G. W. Eddy.

Warming Cars on Railways

No 76175 Patented Mar. 31, 1868.

Fig. 1.

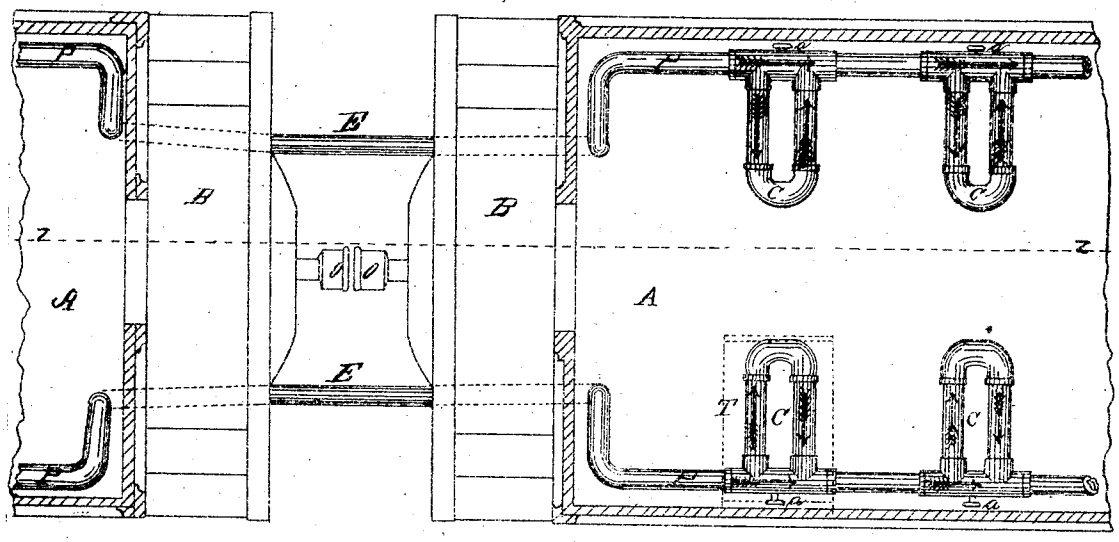
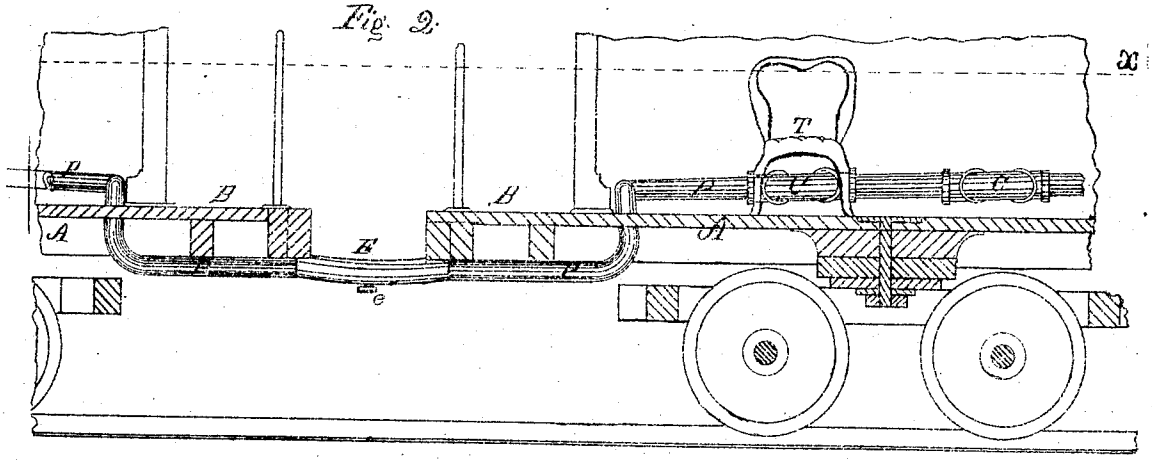


Fig. 3.

Fig. 4.

Fig. 2.



Witnesses

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Letters Patent No. 76,175, *dated March* 31, 1868.

IMPROVEMENT IN WARMING CARS ON RAILWAYS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, GEORGE W. EDDY, of Waterford, in the county of Saratoga, and State of New York, have invented certain new and useful Improvements in Warming Cars on Railways; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and to the letters of reference marked thereon, like letters indicating like parts wherever they occur.

To enable others skilled in the art to construct and use my invention, I will proceed to describe it.

My invention consists, first, in the application of steam to railway-cars, for the purpose of heating them, and thereby dispensing with the use of stoves or furnaces in the cars; it further consists in a peculiar construction and arrangement of devices for applying the steam to the cars, as will be hereinafter more fully explained.

Figure 1 represents a transverse section of a portion of two cars, said section being taken on the line *x x* of fig. 2.

Figure 2 is a vertical section of the same, taken on the line *z z* of fig. 1.

Figures 3 and 4 represent certain portions in detail.

It has hitherto been customary to warm cars by means of one or more stoves or furnaces, placed in each car, but this plan is objectionable for several reasons. In the first place, the heat is very unevenly distributed—that portion of the car near the stoves being unduly heated, while other portions more remote are frequently too cold; second, the heat thus produced, ascends to and exists principally in the upper portion of the car, while the lower portion is left uncomfortably cool, and thereby injuring the health, as well as rendering the cars uncomfortable to the occupants; thirdly, this mode of heating does not require the removal of any seats, as in the case of stoves; and lastly, in case of accident, the car is liable to be set on fire by the upsetting or breaking of the stoves, thus endangering the lives of the passengers.

To obviate these difficulties is the object of my present invention, and in order to accomplish this object, I propose to heat the cars by means of steam conveyed thereto, and distributed therein in pipes or other suitable appliances.

