

(No Model.)

2 Sheets—Sheet 1

H. R. TOWNE.
APPARATUS FOR HEATING RAILROAD CARS.

No. 512,239.

Patented Jan. 2, 1894.

Fig. 1.

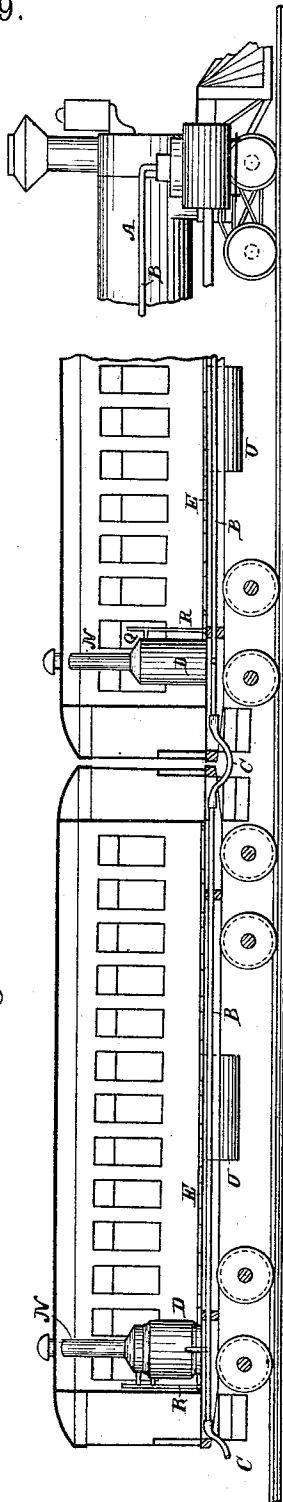
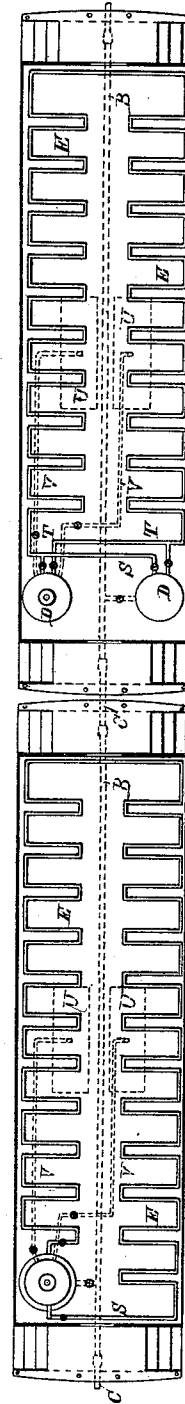


Fig. 2.



WITNESSES

E. A. Newman,
G. M. Newman.

By his Attorneys

Baldwin Hopkins & Peyton.

