

(No Model.)

3 Sheets—Sheet 1.

B. F. TAYLOR.

MEANS FOR HEATING RAILWAY CARS.

No. 396,715.

Patented Jan. 22, 1889.

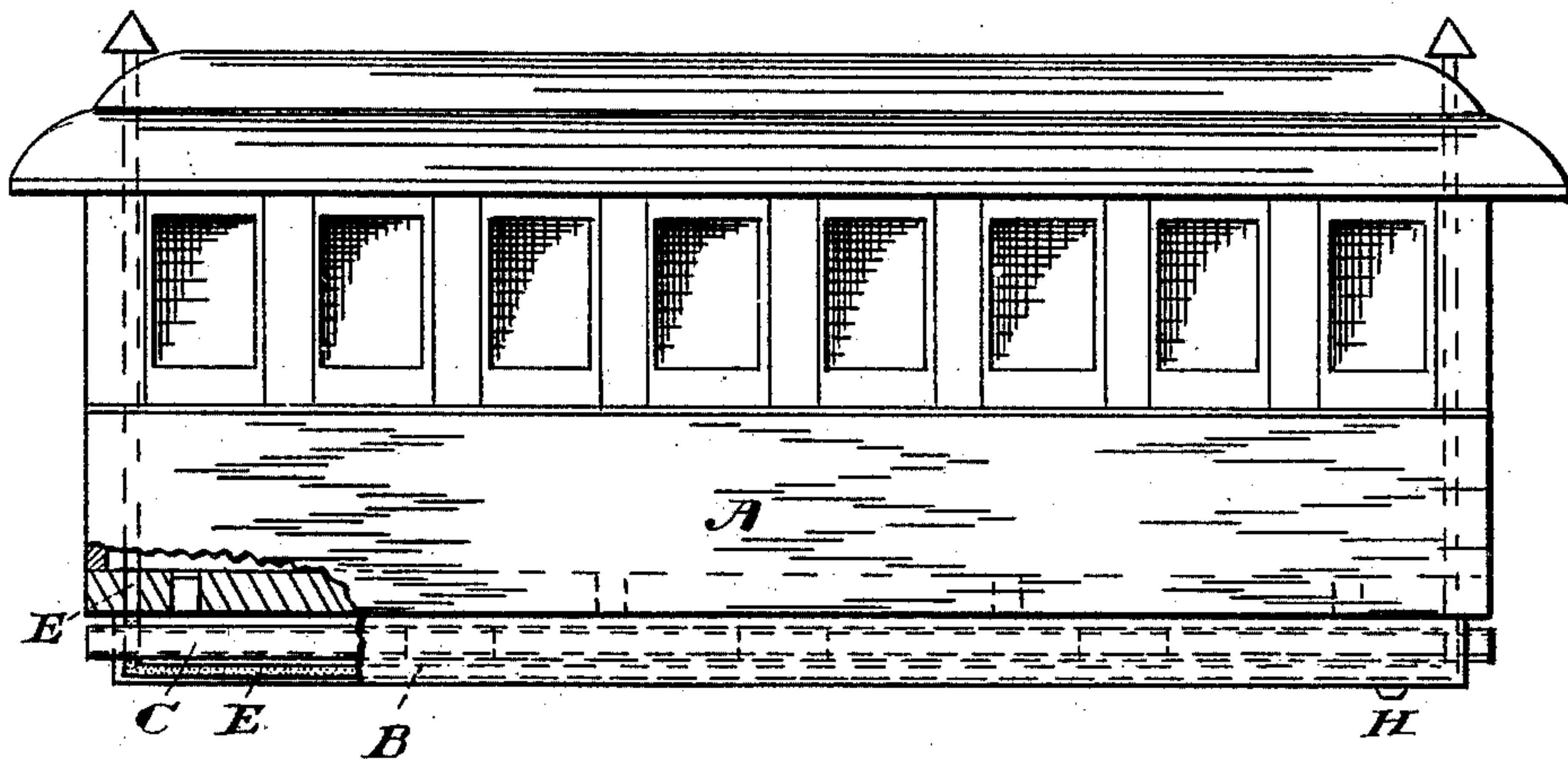


Fig. 1.

