

(No Model.)

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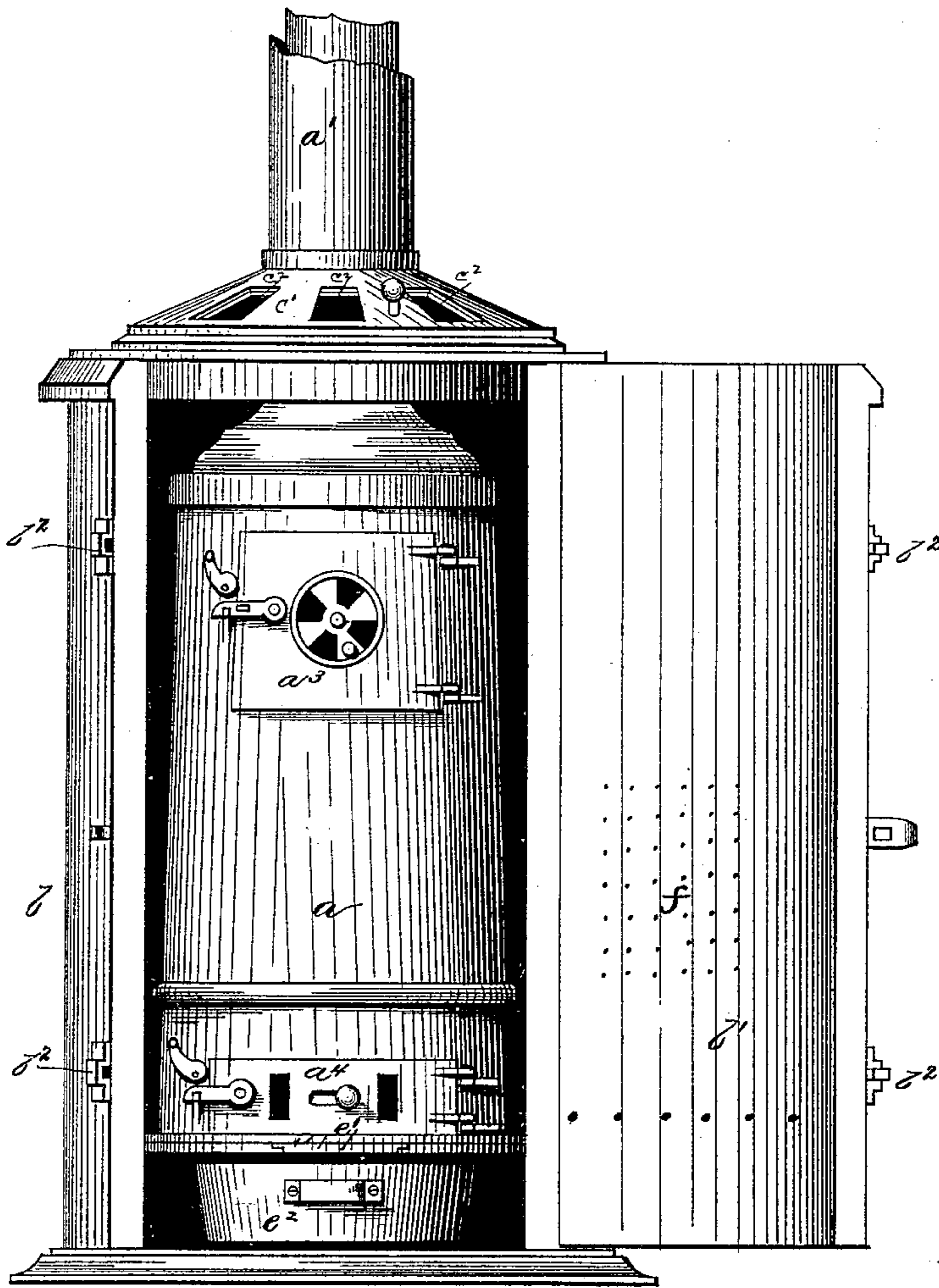
A. W. HERR.

HEATER.

No. 386,127.

Patented July 17, 1888.

FIG. 1.



Witnesses:

H. C. W. Arthur  
as Pare,

Inventor,

August W. Herr.

Per,

H. Harrison,  
Attorney.

(No Model.)

