

(No Model.)

G. T. BREWER.  
HOT WATER HEATER FOR CARS, &c.

No. 489,141.

Fig. 1.

Patented Jan. 3, 1893.

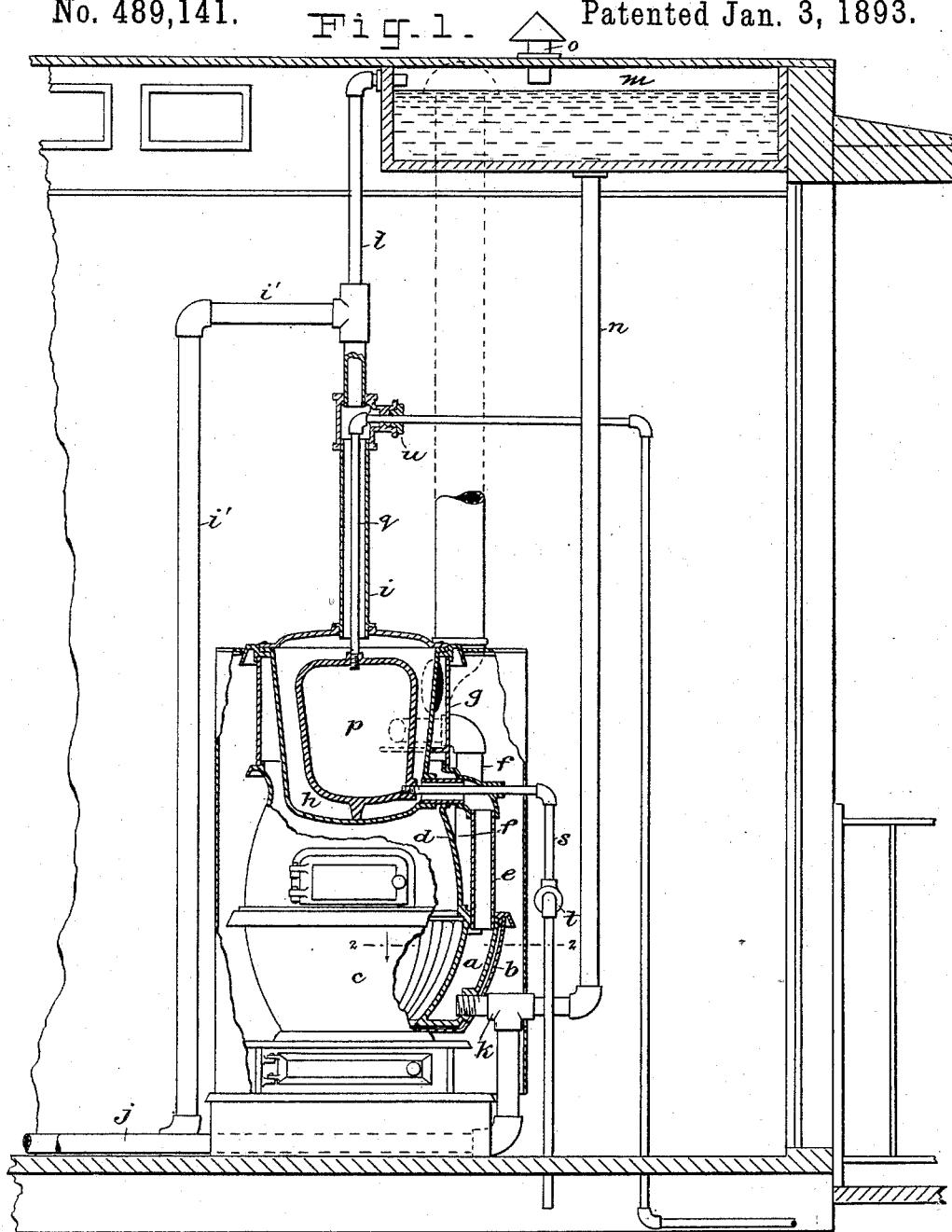
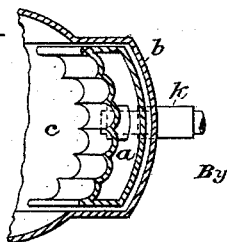


Fig. 2.

WITNESSES:

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INVENTOR:

Gilbert J Brewer.

AG Thayer.

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# UNITED STATES PATENT OFFICE.

GILBERT T. BREWER, OF HOBOKEN, NEW JERSEY.

## HOT-WATER HEATER FOR CARS, &c.

SPECIFICATION forming part of Letters Patent No. 489,141, dated January 3, 1893.

Application filed February 18, 1889. Serial No. 300,370. (No model.)

*To all whom it may concern:*

Be it known that I, GILBERT T. BREWER, a citizen of the United States, residing at Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Hot-Water Heaters for Cars or other Structures; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the kind of car heaters in which there is a hot water system in each car with a fire heater for working it when the car is detached from the locomotive, and a steam heater supplied with steam from the locomotive when the locomotive is attached to the train, for substitution of the steam heater to avoid fire heat while the car is in use, and it consists of the improved contrivance of the apparatus of the water system and the steam heater hereinafter described and claimed, reference being made to the accompanying drawings in which my improved heater is represented in

Figure 1, partly in side elevation and partly in section in its position in a car, part of which is represented in longitudinal sectional elevation. Fig. 2, is a detail in horizontal section on line 2, 2, Fig. 1.

