

H. C. ODENKIRK.
WATER HEATER.
APPLICATION FILED JUNE 13, 1908.

977,538.

Patented Dec. 6, 1910.

2 SHEETS-SHEET 1.

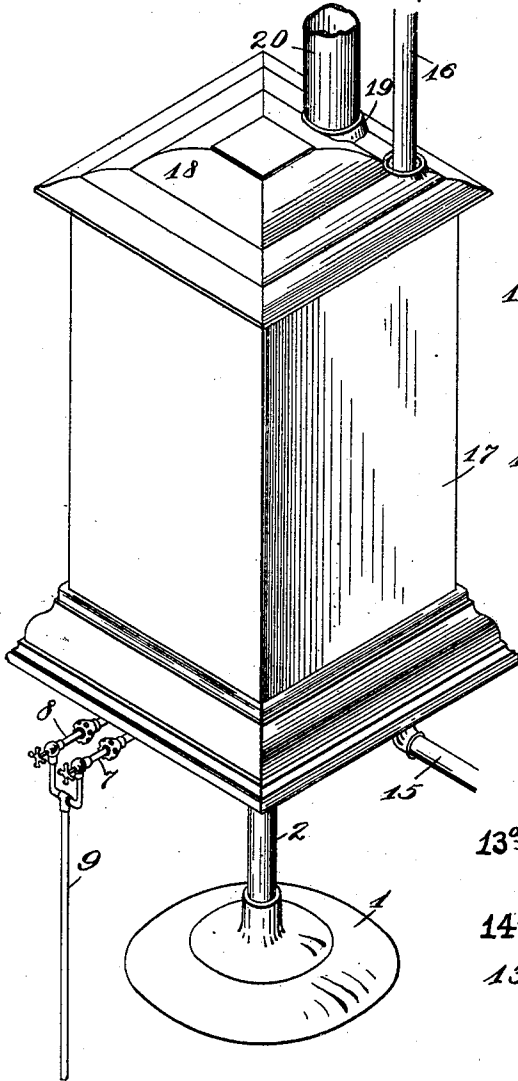


FIG. 1

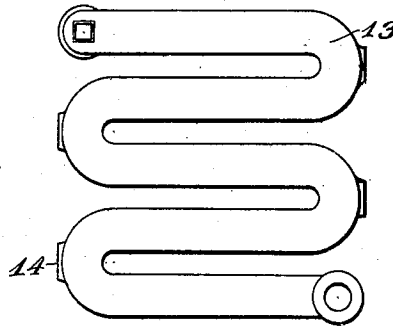


FIG. 3

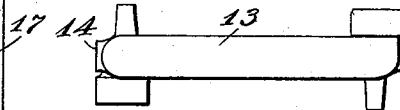


FIG. 4

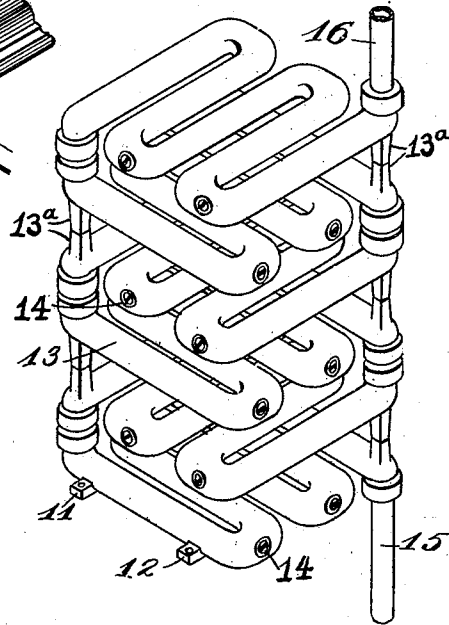


FIG. 5

WITNESSES:

Bruner B. West.
Arthur S. Remberg.

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2 SHEETS—SHEET 2.

