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WATER HEATER

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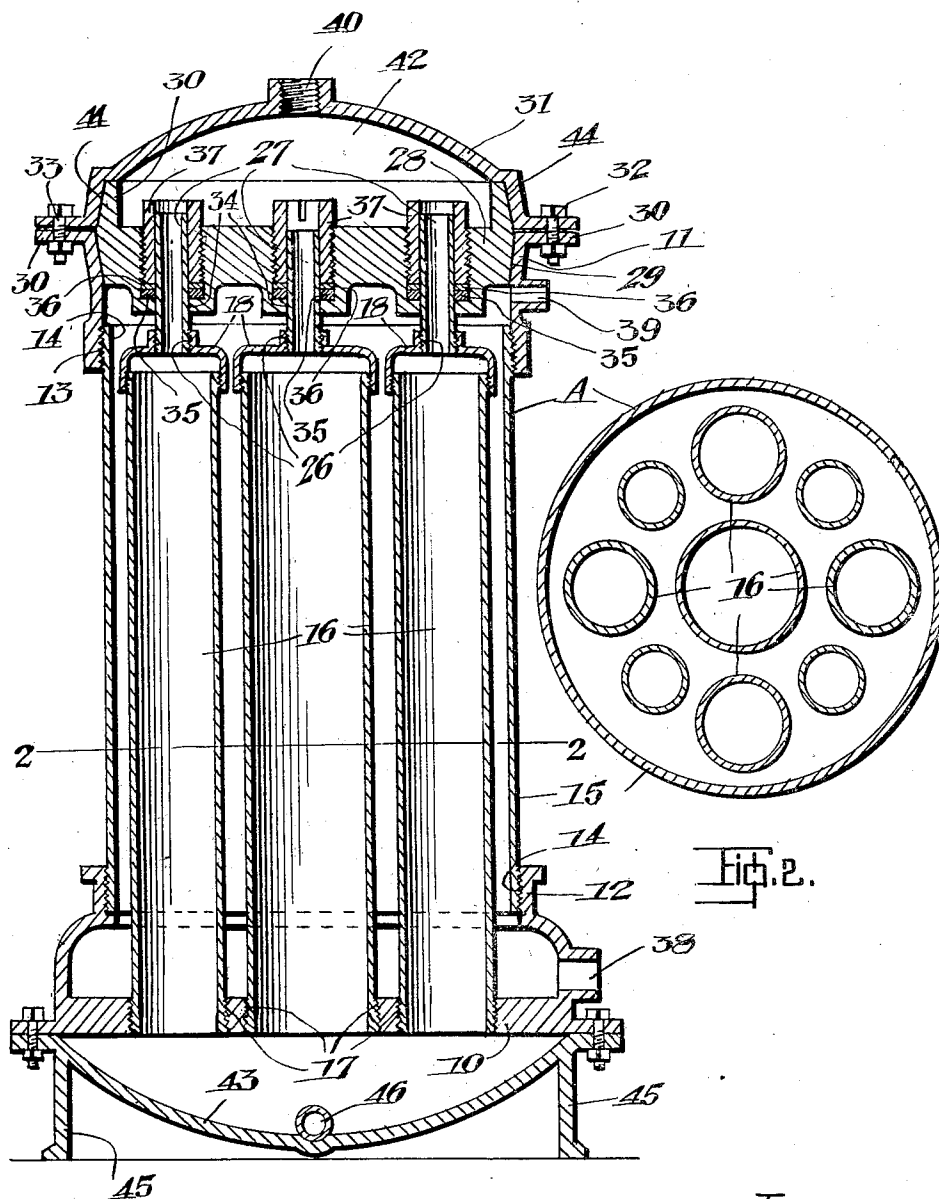


Fig. 1.

Fig. 2.

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## UNITED STATES PATENT OFFICE.

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## WATER HEATER.

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*To all whom it may concern:*

Be it known that I, JOSEPH ALEXIS OVILA TERRIAULT, a resident of the city of Ottawa, in the Province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in Water Heaters, and do hereby declare that the following is a full, clear, and exact description of my invention, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in water heaters and the objects of the invention are to provide a simply constructed and economical device of this kind which can be readily adapted to any length of tubes.

These objects are attained by providing a casing member separate from the top and bottom castings and not formed or cast in one piece integral therewith, the top and bottom castings being so formed as to provide securing means not only for the cylindrical casing which forms the body of the heater but also for the tubes therein.

With the foregoing and other objects in view the invention consists essentially of a pair of castings suitably mounted and provided with a top securing plate and adapted to receive the ends of a suitable casing member designed in turn to enclose a plurality of steam tubes.

Referring now to the drawings in which like characters of reference indicate corresponding parts in each figure and in which, Figure 1 is a sectional elevation.

Figure 2 is a cross section through the top of the heater on line 2—2, Figure 1.

