

(No Model.)

2 Sheets—Sheet 1.

J. F. McELROY.
STORAGE HEATER FOR STREET CARS.

No. 541,871.

Patented July 2, 1895.

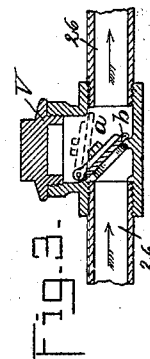
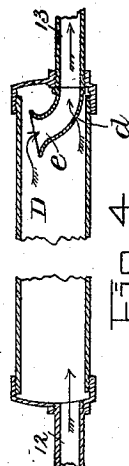
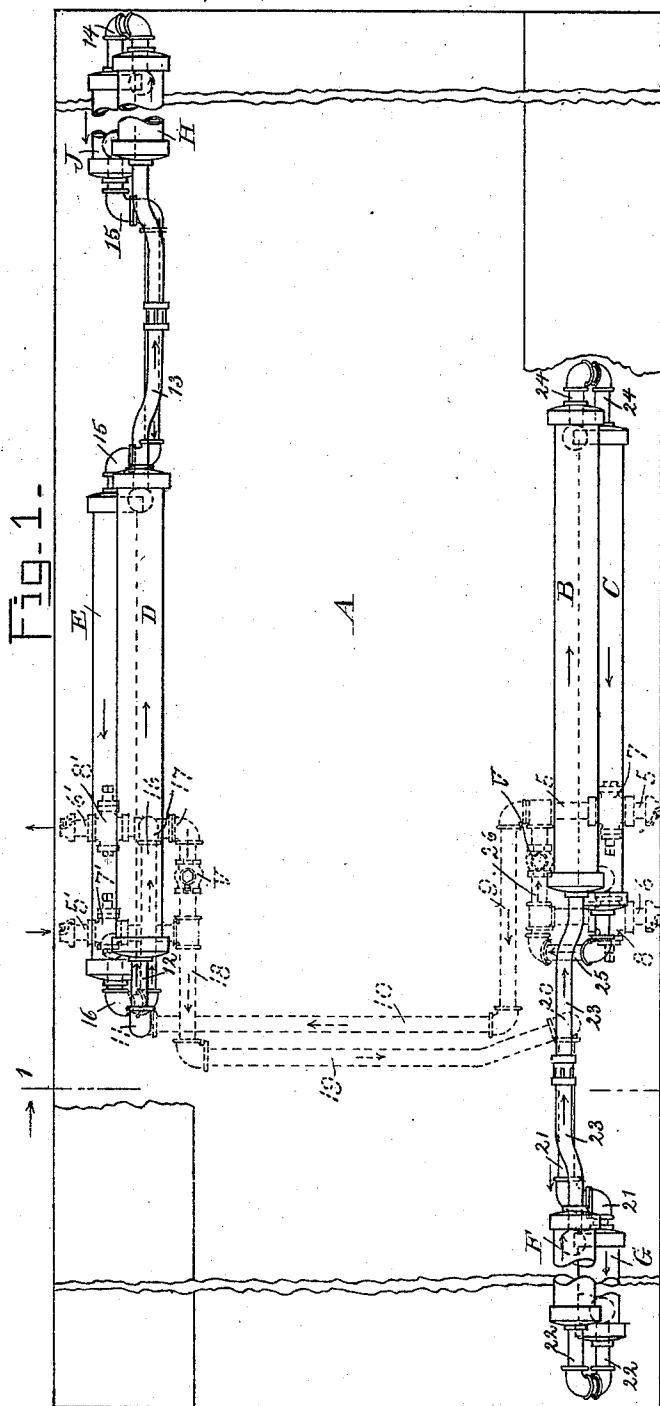
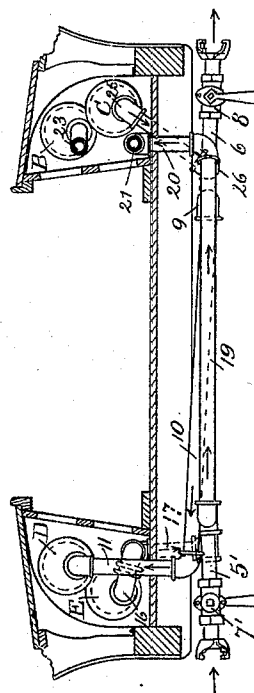


Fig. 2 - Sec. 1-1.