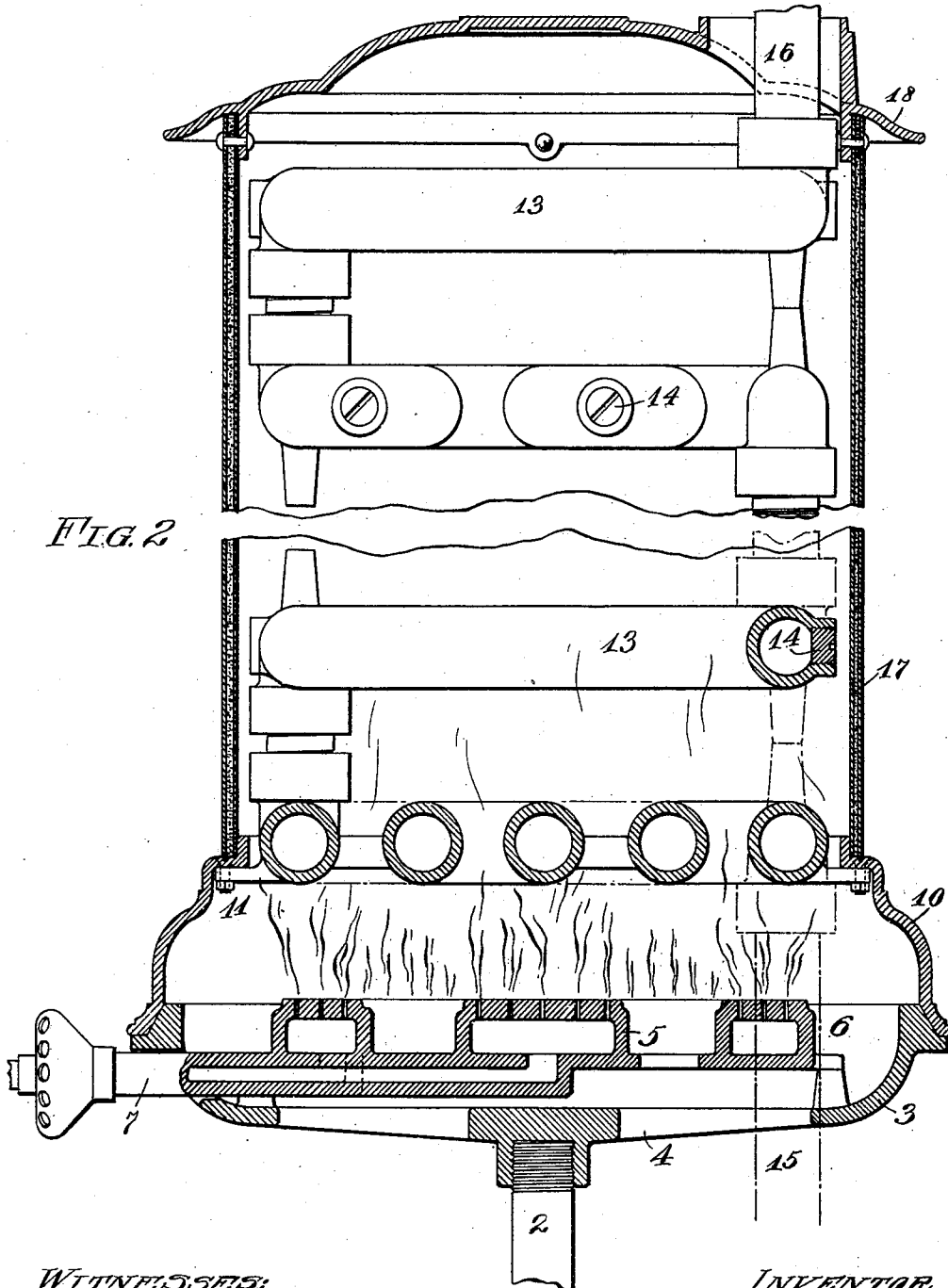


FIG. 2

WITNESSES:
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UNITED STATES PATENT OFFICE.

HARRY C. ODENKIRK, OF CLEVELAND, OHIO.

WATER-HEATER.

977,538.

Specification of Letters Patent.

Patented Dec. 6, 1910.

Application filed June 13, 1908. Serial No. 438,294.

To all whom it may concern:

Be it known that I, HARRY C. ODENKIRK, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Water-Heaters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to hot water heaters, and provides a structure, wherein a very large water heating surface is exposed to the flame from the burner, so that the flame in passing thereover will deliver practically all the heat units developed, to the water to be heated. Again, the heater is so arranged that the heated air has no straight passage from the burner to the flue, but is sent through a sinuous course, thereby insuring its contact with all parts of the heating coils.

My invention also provides for a casing which surrounds the heat coils, which casing is adapted to be lifted from the coils without dismantling the entire structure so that ready access may be obtained to the heating coils for repairs or other requirements.

