

(No Model.)

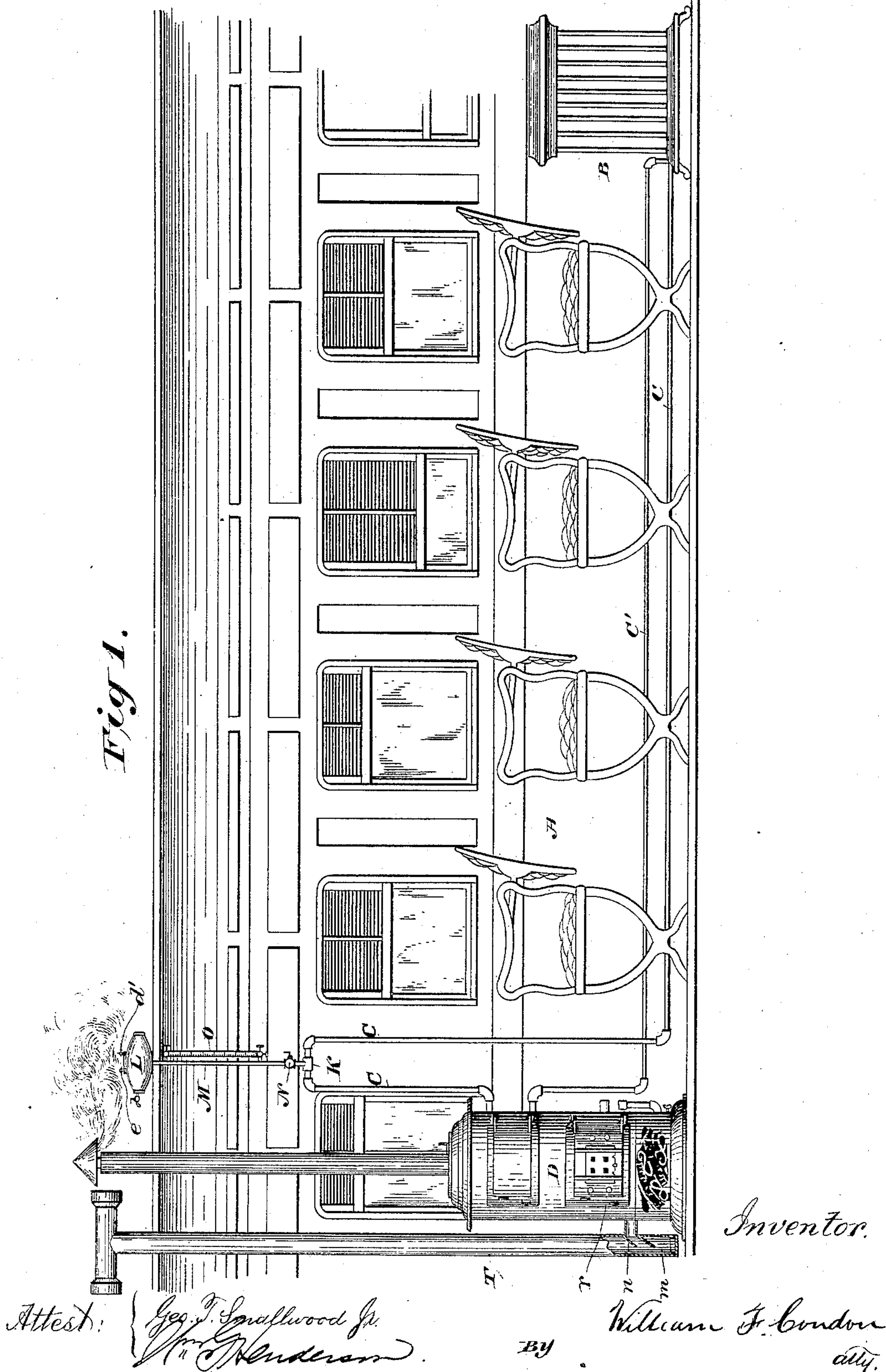
2 Sheets—Sheet 1.

W. F. CONDON.

SAFETY CAR HEATER AND VENTILATOR.

No. 277,546.

Patented May 15, 1883.



(No Model.)

