(No Model.) 2 Sheets—Sheet 1.

C. A. KIMPTON.

CAR COOLING AND VENTILATING APPARATUS.

No. 419,529. Patented Jan. 14, 1890.

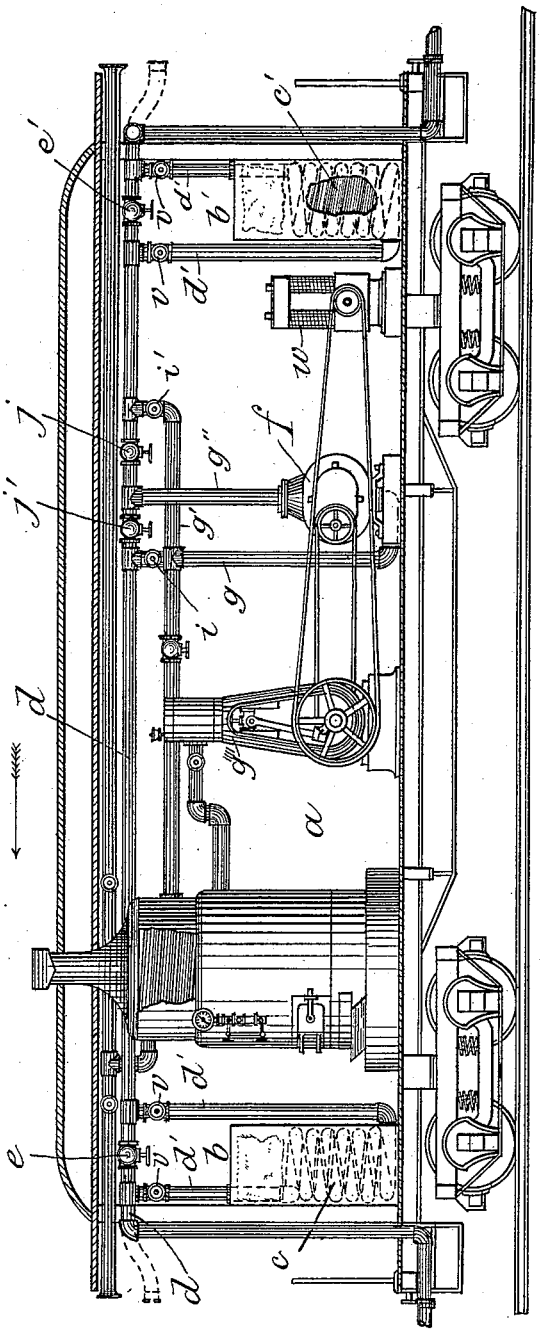

Fig. 1.

WITNESSES.

Chas. Spaulding

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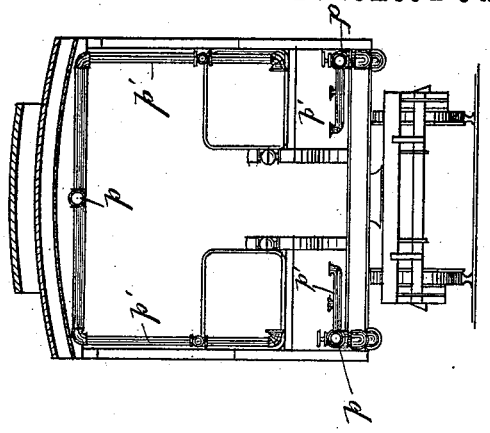

Fig. 3.

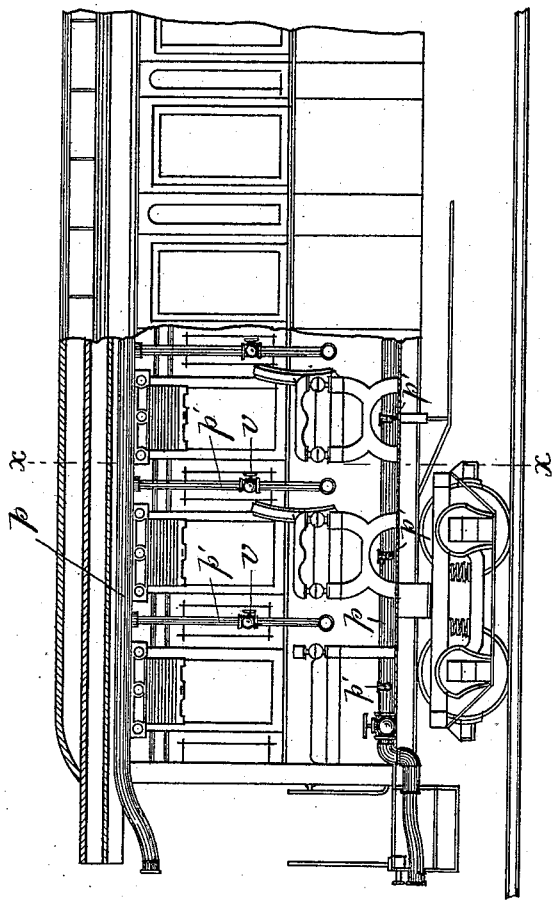

Fig. 2.

WITNESSES.

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UNITED STATES PATENT OFFICE.

CHARLES A. KIMPTON, OF MALDEN, ASSIGNOR OF THREE-FOURTHS TO JOSIAH C. BENNETT AND FREDERICK L. WHITE, BOTH OF LYNN, MASSACHUSETTS.

