(No Model.)

W. C. BAKER.

CAR HEATING APPARATUS.

No. 590,470. Patented Sept. 21, 1897.

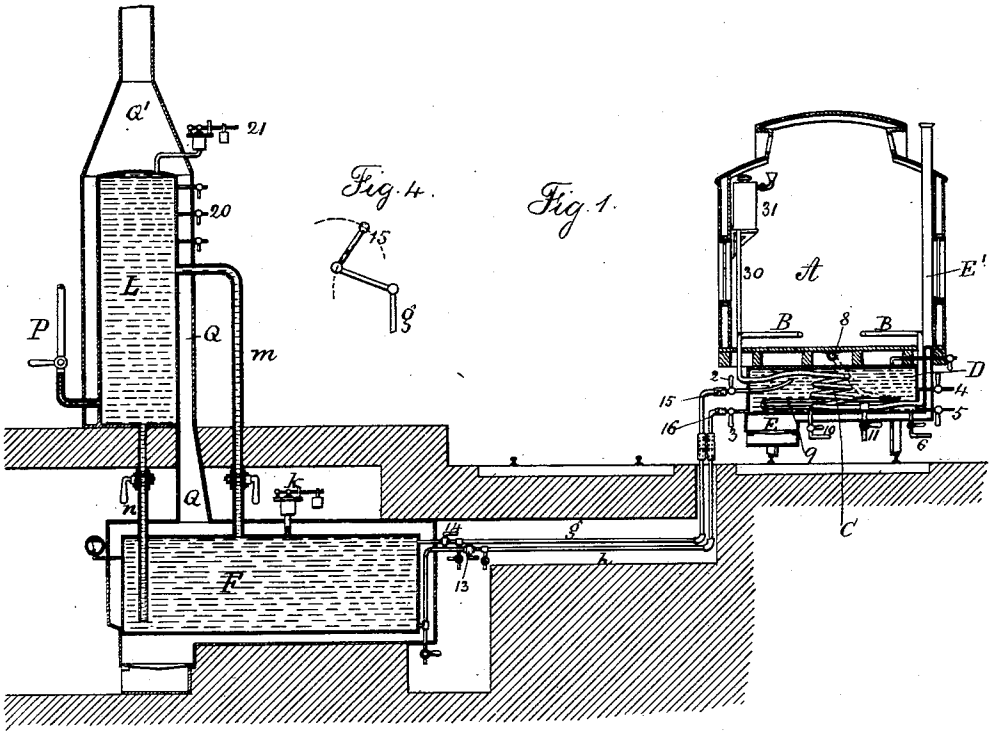


Fig. 2.

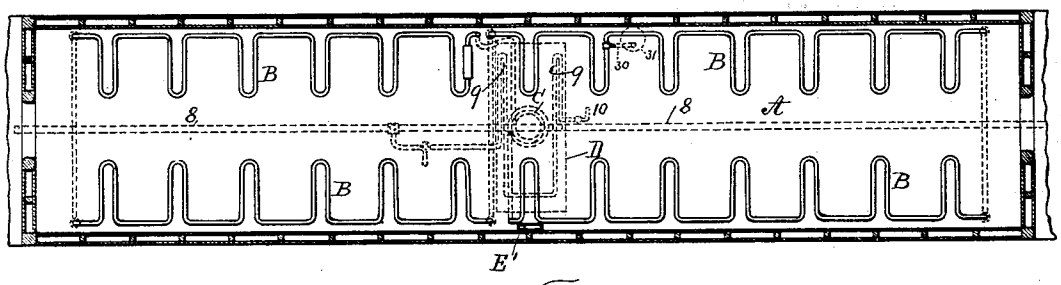
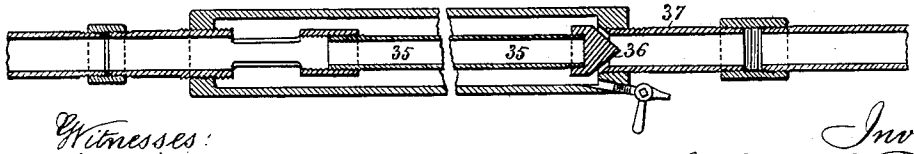


Fig. 3.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM C. BAKER, OF NEW YORK, N. Y.

CAR-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 590,470, dated September 21, 1897.

Application filed April 11, 1887. Serial No. 234,324. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. BAKER, of the city and State of New York, have invented an Improvement in Car-Heating Apparatus, of which the following is a specification.

Difficulty has been experienced in making use of steam for heating cars, because the locomotive-boiler usually has not sufficient capacity to heat the train and also supply steam to the engine.

The object of my invention is to heat the cars by heat from the locomotive when coupled to the train or to employ heat from a stationary boiler when the locomotive is detached, and in carrying out my invention I make use of the combinations of devices hereinafter set forth.

In the drawings, Figure 1 is a cross-section of a car and track and section of the hot-water-supply apparatus. Fig. 2 is a sectional plan of the car. Fig. 3 is a longitudinal section of the thermostatic regulating device, and Fig. 4 illustrates the jointed coupling-pipe.

The car is represented at A, and within it are heating-pipes B, led around the sides of the car or in loops below the seats, or in any usual manner, such heating-pipes usually being termed "radiators," and it is preferable to employ a rising pipe 30 and expansion vessel 31 for the water that is within the coil of pipes to pass up into and also to receive any air or gases, so that the continuity of the circulation may not be interfered with.

