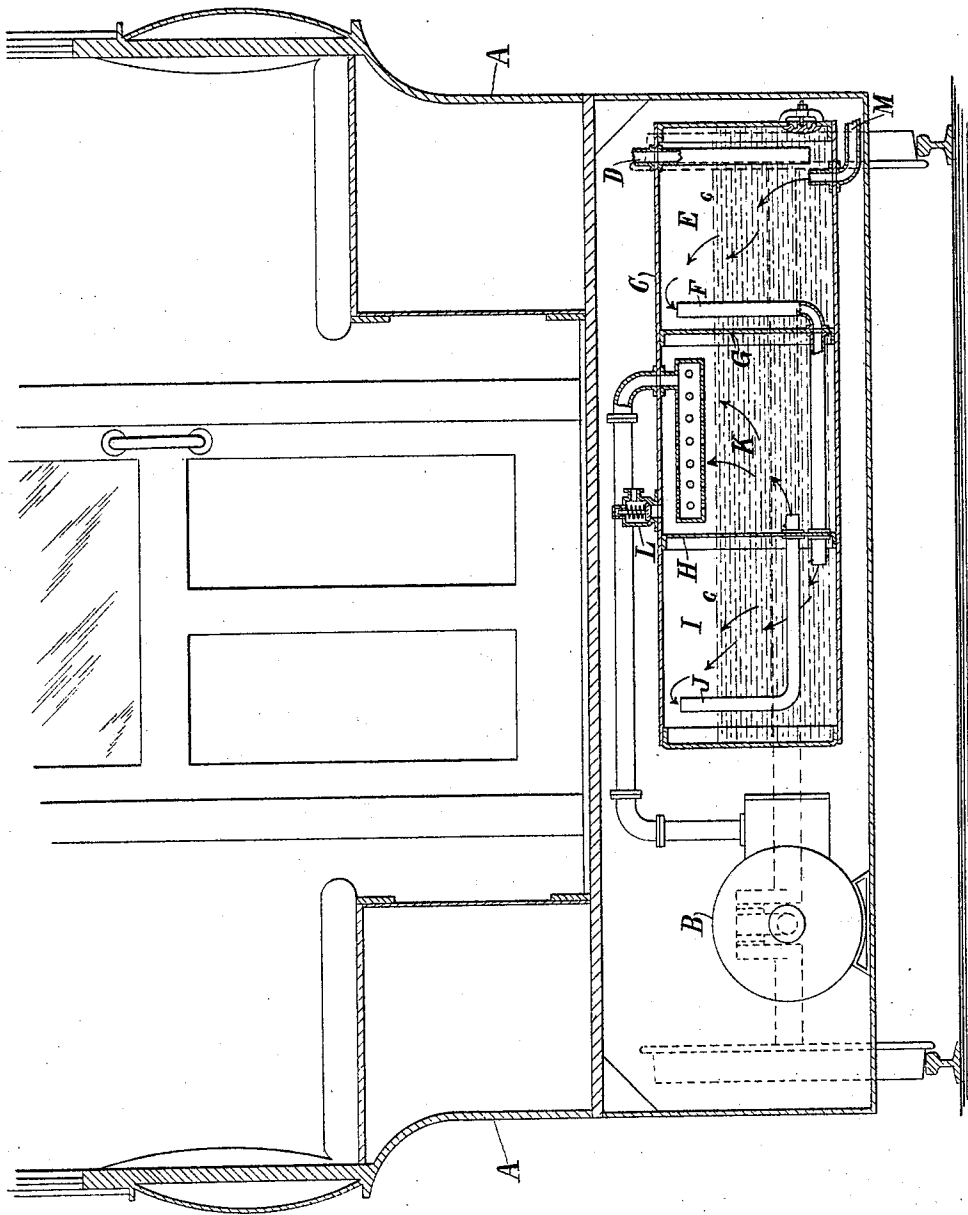


(No Model.)

J. H. HOADLEY.
COMPRESSED AIR HEATER.

No. 581,463.

Patented Apr. 27, 1897.



WITNESSES:

W. V. Biggood
J. H. Hoadley

INVENTOR

Joseph H. Hoadley

BY

Thos. W. Hoadley

ATTORNEYS

UNITED STATES PATENT OFFICE.

JOSEPH H. HOADLEY, OF NEW YORK, N. Y.

COMPRESSED-AIR HEATER.

SPECIFICATION forming part of Letters Patent No. 581,463, dated April 27, 1897.

