

J. H. WEIBEL.
Railway Car-Heaters.

No. 144,425.

Patented Nov. 11, 1873.

Fig. 1.

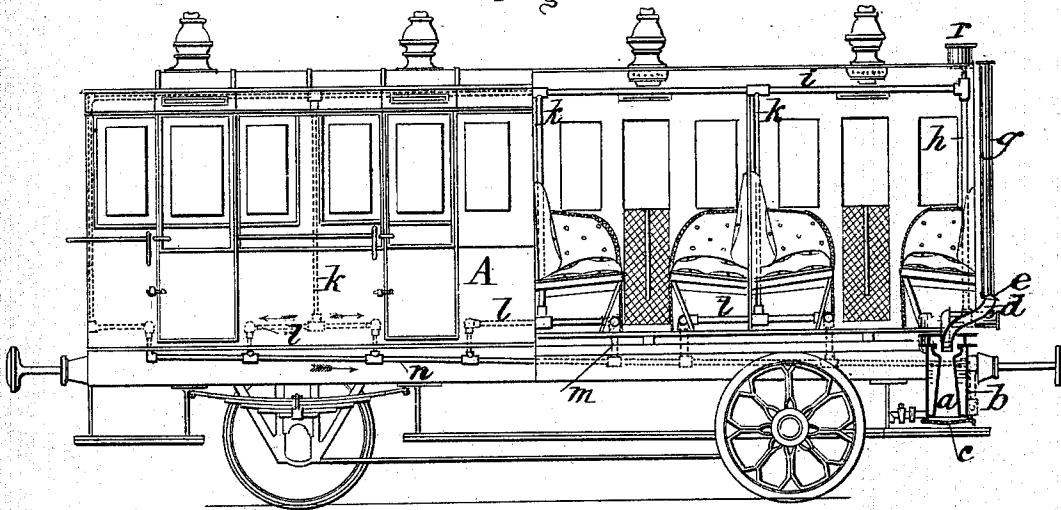
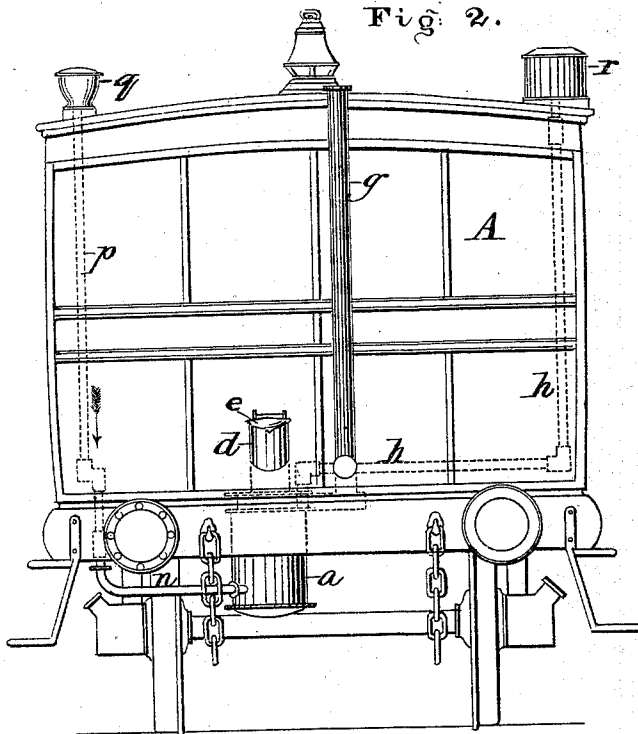


Fig. 2.



Witnesses.

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Fig. 3.

