I. G. SMITH.

WATER HEATER.

APPLICATION FILED MAR. 25, 1916.

1,224,335.

Patented May 1, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

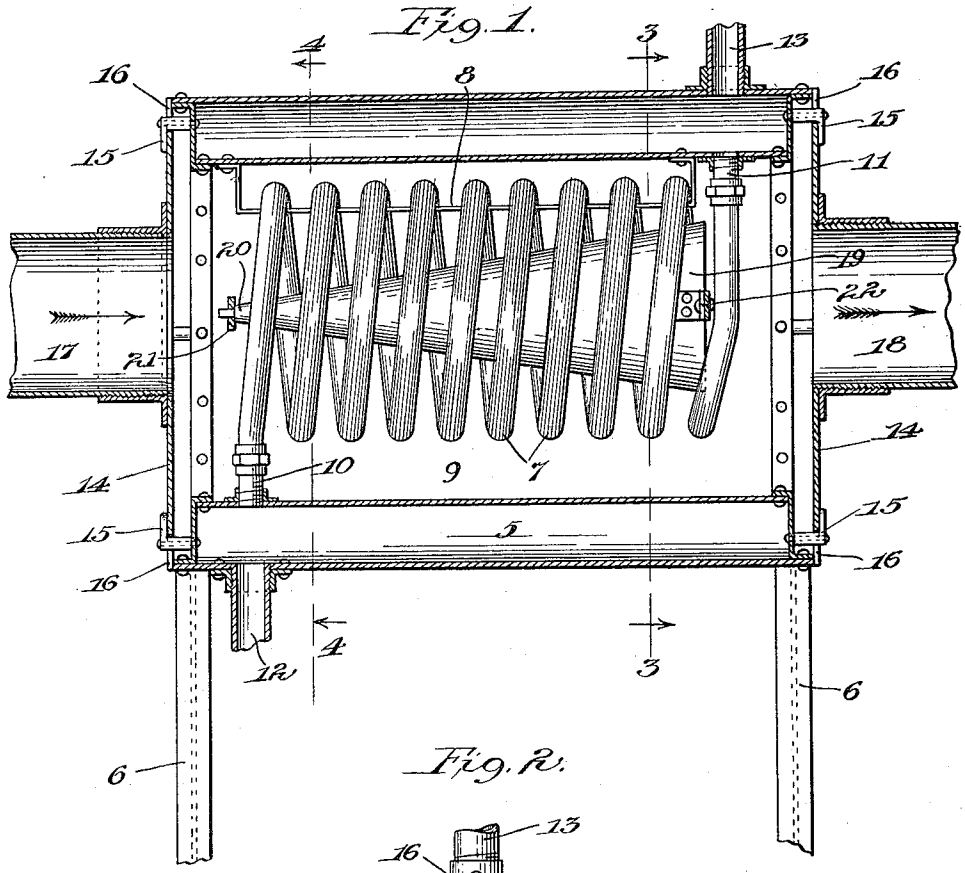
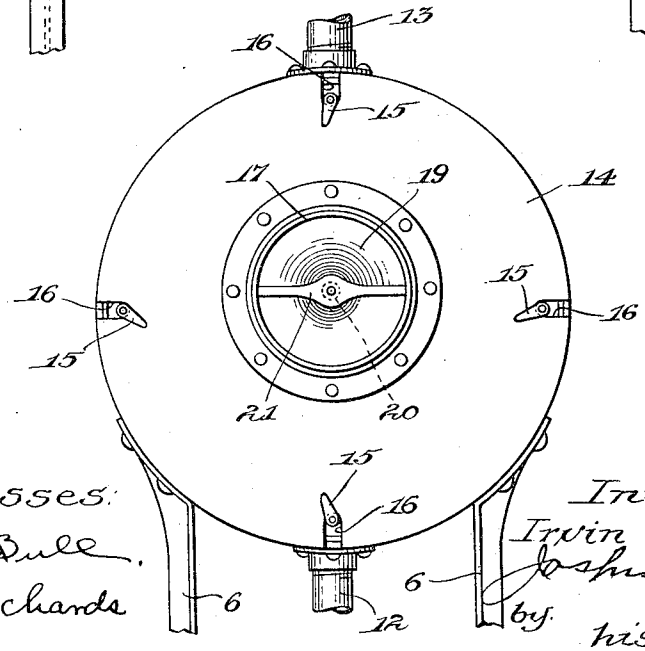


Fig. 2.



