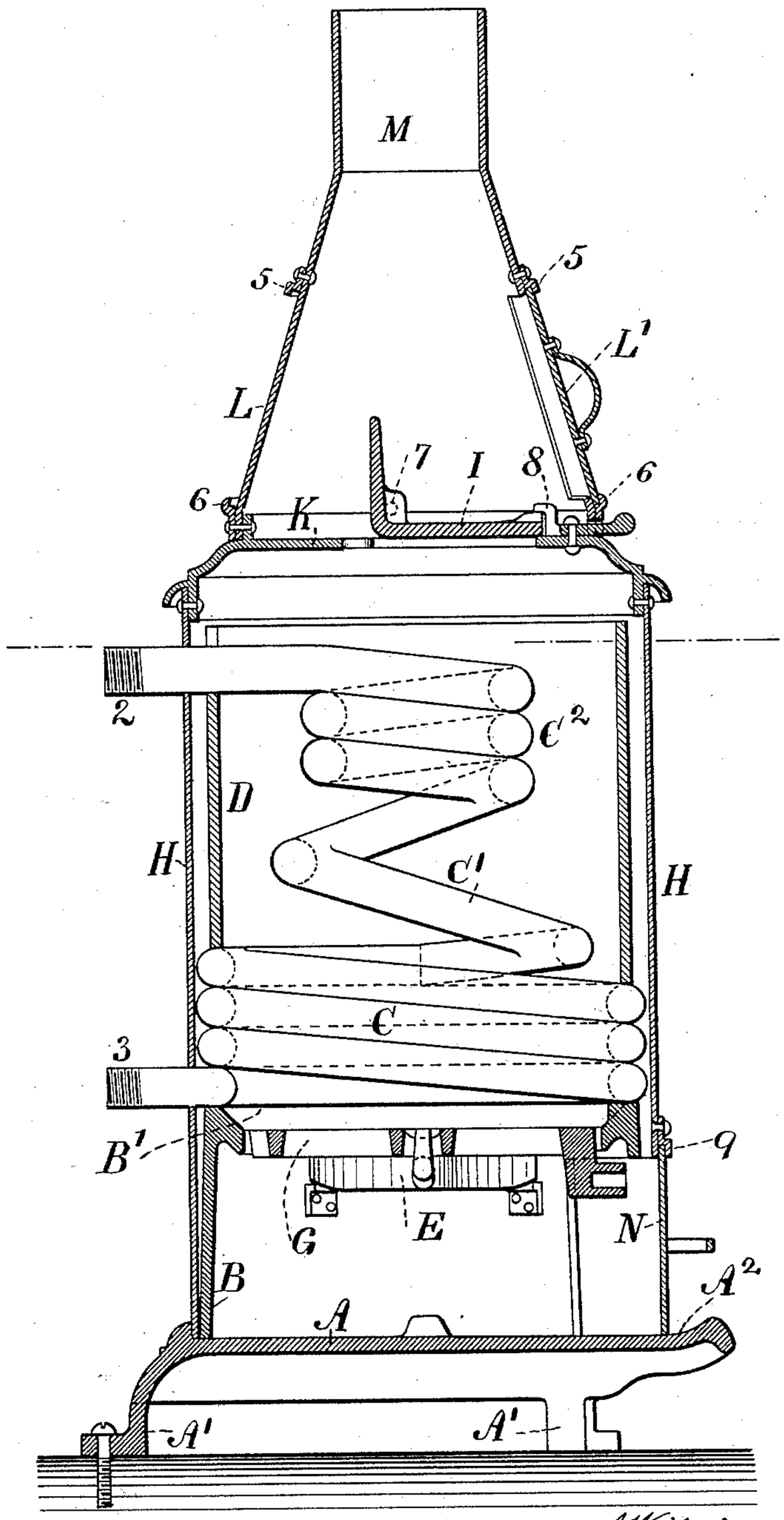
(No Model.) 2 Sheets—Sheet 1.

W. C. BAKER.

CAR HEATER.

No. 476,973. Patented June 14, 1892.

Fig. 1.