Witnesses:
John W. Fisher
Grace T. May.

Inventor,
James F. McElroy
Ward & Cameron.
Attorneys

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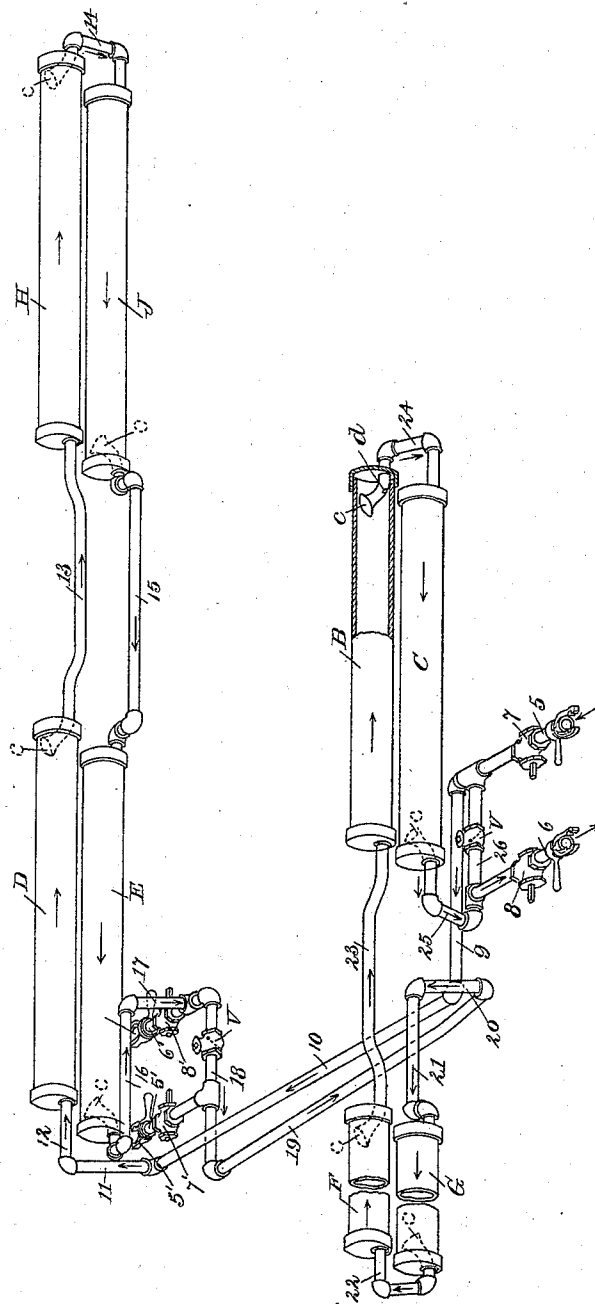
2 Sheets—Sheet 2.

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Fig. 5.



Witnesses:

John W. Fisher.
Grace T. Mary.

Inventor,
James F. McElroy.
Ward & Cameron,
Attorneys

UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO THE CONSOLIDATED CAR-HEATING COMPANY, OF SAME PLACE.

STORAGE-HEATER FOR STREET-CARS.

SPECIFICATION forming part of Letters Patent No. 541,871, dated July 2, 1895.

Application filed March 13, 1893. Serial No. 465,694. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McELROY, a citizen of the United States, residing in the city and county of Albany, State of New York, have invented a new and useful Storage-Heater for Street-Cars, of which the following is a specification.