Generally speaking, the invention comprises the elements and combinations thereof set out in the claims.

Reference should be had to the accompanying drawings, in which—

Figure 1 represents a perspective view of the hot water heater; Fig. 2 at the upper part is a section through the casing just in front of the hot water exit pipe the lower part being a central section through the casing and coils; Fig. 3 is a plan view of one section of the water coil; Fig. 4 is an end elevation of said coil, and Fig. 5 is a perspective view of the coil in its assembled position.

The heater is mounted upon a pedestal which comprises a base portion 1, and an upright tubular member 2 that supports at its upper end a rectangular basin or receptacle 3, the member 3 being provided with openings 4 in the under side thereof to permit of ready passage of air to the burner. The member 3 also forms a support for the burner, which in this instance, is shown as a two part burner, such a burner giving economy in the use of the fuel used in the heating.

The burner comprises the central portion 5 which is surrounded by an annular ring 6,

both of the members 5 and 6 having suitable connection with separate pipes 7 and 8, as shown in Fig. 1. The pipes 7 and 8 are connected with the main supply pipe 9, each of the pipes 7 and 8 having a valve therein, whereby the supply of gas is regulated to the respective portions of the burner with which the pipes 7 and 8 are in communication. It will be observed from the above construction that it is possible to use the burner 5 alone when a small amount of heat is required, and when more heat is required to use the burner 6 alone or in conjunction with the burner 5. As before stated, the burners are supported upon the member 3, the feed pipe for the said burners projecting through the front portion of said member.

Mounted upon the member 3 is a rectangular member 10 forming the upper part and inclosing member for the chamber within which the burners are mounted. The member 10 at its upper end supports two ears 11 and 12 as represented in Fig. 5. These ears 11 and 12 are formed integrally with the lowest coil of the water circulating member. This water circulating member comprises a series of heating coils arranged in tiers, one above the other. One of such coils 13 is shown in Fig. 3 and comprises a hollow member of sinuous form having certain portions parallel each to the other, which portions are joined at their ends, the opposite ends of the said coil extending in directions at right angles to the plane of the other portion of the coil, and in opposite directions with respect to each other. Upon the above mentioned ends of the coil suitable orifices are formed. The coils at their ends and upon the sides opposite that upon which the orifices are formed, are provided with lugs which project outwardly. The coils are formed by casting so that a single coil is formed in one operation. The portions of the coil which join the parallel portions of the pipe are formed with openings which are closed by screw-threaded plugs 14. The purpose of these openings is, in the first instance, to supply a suitable means for placing and supporting the core during the casting operation; and in the second instance, the removability of the plugs will allow access to the interior of the coil to clean the same or for any other purpose that may be desired. The plugs 14 are made of brass, preferably, or at least of some non-corrodible material so that they may be readily

removed from the openings in the pipe when such is desired.

Each coil in the series used to make up the water heater is constructed in the manner
5 above indicated, with the exception of the top and bottom coils, in which cases, the lug which would project away from the other coils in the series is omitted. Fig. 5 will
10 illustrate the manner of assemblage of the coils with respect to each other, each coil being in communication with the one immediately below and the coil immediately above it by means of the orifices at the opposite
15 ends of each respective coil. It will be likewise seen that the part of the coils opposite the point at which the orifices upon two coils engage each other, are spaced apart by means of the lugs or projections 13^a engaging each
20 other in the manner shown in the drawing. The bottom coil is connected with the inlet pipe 15 by means of which water is supplied to the heating coils. The top coil is in communication with the outlet pipe 16 which
25 leads to the hot water boiler or other place where it is desired to use the heated water.

As previously described, the lower coil in the series is supported upon the cross members 10 and 11 so that the hot water pipes are supported immediately above the burners.
30 It will be noted that the coils of pipe are arranged so that the pipes in each coil extend in a direction at right angles to the pipes in the coils which immediately precedes and succeeds it. By means of this construction,
35 the heated air and products of combustion which arise from the burner are broken up, as it were, and caused to travel irregular paths, completely enveloping the pipes in the respective series. In this manner, the
40 entire surface of the individual coils are exposed to the heating medium, and by the time the products of combustion have reached the upper part of the casing, the heat units will have been very largely
45 extracted and absorbed by the water within the coils.