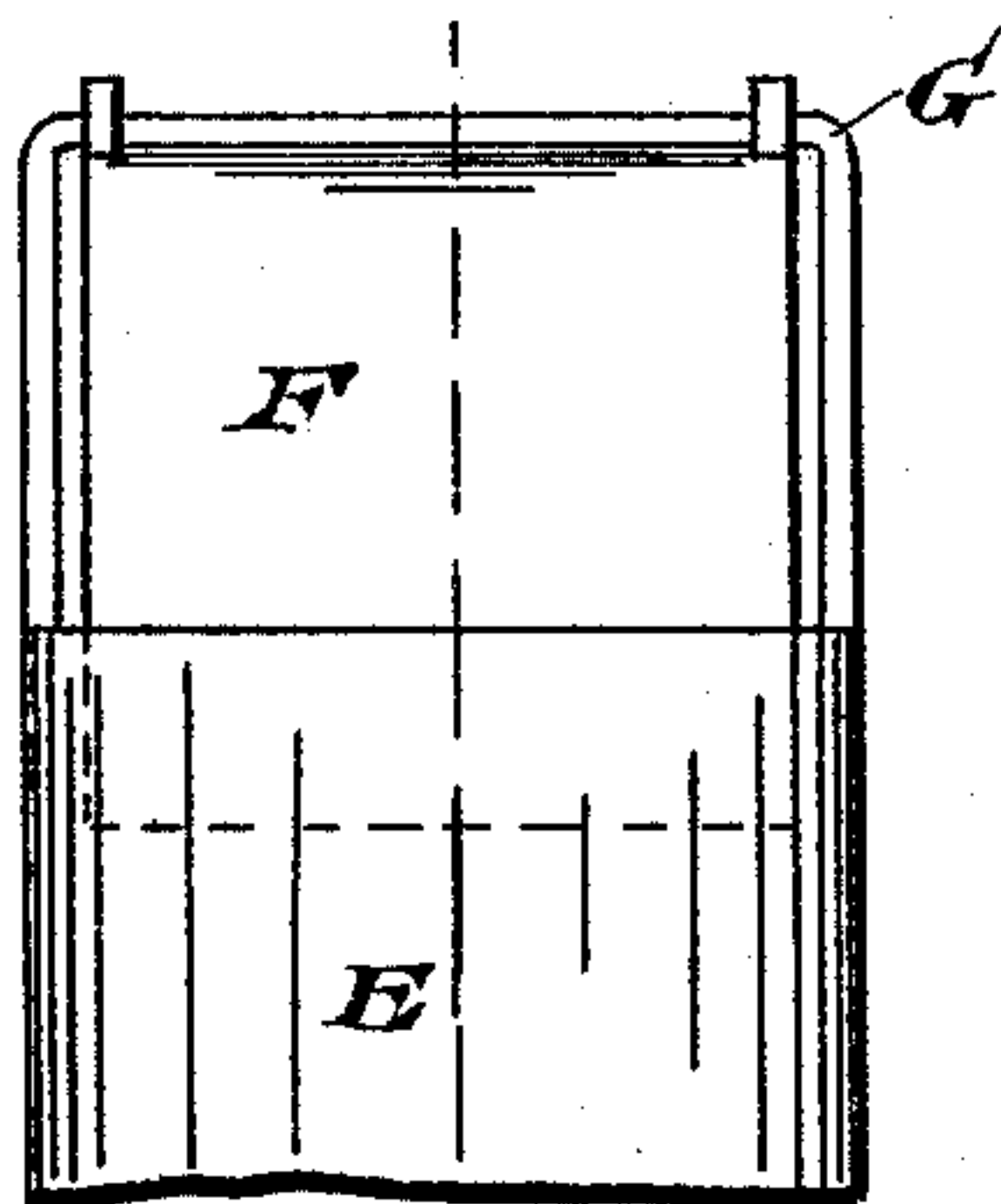


Fig. 3.

