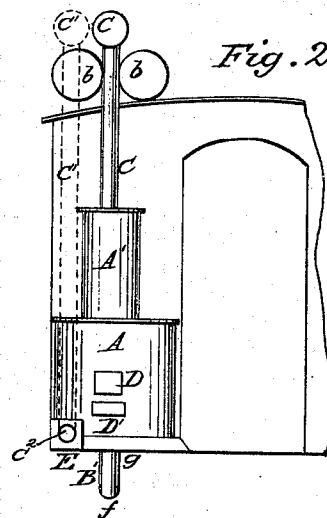
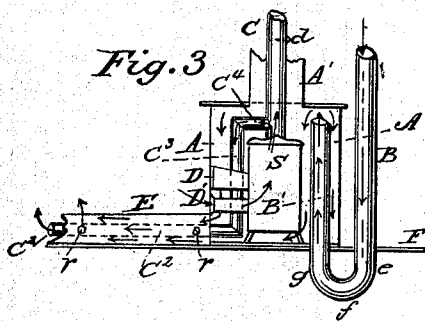
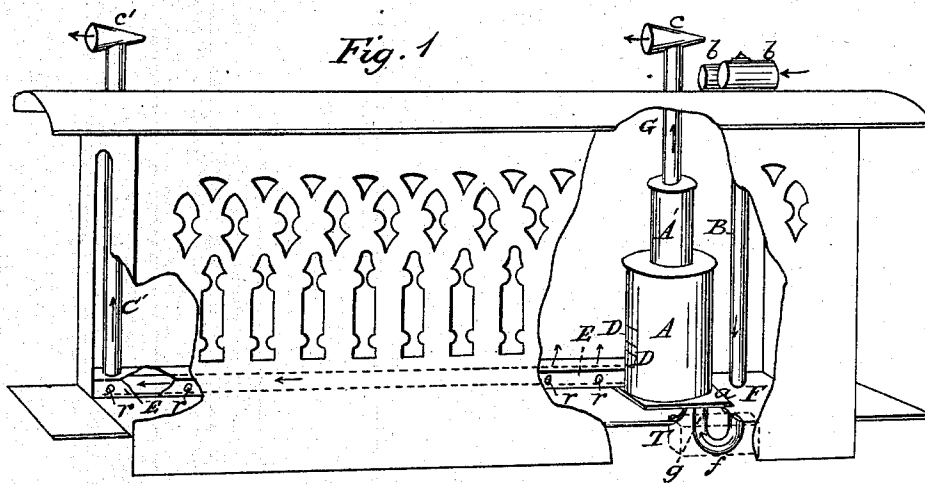


M. T. HITCHCOCK.

Car Heater.

No. 100,404.

Patented March 1, 1870.



Witnesses:
L. L. Davis
J. P. Buckland.

Inventor:
M^y J Hitchcock

United States Patent Office.

M. T. HITCHCOCK, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND J. W. LABAREE, OF SAME PLACE.

Letters Patent No. 100,404, dated March 1, 1870.

STOVE FOR RAILROAD CARS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, M. T. HITCHCOCK, of Springfield, in the county of Hampden, and Commonwealth of Massachusetts, have invented a new and Improved Car-Heating Apparatus; and I do hereby declare that the following is a full, clear, and exact description of my invention, reference being had to the annexed drawings making a part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a perspective view of a miniature car-body having my heating apparatus applied thereto, and having a portion of the floor and of one side and end shown as broken away to display the arrangement of the heating apparatus more fully;

Figure 2 is an elevation of a part of the apparatus as viewed from a point beyond and in line with the door in the opposite end of the car; and

Figure 3 is a vertical section of the case of the heater, showing the arrangement of the pipes for supplying the cold air and removing the smoke and other products of combustion, and for distributing the hot air.

My invention is designed to be applied to a car-heating stove of any form which can be inclosed in a drum or hot-air chamber of sheet metal, and consists:

First, in a certain construction, arrangement, and application of a pipe for supplying cold air to the hot-air chamber from the outside atmosphere, and

Second, in the construction and arrangement relatively to each other of a smoke flue and a hot-air-conduit or distributor, and the application of the same to a railway-car.