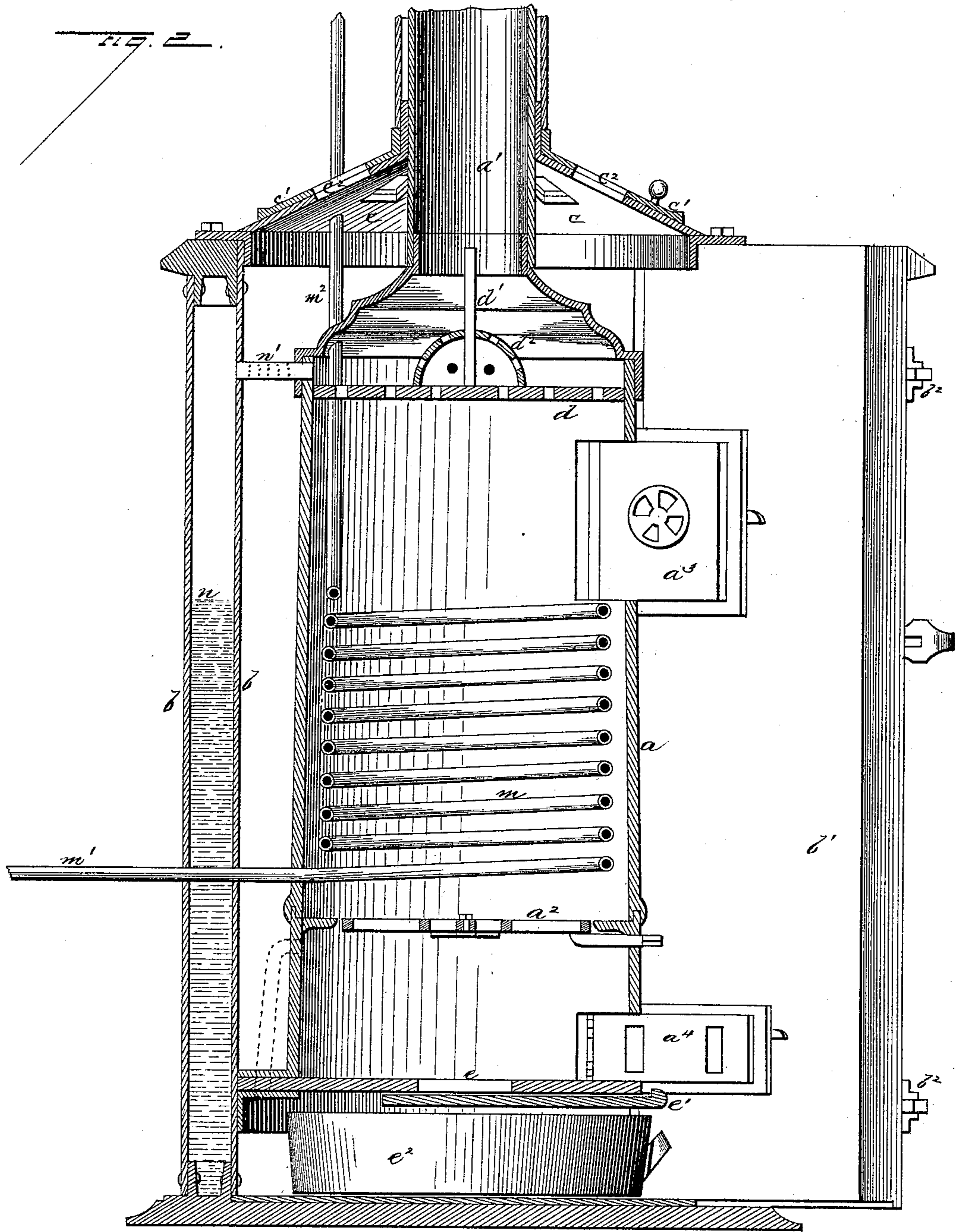
3 Sheets—Sheet 2.