My invention relates to car-heating apparatus; and the object of my invention is to provide a storage heater in which hot water is the heating agent and arranged in such a manner that it may be charged very quickly and the heat distributed uniformly throughout the car, and retain the heat for a considerable period of time; and also so constructed that the contents of the heater may be discharged very rapidly when desired. I accomplish this object by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan of a car provided with my storage heater. Fig. 2 is a section along the lines 1—1 on Fig. 1. Fig. 3 is a detail view of the check valve V. Fig. 4 is a detail view showing the manner of connecting the drums with the pipes. Fig. 5 is a perspective view showing the radiators in section omitting the parts of the car.

Similar letters and numerals refer to similar parts throughout the several views.

Within the car A on each side thereof and about midway between its ends, I arrange the drums B, C, D and E; the drum B being slightly above the drum C on one side of the car, and the drum D being slightly above the drum E on the opposite side. Near each end of the car and on each side thereof diagonally opposite each other, I arrange four other drums F and G on one side and H and J on the other, very similar in their relation to each other as the drums already described. Each of these drums and piping within the car are placed beneath the car seats.

Below the floor of the car on each side thereof and about midway between its ends, I place the pipes 5, 6 and 5', 6', their ends adapted to be coupled with the hose at the supplying station. Near the ends of the pipes 5 and 6, I arrange the cocks 7, 8, by the operation of which the pipes 5 and 6 may be closed or opened as desired.

The piping in the car and the drums are connected up in the following manner: The pipe 5 is connected with the short pipe 9, which is connected with pipe 10 running across the car and which communicates with the interior of the car on the opposite side of the car by means of pipe 11, which connects with the drum D by means of pipe 12. The end of the drum opposite that entered by pipe 12 is provided with pipe 13, which connects with the drum H. The drum H is connected by suitable piping 14 with the drum J, which is connected to the drum E by means of the pipe 15. The drum E is connected by means of piping 16 with pipe 17, which passes through the floor and connects with pipes 18 and 19 extending across the car and connecting with pipes 20 and 21, which enter the drum G, which drum is connected by means of piping 22 with the drum F which is connected with the drum B by means of the piping 23, the drum B being connected to the drum C by means of piping 24; the drum C being connected with piping 25 beneath the floor of the car, which opens into piping 6 and also into the connecting pipe 26 between pipes 5 and 6, and which contains the check valve V.

The check valve V is a hinged disk b arranged within the valve chamber a, (see Fig. 3,) in such a manner that the water in pipe 26 passing into the valve chamber a in the direction shown by the arrows, Fig. 3, will lift the disk b and pass out into pipe 5, but which will prevent the water from pipe 5 passing through pipe 26 in an opposite direction to that indicated by the arrows.

At the end of the drum D with which pipe 13 communicates, I arrange the trap c, by bending the pipe upward within the drum, as shown in Fig. 4, communicating with the drum near the top thereof. I also make an opening d within pipe 13 near the bottom of the drum as shown in Fig. 4. The pipe 14 at the end of the drum H is provided with a similar trap, as is also pipe 15 at one end of the drum J, and pipe 16 at the end of the drum E, and pipe 22 at the end of drum G, and pipe 23 at the end of drum F, and pipe 24 at the end of drum D, and pipe 25 at the end of drum C. Thus at the end of each drum out of which the water flows, in charging my heat-

ing apparatus, I arrange the construction described, which is in order to allow the air driven to the top of the drum by the inflowing water to pass out through the opening
 5 near the top of the drum within the pipe, as shown by the arrows in Fig. 4, and at the same time to allow the water to circulate by passing through the opening d within the pipe near the bottom of the drum. This allows
 10 the drums to be filled full of water, the air which otherwise would accumulate at the top of the drum being carried away, giving place to the water, enabling me to get a greater pressure of water within the pipes, and therefore more of the heating agent within the car.
 15 Thus when my apparatus has been charged with hot water, the drums are completely filled. By means of the opening d in the pipe I can drain the drum.