INVENTOR

Henry R. Towne

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

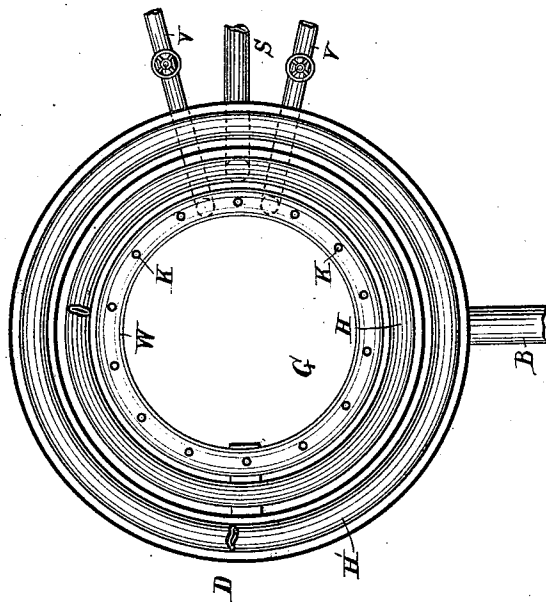
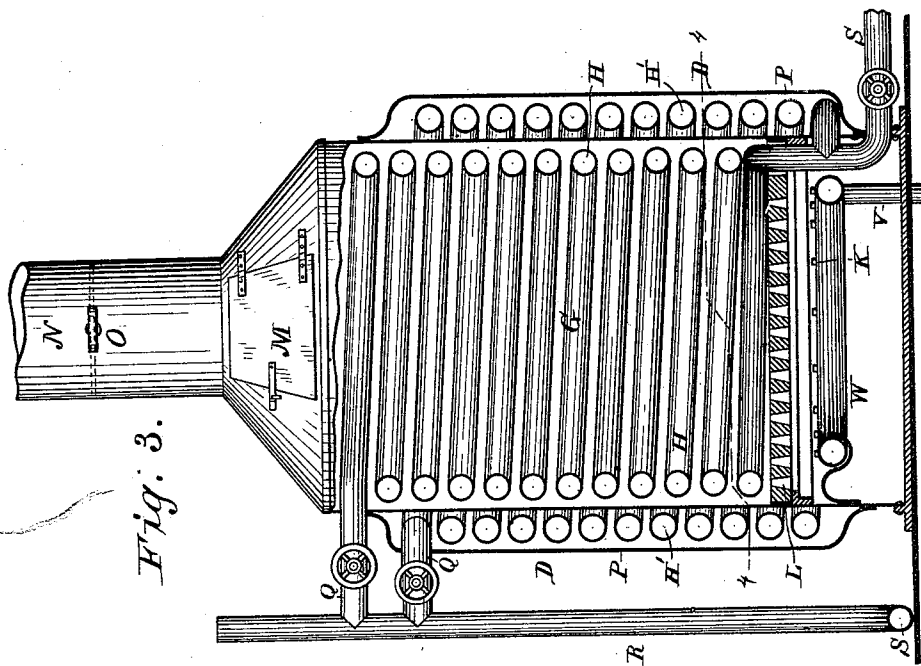


Fig. 3.



WITNESSES

E. Q. Newman,
C. M. Newman.

INVENTOR

Henry R. Towne,

By *his* Attorneys

Baldwin Hopkins & Heyton.

UNITED STATES PATENT OFFICE.

HENRY R. TOWNE, OF STAMFORD, CONNECTICUT, ASSIGNOR TO THE SAFETY CAR HEATING AND LIGHTING COMPANY, OF NEW JERSEY.

APPARATUS FOR HEATING RAILROAD-CARS.

SPECIFICATION forming part of Letters Patent No. 512,239, dated January 2, 1894.

Application filed February 4, 1887. Serial No. 226,569. (No model.)

To all whom it may concern:

Be it known that I, HENRY R. TOWNE, of Stamford, in the county of Fairfield and State of Connecticut, have invented a certain new and Improved Apparatus for Heating Railroad-Cars, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to provide means for heating railroad cars that shall be adapted to heat them when they are made up in a train, and when they are not, and which shall be at once safe and efficient under all circumstances.

My invention belongs to that class of car heaters in which a heated fluid, preferably steam, is employed to heat another fluid, preferably water, to be circulated in cars to warm them. I provide for a circulation of hot water in each car, whether in a train or detached. I use a prime heater, such as a locomotive, or a special large steam generator, for generating steam for heating the water to be circulated in each car when the cars are connected in a train, combined with a local heater for separately heating by direct combustion the water in each car when not in a train; the local heater then taking the place of the prime heater, not to furnish steam, but to heat by combustion. I organize, preferably in one structure in each car, a combustion chamber or heater, and a steam chamber or heater, which latter I call a transfer chamber, because it serves to transfer heat from the initial source to the separate circulating medium of each car whether detached or in a train. By my method, the normal source of heat being a locomotive, or a special furnace car, preferably near the front of the train, the heat from such prime source may be conveyed backward through a train by any well-known means, but preferably in the form of steam contained within pipes, with flexible couplings between the cars. Instead, however, of passing the steam, or other heating medium, directly into the local circulatory system of each car, I introduce it into the transfer chamber, where its heat is transferred to the local circulating medium, which is preferably water. For occasions when the train is broken up and each car isolated, I pro-

vide, as above indicated, a combustion chamber in each car, either directly combined with the steam heated transfer chamber and a part of the same structure, which is preferable, or, it may be, contained in a separate structure but connected by pipes to the said transfer chamber, and in that way combined with it operatively. In either case the same local circulating medium passes into and around the combustion chamber and the transfer chamber, so that either or both may be used, independently or simultaneously, for communicating heat to the local circulating medium in each car.

