

(No Model.)

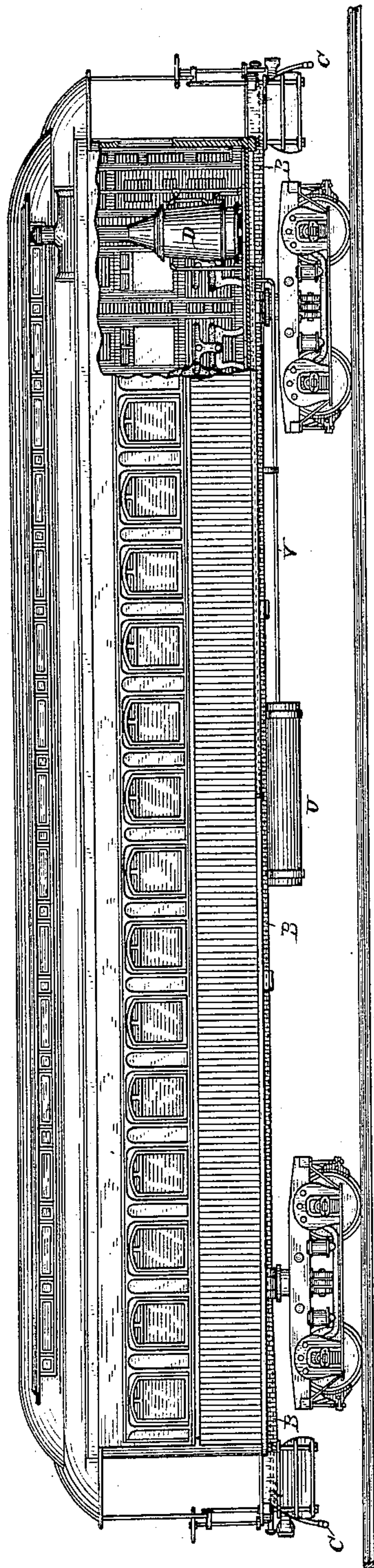
3 Sheets—Sheet 1.

H. R. TOWNE.

# APPARATUS FOR HEATING RAILROAD CARS.

No. 397,152.

Patented Feb. 5, 1889.



WITNESSES

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

INVENTOR,

Henry R. Towne.