A. W. HERR.

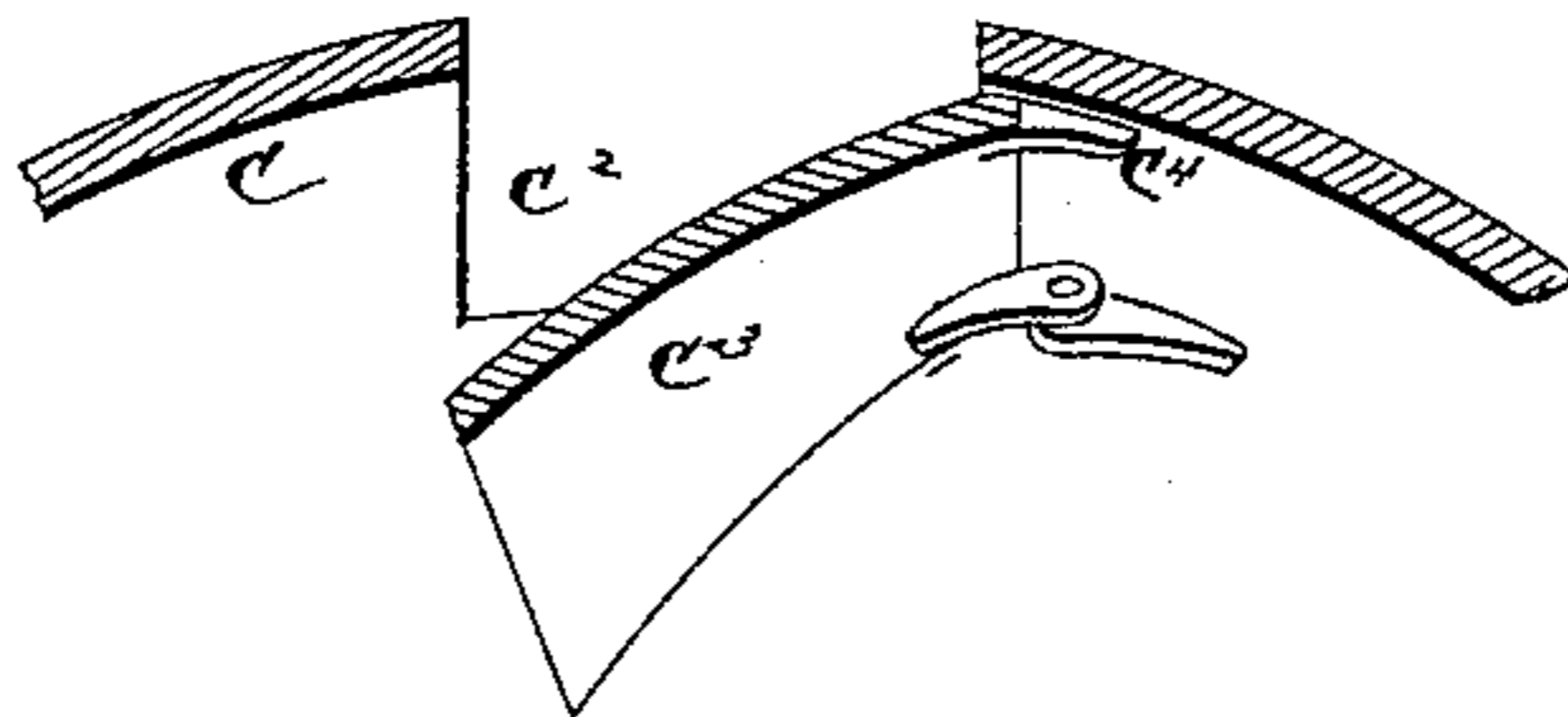
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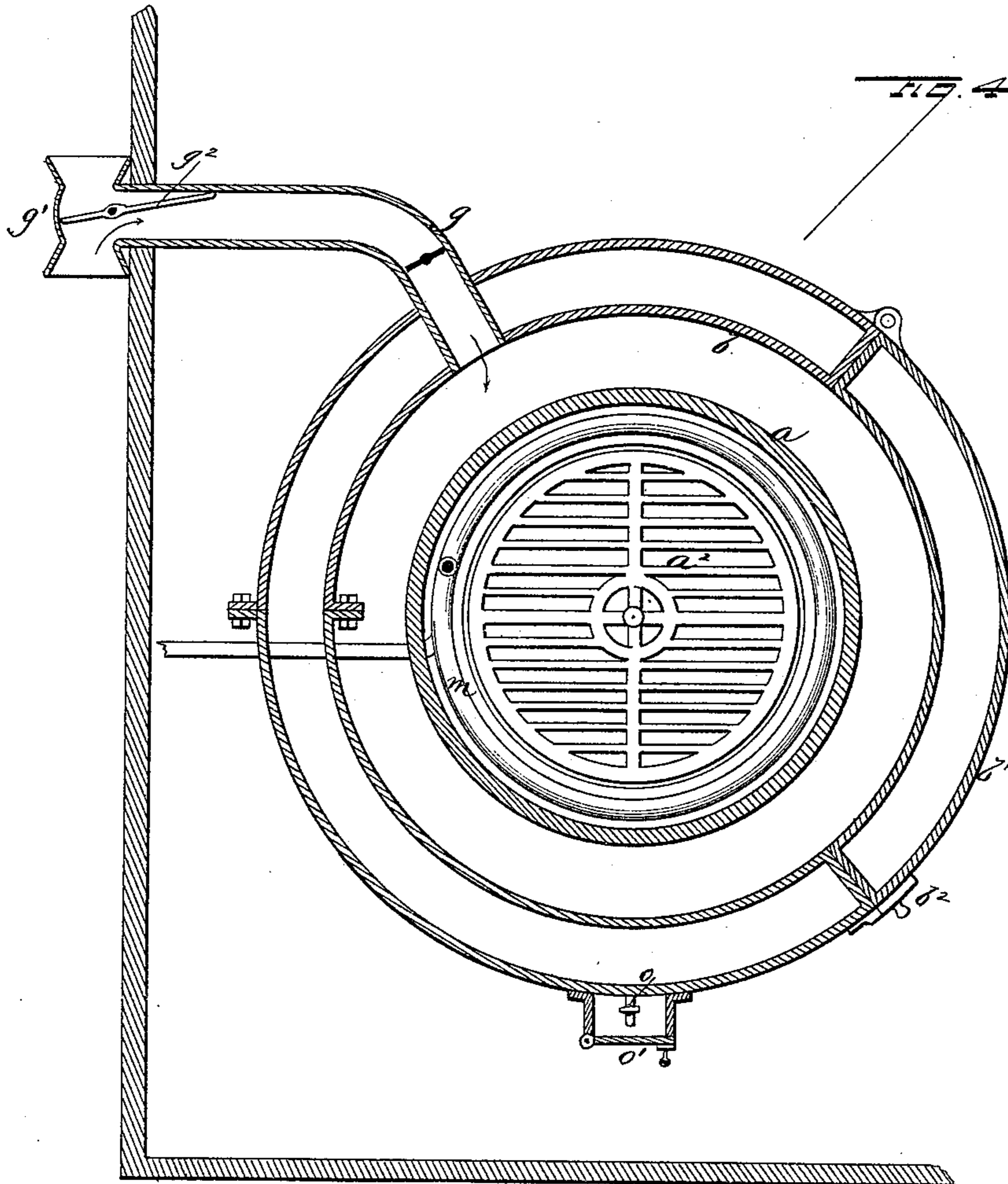
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H. C. McArthur  
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Inventor,  
August W. Herr.

