

(No Model.)

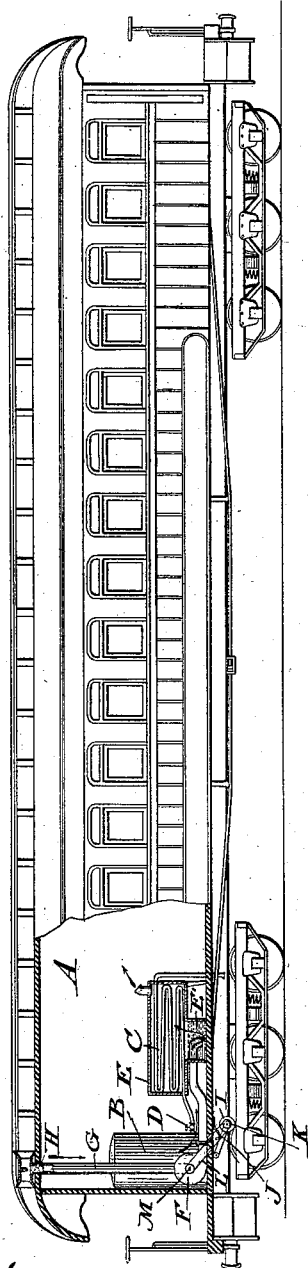
H. C. JOHNSON & F. M. McMILLAN.

COOLING AND VENTILATING CARS.

No. 261,462.

Patented July 18, 1882.

Fig. 1.



Attest.

Sidney P. Hollingsworth
Walter S. Dodge.

Fig. 3.

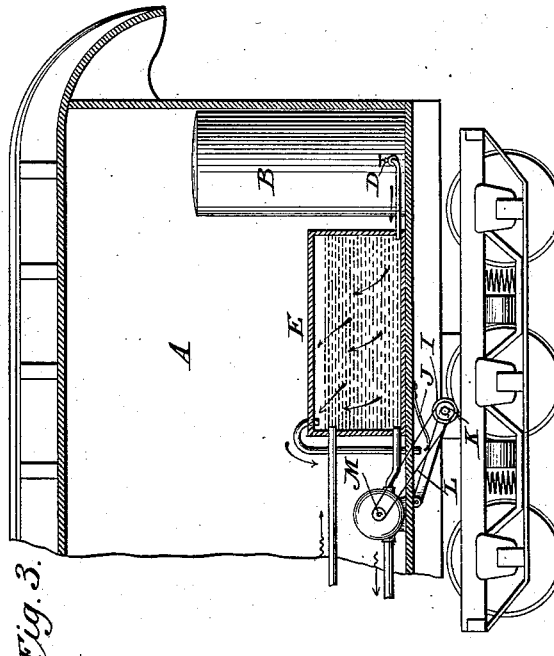
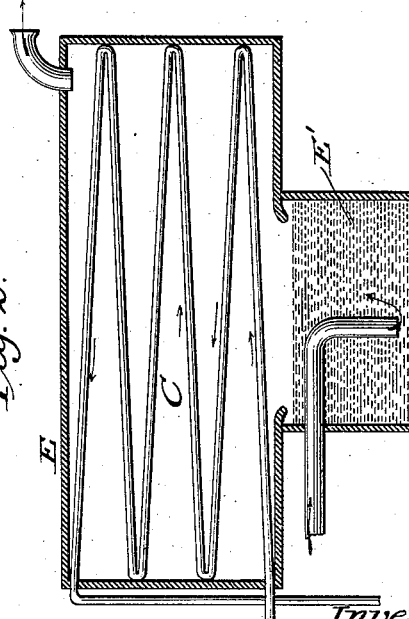


Fig. 2.



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UNITED STATES PATENT OFFICE.

HENRY C. JOHNSON AND FRANCIS M. McMILLAN, OF WASHINGTON, D. C.

COOLING AND VENTILATING CARS.

SPECIFICATION forming part of Letters Patent No. 261,462, dated July 18, 1882.

Application filed April 26, 1882. (No model.)

To all whom it may concern:

Be it known that we, HENRY C. JOHNSON and FRANCIS M. McMILLAN, of Washington, in the District of Columbia, have invented certain Improvements in Cooling and Ventilating Cars, of which the following is a specification.

This invention relates to a modification or adaptation of the system of refrigeration or cooling described and claimed in the patent granted to us bearing date May 9, 1882, and numbered 257,506; and the improvements consist in combining with our former apparatus in a railway-car a fan or air-forcing apparatus driven from the truck-wheels and arranged to draw the air through a filtering or purifying material, to pass it through a chamber cooled by the expansion of gas, as in said patent, and to deliver it thus purified into the interior of the car. It further consists in utilizing the heater-pipes for the circulation of the refrigerating gas or liquid.

