Sept. 25, 1928. 1,685,453

A. T. JOHANSON

WATER HEATING UNIT

Filed May 20, 1927

Fig. 1.

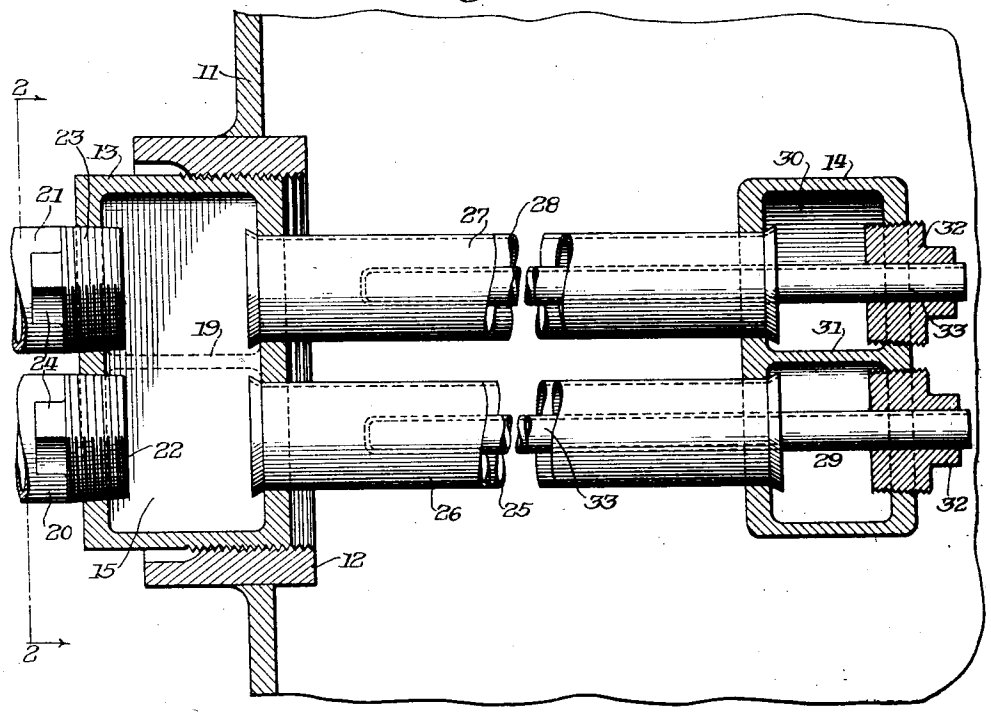


Fig. 2.

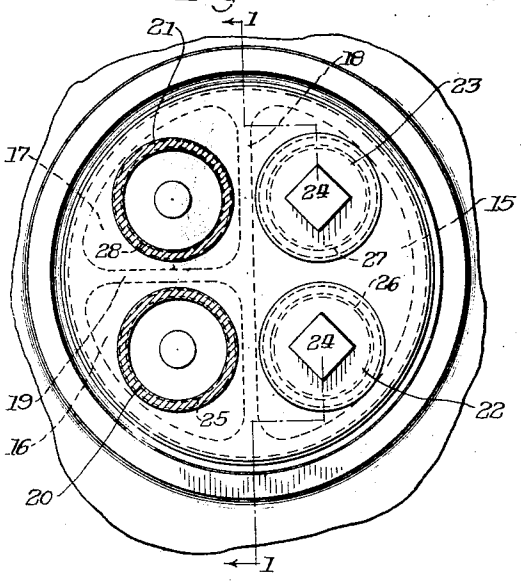
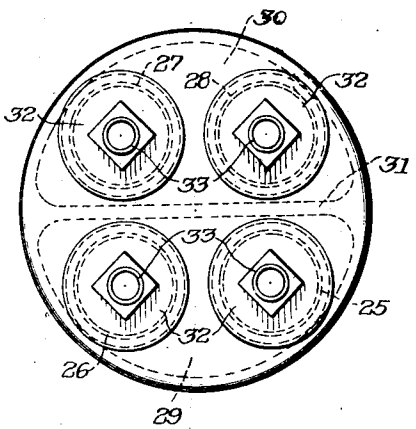


Fig. 3.



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UNITED STATES PATENT OFFICE.

ADOLPH T. JOHANSON, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO MILTON E. PAGE, JR., OF CHICAGO, ILLINOIS.

WATER-HEATING UNIT.

Application filed May 20, 1927. Serial No. 192,841.

My invention relates to novel and improved features of structure and function in water-heating appliances or units for use in boilers, preferably to be immersed in the hot water thereof so that the water contents of the device will be heated thereby and may be drawn off for use in such heated condition.

One object of the invention is to provide a simple apparatus of this character which can be produced economically and which may be inserted in the boiler by merely screwing it into place or in any other equivalent manner.

A further aim of the invention is to supply an appliance of this type which is composed of few relatively-simple elements, which may be used continuously over a long period of time with but little if any depreciation, and which is unlikely to become damaged or injured in service.

An additional purpose of the invention is to provide a structure having these capabilities and which may be readily demounted from the boiler if occasion requires.

To enable those acquainted with this art to fully understand the structural and functional advantages accruing from the employment of the invention, in the accompanying drawing, forming a part of this specification, a present preferred embodiment of the invention has been presented in detail, and, for simplicity, like reference numerals have been used to denote the same parts throughout the several views.