Witnesses:
J. Stair
Chas. H. Smith

Inventor:
William C. Baker
per Lemuel W. Serrell
Atty

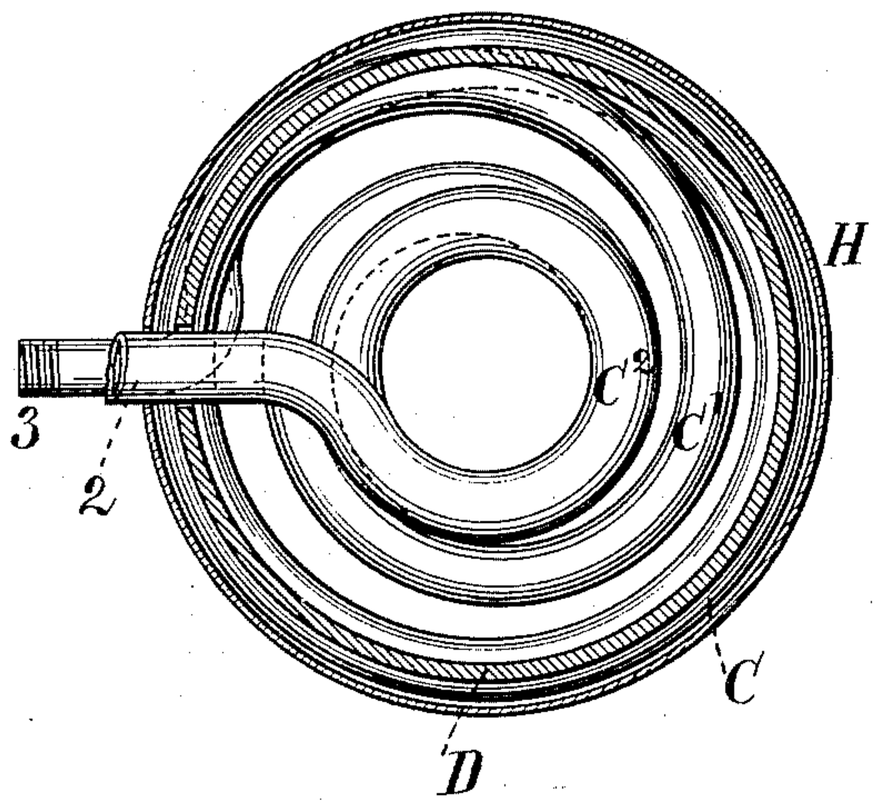
(No Model.) 2 Sheets—Sheet 2.

W. C. BAKER.

CAR HEATER.

No. 476,973. Patented June 14, 1892.

Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM C. BAKER, OF NEW YORK, N. Y.

CAR-HEATER.

SPECIFICATION forming part of Letters Patent No. 476,973, dated June 14, 1892.

Application filed January 6, 1892. Serial No. 417,231. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. BAKER, a citizen of the United States, residing at the city and State of New York, have invented an Improvement in Car-Heaters, of which the following is a specification.

This car-heater is made with reference to compactness, so as to obtain great heating capacity in a small space and at the same time to obtain great strength in the parts, so that they are not liable to injury by the heat, and risk of breakage in case of collisions is reduced to a minimum.

I make use of a wrought-metal case, preferably steel, permanently connected at the bottom to the base and at the top to the top plate of the heater, and within the case is a base supporting the grate and upon which rests a coil of pipe, forming the exterior of fire-chamber, and above this rises a fire-pot, and the pipe for the circulating water is bent inwardly and formed into a second coil of smaller diameter, and the pipe is of larger size, so that the upper part of the coil is surrounded by the incandescent fuel, while the lower part of the coil forms the wall of the fire-chamber, and the increase in the size of the pipe forming the coil gives freedom of circulation, so that the risk of backward circulation or resistance to the circulation by bubbles of steam formed in the pipe is lessened.

In the drawings, Figure 1 is a vertical section of the heater complete, and Fig. 2 is a plan view of the coil and section of the case.

The base A of the heater is usually provided with legs A′, that are firmly bolted to the floor, and with a projecting hearth A^2, and upon this base A rests the ash-pit case B, the upper end of which forms a circular bearing B′ for the lower coil of the circulating-pipe C, and this pipe is coiled around two, three, or more coils, and, rising above the circular upper end of the ash-pit case, forms the lining for the lower part of the fire-chamber, the fire being entirely within this coil in this portion of the fire-chamber, and the pipe is bent inwardly at C′ and coiled to form an upper coil C^2 of considerably-less size than the lower coil C, and there is a fire-pot D, resting at its lower edge upon the top of the coil C, and the distance between the interior of the fire-pot D and the upper coil C^2 is sufficient for the free passage of coal around the upper coil C^2, and this upper coil C^2 is large enough in its interior measurement for the fuel to pass freely down within the coil, and the pipe forming the coils C C′ C^2 is preferably of increasing diameter upwardly, so that the pipe at 2 for the connection that passes upwardly to the expansion-vessel is larger than the portion 3 at the bottom of the coil, to which the return-pipe of the car-radiator is connected.