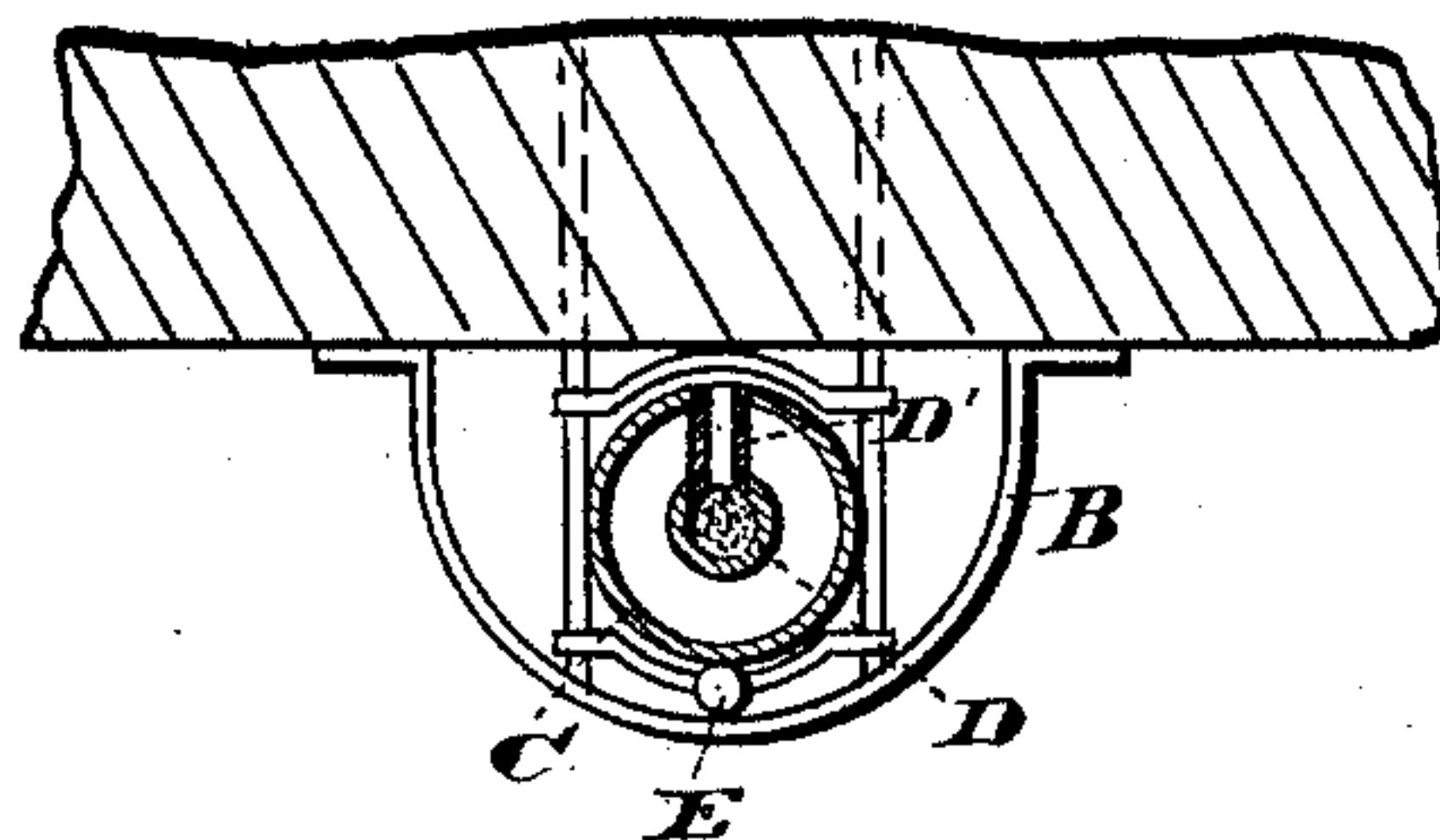


Fig. 2.

