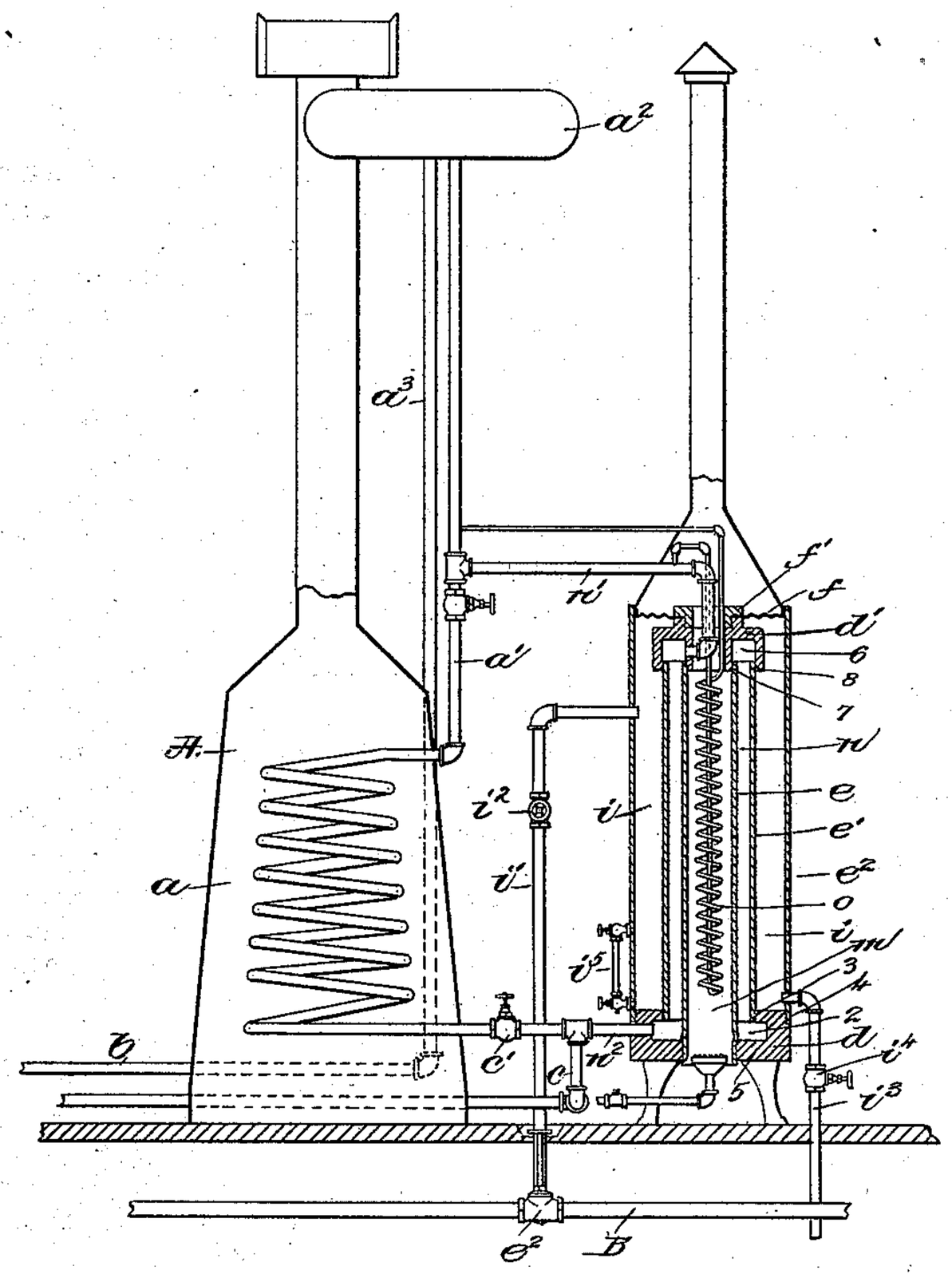
(No Model.)

J. B. PORTER.

CAR HEATING APPARATUS.

No. 402,540. Patented Apr. 30, 1889.



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UNITED STATES PATENT OFFICE.

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CAR-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 402,540, dated April 30, 1889.

Application filed April 21, 1888. Serial No. 271,420. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. PORTER, of New York, county and State of New York, have invented an Improvement in Car-Heating Apparatus, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention has for its object to improve the construction of car-heating apparatus, and the invention is especially applicable to a boiler or heater adapted to be used in connection with another or auxiliary heater—such, for instance, as the Baker heater.

In other applications filed by me, Serial Nos. 271,418 and 271,419, boilers or heaters of different constructions to be used in connection with other heaters are shown, and the boiler or heater herein to be described is designed to be used in substantially the same manner.

