

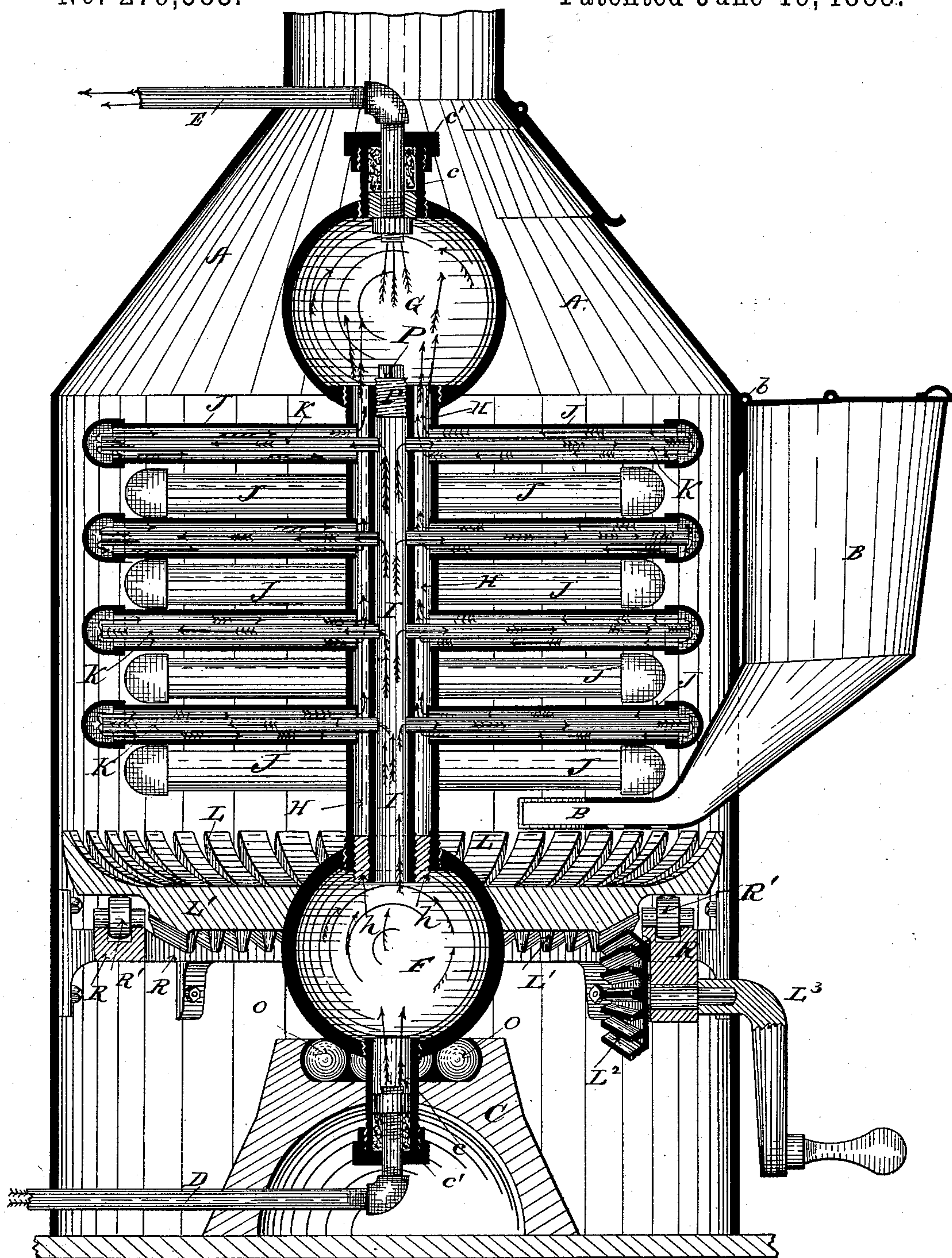
(No Model.)

T. G. MORSE.

WATER HEATER AND CIRCULATOR BOILER.

No. 279,583.

Patented June 19, 1883.



Witnesses  
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# UNITED STATES PATENT OFFICE.

THOMAS G. MORSE, OF ERIE, PENNSYLVANIA.

## WATER-HEATER AND CIRCULATOR-BOILER.

SPECIFICATION forming part of Letters Patent No. 279,583, dated June 19, 1883.

Application filed December 11, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS G. MORSE, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Water-Heaters and Circulator-Boilers; and I do hereby 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.

This invention consists in providing new and improved apparatus for heating and circulating water for heating purposes.

This invention was shown in the application for Patent No. 257,236, of May 2, 1882, and is referred to in said patent between lines 37 and 40 on page 2 of the specification of said patent, wherein I make a reservation of my right to make this application.