2 Sheets—Sheet 2.

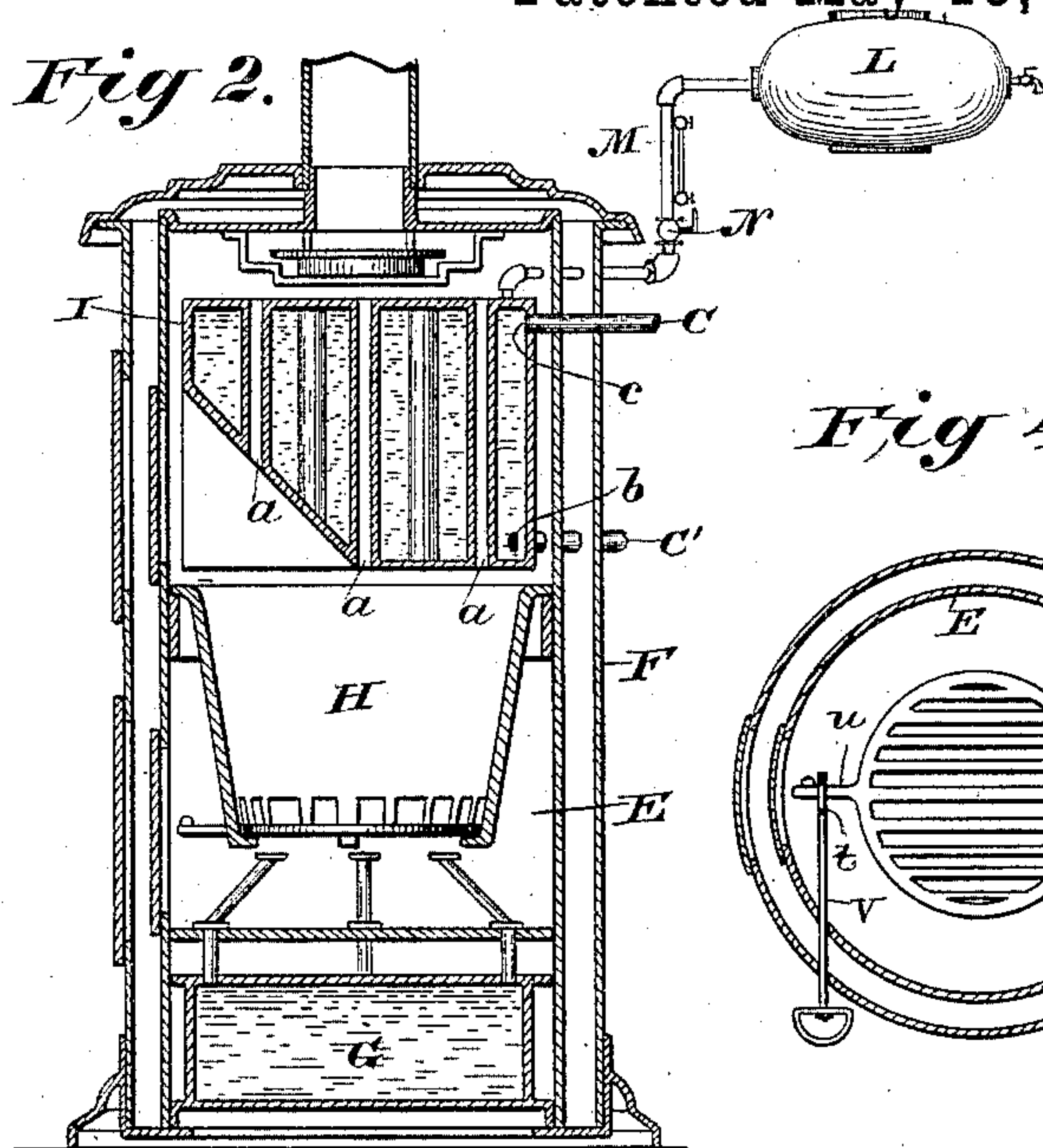
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