(No Model.) 3 Sheets—Sheet 1.

L. P. CONVERSE.

AIR HEATING DEVICE FOR CARS.

No. 383,171. Patented May 22, 1888.

Fig. 1.

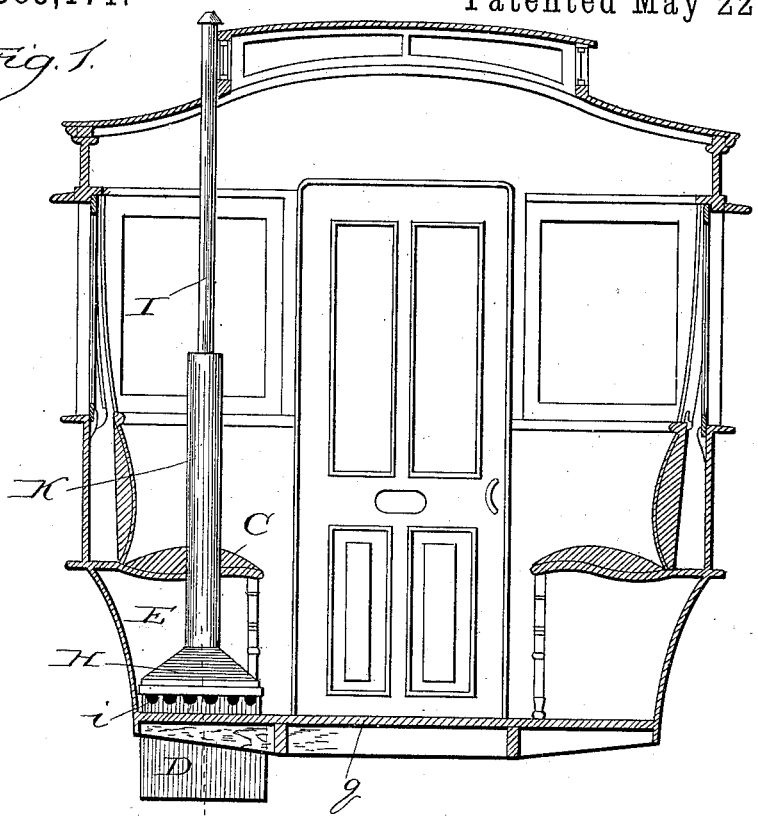
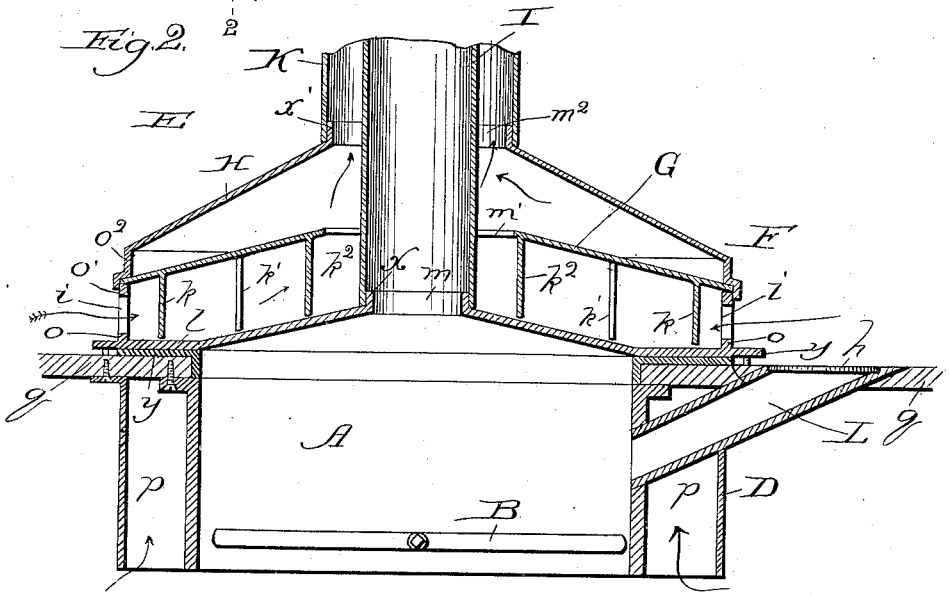


Fig. 2.



Witnesses:
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Att'ys.

(No Model.)