In the accompanying drawings, Figure 1 is a side elevation of a car, partly in section, showing our improved apparatus; Fig. 2, an enlarged section of the cooler proper; Fig. 3, a view illustrating the employment of the ordinary heater pipes or coils.

As will be seen by reference to our patent above referred to, our system of cooling consists essentially in charging a portable receiver with liquefied gas, and permitting said gas to escape in a fine stream and expand in a coil or chamber, then to pass off, and in the present instance we prefer to follow closely the same plan, though not limiting ourselves absolutely thereto.

The air supplied to the cooler is preferably drawn through a filtering-chamber, and then passed upward through water to purify it and to precipitate or remove dust, cinders, and other foreign matters; but the filtering-chamber may in some cases be omitted, and the air simply passed upward through the water.

The present arrangement is designed primarily for cooling passenger-cars, but may also be used with advantage in cars for the transportation of perishable matters.

Referring again to the drawings, A represents a car, within which is placed a receiver, B, charged with liquefied gas, (carbonic-acid

gas being preferred,) said receiver communicating with an expansion coil or chamber, C, and being provided with a cock or valve, D, by which the discharge of gas into the coil may be carefully regulated.

The coil or expansion chamber is placed within a casing or chamber, E, which may or may not contain brine or other non-congealable liquid, and is arranged to discharge the spent gas at the outside of the car ordinarily.

F represents a fan or other air-forcing apparatus communicating with and arranged to deliver air into the chamber E, its supply being taken from outside the car through a suitable inlet-pipe, G, which is preferably extended above the car and formed with a filtering-chamber, H, in which is placed charcoal, sponge, gravel, or other suitable filtering material.

The discharge end of the spout of fan F is bent downward and dips into a well or pit, E', at the bottom or end of chamber E, containing water, the mouth or open end of the fan-spout being carried nearly to the bottom of the well or water-chamber, as shown in Fig. 2, so that the air discharged through said spout is caused to ascend through the water, by which plan all impurities are removed and the air is in a measure cooled. If brine or other non-congealable liquid be employed in the chamber E, as will frequently be the case, the cooling will be wholly effected by the passage of the air through the refrigerated liquid in this manner, and in such case we will preferably employ mechanism similar to that shown and described in our aforesaid patent to effect a circulation of the liquid through the chamber E and outer coil or chamber to remove the heat absorbed.

For the purpose of operating the fan and the circulating mechanism, if any be used, we provide a friction-wheel, I, which is arranged to bear upon the tread of one of the truck-wheels, or upon a special wheel secured to one of the truck-axes, said wheel being held against the driving-wheel by a spring, J.

On the same shaft with wheel I is placed a belt wheel or pulley, K, from which a belt, L, is carried about the fan-pulley M, as shown, thus imparting motion to the fan. The belt L will

preferably be made of elastic material, to prevent any undue strain upon the machinery when the car is turning a curve or through the vertical movement of the car-body.

5 In palace-cars, where double windows are commonly employed and the walls are thick, the invention can be applied to special advantage, the doors, windows, and other openings being closed and the necessary supply and exchange of air being afforded through
10 the action of the cooling apparatus. In this way the heat and dust of summer travel by rail may be entirely obviated.

In cars provided with the Baker heater or
15 similar heater employing circulating pipes or coils the heater proper may be detached and removed, and the brine or liquid or the liquefied gas circulated through the ordinary heating-pipes, thus permitting the apparatus to
20 be applied to cars with great facility and to the best advantage. When this is done the air circulating or forcing apparatus may be omitted in some cases; but we prefer to retain it in all cases to give the proper supply and
25 change of air.

The brine or liquid may in some cases be pumped or raised to the top of the car and allowed to descend in the form of a spray through the cooling-chamber.

30 We are aware that heat-distributing pipes

have been used for cooling purposes, and this we do not claim.

Having thus described our invention, what we claim is—

1. The herein described cooling apparatus 35 for cars, consisting of gas-receiver B, expansion coil or chamber C, tank E, fan F, and friction-gear, substantially such as shown and described, for imparting motion from the truck-wheels to the fan. 40

2. In combination with a refrigerating apparatus substantially such as described, a casing surrounding the expansion coil or chamber or a part thereof, and provided with a liquid-chamber, and a fan arranged to deliver air 45 into the liquid-chamber, substantially as explained, whereby the air is caused to pass upward through the liquid.

3. In combination with a refrigerating apparatus substantially such as shown and described, a fan arranged to supply air thereto, 50 and a supply-pipe for the fan, provided with a filtering-chamber, as and for the purpose set forth.

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FRANCIS M. McMILLAN.

Witnesses:

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