(No Model.) 2 Sheets—Sheet 1.

C. B. TOMPKINS.

WATER HEATER.

No. 496,673. Patented May 2, 1893.

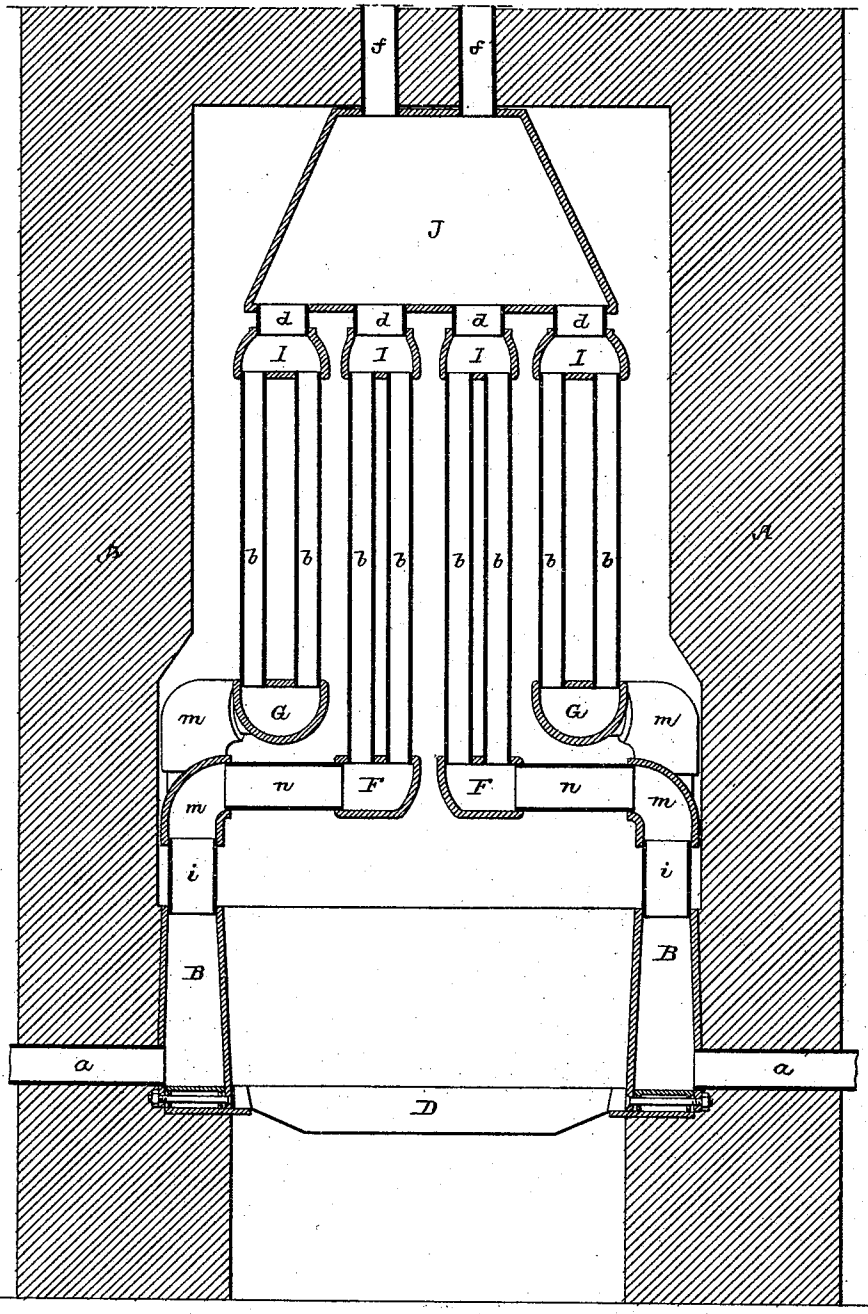

FIG. 1.

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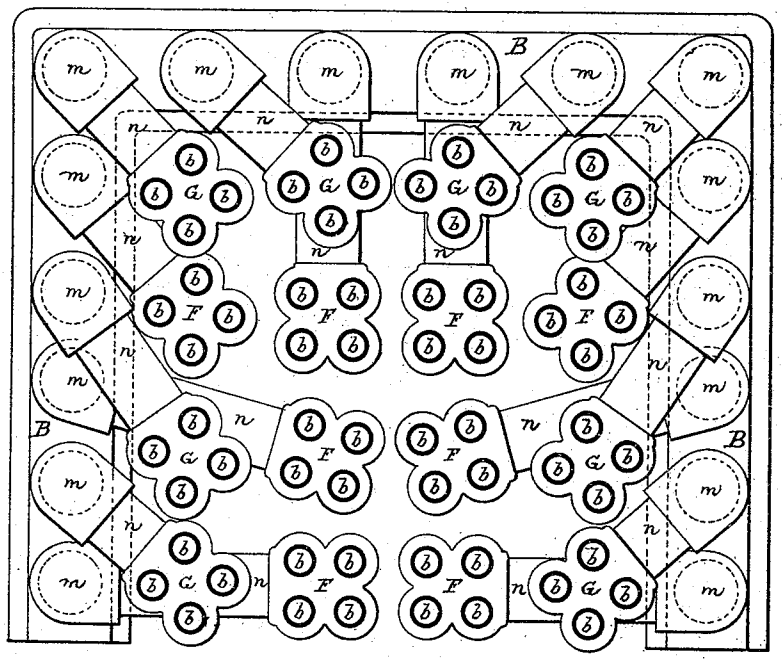
FIG. 2.