The water circulating system comprises the water back *a*, located in a lateral recess *b*, in the side of the lower section *c*, of the fire box of a stove so that the inside of the water back forms part of the inside of the said lower section of the fire box symmetrical with the rest, and the top of the water back projects outside of the upper section *d*, of the fire box, so as to receive the circulating pipes *e*, and *f*, therein, which pipes extend upward outside of the fire box, and through the shell *g*, of the combustion chamber above into the reservoir *h*, located in the upper portion of said chamber, and having the outflow circulating pipe *i*, connected to the top, and extending upward a suitable distance for the required height of the hot water water column for promoting circulation and thence turning downward through the section *i'*, to the floor of the car, and ultimately becoming the return pipe *j*, through which the cold water re-

turns to the water-back of the heater through the connection of said pipe therewith at *k*.

From the top of pipe *i*, when the outflow turns downward, there is a vent pipe *l*, continuing upward and preferably opening into tank *m*, from which the circulating system is supplied through pipes *n*, connecting with the return pipe at *k*, said tank being open to the atmosphere at *o*, but said vent may extend upward through the top of the car, and open directly to the atmosphere if desired, the system being worked without pressure except what is due to the height of the column of the supply reserve.

By turning the water from the stand pipe of the outflow downward into the circulating pipes direct instead of passing it into the tank much heat otherwise lost through the large radiating surfaces of the tank is saved, all or nearly all the heat given off from the tank being useless for heating the car because of the high position of the tank.

The vent *o*, serves for the escape of air or vapor that might otherwise be trapped in the top of the stand pipe where it would break the continuity of the water column and prevent its circulation.

For the steam heater to be used in lieu of the fire heat, I employ the steam tank *p*, located within tank *h*, and having a steam inlet pipe *q*, from the locomotive and also having the waste pipe *s*, for the escape of the condensed water, connected with it, said steam tank *p*, being as much smaller than the water tank, as is necessary for a sufficiently large quantity of surrounding water to take up the heat of the steam rapidly and the waste pipe *s*, having a steam trap *t*, or other approved means of providing for the escape of the water without waste of steam.

The live steam pipe *q*, is preferably connected with the steam tank through said pipe *i*, having a stuffing box at *u*, and the waste pipe *s*, is connected with said steam tank through the elbow of the circulating pipe *e*, entering the water tank near the bottom but these connections may be otherwise made if desired.

The water tank *h*, may be used alone, the water back being dispensed with but both together make a powerful heater for rapidly

heating up a cold car preparatory to the making up of the train at which time more rapid action is necessary than for keeping it warm afterward, and they afford a local circulation of the water when it is desired to shut off the circulation through the radiating system of the car, and it has been found in practice that the water back and tank thus connected for local circulation cause more effective circulation through the radiator system than would be had with the tank alone and thus together with the steam attachment furnish an improved car heater independently of the auxiliary fire heater for starting the heat in the first place.

Whether the tank *h*, is used alone or both the tank and the water back, it, or they have the advantage over a coil of holding ample quantity of water for taking up the heat without obstructing combustion by limiting the space available therefor too much, in the car heater of necessarily limited size as a coil does, and therefore afford a heater of ample capacity within the limit of size that is practicable for car heaters, while the coil heaters are inadequate and unsatisfactory. A coil that would hold the quantity of water which the tank *h*, alone can contain would fill the interior space of the stove to such extent that no practicable fire could be maintained in it, and the steam tank is alike more effective than a steam heating coil can be, through its superior capacity for quantity of steam proportionately to the space it occupies and yet there is ample clear combustion space below and around it and the water tank for substantially the same effective combustion as such stoves afford without the heater attachment.

I do not claim broadly in this application the heater located in the fire pot in combination with the heating tank suspended in the top of the stove such being the subject matter

claimed by me in my pending application Serial No. 293,549 filed December 14, 1888.

I claim as my invention:

1. In a steam and auxiliary fire heating hot water car heating stove, the combination of the stove the water container consisting of the water back in the recess of the fire box and the tank suspended in the top of the stove with intermediate circulating pipes, and the steam heater consisting of the steam tank located within the water tank, said water container and steam heater having the water and steam circulating pipe connections respectively and all combined substantially as described.

2. In a hot water car heater the combination of the water heater, the circulating pipes, the elevated reserve tank for the supply of the water to the heater, open to the atmosphere and connected with the water circulating system by a supply pipe the stand pipe of the outflow connected directly with the circulating pipes independently of and below the reserve tank, and the vent of the steam pipe said tank opening to the atmosphere above the water in the reserve tank substantially as described.

3. The combination in a car heater of the water tank, and the water back located below the said tank, also the local circulating pipes connecting said water tank and water back, also the steam tank located in the water tank, also the steam supply pipe connected with the steam tank and also the circulating pipes of the radiator system connected with the water tank and water back respectively.

In testimony whereof I affix my signature in presence of two witnesses.

GILBERT T. BREWER.

Witnesses:

W. J. MORGAN,  
W. B. EARLL.

It is hereby certified that in Letters Patent No. 489,141, granted January 3, 1893, upon the application of Gilbert T. Brewer, of Hoboken, New Jersey, for an improvement in "Hot-Water Heaters for Cars, &c.," an error appears in the printed specification requiring correction as follows: In line 67, page 2, the words "said tank" should be stricken out and the same inserted before the word "open," line 61, same page; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 24th day of January, A. D. 1893.

[SEAL.]

CYRUS BUSSEY,  
*Assistant Secretary of the Interior.*

Countersigned:

W. E. SIMONDS,  
*Commissioner of Patents.*