CAR COOLING AND VENTILATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 419,529, dated January 14, 1890.

Application filed March 2, 1889. Serial No. 301,749. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. KIMPTON, of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Car Cooling and Ventilating Apparatus, of which the following is a specification.

This invention has for its object to provide improved means for artificially cooling and ventilating railway-cars; and it consists in the improved apparatus which I will now proceed to describe and claim.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a longitudinal section of a car provided with my improvements. Fig. 2 represents a longitudinal section of a passenger-car to be connected with the car shown in Fig. 1. Fig. 3 represents a section on line *x x*, Fig. 2.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents a car similar to an ordinary baggage-car in its general construction. At or near the ends of said car are refrigerators *b b'*, in which are coils *c c'* for the passage of air through said refrigerators.

d represents a pipe extending longitudinally through the car and having its front end open to the external air, so that the forward motion of the car will cause external air to enter said pipe. The pipe *d* is connected by branches *d' d' d' d'* with the refrigerator-coils *c c'*, and is provided between said branches with valves *e e'*, the purpose of which will be presently explained.

f represents a blower, which is driven by an engine *g''''*, located in the car, and has its casing connected with the pipe *d* by branches *g g' g''*. The branch *g* conducts air from the pipe *d* to the blower, and the branch *g''* conducts air from the blower to the pipe *d*, while the branch *g'* conducts air from the pipe *d* to the branch *g*, the branches *g* and *g'* communicating with the pipe *d* at opposite sides of the branch *g''*. The branches *g g'* are provided, respectively, with valves *i i'*, and the pipe *d* is provided at opposite sides of the branch *g''* and between the latter and the branches *g g'* with valves *j j'*.

The operation is as follows: The motion of the car being in the direction indicated by the arrow in Fig. 1, air is forced by said motion into the open forward end of the pipe *d*, said open end being represented by dotted lines in Fig. 1. The valve *e* is open, and the entering air is thereby caused to pass backwardly through the pipe *d* without passing through the refrigerator *b*. The valve *j'* is closed and the air passes through the branch *g* to the blower, and is forced by the latter through the branch *g''* and through the pipe *d* to and through the refrigerator-coil *c'* at the rear of the car, the valve *j* being open while the valve *e'* is closed, and causes the air to pass by way of the coil *c'* to the rear end of the car and through a suitable pipe or coupling to a passenger-car. When the motion of the car *a* is reversed, the valves *e'* and *j'* are opened and the valves *j* and *e* are closed. The entering air passes through the branch *g'* to the branch *g* and to the blower, so that the entering air, after being drawn through the branches *g'* and *g*, is forced through the branch *g''* and the open valve *j'* and the pipe *d* to and through the refrigerator *b* and into the succeeding car. It will be seen, therefore, that air is received at the forward end of the car, forced to the rear end of the car by the blower, and then cooled after its compression by the blower, and that the car may be adapted to move in either direction by adjusting the valves, as described.

The refrigerators may be of any suitable construction, and the refrigerating agent may be ice or of chemical nature.

The branches *d'* have valves *v v*, whereby the coils *c c'* may be shut off from the pipe *d* when it is desired to force air at its normal temperature through the pipe *d* without cooling it. When said valves *v* are closed, the valves *e e'* are both opened, so that the air will pass directly through the pipe *d* to and from the blower.

w represents a dynamo-electric machine, which is operated by the engine *g''''*, and may

furnish electricity to light the train. It will be seen, therefore, that fresh air may be supplied to the cars either at its natural temperature or lowered to any desired lower temperature within the capacity of the refrigerators, so that the cars are thoroughly ventilated and may be easily kept at a comfortable temperature in hot weather. The air thus supplied may be distributed through the passenger-cars by main pipes p, extending lengthwise of the cars and communicating through suitable couplings with the pipe c, said pipes having suitable outlets or branches p', through which the air is discharged at numerous points into the car. (See Figs. 2 and 3.) Said longitudinal pipes p may be placed at or near the roof of the car, and its branches p' may extend downwardly along the sides of the car and discharge the air at any desired distance above the floor. If preferred, the pipes p may be arranged on the floor of the car and its branches under the seats, in which case two pipes p should be employed—one at each side of the aisle; or the same car may have both the upper and lower pipes, as shown in Figs. 2 and 3. Each of the branches p' is preferably provided with a valve v, whereby the air may be shut off, if desired, so that each passenger may control the admission of air to his or her immediate vicinity.

I claim—

The combination, in a car, of the refrigerators $b\,b'$, the pipe d, presenting an air-receiving opening at or toward the forward end of the car, coils or conduits in said refrigerators connected with said pipe d, a blower in the car, pipes $g\,g'$, constituting a receiving branch, connecting the pipe d with the blower, through which fresh air may be drawn by the blower from the forward end of the car, a pipe g'', constituting a delivering branch, connecting the blower with the discharge end of the pipe d, and valves $i\,i'\,j\,j'$, whereby the receiving branch of the blower may be connected with the receiving end of the pipe d, and the delivering branch of the blower with the discharge end of said pipe, the arrangement being such that either end of the car may be forward, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 28th day of February, A. D. 1889.

CHARLES A. KIMPTON.

Witnesses:
C. F. BROWN,
A. D. HARRISON.