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H. E. MOFFAT

WATER HEATER AND PURIFIER

Original Filed March 26, 1926

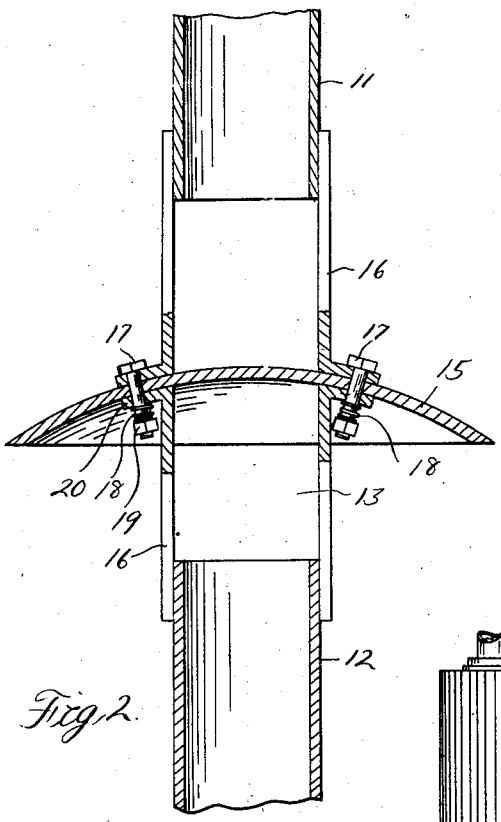


Fig. 2.

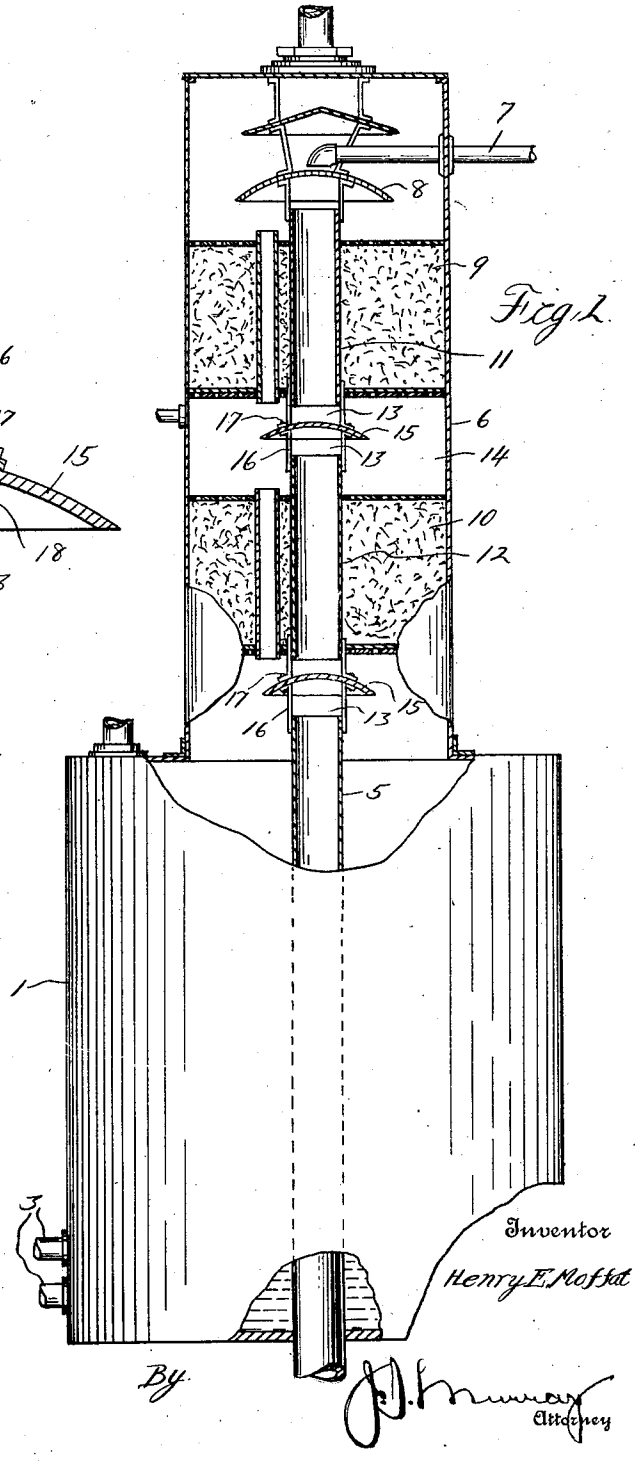


Fig. 1.

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UNITED STATES PATENT OFFICE.

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WATER HEATER AND PURIFIER.

