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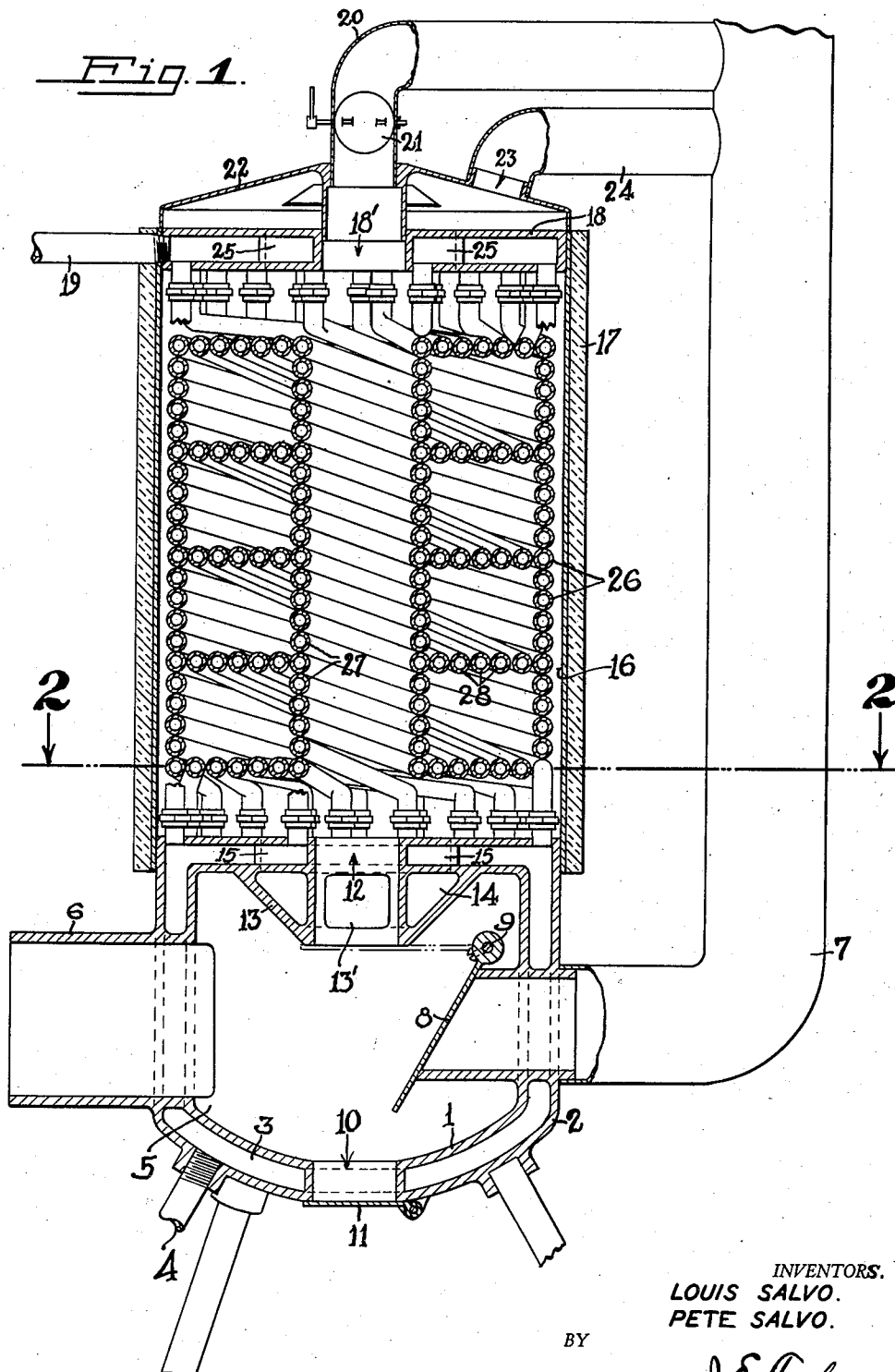
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2,050,465