In accordance with this invention a heating-coil placed in a suitable heating-chamber and forming what is now commonly known as a "Baker heater" is employed as the auxiliary heater, the said coil being in operative contact with the system of warming or circulating pipes. Another heater, which forms the essential feature of this invention, is placed adjacent to the aforesaid heater, it consisting of a water-chamber surrounded by or inclosed by a steam-chamber. Steam is admitted to the steam-chamber from the main steam-pipe to thereby heat the water contained in the water-chamber. Within the water-chamber a supplementary heating-chamber is formed, which will be heated by a flame—such, for instance, as a gas-jet, or it may be a hydrocarbon burner.

The invention therefore consists in details of construction to be hereinafter pointed out.

The drawing shows, in vertical section and partial elevation, car-heating apparatus embodying this invention.

The coil *a* is placed in the heater A, the upper end of said coil being connected by a pipe, *a'*, with a water-reservoir or expansion-chamber, a^2. A pipe, a^3, leads from the reservoir a^2, and connects with a system of warming or heating pipes, *b*. The lower end of the coil *a* is also connected, as by the pipe *c*, with the system of warming or circulating pipes. A cock, *c'*, is placed between the coil *a* and the pipe *c*.

Another heater is employed which comprises the end piece or base *d*, provided with an internal groove or passage, 2, and with internal screw-threads, 3, external screw-threads, 4, and the flange 5, and the head or end piece *d'*, having the internal groove or passage, 6, and internal screw-threads, 7 and 8. A tube, *e*, receives or engages the flange 5 of the base *d* at one end and the screw-threaded portion 7 of the head *d'* at the other end. Another tube, *e'*, is arranged concentric to the tube *e*, it receiving or engaging the screw-threaded portion 3 of the base *d* at one end and the screw-threaded portion 8 of the head *d'* at the opposite end. Another tube, as e^2, is also arranged concentric to the tubes *e* and *e'*, it engaging the screw-threaded portion 4 of the base *d* at one end and engaging a diaphragm, *f*, which is attached to the head *d'*, at the opposite end, said diaphragm *f* being held in place by a nut, *f''*.

By the employment of the tubes *e e' e²*, as herein shown and described, three chambers are formed, one, as *i*, which is an annular chamber and has leading into it a pipe, *i'*, which is connected directly with the main steam-pipe B, extending beneath the car, a suitable cock, i^2, being placed in said pipe to control the passage of steam therethrough. Another pipe, i^3, leads from the lower end of said annular chamber *i*, by which the water of condensation is removed, a suitable cock, i^4, being placed in said escape-pipe. A water-gage, i^5, is also attached to said annular chamber at its lower end to determine the quantity of condensation contained in the chamber *i*. The second chamber, *n*, formed by or between the tubes *e* and *e'*, is a water-chamber, and opens at each end, respectively, into the annular grooves or passages 2 and 6 in the end pieces, *d d'*. A pipe, *n'*, leads into the annular groove or passage 6, it being connected with the pipe *a'*, which leads to the reservoir a^2, and another pipe, n^2, leads from the annular groove or passage 2 to the pipe *c*, connecting with the warming or circulation pipes.

It will be observed that when the three-way cock e^2 of the main steam-pipe B is open and the cock c' closed the steam passes upward into the chamber i, completely filling the said chamber and jacketing the water-chamber n, thereby heating the water contained in said chamber, which starts and thereafter continues to circulate freely through the system of warming or circulating pipes.

If it is desired, a fire may be kindled in the heater A, and thereby employ the coil a as a heating-coil.

The inner chamber, m, or that one formed within the tube e, is also employed as a heating-chamber, it being open at the top for the products of combustion or to maintain combustion and supplied at the bottom with a gas-burner or hydrocarbon-burner, as desired, or other heating apparatus.

A supplemental water-coil, o, may be contained in the heating-chamber, m, the ends of said coil being connected directly or indirectly with the pipe a'.

When the heating-chamber m is utilized, the water contained in the chamber n will be heated, and also the water contained in the coil o.

By the construction herein shown a very large surface of water is exposed to the action of the chambers i or m. The several independent means of heating the water contained in the warming-pipes may be used independently or conjunctively, as desired.

It may be desired to omit the auxiliary heater A and its coil a and to use the main heater herein shown alone, it being heated by a flame or by steam, as desired.

I claim—

1. In a car-heating apparatus, the main steam-pipe and the pipe i' leading therefrom to the steam-chamber, combined with the main heater comprising the closed steam jacket or chamber i, the water-chamber n, contained concentrically and entirely within it, the open-end heating-chamber m, contained within the water-chamber, the grooved heads d d', through which the chamber m is continued, and the circulating-pipes opening into said heads, substantially as described.

2. In a car-heating apparatus, the heater consisting of the vertical annular water-chamber n and the vertical annular steam or heating chamber i, parallel to and surrounding it and attached at its lower end to the head d, the annularly-grooved heads d d', which form the ends of the chamber n, and the diaphragm f, closing the upper end of the chamber i, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN B. PORTER.

Witnesses:
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