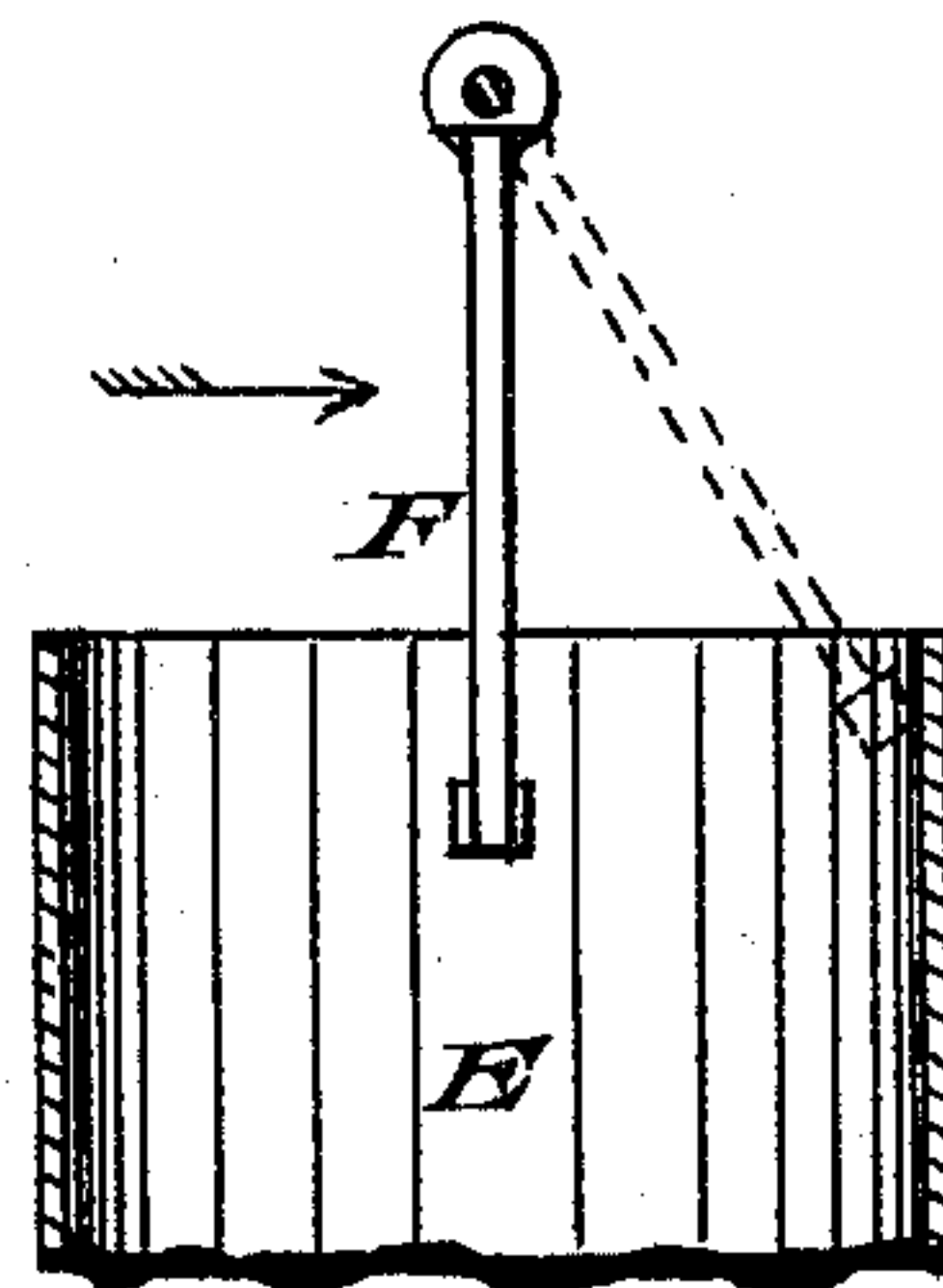


Fig. 4.

—WITNESSES:—

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(No Model.)