*By his Attorneys*

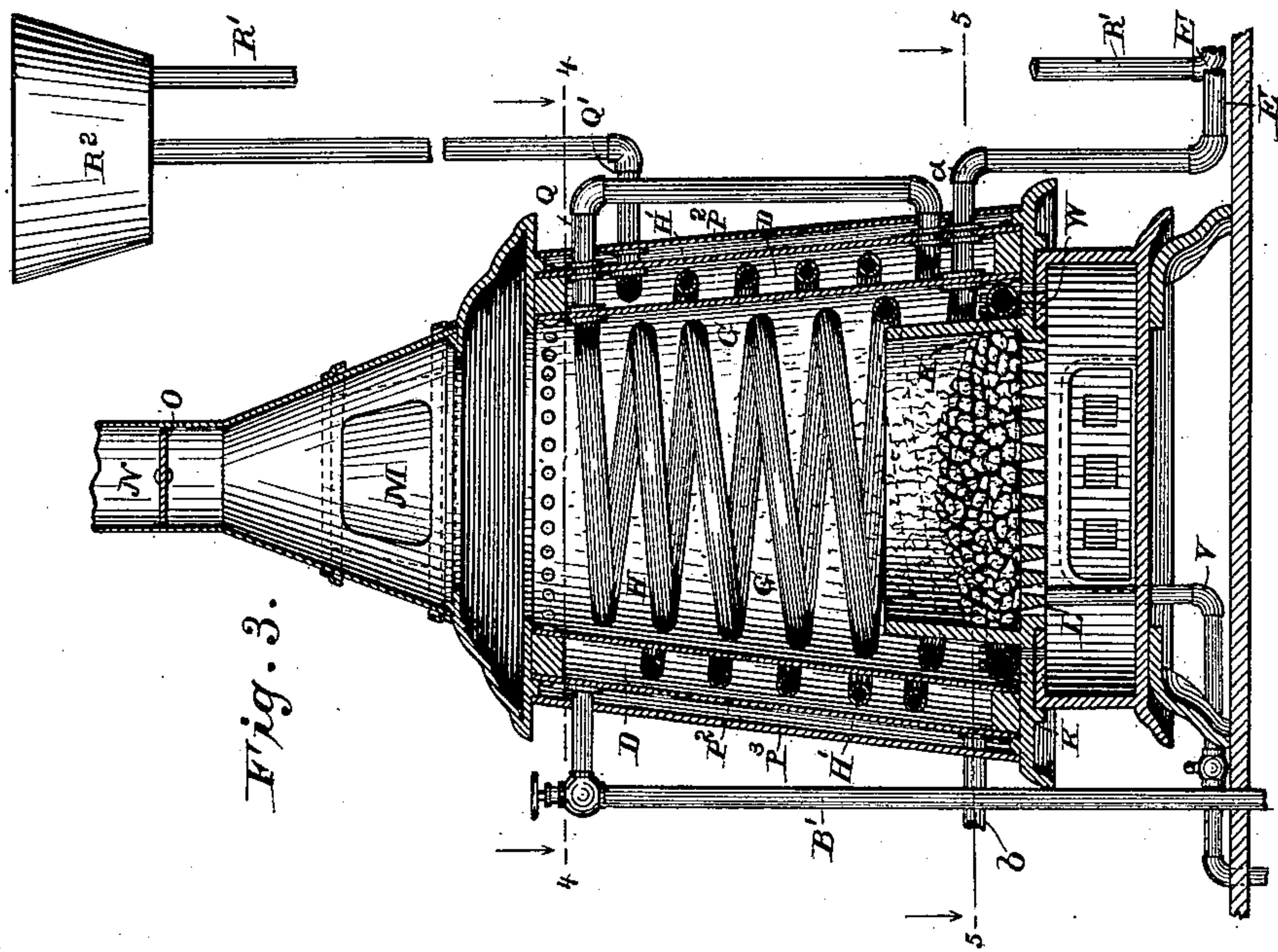
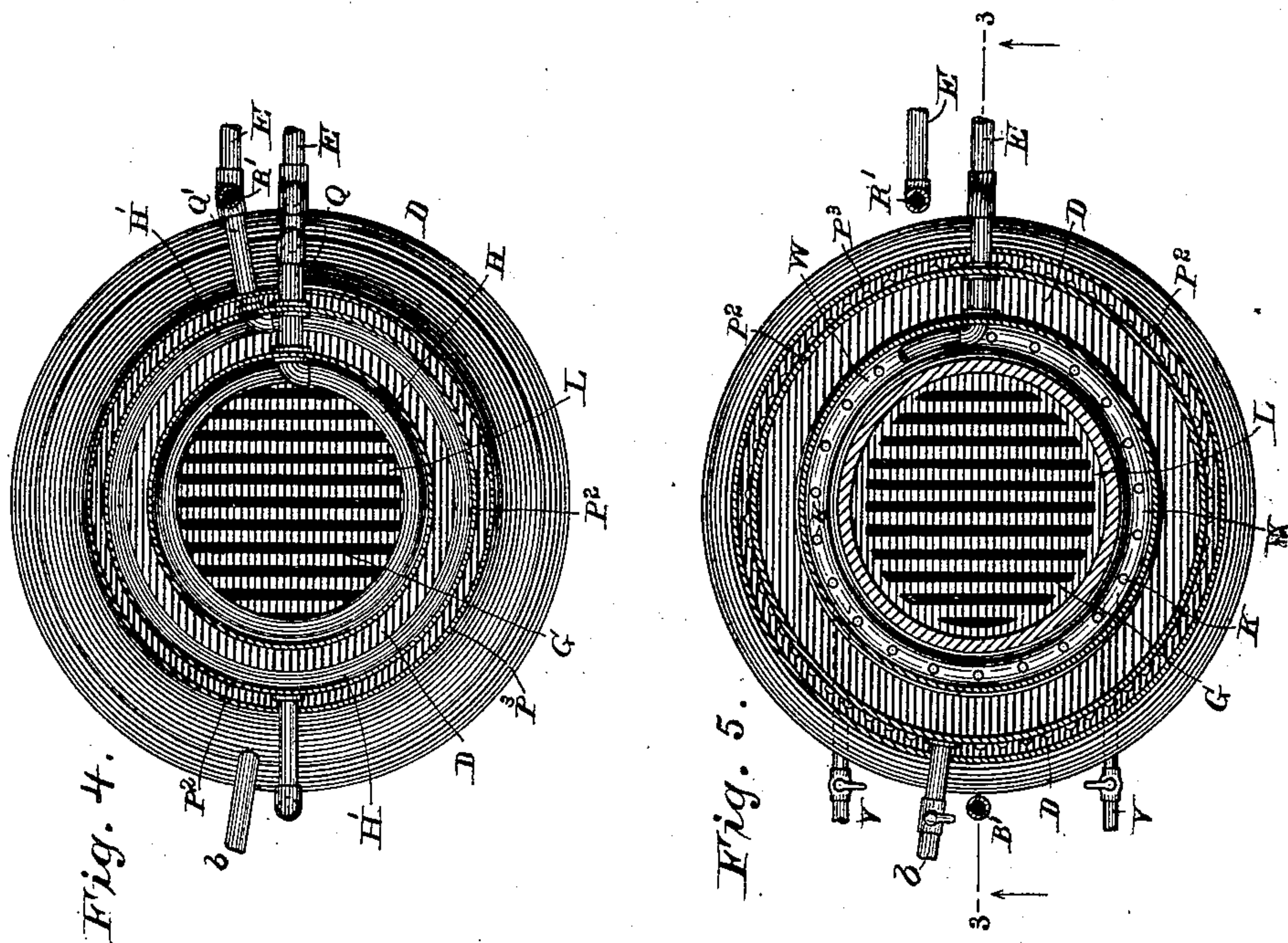
Baldwin Hopkins & Peyton