In the drawings, A represents the heater as a whole, here shown as comprising a bottom casting 10 and a top casting 11. These castings are formed with threaded flanges 12 and 13 designed to engage with the threaded ends 14 of the cylindrical body or casing 15, whereby the latter is securely held in position. Within the casing are mounted a plurality of steam tubes 16 screw secured at 17 and designed to register with apertures in the bottom casting and provided on their other ends with caps 18 hereinafter more fully described.

These caps 18 are screw secured on the tubes 16 and are formed with restricted openings 26 suitably threaded to receive therein the steam intake pipes 27. 28 is an inner plate designed to fit into the top casting and to form therewith a self-grinding

water-tight joint at 29. 30 is a flange formed on the casting 11 and designed to register with a similar flange on the dome piece or head 31 and to receive therethrough the securing bolts 32 and 33 in any well known manner.

The plate 28 is provided with a series of openings 34, through which the intake steam pipes 27 extend and which are secured therein by water-proof joint means comprising packing 35, a washer 36 and screw plug nuts 37. 38 is a water inlet in the lower casting and 39 is a water outlet in the upper casting, while 40 is the steam inlet in the dome piece 31 leading into the dome 42 and from there through the steam inlet pipes into the tubes 16.

43 is the concave bottom portion of the heater, suitably flanged to be bolt secured to the lower casting similar to the manner in which the dome member is secured to the top casting.

It will be noted with regard to the dome member that the inner plate 28 is formed with an upwardly extending flange designed to engage in leak-proof joint construction with the dome member at 44.

45 are suitable legs or supports for the heater formed on the concave base portion 43, while 46 is the discharge opening in the base for the condensed steam.

The operation of my device will be readily understood from the foregoing. The steam is supplied from the opening in the dome and from there through the steam supply pipes 27 into the tubes 16, while the water to be heated is taken in through the inlet 38 and thence circulating all around the tubes and finally being discharged when heated to the required degree through the outlet 39.

It will be thus seen that my construction allows for the contraction and expansion of the tubes independently of the casing by means of the packing in the inner plate and further that the water outlet can be arranged at any desired angle to the water inlet independently of the casing.

As many changes could be made in the above construction and many apparently widely different embodiments of my invention within the scope of the claims, constructed without departing from the spirit or scope thereof, it is intended that all matter contained in the accompanying specification and drawings shall be interpreted as illustrative and not in a limiting sense.

What I claim as my invention is:

1. A heater of the character described comprising in combination, a cylindrical casing threaded at each end to engage with  
5 a lower and apertured plate member, and an upper flanged ring shaped member, a plurality of tubes in the casing adapted to fit into the lower plate member, a detachable inner plate adapted to fit into said ring  
10 member and provided with spaced restricted openings there through, a dome shaped head formed with a flange adapted to overlap the flange on the ring shaped member and bolt securing means extending through  
15 said flanges, an extension formed on the inner plate and a recess formed in the head piece adapted to snugly engage with said extension, whereby the joint between the head piece and the ring shaped member is  
20 rendered leak-proof, restricted pipe means detachably secured on said tubes and designed to extend through said inner plate, and a suitably formed base member provided with supports adapted to be clamped  
25 to the lower plate member, a steam discharge opening at said base and a steam intake opening in the head piece and water intake and discharge means in the bottom plate and ring shaped member respectively.  
30 2. A heater comprising a body portion having a plurality of tubes therein, top and bottom castings suitably secured to said body portion, water intake means in the lower casting and water discharge means in  
35 the upper casting, a concave base formed with supporting legs and suitably clamped to the bottom casting, a plurality of openings in the bottom casting communicating with said base and designed to receive there-  
40 in said tubes, a head piece or dome clamped

on the upper casting and having a steam intake opening therein, an inner plate adapted to fit into the upper casting and formed with a shoulder extending above the clamping means between said head piece and the upper casting to form with the head a leak-proof joint in combination with said clamping means, caps with restricted pipes therein for said tubes and designed to extend through openings in the inner plate to communicate with the interior of the head or dome.

3. A heater comprising in combination a body portion removably secured to top and bottom castings, a plurality of steam tubes  
55 in the body portion designed to fit into openings in the bottom casting, a hollow base provided with supporting means, suitably secured to the lower casting and having a steam discharge opening therein, a dome  
60 shaped head piece suitably clamped on the upper plate, an inner casting adapted to fit into the upper plate and extending thereabove to engage with said head or dome, means for clamping the dome on the upper  
65 plate, openings in said inner casting designed to receive a plurality of steam pipes communicating with the tubes and extending through caps on said tubes, water-proof joint means between said pipes and the  
70 openings in the inner plate, a water intake opening in the lower casting and a water discharge opening in the upper casting.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOSEPH ALEXIS OVILA TERRIAULT.

Witnesses:

W. T. CUFF QUIN,  
M. E. KNOX.