C. A. WEST.
CAR-HEATERS.

No. 195,679. Patented Sept. 25, 1877.

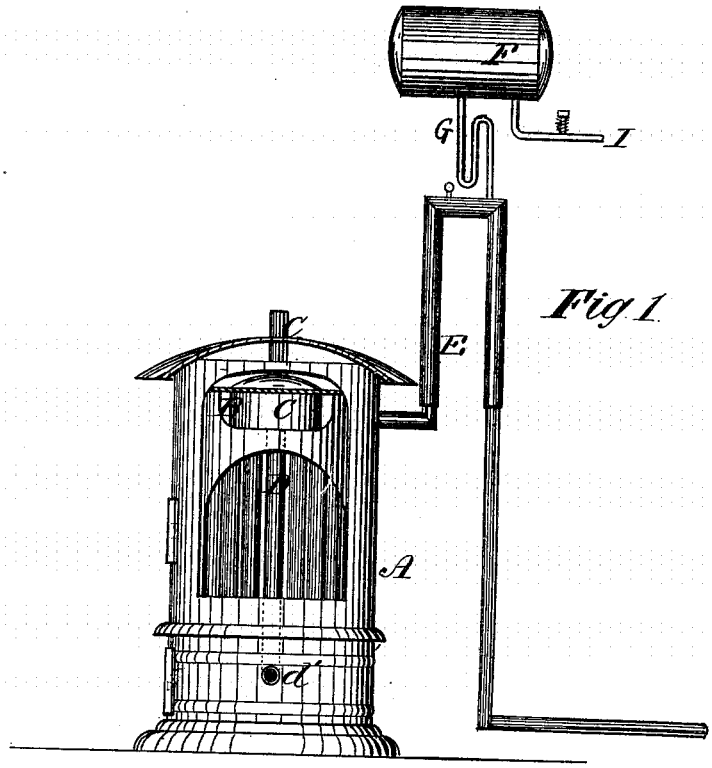


Fig. 1.

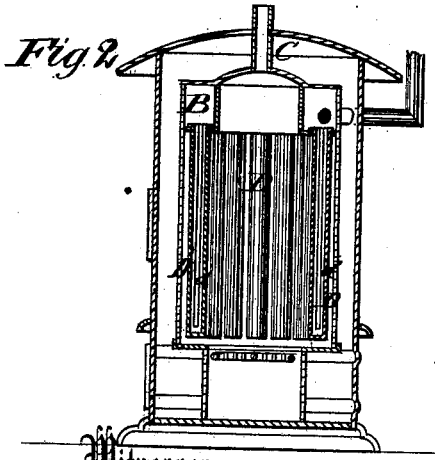


Fig. 2.

Fig. 3.

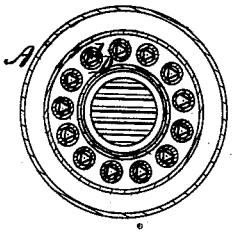
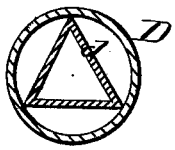


Fig. 4



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES A. WEST, OF RICHMOND, VIRGINIA.

IMPROVEMENT IN CAR-HEATERS.

Specification forming part of Letters Patent No. **195,679**, dated September 25, 1877; application filed April 26, 1877.

To all whom it may concern:

Be it known that I, CHARLES A. WEST, of Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Car-Heaters; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a side elevation of my improved heater, portions of the outer and inner casings and drum being represented as broken away to show interior of heater. Fig. 2 is a vertical central section. Fig. 3 is a horizontal section through heater, and Fig. 4 is a horizontal section of one of the vertical tubes forming fire-pot.

This invention has relation to that class of car-heaters in which the apparatus is adapted to the heating of water for circulation through pipes suitably disposed through the interior of the car.

The heaters of this class in ordinary use are usually provided with vapor-reservoirs located between the heater and the main body of the heating-pipes. The usual construction and arrangement of the vapor reservoir are such that the water from the heater finds its way to the heating-pipes through it, and as the reservoir contains water less heated than that entering from the heater the latter is considerably reduced in temperature and its warming properties greatly impaired.

The object of my invention is to overcome this disadvantage; and it accordingly consists in the provision of means whereby the heated water is caused to circulate through the car-pipes directly from the heater, and returned to the latter without passing through the expansion-reservoir.

My invention furthermore consists in the the combination, with the series of vertical water-pipes composing the fire-pot and the smoke-flue leading from the top of the heater, of an annular water-drum, from which said pipes depend, and through the center of which the heated vapors and products of combustion must pass to reach the smoke-flue.

Referring to the accompanying drawings, A designates a heater, of ordinary pattern externally. B designates a cast-iron drum, preferably of annular form, located within the heater and above the fire-space, a draft and smoke-flue, C, extending from the latter through the former and through the top of the heater.

D D are the upright tubes forming the fire-pot. Their upper ends are attached to and form open communication with the interior of the drum, while their lower ends are closed and detached from any part of the heater, so as to allow for expansion.

Inside each tube is a triangular or equivalent shaped tube, *d*, which terminates at a slight distance from the bottom of the outer tube, so as to leave a communicating space between the two.

The drum is intended to hold water for the supply of the tubes, and for circulation through the car.

One of the tubes forming the fire-pot extends below the rest, and communicates, by a branch, with the car-pipes, as shown at *d'*. The car-pipes have an upper communication with the drum by means of the crook E. Above this crook is arranged the expansion-reservoir F, connected with the former by means of a trap-pipe, G.

The circulation from the heater through the car-pipes, and thence again through the former, is continuous. Entering the heater through the branch *d'*, or otherwise supplied, the hotter current rises through the spaces between the triangular and outer tubes, while the cooler water descends through the triangular tubes, becoming heated in its descent. By this means a constant circulation is kept up within the pipes and the exposed heating-surfaces fully utilized.

From the drum in which the heated water accumulates it passes, by way of the crook E, to the car-pipes, and is prevented from entering the reservoir F by the trap G. The water from the reservoir fills the depending crook of the trap, and, being cooler than the water coming from the heater, has a greater specific gravity. According as the water in the heater becomes heated it expands and rises in the circulating-tubes, and ascends the crook E

until it reaches the water in the trap. Here its ascent to the reservoir is arrested, and, instead of entering the reservoir, the water from the heater passes on through the pipes which heat the car.

H represents a hot-water gage to indicate pressure, and I is a blow-off pipe leading down underneath the car.

The vertical tubes constituting the fire-pot are surrounded by a double-walled casing inside and outside, which are strongly bolted to a round base.

The heater may be connected to direct or indirect radiators, and used in buildings, &c.

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

1. The combination, with the smoke-flue C, passing through the upper part of the heater, and the depending water-pipes D, of the annular water-drum B, constructed and arranged, as described, for the passage of the heated vapors and products of combustion through its central opening to the flue C.

2. The combination, with the heater, expansion-reservoir, and circulation-pipes, of the trap, whereby the water from the heater is prevented from entering or passing through the reservoir, as described.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of April, 1877.

CHARLES A. WEST.

Witnesses:
WM. T. KING,
C. M. BRANCH.