Application filed January 10, 1896. Serial No. 574,962. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. HOADLEY, a citizen of the United States, residing in the city, county, and State of New York, have
5 invented a new and useful Improvement in Compressed-Air Heaters, of which the following is a specification.

My invention relates to an apparatus for heating compressed air by means of hot water, and has special reference to such a heater
10 when used on a vehicle propelled by a compressed-air motor.

My invention consists, first, in the combination, with a vehicle, of such a hot-water
15 air-heater placed transversely of the vehicle to prevent any sudden change of the forward movement of the vehicle or any inclination of the vehicle, as when on grades, from causing
20 an undue shifting of the water, which would otherwise occur, and which would tend to cause some water to be carried out through the air outlet or discharge pipe and from thence into the air-motor.

My invention further consists in dividing
25 the air-heater into compartments by transverse partitions to further prevent the undue disturbance of the water.

My invention further consists in a combination, with such a compartment-heater, of
30 air-ducts so arranged as to cause the air to pass several times up through the water, the ducts leading from the top of one compartment to the bottom of another and being so arranged as to discharge finally into a central
35 compartment from which the outlet leads to the motor.

The accompanying drawing, representing a transverse sectional view of a street-car, shows a heater embodying my improvements
40 applied to a car.

A represents a street-car or other vehicle propelled by an air-motor B.

C represents a reservoir of hot water, the hot-water level being shown at *c*. This water
45 may be heated by having steam injected into it or by a small stove permanently connected with it.

D shows a steam-inlet entering the first compartment E, the steam being discharged
50 near the bottom and allowed to pass up through the water in the direction of the arrows, passing the whole length of the said

first compartment, when it escapes through pipe F, which leads it through partitions G and H and discharges it again under the water in compartment I. The steam then percolates again through the water and passes the whole length of the compartment I and escapes down through pipe J, which conducts
55 it back through partition H to the central compartment K, where the steam is again discharged underneath the water and, passing up through the same, escapes through the safety-valve L.

M is the air-inlet through which the compressed air is discharged into the compartment E under the water. The compressed-air-supply pipe leads from a suitable compressed-air reservoir on the car, which is not shown in the drawing. The compressed air follows the course that the steam followed when the water was being heated and in so doing is in turn heated by the water and accumulated finally into the upper part of the central compartment K, from which it is led
65 off as needed to the motor through perforated outlet. By this means the air becomes substantially of the same temperature as the hot water before it escapes from the heater.

The heater being placed transversely of the vehicle, the water is not subject to the perturbations that it would have if placed longitudinally, with a consequent reduction in the liability of the water being carried over into the air-outlet. On very steep grades the
80 water would be so displaced as to very much interfere with the proper circulation of the air. The partitions G and H assist in preventing oscillations of the water. The air-outlet is placed in the top of the central compartment, as that is the position where there is the least liability of water being projected into it.

When the water in reservoir C is heated by steam, as above described, it is designed to
85 heat the water at intervals when the motor is at rest, the air-supply from the heater to the motor being closed to prevent escape of steam to the motor and cause the steam to escape through the safety-valve. When the motor
90 is started and the compressed air begins to circulate through the heater, the steam-supply is cut off.

Having thus described my invention, the

following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination, in a heater for heating air by passage of same through hot water, of a hot-water reservoir having a partition dividing the same into compartments, an air-passage leading from the air-space of one compartment through the partition and discharging under the water in the other compartment, an air-inlet under water in one compartment, and an air-outlet above water in the other compartment, substantially as set forth.

2. The combination, in a heater for compressed air in which the air is heated by passing through hot water, of a reservoir having partitions dividing it into compartments, a steam-inlet pipe (for charging the water with heat) entering one compartment and discharging below the water in said compartment, ducts leading from the air-space of one compartment through said partitions for car-

rying the steam (or air) from the air-space of said compartment to beneath the water of another compartment, compressed-air inlet beneath the water in one compartment and air-outlet from the air-space of another compartment, as set forth.

3. The compressed-air heater comprising a reservoir having central and end compartments, passages leading from the first end compartment to the bottom of the second end compartment, and from the top of the second end compartment to the bottom of the central compartment, an air-inlet to the bottom of the first compartment, and an air-outlet from the top of the central compartment, substantially as and for the purpose specified.

JOSEPH H. HOADLEY.

Witnesses:

ANNA M. FRANKLIN,
M. V. BIDGOOD.