3 Sheets—Sheet 2.

L. P. CONVERSE.

AIR HEATING DEVICE FOR CARS.

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Fig. 3.

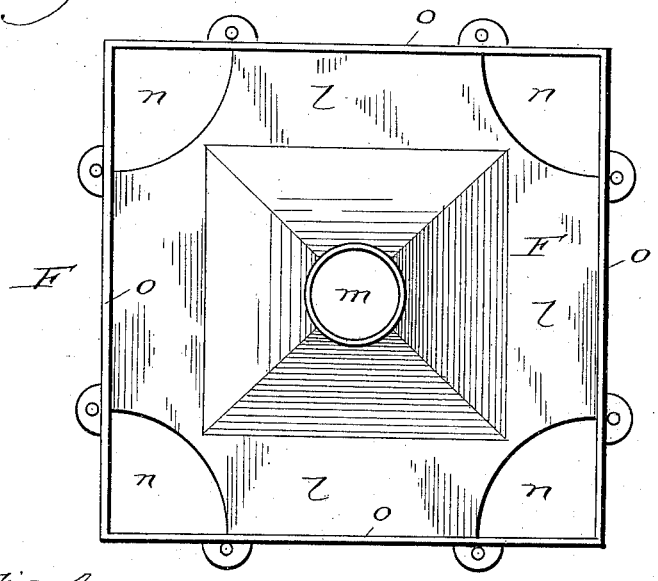
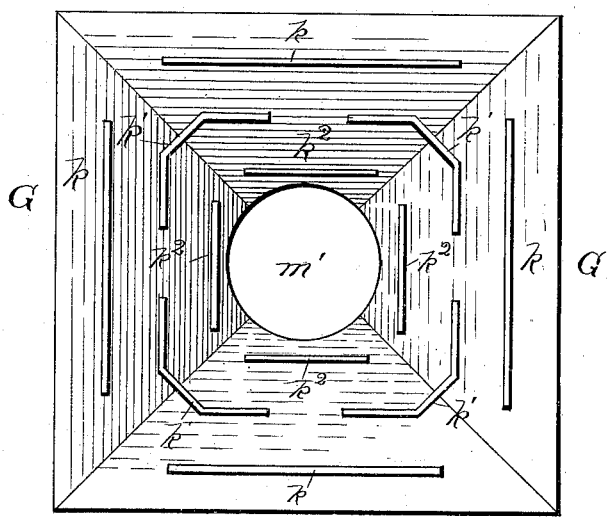


Fig. 4.



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(No Model.)

3 Sheets—Sheet 3.

L. P. CONVERSE.

AIR HEATING DEVICE FOR CARS.

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Fig. 5.

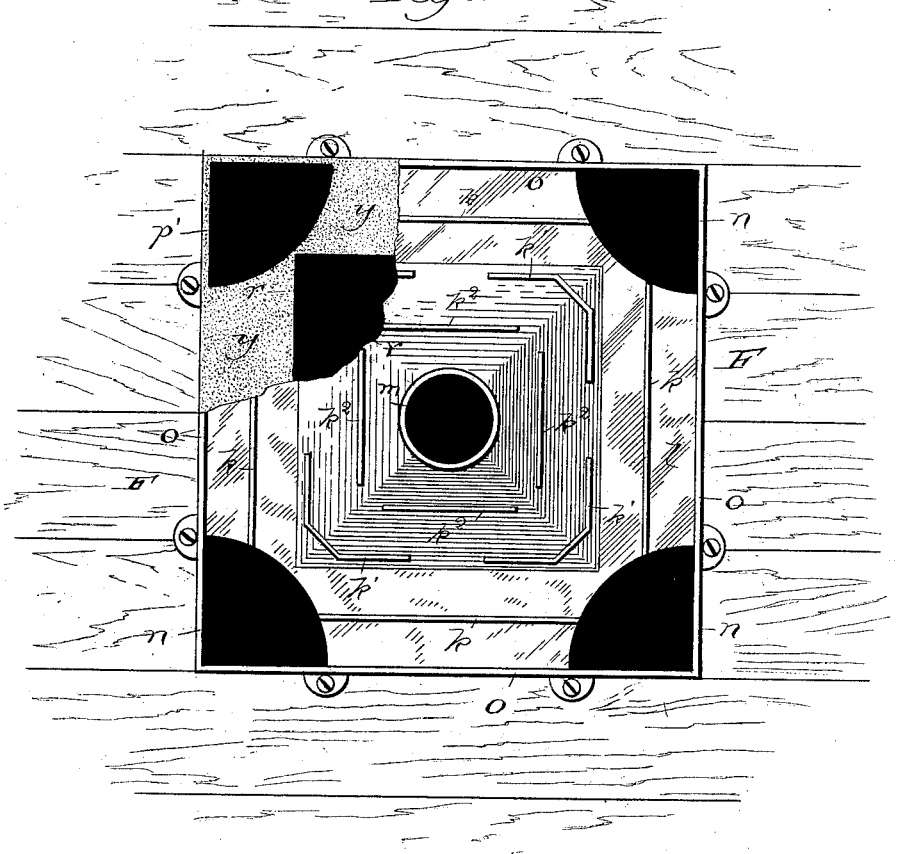
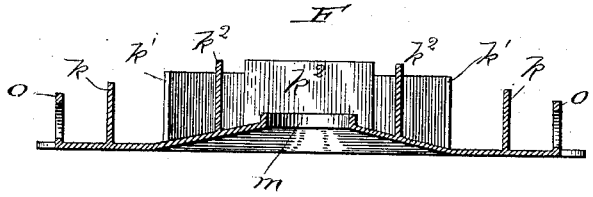