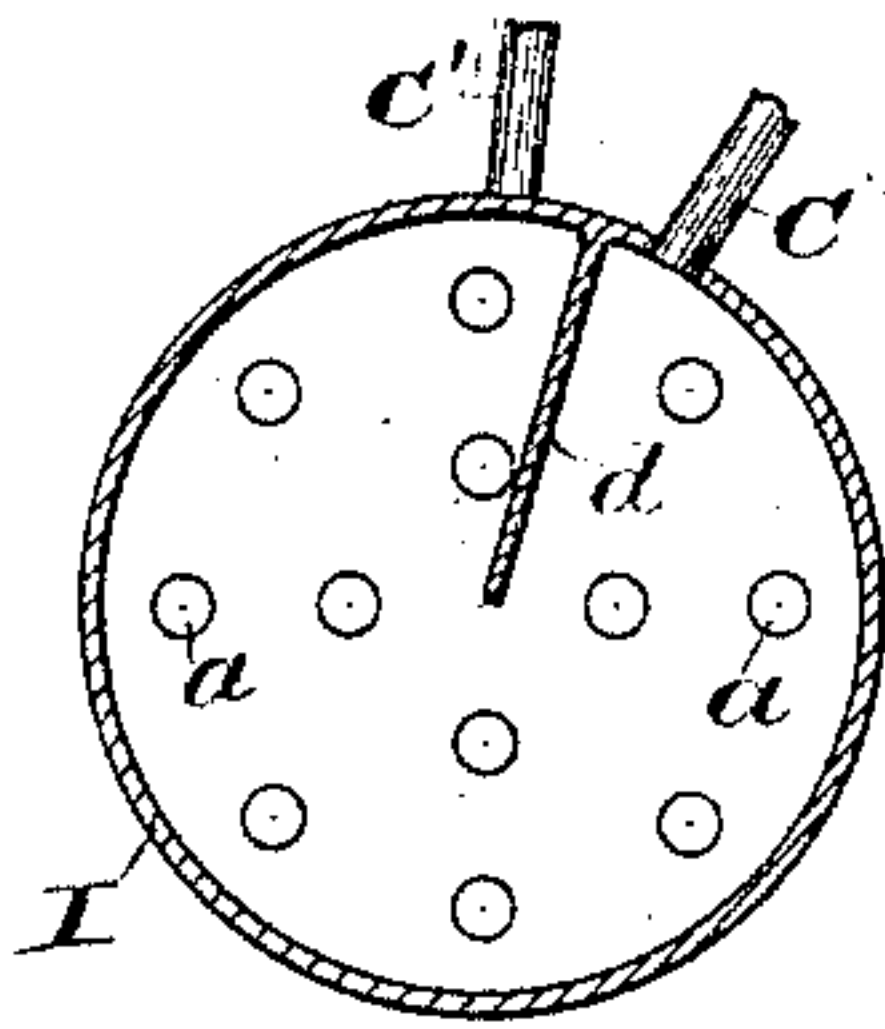
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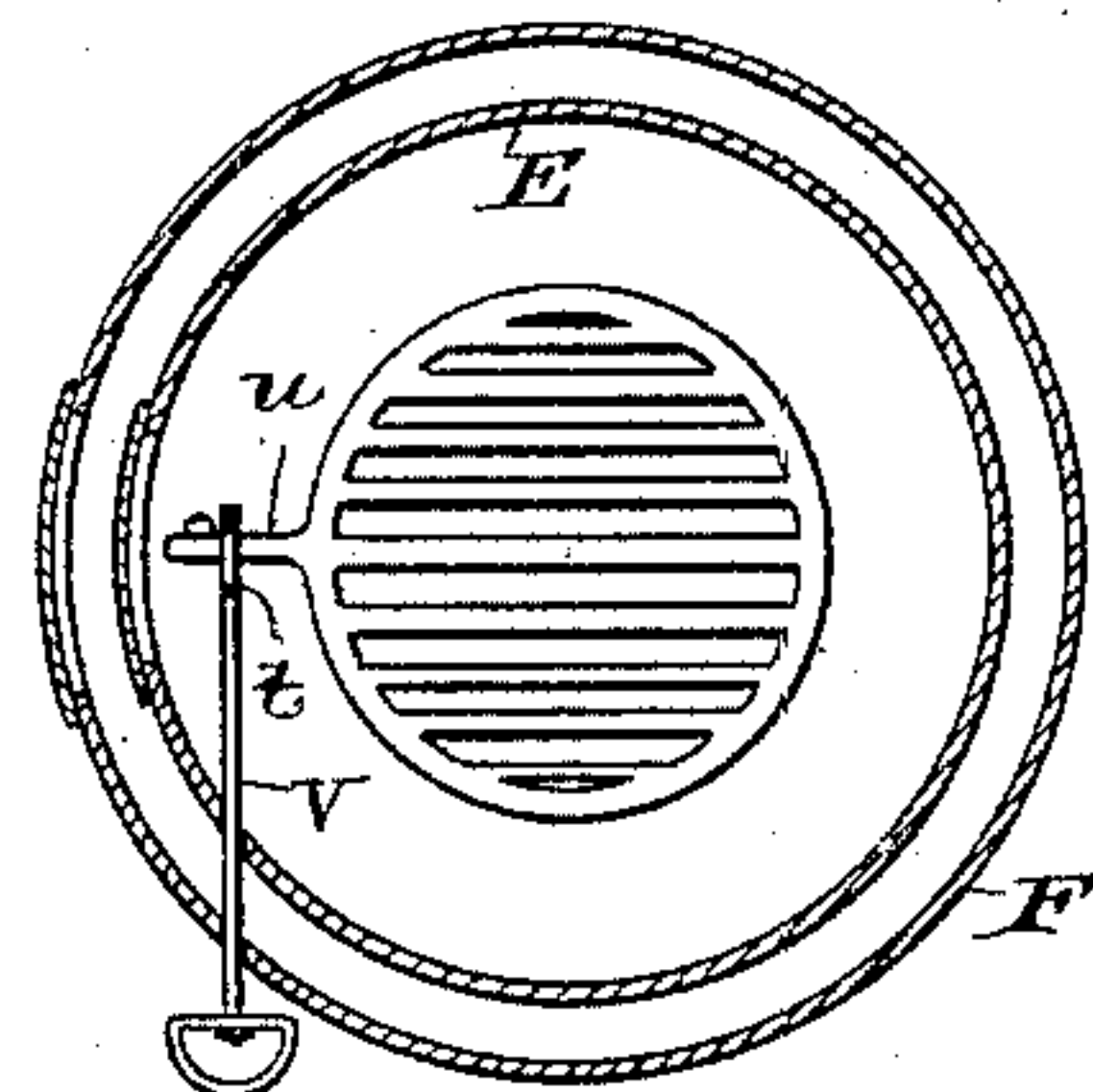
*Fig 2.*



