaces between said floors, said heater-holder C having a fresh-air inlet communicating with the air-space between said floors A′ D, said air space or compartment between said floors A′ D having also an air-inlet opening, and the air-space between said floors A′ F communicating with the interior of the car through perforations or openings in said floor F, substantially as specified.

8. The combination of a street-car, its seats and floor having recesses *a* and air-passages a^2, lower non-conducting floors, D, upper perforated floor, F, heater-stones B, holders C, valves H, valve-rod *h*, levers *h*′, and links h^2, there being air-spaces between said floors and the air-space between said car-floor and said lower non-conducting floor, D, communicating with the interior of the car through said air-passages a^2, and said valves H governing said air-passages, substantially as specified.

9. The combination, with a street-car, its seats and floor A′, having recesses *a* and air-passages a^2, of perforated upper floor, F, having solid or unperforated removable central portions, *f*′, lower non-conducting floor, D, stone-heater B, and heater-holder C, having flaring walls and bottom furnished with central opening, a vertical inner wall, *c*′, furnished with ledges c^2, said vertical inner wall being provided with air-passages c^4, substantially as specified.

10. The combination, with heater-block B, of a cast holder for said block having double side walls, the outer side wall provided with horizontal supporting-flanges *c* and the inner wall having heater-block-supporting ledges c^2 and air passages or openings c^4, substantially as specified.

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Witnesses:
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JOHN W. MUNDAY.