WATER HEATER

Filed April 13, 1936

2 Sheets-Sheet 1



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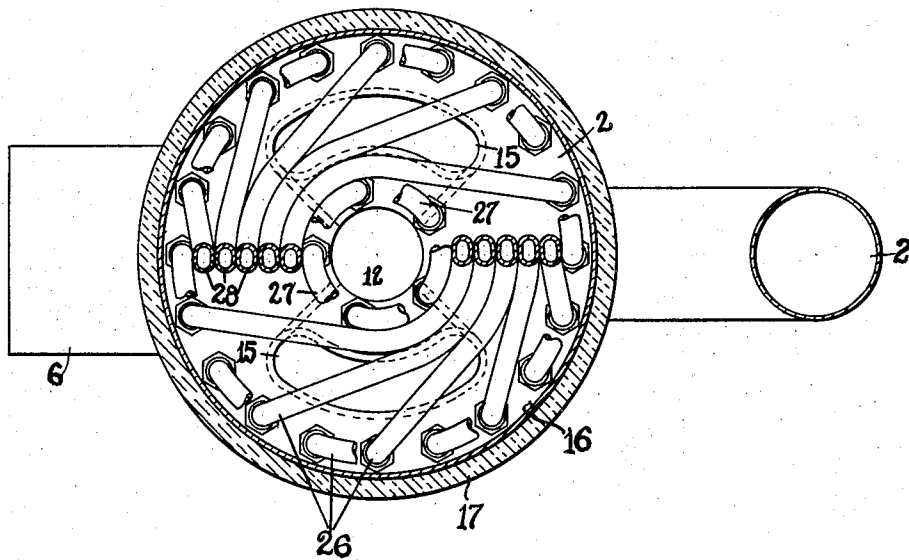
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Fig. 2.



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WATER HEATER

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3 Claims. (Cl. 257-229)

This invention relates to improvements in water heaters.

An object of our invention is to provide an improved water heater having a series of spirally arranged water carrying pipes which form a spiral flue through which the heated gases from a furnace or other source may be conducted.

Another object of our invention is to provide an improved water heater having upper and lower water containing chambers which are connected by spirally arranged pipes that form a spiral flue for the upward passage of heated air or gases of combustion coming from a furnace or other suitable source.

A further object of our invention is to provide an improved water heater having a highly efficient construction adapted to utilize for heating purposes the gases of combustion which ordinarily pass through a furnace and are discharged without being further used.

Other and further objects of our invention will present themselves or will be pointed out hereinafter.

In the accompanying drawings:

Fig. 1 is a vertical sectional view of a water heater embodying the preferred form of our invention; and

Fig. 2 is a sectional view taken on the line 2-2 of Fig. 1.

Referring to the drawings the numerals 1 and 2 designate, respectively, the inner and outer spaced walls of a water containing casing having a chamber 3 which is supplied with water from a suitable source by a pipe 4. The interior of the casing serves as a heat chamber 5 which is supplied with heated air or gas by a pipe 6 connected to a furnace or other suitable means for supplying heated air or gas. Also connected to the chamber 5 is a flue 7 which allows the heated air or gas to escape from the said chamber when a damper 8 normally closing the inwardly disposed end of the said flue is in an upraised position as indicated by the dotted lines in Fig. 1. The damper 8 is affixed, as by a set screw, to a pivoted rod 9 associated with suitable hand operated or thermostatic control means which functions in the usual manner to move the damper to an upraised position when the water in the coiled water carrying pipes reaches a desirable temperature, thereby allowing the heated air or gas entering the chamber 5 to pass upwardly through the flue 7 without contacting the said water carrying pipes.

The lower side of the casing is provided with a central opening 10 which is normally closed by

a door 11, the said opening serving as means for cleaning the inside of the said casing. The upper end of the casing is provided with a centrally disposed opening 12 through which the heated air or gas from the chamber 5 may proceed. The upper side of the inner wall 1 of the casing is provided at points adjacent the central opening 12 with a depending ring shaped member 13 of triangular cross section having an annular chamber 14 therein. The lower end of the ring shaped member 13 is provided with a central opening through which heated air or gas from the chamber 5 may proceed in an upward direction and one or more side openings 13' in the said ring shaped member allows the said heated air or gas to proceed into the annular chamber 14. The damper 8 when in an upraised position engages with the lower end of the ring shaped member 13 and prevents the heated air or gas from passing into the said member. The upper side of the casing is provided with openings 15 through which the heated air or gas may pass from the annular chamber 14 into an enclosed space located directly above the said casing. Secured to the casing by any suitable means is a cylindrical shell 16 having an insulating jacket 17 covering its outer surface. Mounted at the upper end of the shell 16 is a hollow water containing member 18 having a discharge pipe 19 secured thereto through which heated water may be withdrawn. The member 18 is provided with a central opening 18' through which heated air or gas may proceed. Connected to the member 18 at points where the opening 18' is located is a flue extension 20 connecting with the main flue 7 and provided with a damper 21 which may be hand operated or controlled in the usual manner by suitable thermostatic control means. Mounted on the top of the member 18 is a hood 22 having an outlet 23 which discharges heated air or gas into another flue extension 24 connecting also with the main flue 7. The water containing member 18 is provided with a plurality of openings 25 through which heated air or gas may proceed from the interior of the shell 16 into the interior of the hood 22. Suitably connected to the upper side of the outer wall 2 of the casing and to the lower wall of water containing member 18 are a series of spirally disposed pipes 26 which carry heated water from the chamber 3 of the casing to the interior of the said member 18. The pipes 26 are arranged in circular order and are connected to the member 18 and the upper side of the wall 2 near their peripheries. The pipes 26 preferably contact with one another