Beneath the car is a water-holding tank D, and the radiator-pipes B do not open into the same, but there is within the tank D a coil of pipe C, with which the pipes B are directly connected, so that when the heat is applied to the coil C the water therein and within the pipes B is caused to circulate around so as to heat the car throughout.

The positions of the pipes B within the car and the shape and character of the coil C will vary according to the character of the car and to the heating capacity required.

The tank D is to be filled with water, and it is to be heated to a high temperature, preferably by connection at stations. With this object in view I provide a suitable boiler F, preferably at a depth below the track, with pipes *g* and *h*, leading up to the track, with couplings 15 and 16, to connect with the couplings and cocks 2 and 3 upon the tank D, and these couplings are preferably jointed, so as to be swung into the desired positions to coincide with the cocks 2 and 3 upon the car at whatever point the car may be stopped. Two or more universal or swinging joints (shown in Fig. 4) are convenient for coupling each pipe *g* or *h* to the tank on the car. When the cocks 2 3 and 13 14 are opened after the pipes have been coupled, the highly-heated water in the boiler F will circulate up into the tank D and the cooler water in the latter will pass down by *h* to the bottom of boiler F, and by this means water of several hundred degrees of heat can be introduced into the tank D without developing steam.

I remark that the tank D and the pipes are to be surrounded on their exposed surfaces with fireproof and non-conducting material to retain the heat.

A suitable furnace is used with the boiler F, and it is preferable to place a supply and expansion vessel L within the flue Q Q', so that the water therein will become heated and pass by the pipes *m n* into the boiler F. Water is forced into the vessel L by the pipe P. At 20 gage-cocks are shown, and at 21 and K are safety-valves.

The highly-heated water in the tank D heats the water in the coil C, and such water circulates through the pipes or radiators B in the car, and the speed of circulation can be regulated by a cock or by an automatic thermostatic regulator, such as shown in Fig. 3, in which the tube 35 has a valve 36 on the end adjacent to a seat at the end of the adjustable pipe 37, and the tube 35 is to be of copper or brass or other metal to expand more than the iron case of the regulator, and hence the flow of water through this regulator will be in proportion to the temperature, and the expansion heat-regulator can be adjusted to any desired point by moving the seat toward or from the valve or the valve toward or from the seat.

I provide a fire-box E beneath the tank D, and a flue at E', so that the car can be heated by a fire built in said fire-box when the engine

is disconnected or in case of the train being delayed or blockaded in snow or before the engine is connected to the train.

The cocks at 4 5 allow for hot water being passed into the tank D from the other end to the cocks 2 3. The cock 11 allows water to be drawn out from the coil C and pipes B when desired.

I also provide a steam-pipe at 8 that is to extend the length of the car, and at the ends are cocks and flexible or swinging couplings, as usual in steam heating apparatus for cars, and within the tank D there is a second coil of pipe 9, one end of which is connected with the pipe 8 and the other end is provided with a cock or air-valve at 10.

When it is necessary to make use of steam from the locomotive, it is admitted into the pipe 8 and coil 9 and heats the water in the tank D, and this heats the coil C and the water circulates through the pipes B in the car, as in the ordinary Baker car-heater.

These different arrangements adapt the heating apparatus to any circumstances or contingencies under which it may be placed, and I remark that it is preferable to use water saturated with salt to prevent injury by frost.

In my present improvements I am able to make use of heat from the locomotive when coupled to the train and to employ heat from a stationary boiler when the locomotive is detached, thereby warming up the cars by one of two external sources of heat, and I arrange a fire heating apparatus that can be brought into action at the same time as the steam from the locomotive or at the same time that heat is supplied from a stationary boiler through the flexible connections. It will also be apparent that this device is available with a vehicle having a compartment, as distinguished from an open vehicle or platform-car, and that the liquid in the tank D becomes a heat-absorber which is in operative contact with the water or fluid circulating through the system of pipes within the compartment of the car, and while it is to be understood that the locomotive is usually the source of steam heat in the moving train the heat may be supplied from any other vehicle containing the proper heating apparatus.

I claim as my invention—

1. The combination of a tank below the car with the heating pipes or radiators in the car and a coil within the tank connected to and forming a continuation of the radiator-pipes in the car, pipes and cocks and a stationary boiler for supplying heat into the tank and a fire-box connected with the tank for heating the water therein by fire heat whenever necessary, substantially as set forth.

2. The combination in a car-heater of a tank below the car, pipes or radiators within the car, a coil within the tank connected with and forming a continuation of the radiators in the car, pipes and cocks and a stationary boiler for supplying heat into the tank when the train is at rest, and a second coil within the tank and a supply-pipe by which a heated fluid from another vehicle can be admitted whenever necessary, substantially as set forth.

3. The combination with a car and the system of heating-pipes within the car containing liquid that is circulated by heat, of a vessel surrounding a portion of the pipe of the circulating system and containing a liquid, a steam-pipe and connections for steam from the locomotive for heating the liquid in the said vessel, substantially as set forth.

4. The combination of a vehicle having a compartment, a system of pipes containing a liquid that is circulated by heat within said compartment, a tank containing a heat-absorber which is in operative contact with the said circulating system, a heater for the absorber and connections through which heat for the heater may be supplied from another vehicle, and pipes for connecting the tank with a stationary heating apparatus, substantially as set forth.

Signed by me this 5th day of April, 1887.

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