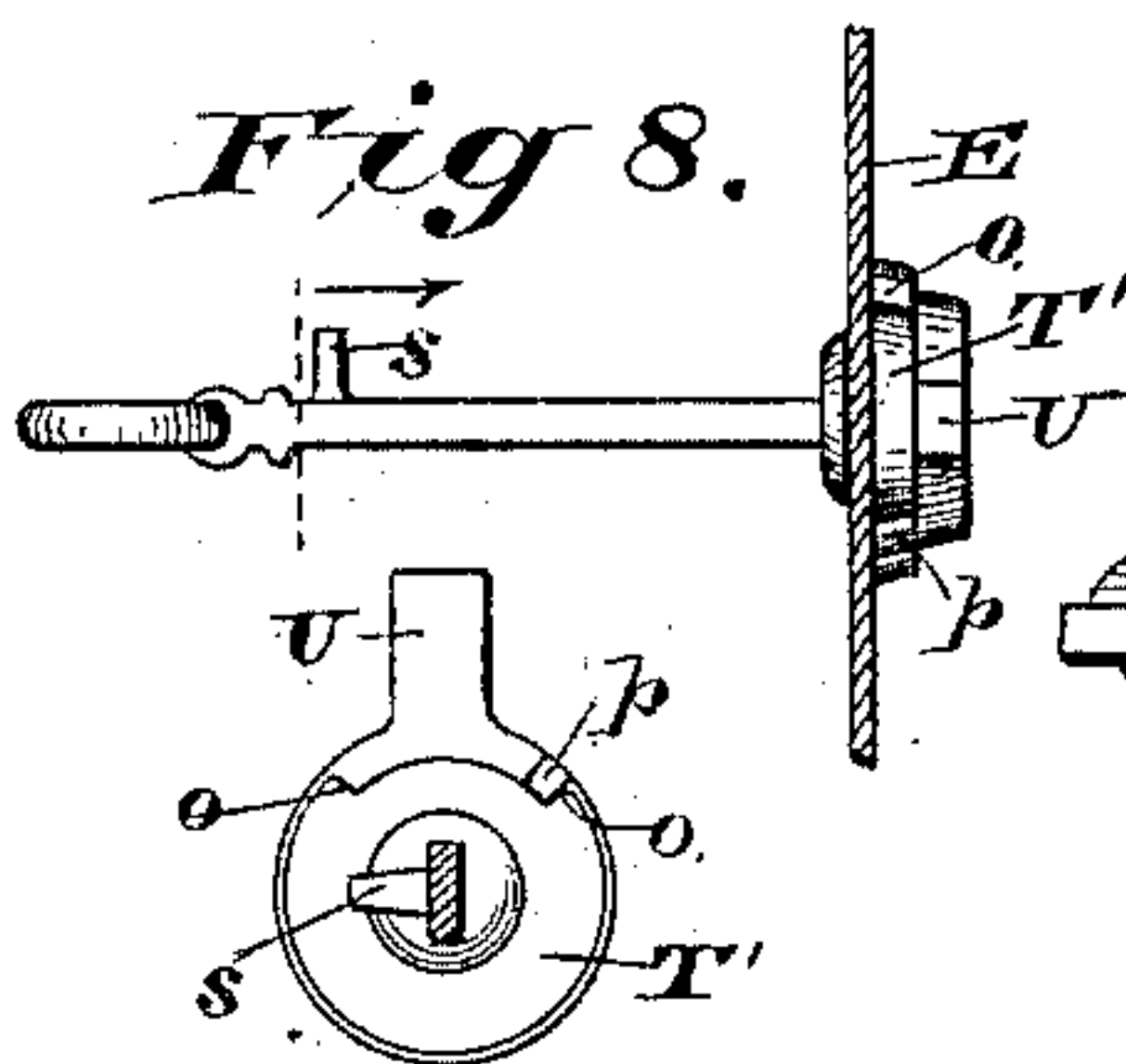
*Fig 3.*



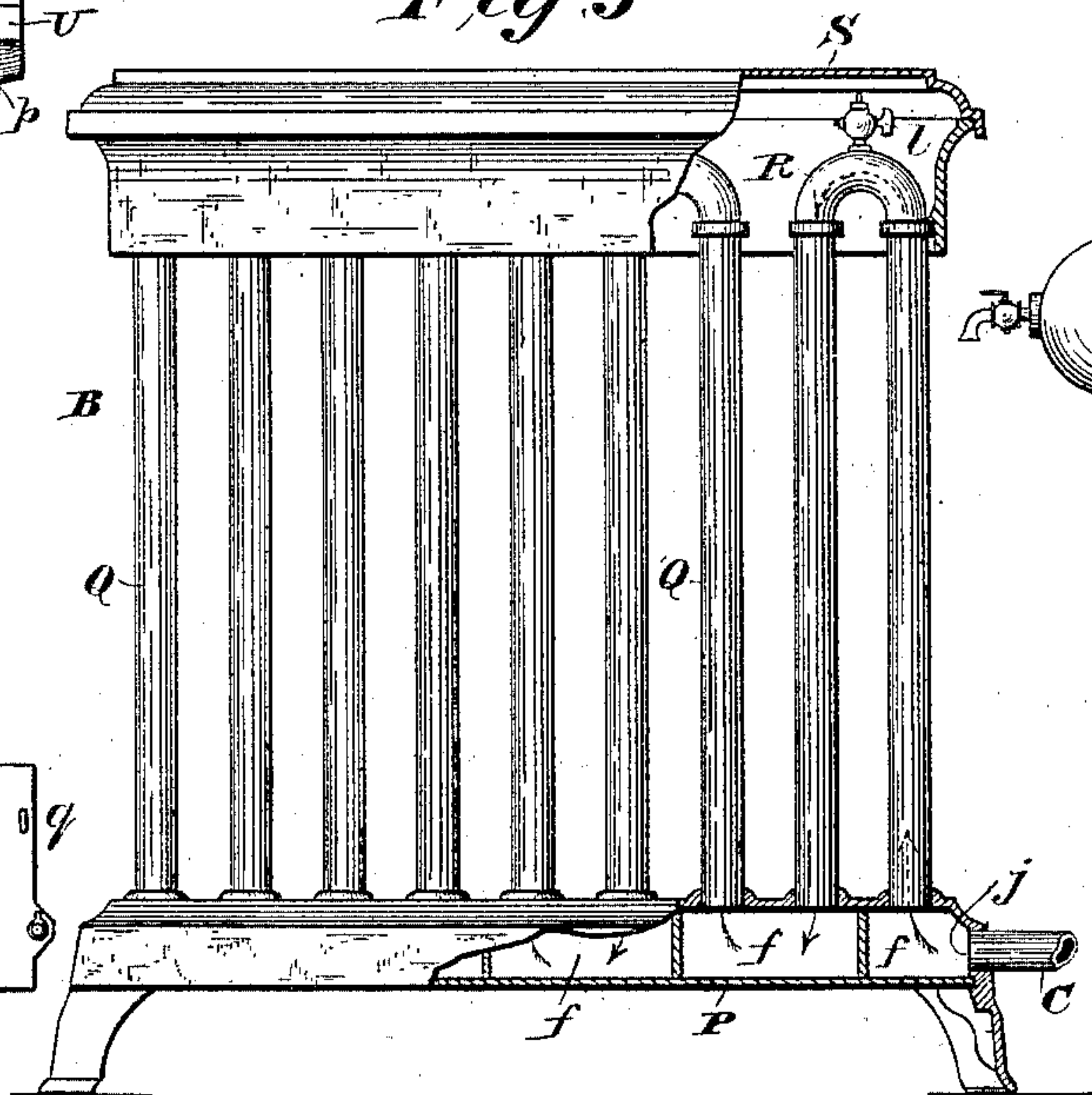
*Fig 4.*



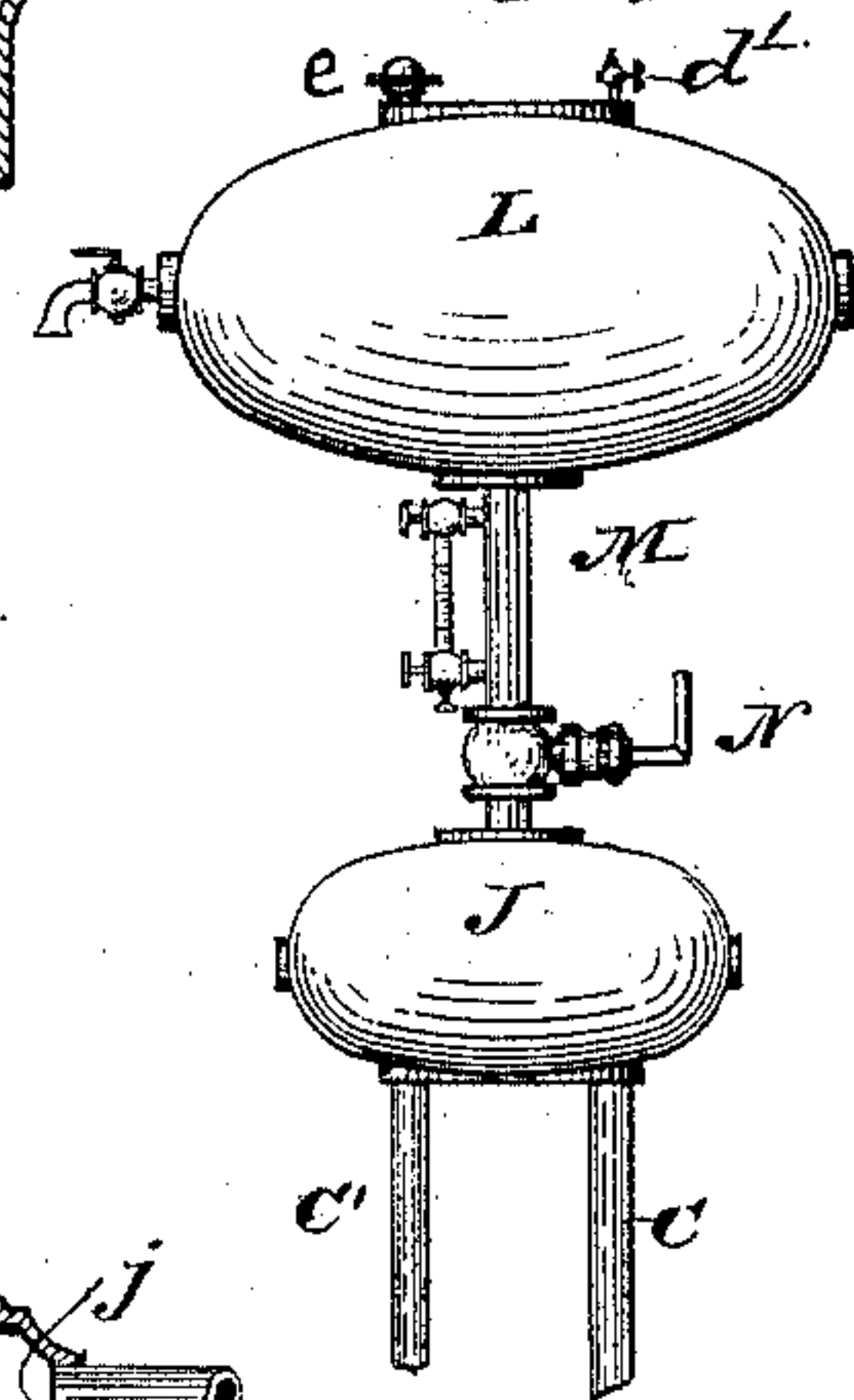
*Fig 8.*



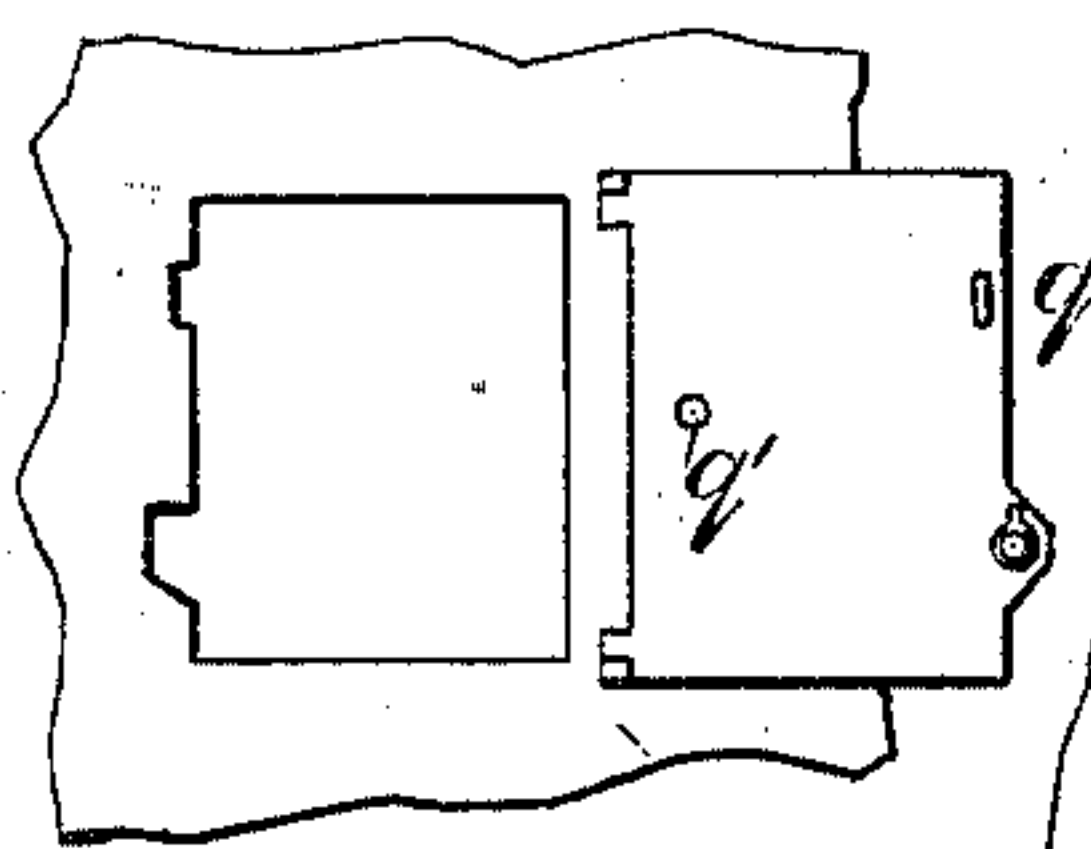
*Fig 5.*



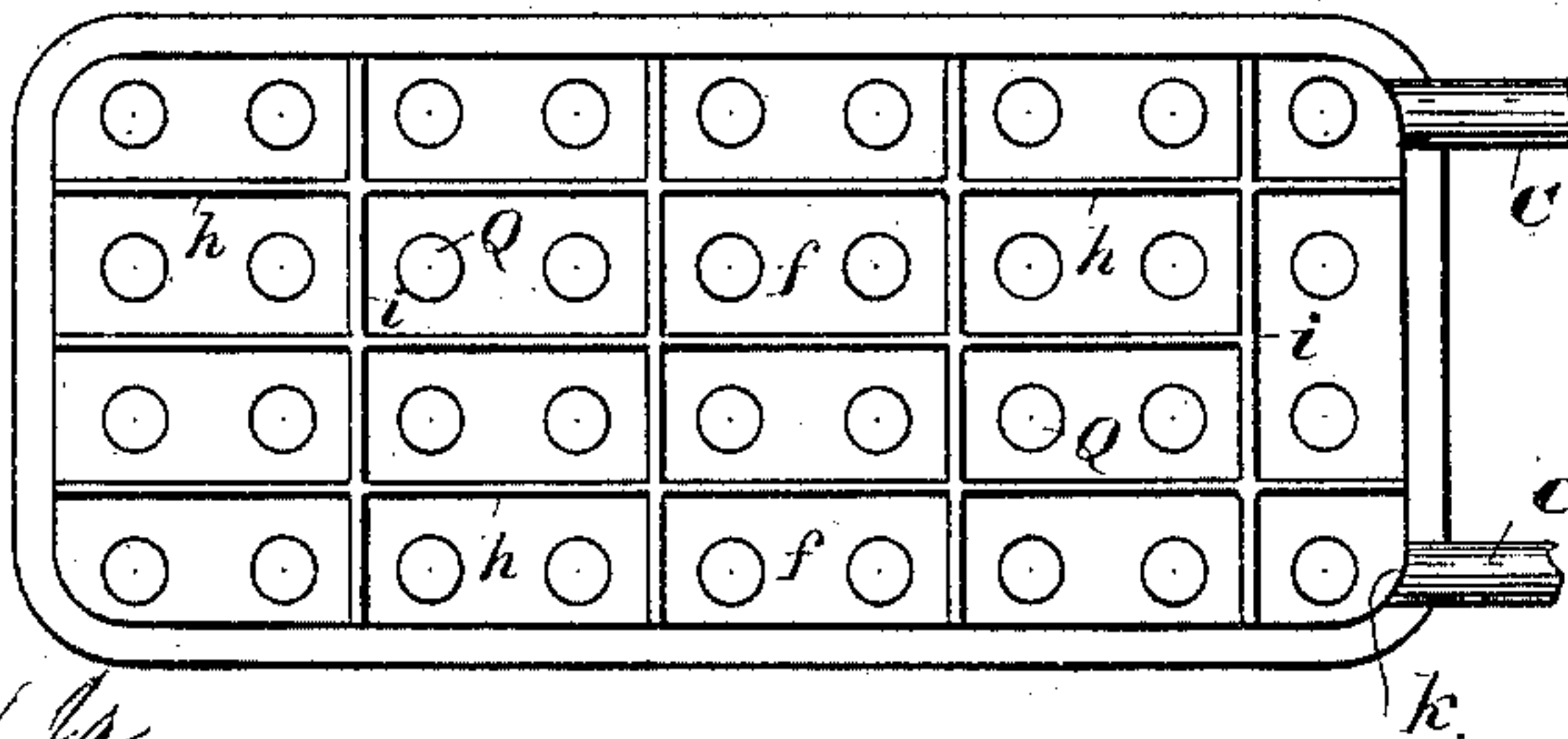
*Fig 7.*



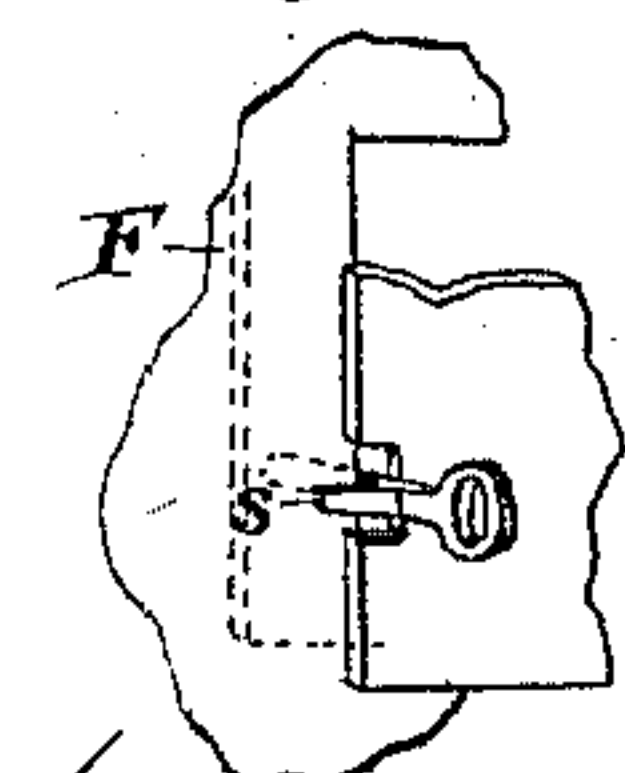
*Fig 9.*



*Fig 6.*



*Fig 10.*



Attest:

Geo. F. Smallwood Jr.  
W. G. Henderson.

Inventor

William F. Condon



# UNITED STATES PATENT OFFICE.

WILLIAM F. CONDON, OF EAST SAGINAW, MICHIGAN.

## SAFETY CAR HEATER AND VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 277,546, dated May 15, 1883.

Application filed April 9, 1883. (No model.)

### *To all whom it may concern:*

Be it known that I, WILLIAM F. CONDON, a citizen of the United States, residing at East Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Safety Car-Heaters; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a vertical section of part of a car with my improvements applied. Fig. 2 is a vertical section through the stove. Fig. 3 is a horizontal section of the boiler. Fig. 4 is a horizontal section through the stove on the line of the grate. Fig. 5 is an elevation, partly in section, of the radiator. Fig. 6 is a horizontal section through the base of the radiator, looking from the under side. Fig. 7 is a detail of reservoirs; Fig. 8, details of door-fastenings; Fig. 9, a detail of stove-door; and Fig. 10, a further detail of stove-door, showing clearly the locking tongue, arm, and recess in outer door.