The steam to be used for this purpose, I prefer to take from the exhaust steam of the engine, after it has been used as a motor, so as to economize the use of the steam and fuel; but it may be taken direct from the boiler of the engine, or from a separate generator, located on the engine, the tender, or in the baggage-car, or on a separate car made for the purpose, and thence conveyed to each and all of the other cars in the train; or, if preferred, each car may be provided with a separate generator, although this last, I do not consider so good a plan. In my plan, while using the waste steam for the general purpose of heating the cars, I propose to so arrange the pipes that steam may also be taken direct from the boiler, or other generator, at will, to warm the cars when the engine is not running.

There are obviously many plans by which the steam may be conveyed from the engine into the cars, and there used for the desired purpose, but I prefer the plan illustrated in the accompanying drawings, which I will now proceed to describe.

The cars A may be constructed in the usual form, and at one end, under the platform B, where it will be out of the way, I start a metallic pipe, P, which extends back under the car, until it reaches a point even with the inner wall of the end of the car, when it is curved upward, extending through the bottom of the same, and from thence is extended along the side of the car to the opposite end, where it is passed down through the floor, and then along under the platform, the same as at the front end, and as represented in fig. 2. To this pipe, P, directly under each seat, I connect a U-shaped pipe, C, as represented in fig. 1, the position of the seat T being indicated in red, in a single instance, in figs. 1 and 2. This pipe C is connected at both ends to the main pipe P, so that the steam, or a portion of it, may enter at one end from the pipe P, and flowing thence around through the pipe C, return through the opposite end to the main pipe P, as indicated by the arrows in black in fig. 1. While this is taking place, a portion of the steam in pipe P passes, by this pipe, C, as indicated by the red arrows, and flows along to the next seat, where another portion of it enters the pipe C, under that seat, and so on, successively, until it has passed entirely through the car.

In order to cause the steam to pursue this course, I locate in the pipe P, at a point between the ends of the

bent pipe C, a check or valve, *a*, as represented in figs. 1 and 4, by which its flow may be regulated, and thus throw more or less of the steam from the main pipe into the curved pipes, as may be necessary to render the heat uniform throughout the car.

Instead of a check or valve located as described, at each auxiliary pipe, there may be used a single valve, located at the rear end of the car in the main pipe. By closing this valve, after the pipe P has become filled with steam, the heat will be communicated, after a brief interval, to the pipes C, more or less, and by occasionally opening the valve at the end of the main pipe, to admit a fresh supply of steam, the heat may be kept up, or tempered as desired. It is obvious that the valve, instead of being located at the rear end of the main pipe in each car, may be located at the rear end of the pipe in the rear car, and operate in the same manner, but as each car may at different times be placed at the rear of the train, it is necessary that each should be provided with a valve.

As represented in fig. 1, there are two sets or series of pipes P and C, there being one on each side of the car.

In placing these pipes in the car, I prefer to raise them from four to six inches from the floor, so as not to interfere with the necessary sweeping or cleaning of the car, and I also arrange the pipe P in a slightly inclined position, so that the water which may accumulate therein by condensation, will flow to the lower end, and there escape, as hereinafter explained. I also arrange the pipes C, so that their outer portion farthest from the pipe P, will be the highest, so that all water formed therein shall flow back into the pipe P, and thence escape.

In order to heat a series of cars in this way, it is obvious that the pipes P in each car must be connected to those of the adjoining cars; and this I do, by means of the flexible tubes E, as represented in figs. 1 and 2. These tubes should be of sufficient size and strength to convey the proper quantity of steam, and should be connected to the pipes with sufficient force to prevent their being casually detached, but not so as to prevent their being detached from the pipes P, in case the car should, by any means, become loosened or uncoupled from the others. If made of rubber, the tubes E may be crowded on to the ends of the pipes P with sufficient force to hold them in place, and still permit their being removed, when desired. In practice, however, and for the purpose of affording a more speedy means of connecting and disconnecting the tubes and pipes, a metal coupling may be used, care being taken to have it so arranged that it shall yield and become uncoupled whenever the cars are detached, and before sufficient strain has been brought on the tubes E to injure them.

In order to permit the escape of the drip or water formed in the pipes, I insert a minute tube, *e*, in the under side of the tube E, as represented in section in fig. 3. It is obvious, however, that this may be omitted, and an orifice provided in the lower part of the pipe P for the purpose, or, that a cock may be inserted in the pipe P instead, and thus opened or closed at pleasure.

It is also obvious that instead of locating the pipes as above described, they may be placed directly on the floor, and made to pass directly through the car, or to have lateral branches pass along in front of each seat, under the feet of the passengers, as may be preferred. In such cases, it may be necessary to place slats over the pipes, as they might be too hot for the feet to rest on; or, there may be formed in the floor of the car a recess, for the pipes to lie in; but, as previously stated, the plan shown in the drawings is preferred, as best answering the desired purpose.

In using the exhaust steam, the apparatus should be so arranged that more or less of the steam may be used, as may be found necessary, and, as previously stated, provision should be made for taking steam direct from the boiler or other generator when the engine is not operating. It will of course be understood that the pipes will be left open at the rear end of the train, so as to permit the steam to escape, after passing through all the cars, especially when the exhaust steam is used for the purpose.

Having thus described my invention, what I claim, is—

1. The combination of the main pipe P, for conveying a portion of the steam directly through the car, and the auxiliary pipes C, for conveying a portion of the steam around under each seat, and back into the main pipe P, when said pipes are arranged substantially as described.

2. In combination with the pipes P and C, I claim the check or valve *a*, arranged substantially as and for the purpose set forth.

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Witnesses:

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