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UNITED STATES PATENT OFFICE.

CORNELIUS B. TOMPKINS, OF ELMIRA, NEW YORK.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 496,673, dated May 2, 1893.

Application filed February 2, 1893. Serial No. 460,695. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS B. TOMPKINS, a citizen of the United States, and a resident of Elmira, New York, have invented certain Improvements in Water-Heaters, of which the following is a specification.

One object of my invention is to so construct a water heater as to present an extended heating surface disposed throughout the entire combustion chamber, a further object being to provide for the rapid and effective circulation of the water through the heater and through the radiators or other heating devices supplied thereby, which objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1, is a vertical section of a water heater constructed in accordance with my invention; and Fig. 2, is a sectional plan view of the same, but on a somewhat larger scale.

A is the outer casing of the heater which may be of brick work or metal, as desired, and in the lower portion of this casing is mounted the fire box B and grate D, the fire box comprising a rear section and side wings, but being discontinued at the front so as to provide for the formation of the desired fire door or fuel opening. The fire box is hollow and receives its supply of water through one or more inlet pipes *a* which receive the water returning from the various radiators or other heating devices employed in connection with the heater.

The fire box B is in communication through a series of curved branches with a number of boxes or headers F and G each of which is connected by a series of pipes or tubes *b* with a box or header I, each of the latter, in turn, being connected by a short neck *d* with a dome J, from which extend the hot water pipes *f* leading to the radiators.

The boxes or headers F and G are arranged in two tiers, the headers F constituting the lower tier and the headers G the upper tier, the curved connections between said headers and the fire box B being varied in length accordingly so that the headers with their connecting pipes may be distributed throughout the entire area of the combustion chamber, as shown in Fig. 2, a result which could not be effected if all of the headers F and G were in the same horizontal plane.

Each of the curved connections between the fire box and the headers F and G is composed of a vertical pipe *i*, a curved elbow *m* and a short horizontal pipe *n*, although a single bent pipe may be used if desired, the object of making the connection in sections being to permit of the ready removal of any one of the elements of the furnace, (that is to say, the header F or G and upper header I and the series of connecting pipes *b*) for by unscrewing the pipe section *n* from either of the lower headers F or G the neck connecting the upper header of said element to the dome J may be likewise unscrewed and the element removed for inspection or repairs, and the re-application of the element can be effected with like facility.

It will be observed that the course of the water in my improved heater is, in effect, a continuous upward one, the short lateral deflections in the course of each volume of water not materially detracting from this general upward course so that the natural rising tendency of the heated water is not obstructed, while an extended heating surface is presented by the fire box, the vertical tubes, the dome, the upper and lower sets of headers and the curved connections between the latter and the fire box.

Two things are essential to the effective and economical working of any system of heating by means of hot water, the first of these being the raising of the water to a high temperature, and the second the rapid circulation of the water thus heated through the heater, the radiators, and the connecting pipes. The first of these objects is, in my improved heater, attained by reason of the very large area of heating surface exposed to the heated fuel in the fire box and to the products of combustion in the combustion chamber, while the second object is attained by permitting the free and rapid rise of the water in the heater from the time it enters the fire box until it is delivered from the distributing pipes at the top of the dome. The heater can, moreover, be constructed at a comparatively small expense as the fire box B,

the headers F, G and I, and the dome J are simple castings and the remaining elements of the heater are ordinary pipes and elbows.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination, in a water heater, of a hollow fire box, a series of sets of vertical pipes, headers at the upper and lower ends of each set of said pipes, a collecting dome communicating with the upper headers, and communications between the lower headers and the hollow fire box, substantially as specified.

2. The combination, in a water heater, of a hollow fire box, a series of sets of vertical tubes disposed throughout the combustion chamber, headers at the upper and lower ends of said sets of tubes, the lower headers being arranged in two tiers one above the other, and connections between said lower headers and the hollow fire box, substantially as specified.

3. The combination of the hollow fire box, the sets of vertical tubes, headers at the upper and lower ends of said sets of tubes, and connections between the lower headers and the fire box, each of said connections consisting of two short pipe sections and an intermediate elbow, substantially as specified.

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

CORNELIUS B. TOMPKINS.

Witnesses:
H. F. REARDON,
HARRY SMITH.