and form a vertical cylindrical wall. Also suitably connected to the upper side of the outer wall 2 of the casing and the lower wall of the member 18 are a series of spirally disposed pipes 27 which carry heated water from the chamber 3 of the casing to the interior of the said member 19. The pipes 27 are arranged in circular order and are connected to the member 18 and the upper side of the wall 2 at points adjacent the central openings 19 and 12. The pipes 27 preferably contact with one another and form a vertical cylindrical wall which is concentric with and disposed inside of the cylinder formed by the pipes 26. Similarly connected to the wall 2 and to the member 18 are a series of spirally disposed pipes 28 which engage with one another and are disposed laterally of one another at points where they extend upwardly in a spiral fashion. The pipes 28 are located between the sets of pipes 26 and 27 and form a spiral partition which together with the pipes 26 and 27, provide an enclosed spiral flue for the upward passage of the heated air or gas from the opening 15 in the upper side of the casing to the opening 25 in the member 18. In ordinary practice the damper 21 is closed, thereby causing the greater part of the heated air or gas entering the central opening in the ring shaped member 13 from the chamber 5 in the casing to proceed outwardly through the openings 13', into the annular chamber 14 and thence through the openings 15 in the upper side of the casing and into the spiral flue which is formed by the three sets of spirally disposed pipes 26, 27, and 28. The spiral movement of the rising heated air and its intimate engagement with the sets of spiral pipes, enables the rising water in the said pipes to be efficiently and quickly heated before it emerges into the hollow water containing member 18. When it is desired that the water before its withdrawal from the member 18 be somewhat cooler, the damper 21 is opened, thereby causing the greater part of the rising heated air or gas to pass upwardly inside the cylinder formed by the spiral set of pipes 27, without proceeding in a spiral manner as above described.

It is understood that our invention may embody various modifications within the scope of the appended claims.

Having described our invention what we claim is:

1. A water heater comprising an enclosing shell, a water containing casing located at the lower end of the shell having a water inlet, a

water containing member located at the upper end of the shell having a water outlet, a plurality of sets of spiral water carrying pipes connected to the casing and to the water containing member, one set consisting of a plurality of pipes forming an outer substantially vertical cylindrical wall, another set consisting of a plurality of pipes forming an inner substantially vertical cylindrical wall, and a third set forming a spiral partition located between the cylindrical walls formed by two first mentioned sets of pipes, the three sets of pipes forming an enclosed spiral passageway for the passage of heated air or gases emerging from the casing.

2. A water heater comprising an enclosing shell, a water containing casing located at the bottom of the shell, the said casing having inlet and outlet means for heated air or gas and also water inlet means, a water containing member located at the upper end of the shell having a water outlet, a plurality of sets of spiral water carrying pipes interposed between and connected to the casing and the water containing member, one set of pipes forming an outer substantially vertical cylindrical wall, another set of pipes forming an inner substantially vertical cylindrical wall and a third set forming a spiral partition located between the cylindrical walls formed by the first two mentioned sets of pipes, the three sets of pipes forming an enclosed spiral passageway extending from the air outlet means of the casing to an air outlet means in the water containing member.

3. A water heater comprising an enclosing shell, a water containing casing located at the lower end of the shell having a water inlet, a water containing member located at the upper end of the shell having a water outlet, a plurality of sets of water carrying pipes interposed between and connected to the casing and to the water containing member, one set consisting of a plurality of pipes forming an outer substantially vertical cylindrical wall, another set consisting of a plurality of pipes forming an inner substantially vertical cylindrical wall, and a third set consisting of a plurality of spiral pipes forming a spiral partition located between the cylindrical walls formed by two first mentioned sets of pipes, the three sets of pipes forming an enclosed spiral passageway for the passage of heated air or gases emerging from the casing.

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