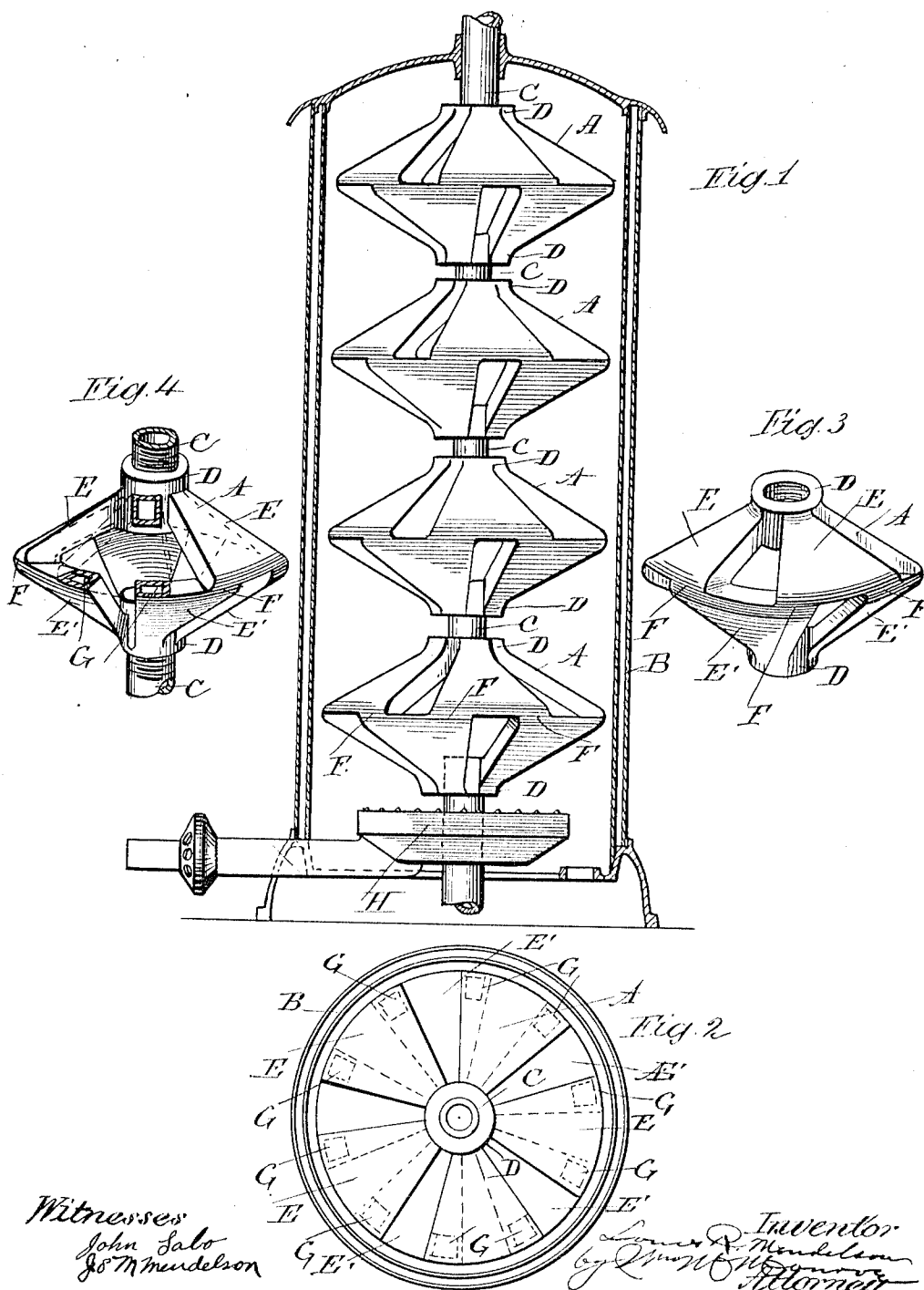


L. R. MENDELSON.
WATER HEATER.
APPLICATION FILED JUNE 4, 1912.

1,063,994.

Patented June 10, 1913.



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UNITED STATES PATENT OFFICE.

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WATER-HEATER.

1,063,994.

Specification of Letters Patent.

Patented June 10, 1913.

