Aug. 3, 1926. 1,594,975

R. E. NEWELL

WATER HEATER

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FIG. 1

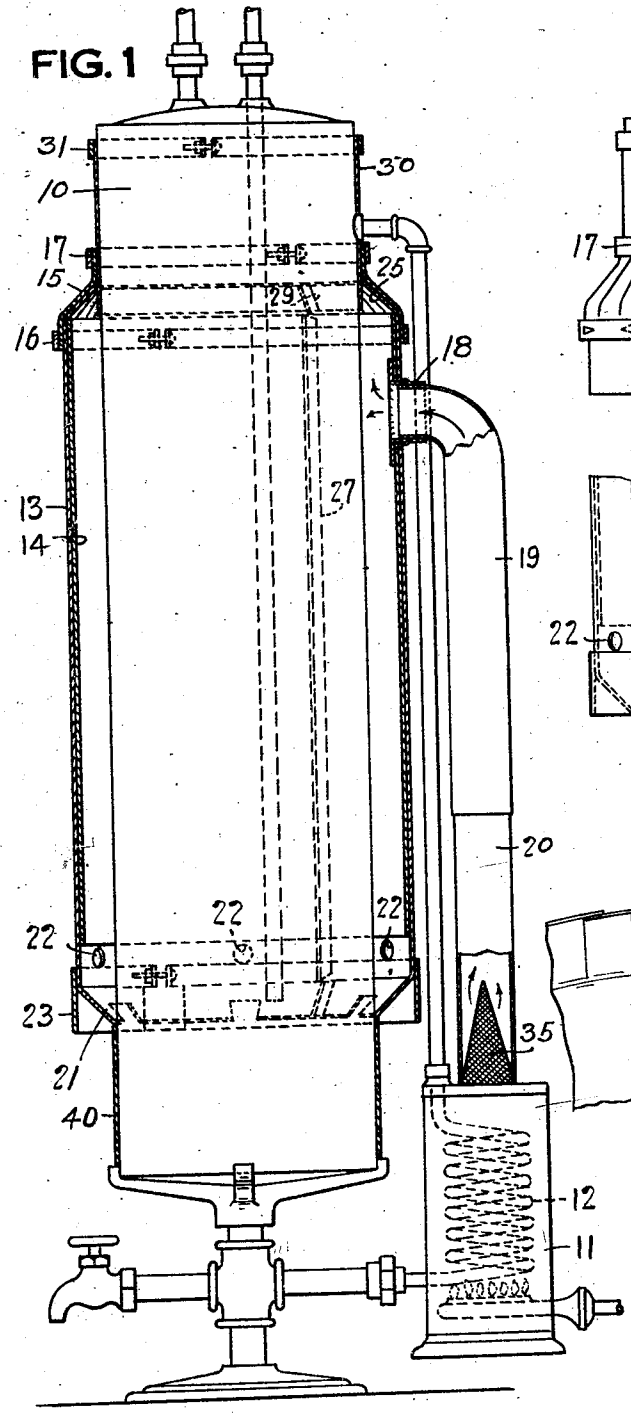


FIG. 2

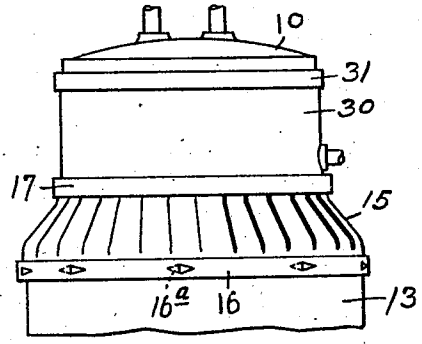
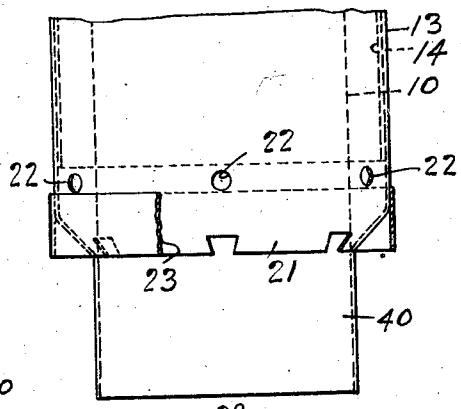