In this drawing,—

Fig. 1 is a fragmentary, vertical section through the boiler, showing the water-heating unit in operative position therein;

Fig. 2 is a vertical cross-section on line 2—2 of Fig. 1, the latter figure being a section on line 1—1 of Fig. 2, the parts of the structure in both instances being viewed in the direction indicated by the arrows associated with such section lines; and

Fig. 3 is an end elevation of the inner end of the unit.

Referring to the views of this drawing, it will be apparent that the boiler-wall 11 has an internally-threaded sleeve or pipe coupling 12 extended through and welded to the margin of a circular aperture in such wall, this member 12 accommodating and detachably or demountably supporting the water-heating unit, the latter including an outer head or connector 13, a companion inner head or connector 14, and the intervening connecting pipes hereinafter referred to in detail.

The hollow, round member 13 is exteriorly threaded, at least for a portion of its length, in order that it may be detachably screwed into the flange 12, as shown in Fig. 1, such part 13 being divided into three chambers 15, 16 and 17 by a vertical, central wall 18 which, midway of its height, is joined to the circular wall by a horizontal partition 19.

A cool-water inlet-pipe 20 is screwed into a threaded hole in the front wall of the member 13 connecting with the chamber 16, a hot-water discharge-pipe 21 is screwed into a similar, threaded aperture connecting with the compartment 17, and two like, symmetrically-arranged, threaded holes communicating with the cavity 15 through its front wall are closed by suitable threaded plugs 22 and 23 having angular heads 24 by means of which they may be turned with facility by a suitable wrench.

The opposite or inner wall of the member 13 is apertured at four places in register with the specified like number of threaded holes through its front wall, and each of such rear-wall openings has expanded and fixedly and securely held in it one of the four, horizontal, copper tubes or pipes 25, 26, 27 and 28 of substantial length, and which extend rearwardly into the boiler, being submerged in, and subjected to the heat of, the hot water therein.

The back ends of such tubes project through and are expanded in holes in the front wall of the connector or coupling 14, which is internally divided into a lower chamber 29 and a correlated upper compartment 30 by a horizontal division wall 31, whereby the two lower tubes 25 and 26 connect with the chamber 29, and the pair of upper tubes 27 and 28 communicate with the compartment 30.

In register with the four tubes or pipes 25, 26, 27 and 28, the rear end wall of the coupling 14 is provided with an equal number of threaded holes, into each of which is screwed a plug 32 having through it a central aperture into which is tightly fitted the end portion of a small copper tube 33 open at its rear end, so that the hot water of the boiler may enter it. and closed at its front end near the coupling 13, it being clear, as shown in Fig. 1, that such inner tubes extend through the back coupling 14 into the larger pipes 25 to 28, inclusive, for the purpose of assisting in heating the water

in the latter by the hot boiler water in the internal tubes, such heating action being supplemental to the main or principal heating operation which is effected or brought about by the hot water of the boiler in which the larger tubes are immersed.

The water to be heated by this appliance, which is really a unit capable of being mounted as such in a boiler and removed as such if occasion requires, enters the chamber 16 of the front connector 13 through the admission or inlet pipe 20, and from which it flows rearwardly through the tube 25 into the lower chamber 29 of the rear coupling 14, thereupon flowing from the latter chamber forwardly through the tube 26 into the lower part of the chamber 15, from the upper portion of which it passes rearwardly through the tube 27 into the compartment 30, from which it in turn proceeds forwardly through the tube 28 into the chamber 17, finding exit as adequately heated water through the delivery-pipe 21.

Obviously, as such water travels back and forth through the plurality of specified conduits connected in series relation, it is subjected to the heat of the boiler hot-water, both externally through the larger tubes and interiorly through their encased, smaller tubes.

Such inner tubes need not necessarily be employed, but better results are usually possible by their use.

Those skilled in this art will readily understand that minor mechanical changes may be incorporated in the appliance presented without departure from the heart and essence of the invention, as defined by the appended claims, and without the loss of any of its material structural and functional advantages.

I claim:

1. A water-heating unit for boilers, comprising in combination, an outer externally-threaded coupling adapted to be screwed into a threaded opening in the boiler-wall and divided into three chambers, four tubes supported by said coupling and adapted to be positioned on the inside of the boiler to be heated by the hot water of the latter, two of such tubes connecting individually to two of said chambers, the other pair of tubes both connecting with the third chamber, an inner coupling divided into two chambers, one of said individual tubes and one of said pair connecting with one chamber of the inner coupling, the other two tubes connecting with the remaining chamber of the inner coupling, said inner coupling being supported by said tubes, internal tubes inside of said four tubes closed at their front ends and open at their rear ends to connect with the hot water of the boiler, plugs in said inner coupling carrying said internal tubes, means to admit water to be heated to said first coupling and means to discharge the heated water from said first coupling.

2. A water-heating unit for boilers, comprising in combination, a coupling having a plurality of chambers adapted to be secured to the wall of a boiler, means to admit cool water to one of said chambers, means to deliver heated water from another of said chambers, relatively large tubes supported by said coupling adapted to project into the hot water in the boiler and connected to said chambers, a second inner coupling supported by said tubes and connecting their inner ends together, whereby the water to be heated is caused to flow through said tubes in series, and relatively small tubes inside of said larger tubes and each closed at one end and open at its other end to communicate with the hot water in the boiler.

In witness whereof I have hereunto set my hand.

ADOLPH T. JOHANSON.