The grate G is circular and is supported by a bracket E, extending out from the ash-pit case B, and this grate and bracket can be of any desired construction—such, for instance, as that represented in my patent, No. 353,839, dated December 7, 1886.

Around outside the coil C and outside the ash-pit case B and the fire-pot D is the cylinder H, which is preferably a steel tube, so as to be fire-proof, the lower end of which is rigidly connected to the base A, preferably by bolts, and the upper end of the case is rigidly connected to the top plate K, which top plate may be more or less ornamental and conoidal, so as to receive the conical base L of the smoke-flue M, and in this conical base L is a fuel-opening with a sliding door L′, received into the annular flanges 5 and 6, as usual in this style of heater, and there is in the top plate K an opening with a safety-plate I of any usual character. I have shown this safety-plate as pivoted at 7 and held by a latch 8. In the fire-proof cylinder H there is an opening to give access to the ash-pit and a door N to close this ash-pit, and this door is to be of any suitable character—such, for instance, as that represented in my patent, No. 439,287; but I have represented the same as adapted to slide laterally in the segmental-grooved flange 9 upon the exterior of the cylinder H, and in a similar groove in the upper surface of the base A. It will now be understood that when fuel is inserted after the door L′ and safety-plate I have been opened such fuel falls down within the coil C^2, and it spreads below such coil C^2 and fills the coil C and rests upon the grate G, and should there be any coal falling outside the coil C^2

it will be confined by the fire-pot D, and in this character of heater the most intense fire will be within the coil C, and this coil, being full of water, becomes highly heated; but the fire-proof cylinder H cannot become of a higher temperature than the coil and the water, and the products of combustion as they rise and pass through the fire-chamber within the fire-pot come into contact with the coil C^2, so that the heat is concentrated upon the coils to the best advantage for imparting to the water circulating through such coils a high temperature, and the car-heater as a whole is made as small in diameter as possible, because there is no lost space between the coil C and the fire-proof cylinder H, and at the same time this fire-proof cylinder H does not become heated to such an extent as to endanger the surrounding woodwork of the car, and the air-space between the fire-pot D and the fire-proof cylinder H prevents the heat of the former being conducted to the latter, and, if desired, this space may receive asbestus paper or packing to act as a non-conductor and to retain the fire-pot in its position.

It is advantageous to make the ash-pit case slightly tapering, as represented, in order that it may fit closely within the bottom of the fire-proof cylinder H and be at a suitable distance from the interior of such cylinder at the upper end of the ash-pit case, so that the fire-proof cylinder will not become unduly heated by conduction, and this construction also allows for connecting the ash-pit case and the fire-proof cylinder together and for bolting the ash-pit case to the base.

I claim as my invention—

1. The combination, in a car-heater, of an ash-pit case and grate, a coiled pipe for the circulating water, the lower coil of pipe resting upon the top of the ash-pit case and the coil surrounding the fire at this place, the pipe of the coil being also bent inwardly and formed into a second or upper coil of less size, a fire-pot surrounding the upper coil and above the lower coil, a fire-proof cylinder surrounding the ash-pit case, the lower coil, and the fire-pot, and a top plate connected with the fire-proof cylinder, a safety-plate, and a smoke-flue, substantially as set forth.

2. A coil for a car-heater, composed of a pipe of increasing diameter upwardly, such pipe being coiled to form the wall of the fire-chamber at the lower portion and bent inwardly and formed into an upper coil of less diameter, substantially as set forth.

3. The combination, in a car-heater, of a base, an exterior fire-proof case connected at its lower end to the base, a top plate permanently connected to the exterior case and provided with flue-openings and a safety-plate, an ash-pit case within the lower part of the exterior case, a grate within and supported by the ash-pit case, a coil of pipe above the ash-pit case and forming the lower inclosure of the fire-chamber, and a case above the coil of pipe and within the exterior case and forming the upper part of the fire-chamber, substantially as specified.

4. The combination, in a car-heater, of a base-plate and exterior fire-proof cylinder, an ash-pit case within the cylinder, such ash-pit case being flaring to set closely within the fire-proof cylinder at the bottom and be slightly distant from the same at the top, a pipe for circulating water, coiled to form the lower part of the fire-chamber, such coil being within the fire-proof cylinder and the pipe being bent inwardly and formed into an upper coil, a fire-pot within the fire-proof cylinder and around the upper coil, and a top plate and escape-flue, substantially as set forth.

Signed by me this 17th day of December, 1891.

W. C. BAKER.

Witnesses:
GEO. T. PINCKNEY,
WILLIAM G. MOTT.