The arrangement for the supply of cold air is as follows:

Blast-pipes to convey cold air from the outside atmosphere to the hot-air chamber of an encased stove have been employed in heaters for cars, and for other purposes, but my invention is designed to obviate a difficulty which has been found to occur in the operation of such pipes as hitherto employed, viz, that the cold air-pipe afforded an escape for the hot-air from the chamber if allowed to remain open when the car was at a stand-still. Cold air has also been forced through a water cistern before entering the case of the stove to free it from cinders, the use of which arrangement is attended with many serious objections. My invention dispenses with any water attachment, and also prevents the hot-air from escaping by the blast-pipe, and constantly maintains the supply of cold air whether the car is in motion or not, and this portion of my apparatus is entirely automatic, and requires no closing of dampers or other adjustment at the stoppage or starting of a train. This I effect by carrying the cold air pipe from the roof down through the car, and a short distance below the floor, to the

lower edge of the car-sill, or thereabouts; thence by a regular curve I return the pipe through the floor and into the drum of the heater, and extend it nearly to the top of the drum. The cold air pipe is, therefore, in the form of an inverted siphon, the long leg of which projects above the roof of the car for taking in cold air through an induction ventilator, while the shorter leg opens into the upper part of the drum, and the bend of the siphon is exposed to the outside air beneath the floor. If necessary, a cinder-trap or case can be attached to the legs in place of the curved portion of the pipe.

The construction and arrangement of the smoke-flue and hot-air conduit or distributor is as follows:

A main smoke-pipe extends directly upward from the stove to the roof of the car, and a branch pipe enters this main pipe just above the stove, and within the drum, and passes down nearly to the bottom of the drum, where it enters the hot-air conduit, and passes within the same to the other end of the car, where it leaves the conduit and is carried out through the roof. The hot-air conduit is made large enough to inclose the branch smoke-pipe with a space between the latter and the sides of the conduit, and is placed along the side of the car near the floor, or so as to be as much out of the way as possible. Openings in this conduit are provided with registers for distributing the hot air at frequent intervals. This conduit enters the drum near the floor, and is to be extended as far toward the opposite end of the car as is necessary to fully distribute the hot air. A damper in the main smoke-pipe above its junction with the branch pipe enables me to cut off the direct escape of the smoke and heated air from the interior of the furnace, and forces them to pass through the branch pipe, which they will readily do after a draught is established, by which arrangement a great amount of heat is radiated from the branch pipe into the hot-air conduit, which would otherwise be wasted. The hot air from the drum is forced through the hot-air conduit by the pressure of the column of cold air which is introduced by the blast-pipe, and is distributed through the car by the registers in the conduit. The heat radiated from the branch smoke-pipe is also added to the hot air which enters the conduit from the drum.

Instead of placing the stove in a corner of the car, as shown, it may be located in the middle of the length of the car, and a hot-air conduit and branch smoke-pipe be then extended either way toward the opposite ends of the car. If the stove be placed as shown, a duplicate apparatus may be arranged upon the opposite side of the car, the stoves being set diagonally opposite to each other.

If it should be undesirable to use the branch smoke-pipe and hot-air-conduit, the arrangement of a stove en-

cased within a hot-air chamber, and a siphon-shaped cold air pipe may be used separately, and by making sufficient openings for the escape of the hot air near the base of the drum, the apparatus so arranged will constitute a most efficient heater, although less economical in fuel than the entire apparatus, as described in full.

The construction of my invention is as follows :

A represents the body of the drum or hot-air chamber, which is shown as surmounted by a smaller drum, A', (not an essential part,) and is supported upon a base, *a*, which rests upon the floor F of the car.

Openings D and D' are made in the side of A, from which casings extend to the fire-door and ash-door of the stove S.

The smoke-pipe C rises from the top of the stove to the roof, and terminates in the conical hood *c*, which is arranged to rotate with the current of air passing around it, so that its mouth will always be away from the wind.

A damper, *d*, is inserted in C to cut off the main current of smoke when required.