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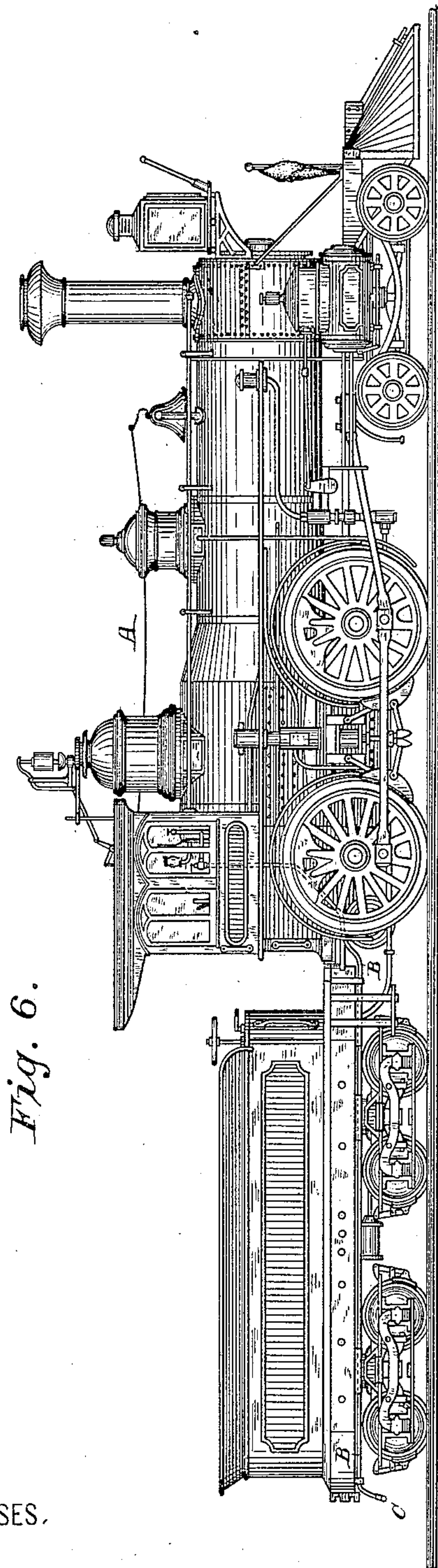


Fig. 6.

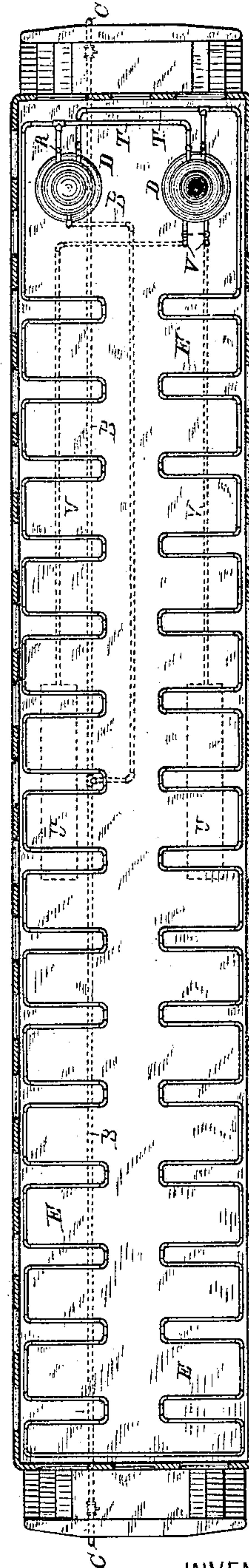


Fig. 7.