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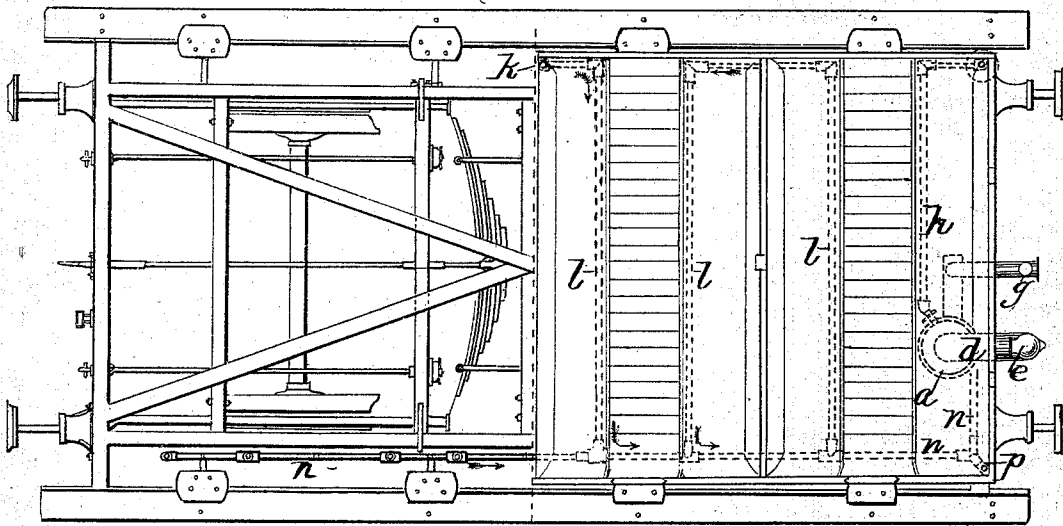
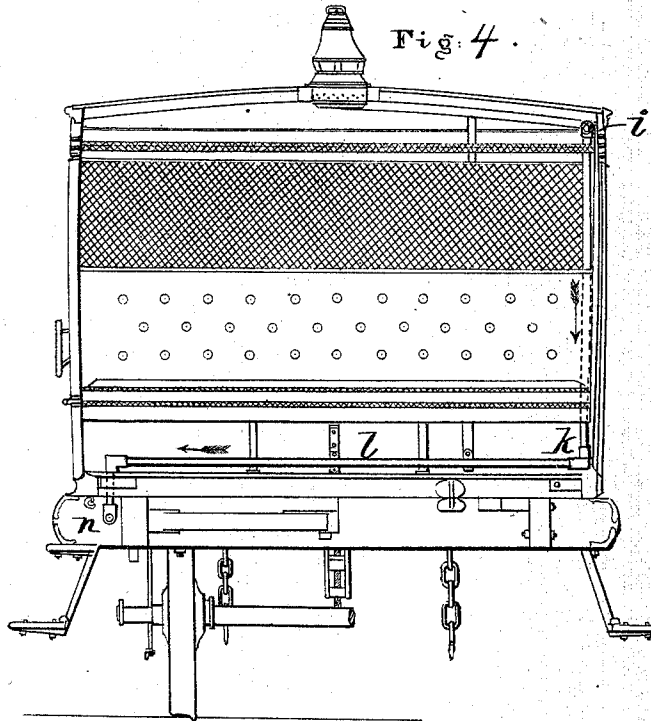


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

JULES H. WEIBEL, OF GENEVA, SWITZERLAND.

IMPROVEMENT IN RAILWAY-CAR HEATERS.

Specification forming part of Letters Patent No. **144,425**, dated November 11, 1873; application filed August 23, 1873.

To all whom it may concern:

Be it known that I, JULES HENRY WEIBEL, of Geneva, in the Republic of Switzerland, have invented Improvements in Apparatus for Warming Railway-Carriages, of which the following is a specification:

My invention consists in the novel construction and arrangement of a furnace and system of pipes, with valves, &c., for heating cars by means of hot water, it being especially applicable to that class of cars which are divided into compartments.

Figure 1 is a side elevation of a car, shown partly in section, with my improvements applied thereto. Fig. 2 is an end elevation. Fig. 3 is a transverse horizontal section, and Fig. 4 a transverse vertical section, like letters referring to like parts in all the figures.

In applying my invention, I provide a furnace, *a*, which is, preferably, located underneath the car at one end, as shown at the right-hand end of Fig. 1, it thus being out of the way, and not liable to injury, and, at the same time, capable of discharging its ashes, &c., upon the ground as the car progresses, thus requiring less attention. This furnace I make in the form of a cylinder, slightly conical, or enlarged toward its bottom, at which latter point it is provided with a grate, *c*, as shown in Fig. 1. It is supplied with fuel through a funnel or tube, *d*, which extends from its top up through the platform at the end of the car, the upper end of this funnel being provided with a hinged lid, *e*, (shown in Figs. 1 and 3.) A smoke stack or pipe, *g*, also extends from the furnace up outside of the car to its top, to carry off the smoke and gases, as shown in Figs. 1, 2, and 3. The furnace *a* I make of such depth that it will contain sufficient fuel for six or eight hours; and it is provided with suitable dampers or valves, located in the smoke-pipe or any desired points, whereby the combustion may be regulated as desired. As represented in Fig. 1, this furnace is surrounded by a boiler or water-tank, *b*, in which the water is heated, this tank being suitably jacketed to prevent loss of heat by external radiation. From the top of the tank *b* a pipe, *h*, extends along within the body of the car, a little distance above the floor, laterally to one side, where it is turned to a vertical position, and extends thence to the