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Inventor,
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2 SHEETS—SHEET 2.

Fig. 3.

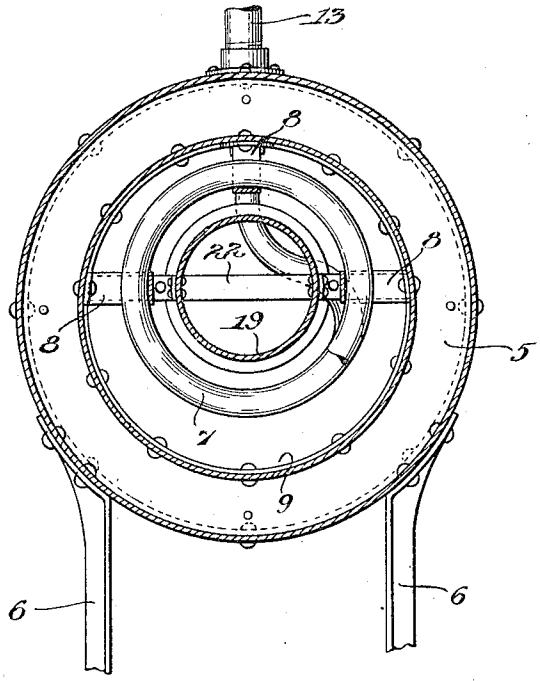
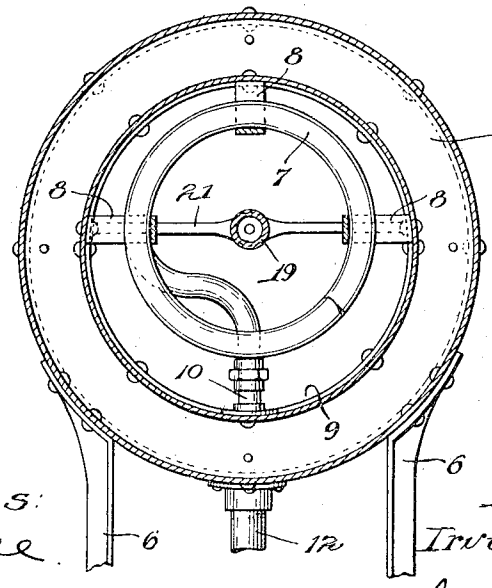


Fig. 4.



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UNITED STATES PATENT OFFICE.

IRVIN G. SMITH, OF ELGIN, ILLINOIS, ASSIGNOR OF ONE-FOURTH TO RUSSELL A. WHEELOCK, OF ELGIN, ILLINOIS.

WATER-HEATER.

1,224,335. Specification of Letters Patent. Patented May 1, 1917.

Application filed March 25, 1916. Serial No. 86,749.

To all whom it may concern:

Be it known that I, IRVIN G. SMITH, a citizen of the United States, and a resident of the city of Elgin, county of Kane, and State of Illinois, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification.

My invention relates to improvements in water heaters especially adapted for use in utilizing the waste heat in the smoke emanating from a heating plant such as a furnace or the like for the heating of water.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a longitudinal section of a heater embodying my invention,

Fig. 2 an end view of the same,

Fig. 3 a section taken on line 3—3 of Fig. 1, and

Fig. 4 a section taken on line 4—4 of Fig. 1.