My invention relates to hot-water-circulating apparatus for heating railway-cars and other chambers, and has for its object the improvement of that class of heaters whereby explosion from confined steam is less liable to occur, the circulating medium is more quickly heated, the construction of the parts simplified, and the cost of their production made cheaper, and the general operation of the heating apparatus rendered more satisfactory; and it consists in the construction, as well as in a combination, of parts hereinafter particularly described, and then sought to be specifically defined by the claims.

In the accompanying drawings, the letter A indicates a section of a railway-car of ordinary construction, in one end of which is placed a radiator, B, connected by supply and return pipes C and C' with a stove or heater, D, which may be located at the other end of the car or elsewhere, as found most convenient or desirable.

The stove comprises a body, E, and jacket

F, and is provided at its bottom with a water-tank, G, and above that with a fire-pot, H, and is further provided with doors and valves and shut-offs, and in its general construction is the same as described and set forth in my Patent No. 263,118, to which reference is made for a fuller description of the parts employed in this improvement, but not herein specifically described.

Inside the stove, immediately above the fire-pot and resting thereon, so as to leave a small space between its bottom and the fire-pot and its sides and top and the stove-body, is a boiler, I, having a series of tubes, a, passing vertically through it, and provided with an inlet-port, b, for the entrance of water from the return-pipes C', and with an exit-port, c, for the passage of the heated water therefrom to the supply-pipe C, the inlet and exit ports being separated from each other by a partition, d, around which the water may circulate. The boiler is cut away or recessed, as shown, at the point in front of the stove-door, so as to permit the introduction of fuel to the fire-pot. The supply-pipe extends from the boiler exit-port to a reservoir, J, shown in Fig. 7, into which it opens, so as to supply the reservoir with heated water. The water passes from this reservoir through another section of the pipe C, as shown in Fig. 7, to the radiator B, and after passing through the radiator it passes by the return-pipe C' back again to the boiler, where it is again heated to be circulated, as before. I prefer to use the reservoir J, as it stores a quantity of heated water to keep up the circulation; but I may dispense with it, and connect the two sections of the supply-pipe by an elbow or T-coupling, K, as shown in Fig. 1, which will permit a continuous circulation through the pipes, and at the same time admit of the application of my device for preventing danger of explosion while removing or replenishing the water in the supply-reservoir L. This reservoir is located on top of the car, and connects by means of a pipe, M, with the distributing-reservoir, or elbow or T-coupling, or directly with the boiler. The pipe M is provided with a valve, N, near the reservoir or coupling, and may have an index, O, to indicate when the water in the supply-reservoir gets so low as to need replen-



ishing. When such is the case the valve N is turned so as to cut off communication with the distributing-reservoir, boiler, or T-coupling, the air-valve  $d'$  in the supply-reservoir is opened, and the reservoir filled with water. No explosion will occur, because there will be no communication between the heating-pipes, distributing-reservoir, or boiler, and the supply-reservoir, and the safety-valve  $e$  and air-valve  $d'$  of the latter reservoir will allow the gases or steam to escape. This is an important feature.