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# UNITED STATES PATENT OFFICE.

AUGUST W. HERR, OF CHICAGO, ILLINOIS.

## HEATER.

SPECIFICATION forming part of Letters Patent No. 386,127, dated July 17, 1888.

Application filed May 20, 1887. Serial No. 238,818. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUST W. HERR, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Heaters, of which the following is a specification, to wit:

This invention relates to an improvement in heaters; and it consists in certain peculiarities of the construction and arrangement of the same, substantially as will be hereinafter more fully set forth and claimed.

In order to enable others skilled in the art to which my invention pertains to make and use the same, I will now proceed to describe its construction and operation, referring to the accompanying drawings, in which—

Figure 1 is a front elevation with the door of the car open. Fig. 2 is a central vertical section; Fig. 3, a detail section of one of the safety-valves, and Fig. 4 a horizontal section of the heater and casing and a part of the side and end walls of a car-body.

$a$  represents the main body of my heater, to the top of which is connected the smoke-escape pipe  $a'$ . In the lower part of the heater is a grate,  $a^2$ , and the cylinder is provided with the usual fire-door,  $a^3$ , and ash-pit door  $a^4$ , above and below the grate, respectively. This heater, while well adapted for use in any location and for any purpose, is especially intended for use as a car-heater. For this purpose it is necessary not only to protect the heating-cylinder from contact with anything likely to be injured by the heat, but also to provide against the escape of the contents should accident to the car displace or overturn the heater. To this end I surround the cylinder by a double-walled casing,  $b$ , having an air or water space between its inner and outer walls. A portion of this casing is hinged to form a door,  $b'$ , by which access is had to the stove proper, which door is provided with suitable latches,  $b^2$ , to secure it firmly in its closed position. The top of this casing is formed double, as in Fig. 2, the under plate,  $c$ , being stationary, and the outer one,  $c'$ , having a short rotary movement, and both are formed with openings  $c^2$ , by which air escapes into the car or room. It is evident that these openings may be wholly or partially opened or

closed by moving the plate  $c'$ , and the amount of heated air supplied to the car thus regulated at will. To the under plate,  $c$ , at one side of each opening  $c^2$ , is hinged a small flap or valve,  $c^3$ , which is represented in Fig. 3. Each valve has a lug,  $c^4$ , cast or secured on its rear edge, which, by contact with the plate  $c$ , holds the valve from falling too far and retains it in position for proper action. From this it will be seen that, normally, the valves rest, as represented in the drawings, with the opening free for the passage of air; but should the heater be upset the weight of these valves causes them to at once close, and if the doors of the heating-cylinder should be burst open, no coals can then escape, but all are confined within the protecting-casing, where they can do no harm.