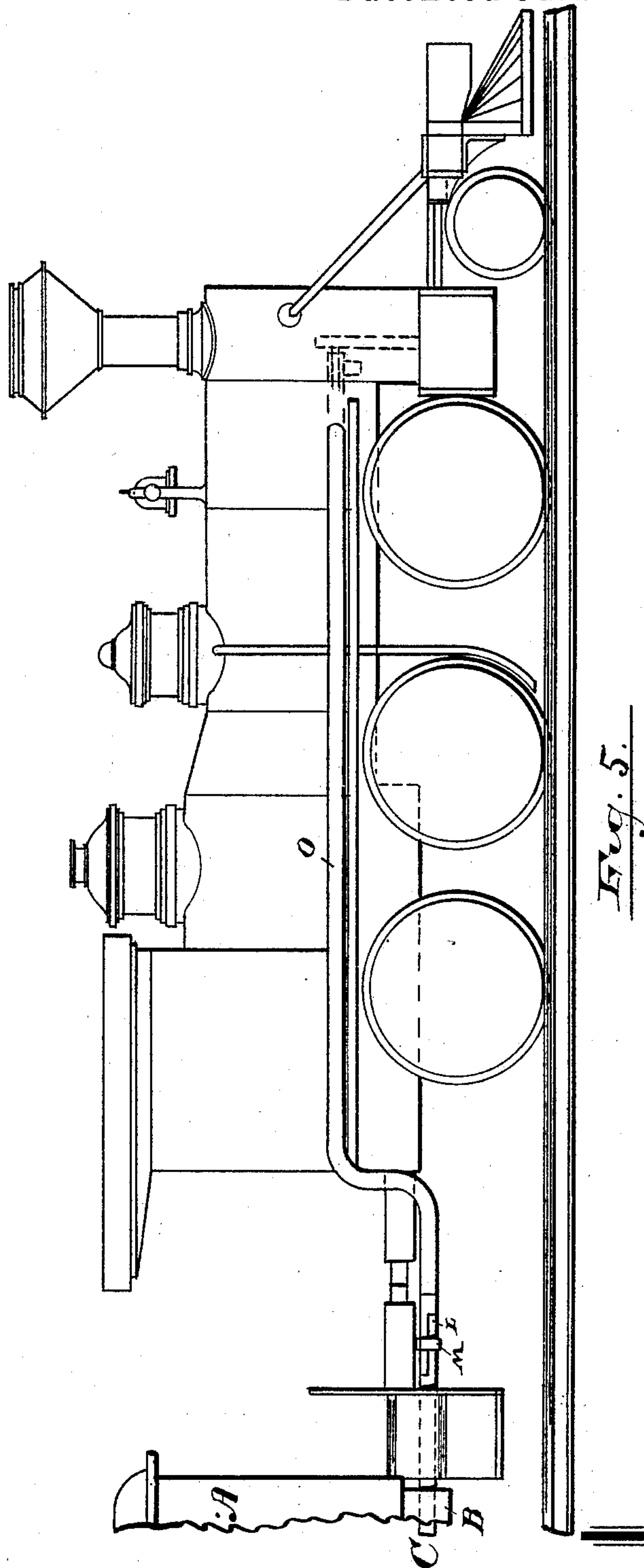
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