In fig. 3 is shown the branch pipe C' C³ C², which leads from the main pipe and enters the hot-air conduit near the bottom of the drum, and leaves it at the other end of the car, at which point the vertical portion C' of the branch pipe passes out through the roof and is capped by a conical hood, *c'*, arranged and operating precisely like the hood *c* upon the main smoke-pipe.

The hot-air conduit may be rectangular or cylindrical, and is large enough to receive the branch smoke-pipe C' with a free space between the two.

The openings *r r* may be fitted with registers, so that the outflow of hot-air in any part of the car may be regulated. This conduit may be made of sheet-metal, and applied near the floor in the most convenient position, and may, if necessary, be protected by an ornamental iron screen of open work.

The cold air pipe B is carried through the roof near the main smoke-pipe, and is surmounted by an induction ventilator, which will direct the air into the pipe.

A pair of induction ventilators are shown as surmounting the pipe B, which are of the form and designed to be similar in operation to the ventilator for which I obtained Letters Patent dated February 18, 1868, and I prefer for this use ventilators of that description, or those which resemble it in having a stationary shell, and operating equally well whether the car moves in one direction or the other. Any device which will guide a current of air into the pipe B will be applicable.

The pipe then descends through the floor F of the car, and is curved, as seen at *e f g*, fig. 3, and is continued upward from the floor into the drum. For the best effect, I extend the vertical part B' of the blast-pipe nearly to the top of the drum. The direction of the current of cold air entering the drum through the pipe B is indicated by the red lines and arrows in figs. 1 and 3.

The supply of draught current is shown by the blue lines and arrows about the opening D' in the drum, and the direction of the currents of smoke and other products of combustion, by the blue lines and arrows extending into the main smoke-pipe C, and the branch pipe C', &c.

The direction of the hot-air current in the conduit E and through the registers *r r* is indicated by red lines in figs. 1 and 4.

Unless the cinders are detained by the ventilators *b b* applied to the end of B, a cinder-trap, T, may be attached to the legs B' B of the cold air pipe, in place of the curved portion *e f g*, this trap being a simple box in which the cinders will lodge by their own gravity.

It will be evident that if a fire is kindled in the stove S, and the air in the drum A becomes heated, the part B' of the hot-air pipe will also become warm, as well as the air within this portion. This heated air will then rise, and the cold air in the longer tube B will descend, pass through the bend, and rise into B', and a steady supply of air colder than the air in the chamber will be kept up, and this will follow whether the car is stationary or moving. In the latter case, however, the rate of the entering current of cold air will, of course, be greatly increased. It will also be evident that no hot air can escape from the chamber A through the cold air-pipe so long as the conduit E is open, or there is any exit for the hot air at a point higher than the lowest part *f* of the curve. The portion *e f g* of the pipe B is, moreover, always exposed to the cold outside air, and any escape of hot air through the bend would soon be checked, unless a great pressure of hot air was maintained in the drum. The bend, or the portion of the cold-air pipe below the floor of the car, is designed, therefore, to act as a "seal" against the improper escape of any heated air, and the short arm is to be carried upward in the drum far enough to become heated, and thus create an inward flow of air through the siphon into the hot-air drum, and I regard such a conformation of the air-passage for supplying cold air to the drum an important feature of my invention.

I am aware that pipes for supplying cold air to car-stoves have heretofore been extended from the roof of the car through the floor, and thence carried by a curve into the bottom of the hot-air drum, and I do not claim such construction as of my invention, and consider it to be necessary to the success of my invention that the short arm of the siphon be extended upward from the bottom of the air-drum a sufficient distance to become quickly heated, and thus create a current to supply the drum. Without such extension of the short arm of the siphon, I find it difficult to obtain any inflowing current through the cold-air pipe unless the car is in motion.

Having described my invention,

What I claim as new therein, and desire to secure by Letters Patent, is—

The siphon-shaped pipe, so applied to the hot-air chamber of a car-heater that its short arm B' shall extend upward within the drum A, so as to create a downward current within the long arm B, and deliver the air to said drum in a partially heated condition, substantially as described and represented.

In testimony whereof I have hereunto set my hand this 23d day of April, A. D. 1868.

Witnesses:

M. T. HITCHCOCK.

L. L. DAVIS,
J. P. BUCKLAND.