My invention is illustrated in the accompanying drawing as follows: a single figure consisting of a vertical section similar to Figure 1 in the patent above named.

The furnace, the grate, the manner of mounting and operating the grate, and the fuel-reservoir are all constructed substantially the same as in said patent, there being only slight modifications, which are incident to the change in the construction of the boiler. The boiler or generator is considerably modified in order to adapt it to the purpose named; but it is constructed upon the same general plan and is mounted in substantially the same manner.

The invention which I now present lies in the modifications in the construction of the boiler or generator, by which it is adapted to circulate the heated water throughout the building or system of pipes and radiators. The said system of pipes and the manner of providing for a circulation of water through them form no part of my invention, and are therefore not shown, further than the pipe E, which connects my device with the same. We therefore have to consider only the means by which the water is heated and made to circulate through said system of pipes, and, so far as the means for heating the water relates to the furnace and the adaptability of the boiler to expose a large amount of surface to the heat from the furnace is concerned, there is nothing novel in this connection, as they are found in

said patent; but in so far as the construction of the boiler effects the circulation of the heated water in the system of heating-pipes and radiators it constitutes the essence of this invention, and will be pointed out in the following detailed description of said boiler.

As shown, the boiler consists of two hollow spheres, F and G, connected together by two concentric tubes, H and I, of which H is the exterior tube. The annular space between said tubes where they enter the sphere F is plugged by a ring, h, leaving only the tube I in communication through the sphere F with the water-supply pipe D. At the point where the tubes H and I enter the sphere G the tube I is plugged by a plug, P. Communication between these tubes H and I is established through a series of concentrically-arranged radial tubes, J and K, of which J are the exterior and connect with exterior tube, H, and K are interior and connect with interior tube, I. The outer ends of the tubes J are capped, while the outer ends of the tubes K are open, and thus a water-way is found from the sphere F to G through the tubes I, K, J, and H successively. The sphere F is connected with the water-supply by the pipe D, and the sphere G is connected with the distributing-pipes through the pipe E. If desired, the spheres can be omitted entirely, for the upper one, G, is of no particular use, except that it presents considerable surface to the heat in the dome of the furnace, and perhaps has some advantage as an expansion-chamber, and the lower one, F, acts as a mud-drum and also as a warming and expansion chamber. So, if these functions are not thought desirable, the spheres can be omitted and the connection of the pipes D and E can be made with the boiler through common reducing-couplings with proper stuffing-box joints, and if it is not desired to have the boiler made so as to be revolved, the object of which is explained in the patent above referred to, the stuffing-box joints can be omitted.

The change in construction of the boiler from that shown in the patent referred to, which is for a steam-generator, is for the purpose of adapting the boiler to circulate the heated water through the distributing-pipes, and this change consists, essentially, in omitting the return-pipes M M and plugging the upper end of the pipe I. As shown and pointed out, other



changes may be made, but they are not essential.

The operation of the device need not be described, as it is so simple, being based on the well-known fact that heat applied to a portion of a circuit of water-pipes will cause a circulation of the water contained. The arrows in the drawing show the course of the water.

I am aware that water and steam heaters have been formed of an inner and outer tube, the former having radial tubes, which project into other radial tubes upon the outer tube; but this form differs from mine in that the lower end of the outer tube is open, so that the steam or water will have access to both of said tubes without passing through the radial tubes, whereas in mine the outer tube is plugged at its lower end, so that the water passing through the inner tube will pass from its radial tubes to the radial tubes of the outer tube, from which it passes to the pipe that delivers hot water to the radiators, which empty into pipes connected with the supply-pipe D.

What I claim as new is—

1. In a boiler water-heater and circulating apparatus; the combination of an inner tube

plugged at one end and connected to the supply-pipe by the other, an outer or inclosing tube connected at one end to the exit-pipe and plugged at the end opposite to the plugged end of the inner tube, and branch pipes which connect the interiors of the outer and inner tubes, substantially as described, so that the water passing from the inner tube will not pass to it again except through the supply-pipe D.

2. In a boiler water-heater and circulating apparatus, the combination of an inner tube connected at one end to the supply-pipe, plugged at the other and having radial branch pipes, and an outer or inclosing tube connected at one end to the exit-pipe, plugged at the other, and having radial capped branch pipes inclosing the branch pipes of the inner end, substantially as described, so that the water passing from the inner tube will not pass to it again except through the supply-pipe D.

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

THOMAS G. MORSE.

Witnesses:

W. S. BROWN,

JNO. K. HALLOCK.