Fig. 6.



Witnesses:
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UNITED STATES PATENT OFFICE.

LYMAN P. CONVERSE, OF CHICAGO, ILLINOIS.

AIR-HEATING DEVICE FOR CARS.

SPECIFICATION forming part of Letters Patent No. 383,171, dated May 22, 1888.

Application filed July 22, 1887. Serial No. 244,962. (No model.)

To all whom it may concern:

Be it known that I, LYMAN P. CONVERSE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Air-Heating Devices for Cars, &c., of which the following is a specification.

The object of my improvement is to provide an effective device of very simple construction, which, without taking up much space, if, in fact, any space that would be otherwise available, will serve to heat to a comfortable temperature a large inclosure with the consumption of a comparatively small quantity of fuel.

While my improved device may be used with all its attendant advantages in various connections, as for heating rooms, it is particularly useful and especially designed for heating street-cars, and I describe and illustrate it in such connection in the accompanying drawings, in which—

Figure 1 is a transverse section of a street-car provided with my improved heating device; Fig. 2, a cross-section of the heating device, taken on the line 2 of Fig. 1, viewed in the direction of the arrow and enlarged; Fig. 3, a plan view of the lower casting of the heater, showing a modified construction; Fig. 4, a bottom view of the intermediate casting within the heater; Fig. 5, a plan view showing the preferred construction of the lower casting of the heater, and having a portion broken away to disclose the central opening in the car-floor, and one of the openings coinciding with the corner-openings in the lower casting; and Fig. 6, a cross-section, through the bottom casting, of the preferred construction.

A is a fire-pot, preferably rectangular, open at its upper end and containing a grate, B, supported near its bottom. The fire-pot is secured at its upper edge to the under side of the car-floor *q* around an opening, *r*, of the same shape as the fire-pot provided in the said floor, preferably near the longitudinal center of the car below a seat, C. A jacket, D, surrounds the fire-pot, being secured, like the latter, to the under side of the car-floor, as shown, whereby a chamber, *p*, is provided between the jacket and fire-pot entirely around the latter. At each of the four corners of the chamber *p* an opening, *p'*, (shown in Fig. 5 of the drawings and corresponding with the corner-openings shown in Fig. 3 in the bottom casting of the heater, hereinafter described,) is provided.

E is the heater, shaped like the opening *r* in the car-floor and comprising a casting, F, Fig. 3, having a flange, *o*, about the edge of its upper side, an opening, *n*, in each corner, and a central circular opening, *m*. The casting F is also raised toward its center around the opening *m* and provided with a horizontal flange, *l*, around its edge. It is imposed upon the upper side of the car-floor (suitable material *y*, such as asbestus, that is non-conductive of heat, being interposed around the opening *r*) in a manner to cause the openings *n* in the corners of the flange *l* to coincide with the openings *p'*, hereinbefore described as being provided over the chamber *p* in the car-floor.

