W. C. BAKER.
Heating-Cars.

No. 209,793. Patented Nov. 12, 1878.

Fig. 2.

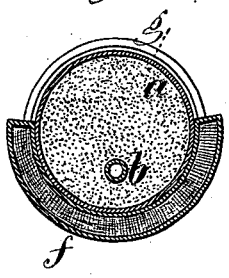


Fig. 1.

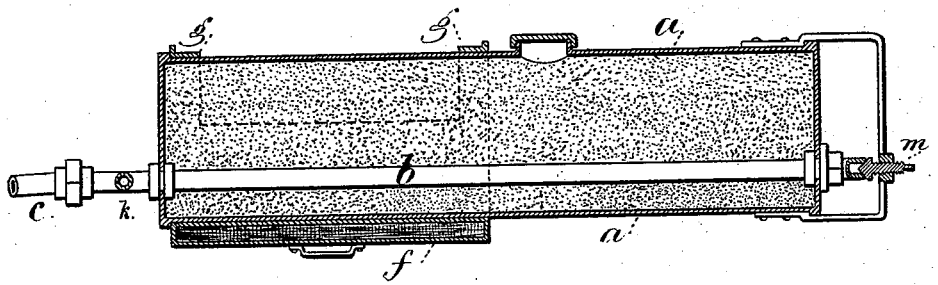
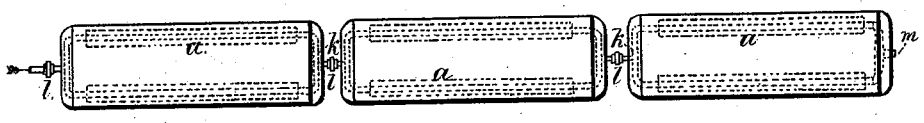


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN HEATING CARS.

Specification forming part of Letters Patent No. **209,793**, dated November 12, 1878; application filed January 21, 1878.

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 Heating Railway-Cars, of which the following is a specification:

Difficulty arises in heating railway-cars, because there is risk of fire where stoves are employed, and if the cars are heated by steam from the engine the pressure in the boiler cannot be properly maintained, especially in very cold weather.

My present improvement is especially adapted to city railways, in which there are frequent stoppages; but the same may be used in main lines of railway or wherever available.

I make use of a caloric-storage radiator, through which the steam passes, and the caloric is received and held in such vessel and given off gradually and uniformly, or nearly so. This prevents the sudden development of heat in the car, and causes the heat to be continued after the steam has been cut off. By this arrangement I am enabled to heat the cars by steam from a stationary boiler while waiting at a depot or terminal station, or by steam turned on from the locomotive while the train is at rest, and the steam can be cut off from the cars while the train is in motion; but the heat continues to be given out by the caloric-storage radiators.

I also arrange the caloric-storage radiators and the pipes connected with the same in such a manner that the heat is rendered equal, or nearly so, throughout the entire train.

By this improvement the steam from the locomotive which is often blown off while the train is at rest is utilized, and the effective power of the engine in drawing the train is not lessened, and fires and the risk from them in the cars are avoided; the sudden and excessive heat from the use of steam is prevented, and its action prolonged, so that for short lines the storage-radiator will only require to be charged at the terminal stations; and on longer lines the steam-heat can be introduced from the engine while the train is at rest or while on down-grades, so as not to tax the steam-producing power of the locomotive or lessen its efficiency.

In the drawing, Figure 1 is a vertical longitudinal section of the caloric-storage radiator. Fig. 2 is a cross-section of the same, and Fig. 3 is a diagram illustrating the connections of the pipes.

The vessel *a* is, preferably, cylindrical, and through it passes the steam-pipe *b*. Around the said pipe *b*, and within the vessel *a*, the space is filled with sand or other material that will absorb and retain heat from the pipe *b* and give the same off gradually by the radiating-surface of the vessel *a*.

The pipes *c*, leading from one vessel to the other, should be inclosed with non-conducting material, such as mineral wool or felt, to prevent the steam condensing when passing from one radiator to the other; hence the steam will easily pass from end to end of the train each time it is turned on from the engine, instead of condensing rapidly, as would be the case if exposed. The steam parts with its caloric to the sand or similar material, and the heat is given off gradually, so as to maintain uniformity of temperature. At the end of the steam-pipe there is to be an air cock or valve, to allow of the escape of air, and when made to close automatically by the expansion, as usual in steam-radiators, the steam will be confined and the apparatus self-acting.

The jacket *f* is lined with non-conducting material, and it is shown as attached to the vessel *a* by rings *g*, so that it may be partially revolved to regulate the heat. When it is above the vessel the heat will be retained, and when turned beneath the heat is free to escape.

The caloric-storage radiators will usually extend from end to end of the car, at each side, beneath or adjacent to the seats. They may also be boxed in, so as to provide for the admission of air into the box, to be warmed by the radiator and pass out into the car.

I have shown the connecting-pipes *k* from one caloric-storage radiator to the other at the ends of the car, and the central pipes and flexible couplings or connections *l* passing from one car to the other. The blow-off or air-cock or automatic air-valve should be at *m*, at the rear end of the train.

I am aware that hot sand has been introduced in a vessel into a railway-car, that heated bodies have been placed in non-conducting receptacles, and that steam has been made to

circulate in incased pipes. This latter mode of heating necessitates either some supplemental means for supplying heat when the train is in motion, or it detracts from the capacity of the engine for drawing the train. I find that sand has a capacity for absorbing and retaining heat, and also for imparting it gradually; hence when the train is at rest the steam-heat will be taken up by the sand and then given off gradually and uniformly. By sand, I mean solid particles of matter having the properties of sand, as before mentioned.

I am also aware that steam has been used for heating purposes while the cars are at rest, and that hot air has been used when the cars are in motion; but sand was not employed to absorb the heat from the heating-pipes, so as to give the same off gradually and uniformly.

I claim as my invention—

1. The method herein specified of heating railway-cars, which consists in supplying steam-heat by a pipe to a heat-radiating apparatus within the cars while the latter are at rest, absorbing the heat from the steam by a bath of sand or equivalent material surrounding the steam-pipe and in contact therewith, and radiating the heat from the sand into the cars, substantially as set forth.

2. The caloric-storage radiator formed of a metallic case surrounding a steam-pipe, and having the intermediate space filled with sand or equivalent material, for the purposes and as set forth.

3. The caloric-storage radiator formed of a cylindrical metallic case, with a steam-pipe passing through the same, and the intermediate space filled with sand or equivalent material, in combination with the non-conducting jacket *f*, that partially surrounds such caloric-storage radiator and is movable, for the purposes and as set forth.

Signed by me this 18th day of January, A. D. 1878.

W. C. BAKER.

Witnesses:
GEO. T. PINCKNEY,
CHAS. H. SMITH.