20 The operation of my apparatus is apparent. I attach pipes 5 and 6 to a hose at the supplying station. The hot water entering the apparatus through pipe 5 passes into pipe 9. It being impossible for it to make an exit
 25 through the pipe 26, because of the check valve V, it crosses the car through the pipes 10 and 11 and enters the drum D within the car. The drum D fills up with water and a part of it continues to flow through pipe 13, but
 30 when the drum is filled with water, as much flows out through pipe 13 as enters through pipe 11. The water then passes through drums H, J, E and through pipes 16, 17, through the check valve V into pipe 18 across
 35 the car, through the drums G, F, B, and C and pipes 25, and out through pipe 6 which is connected with the return pipe at the station, each of the drums being completely filled with hot water.

40 In order to put an extra pressure upon the water, I close the cock 8 in the return pipe and continue to force the water through the charging pipe 5, thereby bringing the water within the drums and piping within the car up to
 45 boiler pressure. I then close the cock 7 and break the connection at 5 and 6. The water within the drums and piping will continue to circulate caused by the motion of the car. The stopping and starting of the car impart motion
 50 to the water within the drums and pipes, as well as the constant motion of the car in its journey.

The supply and return pipes 5 and 6 on one side of the car having their counter-part
 55 in pipes 5' and 6' on the opposite side of the car; the connections are the same and therefore the car may be charged from either side.

It is impossible to change the circulation because of the check valves V arranged in
 60 pipes 18 and 26. There is no danger of freezing in the pipes beneath the car because of the constant circulation.

When a car provided with my apparatus returns to the station to be reheated, or re-

charged, when the coupling is made and hot 65 water is forced into the pipes and drums, the contents of the pipes and drums are driven out into the station apparatus, the hot water taking its place, and the same operation takes place in charging the car as already described. 70

When it is desired to empty the apparatus, of water, I open the cocks, and the drums and pipes will be drained out. The openings d in the pipe at the bottom of the drum allow for the drainage of the drums. 75

A very important part of my invention is the arrangement of my apparatus so that it can be charged from either side.

When it is desired to charge the drums from the side of the car opposite to that already described, the charging hose is attached to pipe 5', and the return hose to pipe 6'. The water then enters through pipe 5' passing through valve 7' into pipe 18 and thence
 80 passes through pipes 19, 20 and 21 into drum G, into pipe 22 into drum F, pipe 23 into drum B, pipe 24 into drum C, through pipes 25, 26, through valve V into pipes 5, 9, 10, 11 into drum D, pipe 13 into drum H, pipe 14 into drum J, pipe 15 into drum E, pipe 16 into
 90 pipe 17, through valve 8' into pipe 6' into the return hose.

I do not limit myself to the exact arrangement of the pipes and drums. I have shown the drums arranged in pairs, but one drum 95 may be used where I have shown two, or they may be placed in different positions from that shown.

What I claim as my invention, and desire to secure by Letters Patent, is— 100

1. In a storage heater, a drum suitably mounted, a pipe arranged to convey hot water into said drum at one end thereof, a pipe entering said drum at the opposite end thereof, a trap arranged within said drum in connection with last mentioned pipe, said trap opening into the drum near the top thereof, with an orifice in said trap near the bottom of said drum, substantially as described and for the purpose set forth. 105

2. In a storage heater, one or more drums located on each side of a car suitably connected with piping, with a trap arranged in that end of each drum out of which the water passes, about midway between the ends of the car said trap communicating with the drum near the top thereof, with a vent within said pipe communicating with the drum near the bottom thereof, said piping provided with a check valve on each side of the car constructed in such a manner as to permit of the circulation of the water in but one direction, substantially as described and for the purpose set forth. 110 115 120

JAMES F. McELROY.

Witnesses:

EDWIN A. SMITH,
 WILLIAM P. EDDY.