WITNESSES.

E. A. Newman,  
C. M. Newman,

By his Attorneys

Baldwin Hopkins & Lytle.

INVENTOR.

Henry R. Towne,



# 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. 397,152, dated February 5, 1889.

Application filed June 13, 1887. Serial No. 241,187. (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 certain new and useful Apparatus for Heating Railroad-Cars, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to car-heating apparatus of the class which comprises a system of circulating-pipes within the car and two heaters in operative contact with said circulating system, which are adapted to be operated simultaneously or separately for imparting heat thereto, one of said heaters designed to be connected to a prime source of heat—such, for instance, as the boiler of a locomotive—and adapted to transfer the heat from the steam to the circulating medium within the car to be heated, the other a secondary heater—a stove of any suitable construction—and adapted to impart heat to the circulatory system when the primary heater is not in use, as in the case of an emergency, or when the primary heater for any reason does not furnish sufficient heat to effect the proper heating of the car.

In a former application—to wit, No. 226,569, filed February 4, 1887—I have generally described such a car-heating system, and in my present application I carry the development of my system of car-heating further into detail as respects the system as a whole and the construction of the various parts which go to make up the system.

In my improved system, which I will now proceed to describe, there is shown a local heater, which comprises both the primary and the secondary heaters, as fully described in my former application, and there is further shown a local heater in which the primary heater is separated from the secondary heater, and there is further shown means by which the secondary portion of the local heater may be heated by gas stored in appropriate tanks carried by the car.

In the accompanying drawings, Figure 1 is a side elevation of a car provided with my invention. Fig. 2 is a plan of the same. Fig. 3 is an enlarged view of my local heater containing in one construction a transfer-chamber and a combustion-chamber with suitable pipes and connections. Fig. 4 is a view of the same, taken on the line 4 4 of Fig. 3. Fig. 5 is a view of the same, taken on the line 5 5 of Fig. 3. Fig. 6 is a side elevation of a locomotive and tender. Fig. 7 is a plan view of a car, showing the local circulatory system of pipes and the local heating apparatus, in this case, however, the local heater being divided into two constructions, one containing the combustion-chamber and the other containing the transfer-chamber.

In the drawings, in order to show the relations, operation, and utility of the improvements I set forth herein, I show many things which I do not here claim, some of which are claimed in my said pending applications.

I will first, by referring to the letters upon the drawings, give an outline of the entire apparatus as illustrated, and afterward point out the particulars in which my present improvements consist.

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 (primary heater) contained in the local heater of 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. The local heater may be, as is shown by Fig. 3, 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 (secondary heater) 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 series of gas-burners, K, of any suitable form or kind, adapted to heat the coil H. There is also beneath them 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 smoke-pipe leading out of the top of the car from the local heater, and provided with a damper, O.

P<sup>2</sup> indicates a jacket forming the outer wall of the annular transfer-chamber D, 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.

Water might be contained in the transfer-chamber D and the water-pipes be connected to it, and steam might be admitted into the coil of pipes H' within the transfer-chamber with the same effect, this being a mere matter of choice of the constructor. The pipes are all connected and provided with cocks, 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 as hereinafter described.

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 contained in two separate structures, as shown by Fig. 7. If separated, the combustion-chamber and its coil of water-pipes might be in one position and the steam-heater or transfer-chamber and its coil be in another position, either in or under the car, the pipes of both and of the circulatory system all being connected together, substantially as indicated in Fig. 7 at T T. Where for any reason it is desired to separate these two chambers into two constructions, as represented in Fig. 7, the same method of connection and of operation will be obtained. In that case the combustion-chamber and its coil will remain just as shown in Fig. 3, and as at present in general use, while the transfer-chamber will consist simply of an inclosing-shell—such as P<sup>2</sup> in Fig. 3—containing within it the coil H', and having connected to it the steam-pipe B' and drip-pipe b in manner substantially the same as shown in Fig. 3. The coils H and H', contained, respectively, within these two separate chambers, will then be connected by a circulating-pipe, Q, precisely as in Fig. 3, and the flow of water from the second or last of the two chambers will be effected through the pipe R into the reservoir R<sup>2</sup>, and the return or opposite end of the circulatory pipes of the car will be connected with an inlet-pipe, a, connecting with the lower end of the coil contained in the first of the two heaters, the action of all of the several parts, either considered separately or relatively to each other, being precisely the same in this case as when the two chambers are combined in one construction, as shown in Fig. 3.