The radiator B is composed of the base P, divided into chambers  $f$  by longitudinal and transverse partitions  $h$  and  $i$ , communicating with one another through a series of vertical tubes, Q, every two tubes of the series being connected together at the top by an elbow, R, and placed so that one tube will open into one chamber, and the other into the adjoining chamber, whereby a free circulation is maintained through the chambers and tubes, the water entering the first end chamber through a port,  $j$ , from the supply-pipe C, and passing thence through the vertical tubes through the series of chambers, and then out through the port  $k$  into the return-pipe C' and back to the boiler. The upper part of the tubes are shielded by a hinged cover, S, and each elbow is provided with a valve,  $l$ , for the escape of air from the tubes.

In order to ventilate the car, I extend a pipe, T, from the outside of the top of the car (where it has an elbow, as shown) downward to the side of the heater, where it is caused to communicate with the hot-air space between the body of the stove and its jacket, so that the introduced air will be heated and then distributed throughout the car by means of pipes.

To prevent dust and cinders from being carried into the space between the stove body and jacket, I provide the ventilating tube or pipe with a pocket,  $m$ , preferably below the point of its entrance into the hot-air space, to receive the cinders carried down the pipe, which may be removed through an opening closed either by a cap, door, or cover. To insure the passage of the cinders past the entrance to the hot-air space and into the pocket, I place a deflecting-shield,  $n$ , over the opening into the jacket, so that the air and cinders will pass first into the pocket, where the cinders will deposit, while the air will pass upward to and into the hot-air space. This construction of ventilating-tube may be employed in other forms of stoves than hot-water radiators, and whether the air introduced through them is used for heating and ventilating or only for ventilating purposes.

To prevent the entire revolution of the locking-tongue to the door and to know when the door is locked, I cast with or secure by any suitable means to the inside of the stove-door a boss, T', formed with shoulders  $o$ , and form a lug,  $p$ , on the heel of the tongue U, so that when the tongue is turned one-quarter of a

revolution in either direction the lug will strike against the shoulder and prevent the tongue from being turned any farther in that direction. When the lug strikes against one shoulder the door is locked, and when against the other shoulder it is unlocked.

It will be observed that the boss T' is on a lug in the edge of the door, and that the tongue U fits into a recess formed in the body of the stove, so that when the tongue is turned upward it catches against the inside of the stove-body, just above the recess or slot.

A catch or lug,  $q$ , is formed on the inside of the door, near one edge, so as to fit into a recess or slot in the stove-body to aid in holding the door closed, and a second lug,  $q'$ , is formed near the other edge, so as to bear against the edge of the stove-body when the door is closed. These two lugs, when the door is closed, bear against the edges of the stove-body and strengthen the door, so as to brace it against lateral jars that might otherwise throw it open.

The outside flange,  $r$ , of the jacket-door is recessed, so that when the door of the jacket and the door of the stove-body are both closed the arm of the locking-tongue will fit in the recess of the jacket-door.

The construction of the two doors and the application of the locking-tongue and its arm is such, as shown, that the jacket-door cannot be closed and fastened unless the door to the stove-body is closed and locked. Consequently the outer door cannot be closed and the inner door by carelessness be left unlocked.

To further guard against the possibility of the outer door being closed without the inner door being locked by the outer door slipping past the thumb or finger piece of the arm of the tongue, I form a lug,  $s$ , on one side of the arm quite close to the thumb-piece, as shown, so that the flange of the jacket-door must strike the lug and by it be prevented from closing unless the inner door is closed and locked.

In order that the fire-grate may be shaken without opening the doors, which would allow the ashes and dust to scatter, I pass a rod, V, through both jackets and stove-body, and pivot a hook,  $t$ , to its inner end and engage the hook with the arm  $u$  of the grate, so that by pushing in and drawing out the rod the grate will be shaken. The rod can be readily disconnected from the grate by simply throwing back the pivoted hook.

Instead of pivoting the hook to the rod, it may be rigidly secured thereto and the rod allowed play enough to be lifted from connection with the grate-arm, and the rod may be made removable from the jacket and stove by providing its outer end with a screw-cap or knob.

By setting the boiler on the fire-pot it can be readily removed when desirable for any purpose, and by leaving a space on all sides and top and bottom of same, and passing tubes through it, the water is more quickly heated than under other constructions.



Instead of using the T-coupling or elbow, or even the reservoir J, the supply-reservoir may be connected directly with the boiler I, as shown in Fig. 2, and two deflecting-plates, instead of one, may be used at the air-opening into the stove above the pocket.

I reserve the right to make a separate application for the construction of radiator shown and described.

10 I reserve the right to make a separate application for the grate provided with a detachable shaking-rod, in combination with the stove, as hereinbefore described.

15 Having fully described my invention and set forth its merits, what I claim is—

1. The combination of the water-heater, pipes for distributing water from the heater to a radiator and back to the heater, a reservoir for supplying water for the distributing-pipes, a cut-off valve between the supply-reservoir and pipes, and the radiator having a series of chambers in its base communicating with one an-

other by upright tubes connected together at the top, each set of tubes being provided with a valve in the connecting part for permitting the escape of air, substantially as set forth. 25

2. The stove provided with a door having a revolving locking-tongue, in combination with a jacket having a door provided with a recess adapted to receive the arm of the locking-tongue, substantially as and for the purpose set forth. 30

3. The stove provided with a door having a revolving locking-tongue, with a lug on its arm, in combination with a jacket having a door provided with a recess adapted to receive the arm of the locking-tongue, substantially as and for the purpose set forth. 35

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

WILLIAM F. CONDON.

Witnesses:

WM. G. HENDERSON,  
M. P. CALLAN.