To provide a fuel for use in the combustion chamber which shall eliminate, or at least greatly reduce danger from fire, I employ one or more gas storage tanks in or under each car for carrying a combustible gas, preferably under high tension (for economy of bulk), which, by any of the well known means, may be burned in the combustion chamber. Finally to meet the emergency of a possible exhaustion of the gas, I provide the combustion chamber with an ordinary grate on which coal or other solid fuel may be burned in case of need, although it is not intended to resort to this, except in extremity when the supply of gas shall have become exhausted, for example in case of a car being long snowed in. In this way I provide a mode of heating, by which, under the normal conditions existing when a train is made up, absolute safety is assured; in which there is provision for the further perfectly safe maintenance of heat in a detached car for a considerable period of time; and, finally, in which there is also provision by which, in the event of the long continued isolation of a car from a locomotive, and the entire exhaustion of its supply of gas, its heating apparatus may still be utilized by the combustion of any ordinary fuel. By the use of my devices therefore, I prevent the circulation of steam through the cars and confine it to one point in each car, where it will be comparatively harmless; and I limit its use to the minimum quantity required for heating the water for circulating in each car. I also greatly diminish the danger of fire by the manner in which I accomplish supplemental heating of the water by gas in each detached

car. I thus reduce the danger of loss of life and property from fire, or of scalding by local circulating steam, in case of accident, and minimize the loss of heat, (due to changes in firing which affect the supply of steam, or due to cutting off steam and resorting to the supplemental gas heating) by the use of water circulation at all times for warming each car whether detached or in a train. I prefer to employ hot water for circulation in each car to heat it, because it retains its heat much longer than an equal volume of air or steam, and is more easily managed so as to preserve an equable and proper temperature in a car. Therefore I will describe my apparatus in detail as a water heating one; although air might take place of water for local circulation in a car.

Aside from my improved sub-structures or combinations, as hereinafter described in detail and claimed, the essential features composing an organization embracing my invention in the complete working form which I deem the simplest and best are—first, a prime heater, capable of providing a heating medium, preferably steam, sufficient in volume to supply a train; second, a transfer chamber in each car adapted to be connected with the prime heater and to receive heat therefrom through pipes and flexible couplings between the cars, and to transfer the heat thus received to the local circulating medium of the car; third, a local circulatory system of pipes in each car connected with the transfer chamber and adapted to have the water contained in said pipes heated by it; fourth, a local supplementary heater in each car connected with the transfer chamber and adapted to heat the local circulating medium by direct combustion of fuel.

I have above named what I deem the best agencies for heating and warming, but others might be employed to utilize my invention.

In the accompanying drawings illustrating a simple form of embodiment of my invention—Figure 1 is a side elevation of two cars in a train provided with my invention. Fig. 2 is a plan of the same. Fig. 3 is an enlarged view of my transfer chamber and connected pipes. Fig. 4 is a view of the same, taken on the line 4, 4, of Fig. 3.

Referring to the letters upon the drawings to aid in describing them, A designates the prime heater which in this instance is a locomotive.

B designates the pipes, and C the flexible couplings of any usual or suitable character for conveying the initiatory heating medium from the prime heater into the transfer chamber D in each car, which serves to transfer the heat it receives from the initiatory heating medium to the secondary heating medium contained in the local circulatory system of pipes E in each car, whether the cars are in a train or detached. The local heater is in its simplest form as shown in Fig. 3, that is to say, a single structure embracing means

for heating the water in the circulating pipes of each car by steam supplied from the locomotive, and also for occasionally or temporarily heating it by direct combustion of some kind, preferably of gas.

G, in Fig. 3, indicates a central combustion chamber containing a nest or coil of water pipes H, which are a part of the circulatory system of the car containing the local heater. Beneath them is a gas burner K of any suitable form or kind adapted to heat the coil H. There is also a grate L adapted to receive solid fuel through a door M, and heat the coil H in case the gas supply should be exhausted.