The coils are housed within an upper casing 17, which casing is provided with a cover 18 at its upper end, and at the lower
50 end rests upon a flange portion of the member 10. The cover 18 is provided with an opening 19 which communicates with the flue pipe 20, the said flue pipe having suitable communication with the chimney of the
55 building in which the apparatus is used. It will be noted that the casing 17 is not secured upon the member 10, but simply rests thereon. The purpose of this construction is to enable the casing 17 to be easily removed in order that the heating coils may
60 be readily accessible. By removing a portion of the flue pipe 20, the casing 17 may be raised and held above the heating coils. It is also to be noted that the member 10 is
65 not fastened or secured to the member 3, the

said member 10 simply resting upon the member 3 in the manner indicated in Fig. 2, which will allow the removal of the casing 17 and member 10 together or separately, as
70 may be desired, and will provide a means of easy access to the burner for the purpose of cleaning or repairing the same.

In operation, the water is admitted through the pipe 15, and so, in the first instance, circulates through the coil nearest the
75 flame from the burner. This has the advantage that the lower coil is always kept cool and less likely to be affected by the direct heat from the burner.

It will thus be seen from the above described device that I have provided a device
80 simple in construction, one which may be easily dismantled, and one in which ready access to the parts for the purpose of repair is attainable. Again, due to the peculiar
85 form of the water heating coils which I have employed, I am enabled to extract practically all the heat units supplied by the burner which renders my device most economical.
90

Having thus described my invention, I claim:

1. In a water heater, the combination with an inlet pipe, of an outlet pipe, a plurality of coils connecting said pipes, said coils being
95 connected in series one after the other, whereby the water flows from the inlet pipe through each of said coils in series and out through the outlet pipe, each of said coils being formed with a plurality of parallel
100 portions, the parallel portions of each coil extending in a direction at right angles to the parallel portions of the coils adjacent thereto and lugs formed upon said coils in position such that a lug on one coil engages
105 a lug on the adjacent coil when the coils are assembled, whereby the coils are spaced apart.

2. In a water heater, the combination with an inlet pipe, of an outlet pipe, a series of
110 coils arranged one above the other, the end coils in the series being connected with the inlet and outlet pipes respectively, and each of said coils being connected with the adjacent coil whereby a continuous passage
115 for water is provided from the inlet pipe through said coils in series to the outlet pipe, and lugs upon said coils, the said lugs being so arranged that, when the coils are assembled, a lug upon one coil engages with
120 a lug upon the adjacent coil, whereby the coils are spaced apart.

3. In a water heating device, the combination with an inlet pipe, of an outlet pipe, a series of coils arranged one above the
125 other, each of said coils having an orifice at each of its ends, one orifice in one coil registering with a similar orifice in the coil immediately above it, and the other orifice in the said coil registering with a similar ori-
130

5 fice in the coil immediately below it, a lug
formed upon each coil opposite an orifice
therein, the lug on one coil engaging with
the corresponding lug upon the coil adjacent
10 the same, whereby the coils are spaced apart,
a pedestal, and a casing surrounding the
said coils and resting upon the pedestal, said
casing being freely held by the pedestal
whereby the casing may be removed to allow
15 access to the coils.

4. In a water heating device, the combi-
nation of a base portion, a series of coils
arranged one above the other, lugs formed
upon the lowermost coil, means for secur-
15 ing said lugs to the base portion, each of
said coils being provided with an orifice at
its opposite ends, the orifice at one end of
one coil registering with a similar orifice
in the coil immediately below it, and the
20 other orifice, in the first mentioned coil,
registering with an orifice in the coil im-
mediately above it, and lugs formed upon
the coils, said lugs engaging with each other

when the coils are assembled, whereby the
coils are spaced apart. 25

5. In a water heater, the combination with
an inlet pipe, of an outlet pipe, a plurality
of separately formed coils, said coils being
connected together in series, the end coils
being connected to the inlet and outlet pipes, 30
respectively, whereby the water flows from
the inlet pipe through all the said coils in
series to the outlet pipe, each of said coils
being formed of a plurality of parallel por-
tions joined by curved portions at their ad- 35
jacent ends and said curved portions being
each provided with an aperture, and a plug
for and closing each of said apertures, as
and for the purpose specified.

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

HARRY C. ODENKIRK.

Witnesses:

A. J. HUDSON,
BRENNAN B. WEST.