The upper part of the fire cylinder  $a$  is provided with a heavy perforated plate,  $d$ , through which the smoke, gas, and other products of combustion must pass to the smoke-pipe. This plate becomes so highly heated that the gases are all consumed when coming in contact with it, and thus add to the heat-producing qualities of the fuel used. This plate is also provided with a standard or rod,  $d'$ , which extends up into the smoke-pipe, and upon this rod is a half-spherical valve,  $d^2$ , which, when the stove is capsized, slides readily upon the rod and closes the smoke-pipe to effectually prevent the escape in that direction of any ignited material. This valve is also perforated, as at  $d^3$ , to present as little interference to the passage of the smoke and gas in either position as is possible.

The main portion of the heating-cylinder is preferably secured in the casing a short distance above the floor or base, and this prevents hot coals falling into the ash-pit from heating the base sufficient to injure surrounding objects. The bottom of the ash-pit is formed with a central opening,  $e$ , closed by a slide,  $e'$ , and beneath it is placed a removable pan,  $e^2$ . The coals and hot ashes are first raked down into the ash-pit and allowed to cool, after which the slide  $e'$  is drawn and the ashes allowed to fall into the pan, in which they are removed without dust or dirt and the device kept clean.

Air is admitted to the interior of the casing

for purposes of combustion often by means of small holes *f* in the door-casing, the holes in the inner and outer walls of the door being so placed as to prevent any possibility of hot coals from passing through in case of accident. For supplying the heated air for the car or room, however, I provide a pipe, *g*, passing entirely through the double casing and out through the side of the car, as in Fig. 4, and provided on its outer end with a head, *g'*, opening in both directions, and in which is a pivoted plate, *g''*, longer on one end than the other. The forward motion of the car acting on the unequally-balanced plate always keeps open the air-passage, so that the forward rush will direct a large body of pure air into the pipe and casing, where it is thoroughly heated by the stove and passes up through the top of the casing into the car, and a constant supply of pure air is thus readily had, and is well adapted for heating by hot air; but in some cases it is desired to heat by the use of hot water or steam, in which case a coil of pipe, *m*, is placed in the fire-pot, as in Fig. 2, and the return *m'* and supply *m''* of the circulating-pipes, connected as shown, and led off through car in any of the usual and well-known ways; and it will be seen that my heater is thus well adapted to any desired mode of distributing the heat, and, if suitable, both the air and water circulations may be used at the same time.

I prefer to fill the hollow casing partially full of water, as at *n*, by any well-known means. For instance, a short inlet-pipe provided with a screw-threaded cap may be fitted into the outer wall of the casing and protected by a device similar to *o'*, and connect this hollow water-space with the interior of the stove (preferably above the perforated plate *d*) by a pipe, *n'*, which is perforated at its sides, where it passes through the air space around the heating-cylinder. This not only gives a vent for any steam that might be raised, but allows enough moisture to escape through the perforated pipe to render the heated air moist and agreeable for heating purposes, while in case of accident and the smashing or upsetting of the whole device the water at once rushes into the stove and renders the fire harmless. I provide one or more try-cocks, *o*, in the side of the casing, in order that the attendant may at

any time ascertain the amount of water therein, and close these in with a small door, *o'*, locked to prevent tampering by any one but those whose duty it is to attend to it.

It will be seen from the foregoing that my heater is not only adapted to any system of car-heating, but is so constructed that in case of accident all fire is confined to the casing and cannot under any circumstances get out.

In some cases the ash-pan is used as a water-pan, and the chamber in which it is placed is connected by a pipe or pipes with the stove-cylinder just below the grate, and the water in this pan is thus readily conducted to the fire-pot.

There is no heat lost by inclosing the stove in the casing, but all is carried out by the circulation and distributed through the car far better than if no casing is used. The pipe *n'*, connecting the stove and its casing, also acts as a brace to more firmly bind the whole together.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for heating, the combination, with a heating cylinder or stove having a smoke-escape pipe, a valve located at the entrance to said pipe to automatically close the same in case the stove should become upset, of the double wall-casing surrounding the heater, and provided with a door and having a stationary and a rotating plate, each plate provided with openings, and a flap-valve having a stop-lug, substantially as and for the purpose specified.

2. The combination, with a stove or heating-cylinder, of a protecting-casing surrounding the same, said casing provided with a stationary and a rotating plate, each plate provided with openings adapted to register one with the other, and a flap-valve having a stop-lug hinged beside each opening to automatically close said opening in case the stove should upset, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUST W. HERR.

Witnesses:

W. C. MCARTHUR,  
W. S. MCARTHUR.