G is a casting shaped like the casting F, except that it has no lateral flange *l*, but sloping from an opening, *m'*, provided in its center, which opening is of greater diameter than the opening *m* in the casting F below it, which is provided with a collar, *x*. Upon the under side of the casting G are three series of ribs, the first comprising strips *k* extending on each side of the opening *m'* near the edge, but separated at the corners; the second, bent strips *k'* blocking the openings between the strips *k* between the latter and the opening *m'* and separated to have spaces near the center of the strips *k*, and the third, straight strips *k²* on four sides adjacent to the opening *m'*, separated at the corners and blocking the openings between the strips *k'*. A flange, *o'*, extends downward from the edge of the casting G to coincide with and rest upon the flange *o* on the casting below it, and openings *i*, in any desired number, are provided between the flanges *o* and *o'*.

The top casting, H, shaped substantially like the casting G, but sloping more from the central opening, *m²*, provided with a collar, *x'*, is imposed upon the casting G at its edge on a vertical flange, *o²*, bent, as shown, toward its lower edge to form a seat. The opening *m²* coincides with the opening *m'* below it, and a smoke flue, I, extends from the opening *m* in the casting F, to which it is secured around the collar *x* through the openings *m' m²* and roof of the car. A hot-air flue, K, extends

from the casting H about the collar x' at the opening m^2 therein to any desired height within the car and surrounds the smoke-flue.

Fuel is fed to the fire-pot through a chute, L, extending from the floor at a convenient point, and provided with a removable cover, *h*.

The operation of my device is as follows: Cold air enters the heater E by way of the chamber *p* through the openings *n*, and also through the lateral openings *i*. As the heater is directly over the fire-pot, it becomes rapidly and intensely heated, thereby also heating the cold air in its passage through the chamber *p*. Within the heater, owing to the impeding effect of the strips *k*, *k'*, and k^2, the air, before escaping through the flue K, must, to reach the latter, make a circuitous route, whereby it is retained within the heater a sufficient length of time to raise it to a very high temperature, in which condition it eventually discharges into the car or inclosure from the hot-air flue K.

It will thus be seen that a compact device of simple construction is afforded, which heats not only by radiation, like other devices for the same purpose, but that the same amount of fuel is employed to heat air which is discharged directly into the inclosure, thereby greatly augmenting the heating capacity of the device.

If desired, the strips *k*, *k'*, and k^2 may be provided on the upper surface of the casting F, instead of on the lower surface of the casting G, as shown, and this construction is, in fact, the preferable one, since, as the strips then form part of the lowest casting, which is in direct contact with the fire, they become hotter than when provided on the casting G, and I manufacture my device in accordance with this preferred construction.

What I claim as new, and desire to secure by Letters Patent—

1. In an air-heating device, the combination of a fire pot, A, a jacket, D, surrounding the fire-pot and affording a chamber, *p*, a heater, E, supported directly over the fire-pot, comprising a casting, F, provided with an opening, *m*, a casting, G, provided with an opening, *m'*, and surmounting the casting F, ribs between the two castings about the openings therein, affording a circuitous chamber having communication with the surrounding atmosphere, and a casting, H, surmounting the casting G, and provided with an opening, m^2, a smoke-flue, I, extending through the openings *m*, *m'*, and m^2, and a hot-air flue, K, extending from the casting H around the smoke-flue and opening into the inclosure to be heated, substantially as described.

2. The combination, with a car having an opening, *r*, in its floor, of a heating device comprising a fire-pot, A, and a jacket, D, surrounding the fire-pot underneath the car, and affording a chamber, *p*, a chute, L, having its inlet in the floor of the car and leading from the car-floor into the fire-pot, a heater, E, supported on the upper side of the car-floor directly over the fire-pot, and comprising a casting, F, provided with an opening, *m*, and with openings *n*, leading into the chamber *p*, a casting, G, provided with an opening, *m'*, and surmounting the casting F, ribs between the two castings about the openings therein, affording a circuitous chamber having communication with the surrounding atmosphere, and a casting, H, surmounting the casting G, and provided with an opening, m^2, a smoke-flue, I, extending through the openings *m*, *m'*, and m^2, and car, and a hot-air flue, K, extending from the casting H around the smoke-flue and opening into the interior of the car, substantially as described.

LYMAN P. CONVERSE.

In presence of—
J. W. DYRENFORTH,
CHAS. E. GAYLORD.