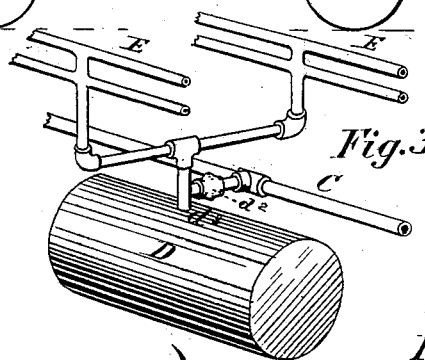
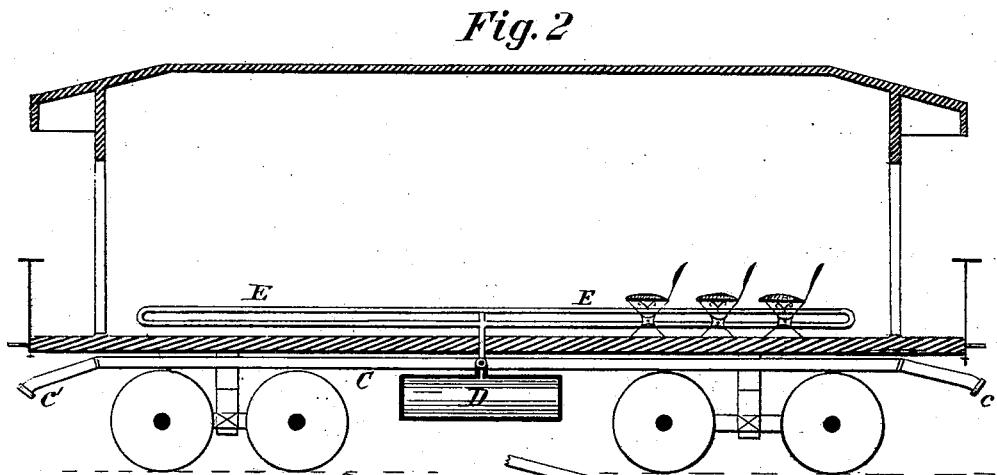
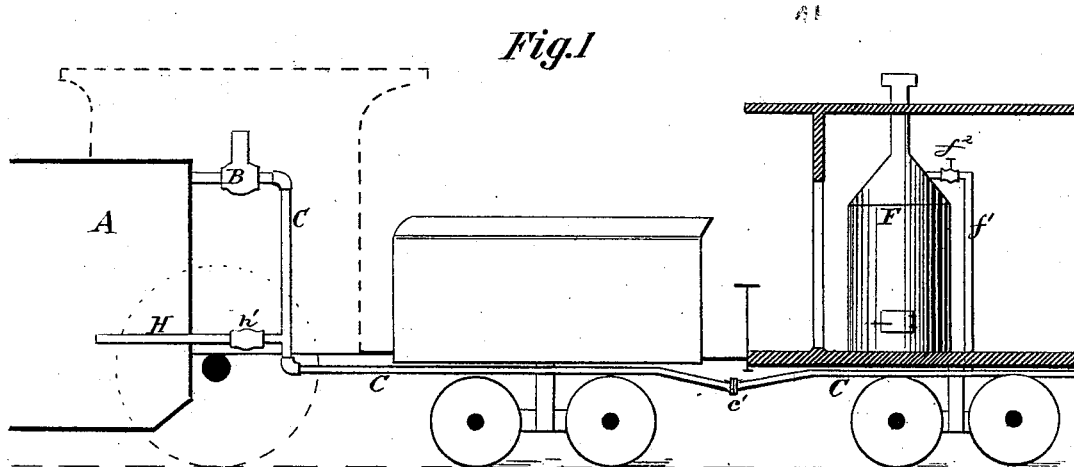


A. S. BROWNELL.
 Apparatus for Heating Railroad Cars.

No. 207,588.

Patented Sept. 3, 1878.



Witnesses.
 Chas. W. Sherburne
 Jas. H. Purges.

Inventor:
 Andrew S. Brownell.

UNITED STATES PATENT OFFICE.

ANDREW S. BROWNELL, OF WATERTOWN, MASSACHUSETTS.

IMPROVEMENT IN APPARATUS FOR HEATING RAILROAD-CARS.

Specification forming part of Letters Patent No. **207,588**, dated September 3, 1878; application filed August 15, 1877.