I prefer, for purposes of safety and convenience, to constitute the apparatus for heating each car by local combustion as follows: U U, Figs. 1 and 2, designate two storage-tanks

on each car for containing combustible gas under pressure. V V designate gas-pipes leading from the tanks U U to the pipe W, whence it passes to the burners K. 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 which are non-combustible until combined—as, for example, in pipe W.

Proceeding now to describe more particularly the improvements I here claim and referring to Fig. 3, it will be seen that an expansion-reservoir, R<sup>2</sup>, is provided at the upper part of the series of circulating-pipes, the purpose of which, as is usual in water-circulating systems, is to provide for conveniently charging the pipes with salted water or other non-freezing circulating medium, and also to provide for the expansion and contraction of the volume of water contained within the pipes resulting from changes of temperature. The construction of this reservoir is as usual and is well understood, and therefore I do not describe it in detail. The heated water rising from the heater passes through the expansion-reservoir R<sup>2</sup> downward through the pipe R' into the circulating-pipes E of the car, whence it returns at the opposite end and, passing through the pipe a, enters at the lower end of the coil H, contained within the combustion-chamber G. Supposing a fire to exist in the combustion-chamber, the heat thereby imparted to the water within the coil H causes it to flow upward within said coil and to pass out from said coil at its upper end through the circulating-pipe Q. This pipe then conducts the flow of water downward again to the lower end of the coil H', contained within the transfer-chamber D, through which it again flows upward and escapes at the top through the pipe Q' into the vertical pipe R, through which it passes into the expansion-reservoir R<sup>2</sup>, thus completing the circuit. In like manner, if the transfer-chamber D be filled with steam from any external source, the heat imparted to the water or other fluid contained within the coil H' will cause the water in the latter to flow upward in the same manner as heat imparted to water contained in the coil H within the combustion-chamber, as already explained. In this way the same result is arrived at whether heat be communicated through the combustion-chamber or transfer-chamber, or through both, the result in any case being to set in motion the circulating medium contained within the coils and circulatory pipes of the car, as described.

The water of condensation collects in the bottom of the transfer-chamber D, and is removed therefrom by the drain-pipe b.

An external jacket, P<sup>3</sup>, incloses the body of the local heater, leaving an air-space between it and the outer jacket, P<sup>2</sup>, of the transfer-chamber, in order to prevent undue radiation from the latter.

In this application I make no claim to the combination, with a car, of a system of circu-



lating-pipes within the car and two heaters in operative contact with said circulating system adapted to be operated simultaneously or separately for imparting heat thereto.

5 Neither do I claim the combination, with said elements, of mechanism for supplying one of said heaters so combined and operative with steam as a primary means for heating the circulating medium within the circulatory  
10 system, as the same have been made the subjects of claims in the application to which I have heretofore referred.

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

1. In a car-heating system, the combination, with a system of water-circulating pipes within a car, of a water-heating device provided with a heating-coil, one portion of  
20 which is located within the combustion-chamber of said heater and the other portion within a transfer-chamber arranged external to said combustion-chamber, and said heating-coil connected to and forming part of the  
25 said water-circulating system, substantially as and for the purpose set forth.

2. In a car-heating system, the combination, with a system of water-circulating pipes within a car, of a water-heating device provided with a heating-coil, one portion of which  
30 is located in the combustion-chamber of said heater and the other portion in a transfer-chamber arranged external to said combustion-chamber, said coil connected to said water-circulating system, a main steam-pipe connected to the source of steam, and a branch  
35 connected to the source of steam, and a branch

pipe connected to said main pipe and said transfer-chamber, substantially as and for the purpose set forth.

3. In a car-heating system, the combination, with a system of water-circulating pipes within a car, of a water-heating device provided with a heating-coil, one portion of which  
40 is located within the combustion-chamber of said heater and the other portion within a transfer-chamber arranged independently of  
45 and separated from that portion of the device containing the combustion-chamber, and said coil connected to the said water-circulating system, substantially as and for the  
50 purpose set forth.

4. In a car-heating system, the combination, with a system of water-circulating pipes within a car, of a water-heating device provided with a heating-coil, one portion of which  
55 is within the combustion-chamber of said heater and the other portion within an independently-arranged transfer-chamber, said coil connected to the water-circulating system, a gas-heating device in said combustion-  
60 chamber, a main steam-pipe connected to the source of steam, and a branch pipe connected to said main pipe and to said transfer-chamber, substantially as and for the purpose set  
65 forth.

In testimony whereof I have hereunto subscribed my name.

HENRY R. TOWNE.

Witnesses:

E. W. RIKER,  
J. H. TOWNE.