The preferred form of construction as illustrated in the drawings comprises an annular boiler 5 supported upon suitable legs or standards 6 and provided with a copper heating coil 7 suspended therein upon straps 8 as indicated. The coil 7 is made somewhat smaller than the space inclosed by the annular boiler 5 and is suspended therein adjacent to the top of said space so as to leave a considerable free space 9 at the bottom for the collection of soot and ashes without contact with the coil. One end of the coil 8 is connected at 10 with the lower portion of the boiler adjacent one end and the other end of said coil is connected at 11 with the upper portion of the boiler adjacent the other end thereof. A water supply pipe 12 is connected with the lower portion of the boiler opposite the coil connection 10 and a water withdrawing pipe 13 is connected with the upper portion of the boiler opposite the connection 11, thus facilitating the circulation of the water through both the boiler and the coil as will be readily understood.

Removable end plates 14 are provided for the boiler 5, said end plates being detachably mounted in position by means of buttons 15 pivotally mounted on the ends of the boiler and adapted to engage through notches 16 in the peripheries of plates 14 as indicated. Both of the plates 14 are centrally perforated and provided with nipples for the connection of pipe sections 17 and 18 therewith, said pipe sections being a smoke pipe leading from a furnace or other heating plant and serving to conduct the smoke therefrom through the space inclosed by the boiler 5. A conical deflector 19 is mounted within the coil 7, the smaller end 20 thereof being supported in a cross bar 21 adjacent the pipe 17 which leads directly from the furnace. The other end of deflector 19 is supported on a cross bar 22 as shown.

By this arrangement it will be observed that the construction may be readily inserted in the smoke pipe of any form of heating system and when connected with a water system will serve as efficient means for heating said water, thus utilizing the heat in the smoke which would be otherwise wasted. By arranging the coils 7 in the upper portion of the space inclosed by the boiler 5, it is subjected to the most highly heated portions of the smoke which tend to rise and ample space is provided for the deposit of soot and ashes. The deflector 19 will cause the smoke to spread in to close contact with the turns of the coil 7 thus conducing toward efficiency. The arrangement of the pipe connections opposite each other as indicated facilitates the circulation of the water. The specific arrangement set forth will be found to be a simple and efficient one for the purpose.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. A water heater comprising an annular boiler; a coil inclosed by said boiler and having its ends connected therewith; means for introducing and withdrawing water to and from said boiler; removable end plates for said boiler having central openings; and pipes connected with said end plates to

conduct smoke through said boiler, substantially as described.

2. A water heater comprising an annular boiler; a coil inclosed by said boiler and having its ends connected therewith; means for introducing and withdrawing water to and from said boiler; removable end plates for said boiler having central openings; and pipes connected with said end plates to conduct smoke through said boiler, substantially as described.

3. A water heater comprising an annular boiler; a coil inclosed by said boiler and having its ends connected therewith, said coil being smaller than the space inclosed by said boiler and located in the upper portion of said space; means for introducing and withdrawing water to and from said boiler; and means for passing smoke from a heating plant through said boiler; substantially as described.

4. A water heater comprising an annular boiler; a coil inclosed by said boiler and having its ends connected therewith, said coil being smaller than the space inclosed by said boiler and located in the upper portion of said space; means for introducing and withdrawing water to and from said boiler; removable end plates for said boiler having central opening; and pipes connected with said end plates to conduct smoke through said boiler, substantially as described.

5. A water heater comprising an annular boiler; a water supply pipe leading into the lower portion of said boiler adjacent one end thereof; a water withdrawing pipe leading from the upper portion of said boiler adjacent the other end thereof; a coil inclosed by said boiler and having its ends connected therewith opposite said supply and withdrawing pipes, said coil being smaller than the space inclosed by said boiler and located in the upper portion of said space; removable end plates for said boiler having central openings and peripheral notches; buttons pivotally mounted on the ends of said boiler and adapted to engage through said notches; and pipes connected with said end plates to conduct smoke through said boiler, substantially as described.

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

IRVIN G. SMITH.

Witnesses:
CHARLES J. LEHMANN,
FRIDA ANDERSON.

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