To all whom it may concern:

Be it known that I, ANDREW S. BROWNELL, of Watertown, in the county of Middlesex and State of Massachusetts, have invented a new and Improved Apparatus for Heating Railroad-Cars by Steam, of which the following, when taken in connection with the accompanying drawings, is a full, clear, and exact description.

The use of this apparatus is designed to obviate and entirely prevent the possibility of burning cars, in consequence of collisions or accidents, by their taking fire from stoves, as has often been the case, as well as to furnish a cheap, effective, and comfortable manner of heating cars, so that the temperature will be uniform and agreeable throughout the cars.

This improved apparatus consists in the attachment to a locomotive-boiler of a pressure-regulator, connected by suitable pipes and couplings to reservoirs placed beneath the cars, from which reservoirs pipes extend into the cars on either side for the purpose of heating the car.

Figure 1 shows the outline of part of a locomotive, a tender, and section of one end of a car. To the locomotive boiler A is attached a pressure-regulator, B, to which is connected the pipe C, which passes beneath the tender, also beneath each car of a train, the pipe C being connected between each car by flexible pipe and suitable couplings. (Shown at *c'*.) The pipe H is connected with the pipe C, as shown, also with the exhaust-pipe of the locomotive, and has a check-valve, *h'*. The steam-generator F, located in the portion of car shown, is also connected with the pipe C by pipe *f*¹, having valve *f*².

Fig. 2 shows a section of a car with the pipe C passing beneath it; also, a section of a reservoir, D, which is connected with the pipe C, and the pipes E E, which are also connected with the reservoir D, extending inside the car, and the couplings *c'*, at either end of pipe C, for connecting with pipe C of other cars.

Fig. 3 is a perspective view of the reservoir D, showing the connection with pipes C and E E at *d*³, a check-valve, *d*², and a portion of the pipes E E, which extend into the car on each side.

In the operation of this improved apparatus steam is admitted from the boiler A through the pressure-regulator B, and passes through the pipe C into the reservoir D, and also into the pipes E E, which extend into the car on either side for heating the same.

The pipe H is for the purpose of using the exhaust-steam for heating the cars, the check-valve *h'* permitting the entrance of the exhaust-steam to pipe C, and preventing the escape of live steam when admitted through the pressure-regulator to the pipe C.

The pressure-regulator B is for the purpose of reducing the steam-pressure in the pipes C C and reservoir D from the boiler-pressure to any pressure required in the said pipes and reservoir.

The check-valve *d*² admits the steam to reservoir D, but prevents its escape in case the couplings *c'* *c'* be accidentally disconnected.

The reservoir D is made any suitable size and shape, and placed beneath the cars, being for the purpose of containing a quantity of steam, which, circulating through the pipes E E, heats the cars, the reservoir D being provided with a valve, (not shown,) or other suitable device, for the purpose of drawing off the condensed steam.

The pipe C passing beneath each car is shown in that position as the most convenient method of illustrating the same; but the said pipe C may pass beneath, beside, or inside of the car, as desired, and is for the purpose of conveying steam from one car to another the entire length of the train, and is also to be provided near each end with a stop-cock, by which the pipe C may be closed at either end when desired.

The steam-generator F is located in any convenient car of a train, and connected by pipe *f*¹, having valve *f*², with the pipe C, and is for the purpose of supplying steam whenever the locomotive may be disabled or disconnected for any great length of time.

I do not claim the heating of cars by steam or the use of steam-pipes in or about cars for that purpose, as I am aware that the same is not new.

Any suitable pressure-regulator and steam-generator, as well as the ordinary steam-pipe, valves, and other connections suitable for the

purpose, may be used, and the pipes and other portions of the apparatus may be fastened to the sides and floors of the cars in any convenient manner.

Having thus described my improvement, what I claim, and desire to secure by Letters Patent, is—

1. The combination and arrangement of the pipes C C, pipe H, reservoir D, and pipes E E with the pressure-regulator B, for the purpose herein described.

2. In combination with the pipes C C, reservoir D, and pipes E E, the steam-generator F, for the purpose of supplying steam when the locomotive-boiler is disconnected therefrom.

ANDREW S. BROWNELL.

Witnesses:

HY. C. SHERBURNE,
JAS. H. BURGESS.