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To all whom it may concern:

Be it known that I, LOUIS R. MENDELSON, a citizen of the United States, and resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Water-Heaters, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The objects of the invention are to provide a water heater by means of which hot water can be quickly obtained for domestic purposes or for heating a building and the invention belongs to that class of heaters in which a series of hollow sections connected by metal tubing provide the circulating means for the water, and are inclosed in a casing whereby the heat is confined and made to affect the surface of each section in turn and thereby the amount of exposed surface is greatly increased and quick results are produced.

The present invention provides for checking the upward flow of water in the sections and redistributing the same so as to somewhat retard the flow of water until the greatest amount of efficiency of the heating medium can be obtained and also provides means constantly dividing and redividing the currents of water and spreading them thus divided over a greater amount of surface.

I am aware that sections have been made for this purpose in which vertical return bands connecting hollow hubs have been used to cause a free uninterrupted circulation from one hub to another and also sections have been built in which hollow casings forming an inclosed water space have been employed and connected together by central tubes to form spaced sections.

In the latter forms of sections an unimpeded annular space encircles the sections and the flow of water therethrough is therefore substantially unimpeded.

In the present device no annular unimpeded water channel of any kind is employed and no vertical return bends are employed through which the water can flow freely.

The invention comprises a series of sections having spaced hollow hubs and series of upper and lower hollow arms extending

from the hubs and arranged in pairs. These hollow arms are formed in fan like shape and are enlarged at the outer ends and have their outer ends overlapping and communicating with each other at their approximated outer edges only. In this manner a transverse as well as vertical circulation is provided and each column of water rising from one hub is divided into two portions which join again at the other hub.

The invention is further hereinafter described, illustrated in the accompanying drawings, and specifically pointed out in the claims.

In the accompanying drawings Figure 1 is a vertical section of a heater showing the improved forms of sections, Fig. 2 is a plan view thereof the corner being removed, Fig. 3 is a perspective view of one section and Fig. 4 is a vertical section showing the construction of the section.

In these views A A are the sections inclosed in a casing B which may be double to retain the heat or of any desired type of construction; *c, c* are short pipes connecting the sections. Each section is provided with upper and lower hubs D, D and comprises the fan shaped arms E E' which are broadest at their outer extremities and are formed in two series, the upper series E extending downwardly and outwardly and the lower series E' extending upwardly and outwardly. The meeting edges of the sections overlap at F F and openings G G form means of connection between the outer edges of each section with two others, thus dividing each column of water into two parts and causing them to spread over the broad surfaces intermediate of the openings before returning to the upper hub.

Greater heating efficiency and practicality of action is obtained by this form of construction since no single body of water can pass at any one point and the constant subdivision of the streams and spreading them out in the fan like extremities compels an equal distribution of heat throughout the using streams of water and also quickly transmits the heat thereto.

The subdivision is continuous as the water passes through each section and each stream both before and after subdivision is exposed over the fan like extremities of the arms. The momentary checking of the flow after expansion of the current before subdivision

through the smaller openings also give a momentary rest to the water to give it time to absorb the transmitted heat. No free flowing action is permitted.

5 H is a burner for gas or oil and may be of any character desired.

Having described the invention what I claim as new and desire to secure by Letters Patent is—

10 1. A water heater section comprising hollow hubs, upper and lower series of hollow arms extending outwardly from said hubs, the outer ends of said series of arms broadened and overlapping at their edges, each
15 arm of each series communicating with two arms of the other series.

2. In a water heater, a heating element, comprising spaced hubs, upper and lower series of hollow arms said arms having their
20 outer extremities laterally extended, each arm of the lower series of arms communi-

cating with the two arms of the upper series of arms at their edges.

3. In a water heater, a heating element comprising upper and lower tubes spaced 25 apart on a common axis and closed at their approximated ends, a series of radially and downwardly extended hollow arms communicating with the upper hub, a similar series of radially and upwardly extending hollow 30 arms communicating with the lower hub, said lower arms alternating in position with said upper arms, each lower arm communicating with two upper arms at its outer extremity. 35

In testimony whereof, I hereunto set my hand this 1st day of June 1912.

LOUIS R. MENDELSON.

In presence of—

JOHN SABO,

WM. M. MONROE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."