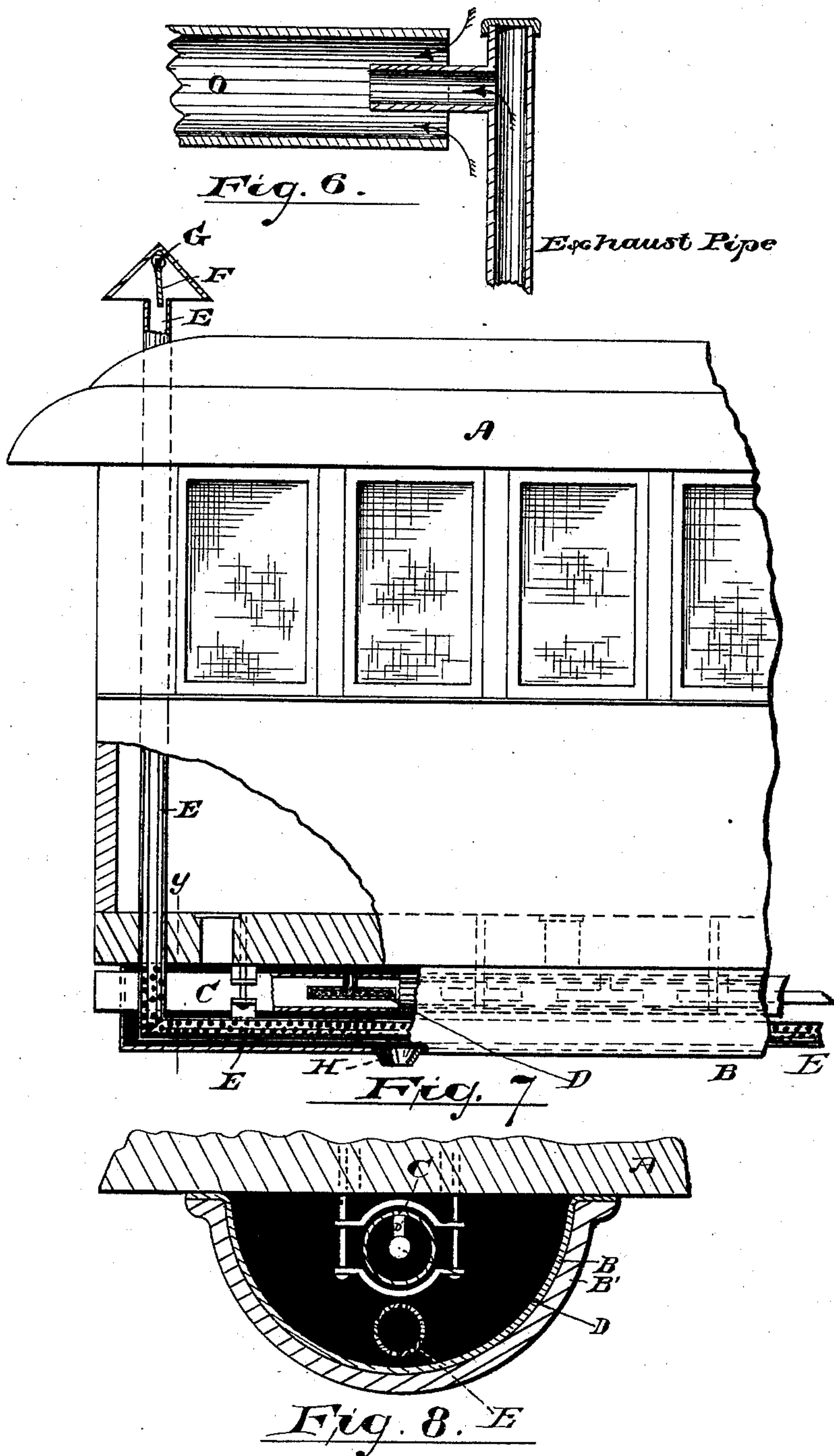
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# UNITED STATES PATENT OFFICE.