top of the compartment, where it connects with a horizontal pipe, *i*, Fig. 1, which extends the entire length of the car. Connected to this supply-pipe *i*, in each compartment, is a descending pipe, *k*, which extends to near the floor, where it is connected to pipes *l*, which pass underneath the seats of each compartment, and are connected, by branch pipes *m*, to a return-pipe, *n*, located below the floor, and which return-pipe extends from end to end of the car, and is connected with the tank *b* near its bottom. In arranging the heating-pipes *l* in the several compartments, care is taken to so locate them under the seats as not to cross the passage-way of the compartment, and they may be doubled back and forth under the seats to any desired extent for the purpose of increasing their heating-surface.

In order to fill the tank and pipes with water without difficulty, I provide a vertical pipe, *p*, (shown in dotted lines in Figs. 2 and 3,) which is connected with a funnel, *q*, located upon the roof of the car at one corner, and which pipe connects, at its lower end, with the return-pipe *n*, or which may connect directly with the tank *b*. To permit the escape of the air from the tank *b*, and from the pipes, and which, if retained, would accumulate at the higher points in the pipes and impede or prevent the circulation of the water therein, I extend the vertical hot-water pipe *h* up through the roof of the car, and connect it with a vessel, *r*, located thereon, as shown in Fig. 2, this vessel being of sufficient capacity to compensate for the increased bulk or volume of the water in the tank and pipes incident to its becoming heated. This vessel *r* I provide with an orifice at the top to permit the escape therefrom of the air, but so construct the vessel as to prevent the water from being spilled or thrown out by the motion of the car.

Variations in the intensity of the heat may be obtained in various ways: First, by regulating the combustion by dampers, as previously stated, the valve or damper in the smoke-pipe being so arranged that, even when closed, it allows sufficient air to pass to prevent the extinction of the fire, while the combustion is retained at, or reduced to, a minimum; second, by the use of cocks in the circulating-pipes at the points where they join the return-pipe, so

that, by closing these cocks more or less the circulation may be retarded accordingly, and thus each compartment be regulated according to the desire of its occupants; third, by means of a single cock arranged in the return-pipe, by which the circulation in the entire car can be regulated at will; also, by combining different circuits of greater or less length or extent, by means of pipes and cocks suitably arranged, the heating-surface may be varied at pleasure, either in the separate compartments, or in the entire car.

The operation will be readily understood. Fire being started in the furnace, the water in the surrounding tank is rapidly heated, and ascends the pipe *h* to the supply or distributing pipe *i*, along which it flows, a portion passing from it through each of the pipes *k* in the several compartments to the heat-distributing pipes *l* under the seats, from whence it passes, through the pipes *m*, into the return-pipe *n*, which returns it to the tank to be reheated, and thus a constant circulation is maintained so long as the fire is kept up.

In applying this plan of warming to cars constructed on the plan common in the United States, where the seats are arranged along each side, with a passage-way along the center of the car, it will be preferable to use two sets of distributing-pipes, and also two return-pipes, one

set of distributing-pipes and one return-pipe being arranged on each side, so as not to cross or impede the passage-way; and it is obvious that this arrangement may also be adopted in the compartment-cars; but in the latter it is not deemed advisable, as to do so would unnecessarily increase the amount of pipes required, and, consequently, the expense.

Having thus described my invention, what I claim is—

1. In combination with a heater the supply-pipe *i* and a series of descending pipes, *k*, located at intervals along the car, and connected by cross-pipes *l* to a return-pipe, *n*, with suitable cocks interposed between the supply and return pipes for regulating or shutting off at will the flow through any or all of the pipes *k*, the whole being constructed and arranged to operate substantially as and for the purpose herein set forth.

2. In combination with the heater, constructed and arranged substantially as described, the tube *d* with its cover *e*, arranged as shown, whereby fuel can be supplied from the exterior of the car, as set forth.

JULES HENRY WEIBEL.

Witnesses:

J. FAESCH,
PAUL MERILLE.