N is a chimney leading out of the top of the car and provided with a damper O.

P indicates a steam jacket forming the outer wall of the transfer chamber, within which chamber is another coil of water pipes H', which are also a part of the circulatory system of the car containing the local heater. Instead of coils other forms of water holders to be heated might be used, but coils are preferable. The pipes are all connected and provided with cocks in the usual manner, substantially as illustrated, to admit or cut off steam, water, and gas; and to control the heating and the water circulation, the details of construction for these purposes being well understood and forming no part of the novelty of my apparatus. The water as it is heated will of course rise and pass out at Q Q and enter and pass down the pipe R, thence through the pipe S into all the nests of pipes in the car, and a continual circulation of water, as usual in water heating systems will be kept up.

Instead of having the local heater embody in one structure the steam heated transfer chamber and the combustion chamber, as just described, these two chambers may be either duplicated or divided. If divided the combustion chamber and its coil of water pipes might be in one part of the car, and the steam heater or transfer chamber and its coil be in another part, the pipes of both and of the circulatory system all being connected together as indicated in Fig. 2 at T T. But this is not ordinarily desirable.

I prefer, for purposes of safety and speedy heating, to constitute the local heating apparatus for each car as follows: U U designate two storage tanks on each car containing different gases under pressure which when commingled in any usual way for such a purpose will form a good combustible heating gas. V V designate gas pipes leading from the tanks U U to a small gas receptacle W, where the two gases are commingled to form one which enters the burners K.

Pipes and cocks may be provided, if desired, for letting the steam in the transfer chamber and the gas in the gas receptacle escape into the open air instantly on the happening of an accident, or on warning of approaching danger; but without such provis-

ion the danger from the steam or gas is exceedingly remote, because the instant a car is detached the steam escapes from the coupling between the cars, and the gas is so stored as not to be a source of danger.

Instead of two storage tanks for gas I may employ a single one containing combustible gas, but I prefer to use two tanks containing different gases, as described.

The details of all the parts illustrated and referred to by letter may be varied greatly in numerous respects without departing from the substance of my invention.

The gas tanks may of course be filled at stations where apparatus may be provided of any ordinary kind for the purpose. It will also be practicable to supply steam from a prime generator at a station by coupling the train pipes with it instead of with the locomotive if in any case that shall be desirable.

I have not shown or described any means for filling the local circulatory pipes with circulating fluid, because I adopt the ordinary means well known in connection with circulatory systems, and which form no part of my invention, such for example as a common expansion reservoir well understood in this art. Neither have I illustrated or described the details of construction of a locomotive, or of ordinary passenger cars, because they are also well understood and form no part of my invention, which is limited to the subject-matter defined in my appended claims.

Having described my invention, what I claim to be new, and desire to secure by Letters Patent of the United States, is—

1. The combination with a car, of a circulatory system within said car, and two heaters, one an emergency heater, both in operative contact with said circulatory system or

with branches thereof, and adapted to be operated simultaneously or separately for imparting heat thereto, substantially as set forth.

2. In a car heating system, the combination with a circulatory system within the car, of a suitable heater in contact with said circulatory system or a branch thereof, mechanism for supplying said heater with steam as a primary means of heating said circulatory system, and a secondary heater also in operative contact with said circulatory system and adapted to heat the same, substantially as set forth.

3. The combination of a car, a circulatory system carried thereby, and two heaters in operative contact but not in communication with the said system, one of the heaters having a pipe for supplying it with heat from a generator borne by another vehicle, substantially as set forth.

4. The combination of a car, a circulatory system carried thereby, and two heaters in operative contact but not in communication with the said system, one of the heaters having a pipe for supplying it with steam from a generator borne by another vehicle, substantially as set forth.

5. The combination of a car, a circulatory system carried thereby, a heater in operative contact but not in communication with the said system, a pipe for supplying said heater with steam from the steam generator of the locomotive, and means for supplying heat to said system when the car is disconnected from the locomotive, substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

HENRY R. TOWNE.

Witnesses:

E. D. OGDEN,
CHAS. E. VAIL.