BENJAMIN F. TAYLOR, OF NEWARK, NEW JERSEY, ASSIGNOR TO HIMSELF  
AND ANDREW D. CAMPBELL, OF SAME PLACE.

## MEANS FOR HEATING RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 396,715, dated January 22, 1889.

Application filed February 28, 1887. Serial No. 229,157. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN F. TAYLOR, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in the Method of and Means for Heating Railway-Cars; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of heating devices for railway-cars in which the heat is transmitted from the locomotive to the cars by means of pipes coupled together and communicating with the fire-box or exhaust-steam pipe of the said locomotive, the general objects of the invention being to more perfectly avoid the danger attending the use of stoves and burning coals in the passenger-cars of a railway-train, especially in the event of an accident thereto, and also to avoid the use of live or scalding steam, to reduce the cost of heating involved in the use of said means, to secure a better ventilation and adequate supply of fresh warm air in said cars, thus conducing or contributing to the health and comfort of the passengers, and to secure certain results in detail, as will be hereinafter set forth.

The invention consists in the arrangements and combinations of parts, substantially as will be hereinafter set forth, and finally embodied in the clauses of the claim.

Referring to the accompanying drawings, embraced in three sheets, in which like letters of reference indicate corresponding parts in each of the several figures, Figure 1, Sheet 1, is a side elevation of a railway-car having the improved heating apparatus attached. Fig. 2 is an enlarged sectional view of the said heating apparatus. Figs. 3 and 4 are respectively a front view and a sectional view of a device for forcing air into a fresh-air-supply pipe. Fig. 5 is a side elevation of a locomotive from which the heat is received. Fig. 6

is a detail view showing the method of commingling the exhaust-steam from the cylinder of the locomotive with the hot air from the fire in the locomotive or the hot gases, which are the more immediate products of combustion. Fig. 7 is an enlarged side view of a portion of a car, showing more clearly the arrangement of parts; and Fig. 8 is a section on line *y*, Fig. 7, illustrating a modified or preferred arrangement of parts.

In said drawings, A indicates a railway-car; B, a casing secured to said car and running longitudinally beneath the same, said casing being preferably of sheet metal, and being bent to approximate a U shape, and at the edges bent to provide flanges, by means of which the said casing is fastened to the car-bottom by means of bolts or other form of fastening. Said casing is preferably inclosed with suitable non-conducting material, B', Fig. 8—such as felt—to prevent the radiation of heat into the outer atmosphere. The said U-shaped casing forms, with the bottom of the car, a longitudinal heat-chamber, having at appropriate points in its length open communication with the passenger-chamber of the car. The heat from the heat-conducting pipes, hereinafter referred to, is mixed with the pure outer atmosphere introduced to said heat-chamber by conducting-pipes, also referred to hereinafter, within said heat-chamber, and is then introduced to the car, the passenger-chamber being thus warmed by what is sometimes known as an “indirect system of heating”—a system possessing well-known advantages. The U-shaped casing is applied to the car-bottom very readily, is more durable and compact, and may be lined with non-conducting material with greater facility and more efficiently than an ordinary box would admit of. The heat-chamber is arranged at the bottom of the car, so that the heat may rise therefrom naturally, and thus diffuse itself more perfectly and quickly throughout the car than if said chamber were arranged at the top of the car.

Within the casing is secured a steam-pipe, C, which is held in place by suitable bolts, spiders, or other holding devices, being provided at its ends with suitable tubular coup-



ling means, preferably such as will be described, whereby the steam is conveyed to said pipe from a similar pipe in the car next preceding in order and delivered to the one on the car next in succession.

By arranging the U-shaped casing beneath the flooring of the car in the manner indicated in the sectional view, so that the open side is toward the car, the said U-shaped casing may be readily removed from the steam-pipes without disturbing the latter in their positions or connection with adjacent parts. The workman in removing the casing simply removes or unfastens the attaching means and allows the casing to lower by gravity, the said pipes passing out of the casing by the downward movement of the latter. By being of the shape described there will be no danger of warping and the formation of cracks or openings such as would be formed if boards were used in the construction of the casing.

The steam-pipe may be round in cross-section, as shown, and within the same may be provided pipes or receptacles D, of any kind or construction for heat-absorbing material—such as soapstone or other suitable matter or material—by means of which the heat may be absorbed while passing through the steam-pipe, and when the supply from the locomotive has been cut off subsequently radiated or ejected into the passenger-chamber of the car. Said pipe for the absorbent is preferably a J-shaped pipe, the stem D' of which is screwed or otherwise fastened into the pipe C, so that the chamber for the absorbent opens into the hot-air chamber formed around the steam-pipe, but has no communication with the steam-passage of the steam-pipe.

At several points in the length of the hot-air chamber within the casing the same has communication with the passenger-chamber of the car, suitable openings provided with registers or valves of any ordinary construction being provided to allow and control the ingress of heated air.