Original application filed March 26, 1926, Serial No. 97,813. Divided and this application filed July 23, 1926. Serial No. 124,429.

This invention relates to an apparatus for heating and purifying water, and relates particularly to a water heater and purifier adapted to use exhaust steam as the heating medium. This application is a division of my application Serial Number 97,813 filed March 26, 1926.

It is an object of the invention to provide a water heating apparatus having a pipe extended therein delivering exhaust steam at various points in said apparatus for water heating purposes, and to safeguard the apparatus against any damage due to differential expansion of different portions of said steam delivery pipe.

More specifically, it is the object of the invention to deliver steam to a water heating apparatus through a pipe comprising aligned sections spaced for the delivery of steam to the apparatus, and to establish a connection between said sections that will resiliently yield to permit differential expansion of the sections, and thus avoid an undue strain upon said pipe and the portions of the apparatus to which the pipe is anchored.

These an various other objects the invention attains by the construction hereinafter described and illustrated in the accompanying drawings, wherein:

Figure 1 is a view in side elevation and partial section of the improved apparatus.

Figure 2 is an enlarged view of a portion of Figure 1 primarily disclosing the resilient connection between sections of the steam delivery pipe.

In these views the reference character 1 designates a cylindrical hot water storage tank, 3 designates a plurality of discharge pipes connecting with the lower portion of the tank 1 for conducting hot water to washing machines (not shown) or any desired point of use. Exhaust steam is delivered from any suitable source of supply to the lower end of a pipe 5 rising centrally through the tank 1.

Upon the tank 1 is mounted a combined water heater and purifier comprising a cylindrical casing 6 preferably of lesser diameter than said tank and co-axial with the latter. Water to be heated is delivered to the upper portion of the casing 6 by a pipe 7 and is discharged in the central upper portion of the casing upon a spreader plate 8 of inverted dish-shape. Said plate is marginally spaced above a filter bed 9 which is in turn spaced above a similar filter bed 10. Water descends successively through said filter beds which, as will presently be explained, are heated by steam which is also delivered to the spaces above and below each filter bed. 11 and 12 designate sections of steam pipe passing axially through the respective filter beds and having their ends spaced from each other, as indicated at 13, to permit steam to flow into and out of the heating space 14 between said beds. The lower steam pipe section 12 has its lower end similarly spaced from the upper end of the pipe 5, which latter projects slightly above the storage tank and into the casing 6. Within each of the spaces 13 there is preferably mounted a baffle plate 15 of inverted dish-shape, which serves both to deflect the rising exhaust steam into the heating spaces 14 and to sufficiently cover the upper ends of the exhaust pipe sections to prevent the descending water from entering said ends.

As a preferred means for connecting to each other the several sections 5, 11 and 12 of the steam delivery pipe, and for also mounting the baffle plates 15, a plurality of vertical bars 16 are welded or otherwise rigidly secured to the end portions of said pipe sections which bars project into the steam outlet spaces 13 and are bolted to the baffle plates 15 as indicated at 17. As a provision for differential expansion of the pipe sections 5, 11 and 12, a coiled spring 18 is mounted upon each bolt 17 between a nut 19 or other abutment on said bolt and the enlarged end portion 20 of the bar 16 secured by said bolt. These springs will permit the bars 16 carried by any of said pipe sections to seat against the adjacent baffle plate (or plates) 15, when said section is subject to a maximum expansion, and will permit said bars to withdraw from said plate in proportion as the section contracts.

What I claim is:

1. The combination with two spaced sections of steam pipe, substantially aligned, of a baffle member arranged substantially transversely of said pipe in the space between said sections, and connections between each pipe section and said baffle member, one of said connections including an element yieldable to provide for differential expansion of said sections.

2. The combination with two spaced sections of steam pipe, and a baffle member arranged transversely to and in the space between said sections, of means connecting said baffle member to said sections yieldable to provide for an expansion and contraction of said sections.

3. The combination with two spaced aligned sections of pipe, of a baffle member disposed in the space between said sections, members secured to each pipe section extending oppositely toward said baffle member, fasteners securing the last named members to the baffle member and to each other, and springs mounted upon said fasteners providing for expansion and contraction of said sections.

4. The combination with a section of steam pipe, of a baffle member spaced from an end of said pipe, and means supporting said baffle member upon said pipe, including an element yieldable to allow a relative movement between the pipe and baffle member due to expansion and contraction of said pipe.

5. The combination with two sections of steam pipe substantially aligned and spaced to provide for the lateral discharge of steam from one of the sections and a lateral flow of steam to the other, of a baffle member arranged in the space between said sections, members projecting toward each other from said sections, rigidly secured to said sections, and a connection between said members yieldable to provide for the expansion or contraction of said sections.

In testimony whereof I sign this specification.

HENRY E. MOFFAT.