To supply the hot-air chamber with fresh air to be heated, I have provided supply-pipes E, which extend from the top of the car, where the air is more free of dust, into the said chamber, where it is bent to extend in a direction parallel with the said chamber. This portion of the supply-pipe is perforated, so that the fresh air is supplied in equal quantities throughout the length of the hot-air chamber. To cause a direct inflow of cold or fresh air to the hot-air chamber and prevent any possible escape of heated air through the supply-pipe, I have provided at the outer end of the said supply-pipe automatically-acting means for forcing the said fresh air through the said supply-pipe to the hot-air chamber. Said means preferably consists of a wing or flap, F, suspended over the end of the supply-pipe on a suitable bar, G, secured to said pipe in any suitable manner. The motion of the car causes a counter-current of air to throw the

wing which extends into the pipe against the wall thereof, as shown in Figs. 4 and 5, and to hold it there during the progress of the said car. The said wing thus opens the supply-pipe on the windward side thereof and automatically causes the air to flow into said pipe, as will be understood. This action and result occur whether the car is moving in one or the other direction.

I have provided the steam-pipes with suitable exits, H, for the water of the condensed steam. These may be of any suitable constructions and be formed in any appropriate position, and may be provided with automatically-acting valves of any of the well-known constructions, whereby the condensed water may be automatically emitted without allowing the escape of steam.

The coupling for uniting the several steam-pipes may be of any ordinary or of a special construction.

The steam-pipes are supplied with steam from the locomotive in any suitable manner; but I prefer to supply the said pipe with exhaust-steam by connecting the exhaust-steam pipe or valve of the ordinary cylinder of the locomotive with a service-pipe, O, which leads to and is coupled with the steam-pipe of the car to be heated in any suitable manner. Said pipe O has also a communication with the chamber below the smoke-stack, so that as the exhaust-steam passes from the exhaust-steam pipe or valve, or is injected into the said service-pipe, the heated air from said chamber is drawn in said service-pipe also, so that back-pressure is prevented and the heat of the steam is raised to a higher temperature. The connections to accomplish this result most efficiently may be of any suitable construction,

By the construction and arrangements of parts thus described the use of burning coals on passenger-cars is entirely avoided, and all danger of subjecting the passengers to the action of steam, whether it be what is commonly known as "live steam" or "exhaust-steam," or other injurious heat from the locomotive, is obviated, inasmuch as the steam or heat conducting pipes are all arranged on the outside of the car.

I am aware that one Cody, in Patent No. 329,017, describes a device for heating a car by steam derived from the locomotive. In my improved heater the casing B extends substantially the whole length of the car, covering or inclosing the heat or steam pipe as it extends longitudinally the length of the car, and thus is adapted to couple or connect with corresponding pipes forward of and at the rear of the car to which said pipe is attached, taking steam from one of said corresponding pipes and delivering it to the other in the series. A very long heat-chamber is thus secured beneath said car, and there is very little heat lost in transmission. In my device the air to be introduced to said chamber is from the outer atmosphere, and not from



within the passenger-chamber above the flooring. It thus, when heated, passes upward, because of its lightness and freedom from heavy exhalations of the passengers, and is at  
5 once efficient in supplying heat and fresh air to those seated in the car, the whole air being at once affected.

I am also aware that one Chesebrough, in Patent No. 73,781, shows a steam-pipe extending through a chamber at the top of the car within the passenger-chamber, but which, he says, may be at the bottom of the car. In my device the chamber, where the heat is brought into contact with the outer atmosphere and  
15 then delivered to the passengers, is beneath the flooring, so that the heated air may rise and at once uniformly heat the car and without presenting any obstacles—such as steam-pipes—within said passenger-chamber.

20 Having thus described the invention, what

I claim as new, and wish to secure by Letters Patent, is—

In combination with a car, A, a casing secured beneath the flooring of said car, a heat or steam pipe extending through the  
25 chamber formed by said casing, a perforated outer air-pipe extending through said chamber, and a heat-absorbent receptacle arranged within said steam-pipe and open to said chamber formed by said casing, all said parts  
30 being arranged and adapted to co-operate substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 21st day of February, 1887.

BENJAMIN F. TAYLOR.

Witnesses:

OLIVER DRAKE,  
CHARLES H. PELL.