FIG. 3



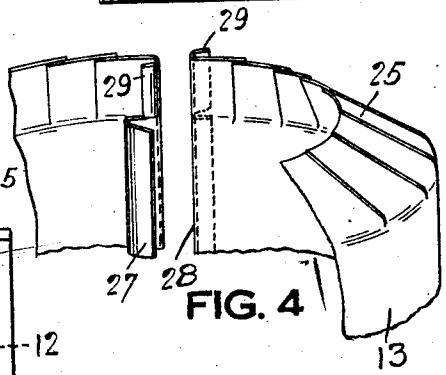


FIG. 4

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FIG. 5

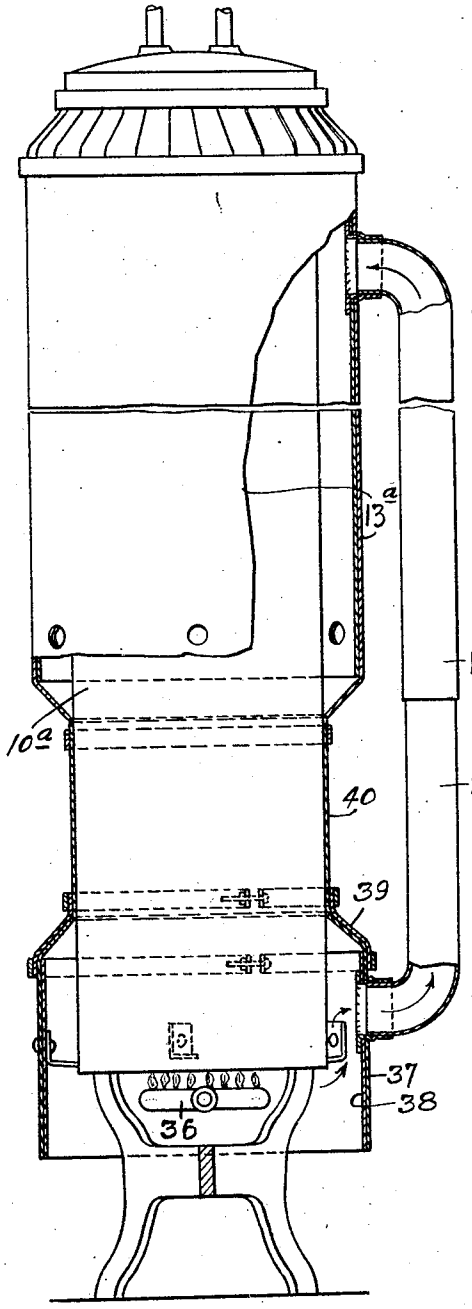


FIG. 6

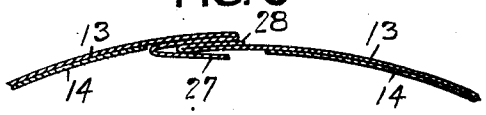


FIG. 7

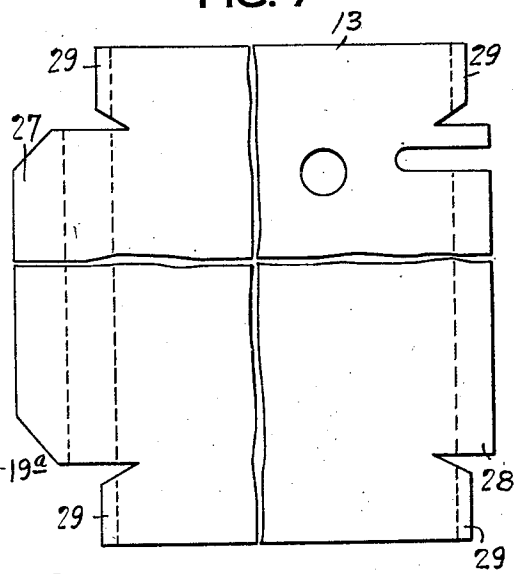
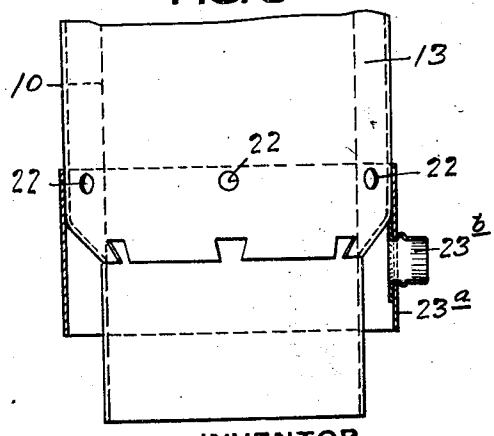


FIG. 8



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Patented Aug. 3, 1926. 1,594,975

UNITED STATES PATENT OFFICE.

ROBERT E. NEWELL, OF IRWIN, PENNSYLVANIA.

WATER HEATER.

Application filed September 16, 1924. Serial No. 738,069.

My invention relates to water heaters, and has particular reference to apparatus applicable to the burners and tanks of water heaters, with a view to conserving heat.

The object of my invention is to provide an improved form of apparatus whereby heat, which has heretofore been wasted, may be absorbed by the water being heated and which also prevents radiation of heat from the tank containing the water.

Another object of my invention is to provide a device that may be easily applied to or removed from water heaters already installed, and which is adaptable to a variety of styles and sizes of heaters.

Still another object of my invention is to simplify and improve generally the structure and function of devices of this character.

Some of the forms which my invention may take are shown in the accompanying drawings, wherein Fig. 1 is a view, partially in elevation and partially in section, of a heater to which my invention is applied; Fig. 2 is a view, in elevation, of a portion of the apparatus of Fig. 1; Fig. 3 is a view, partially in elevation and partially in section, of another portion of the apparatus of Fig. 1; Fig. 4 is a detail view, on an enlarged scale, of a portion of the jacket of Fig. 1; Fig. 5 is an elevational view, partially in section, of a modified form of apparatus; Fig. 6 is a view, on an enlarged scale, showing the form of sealing joint which I employ, Fig. 7 is a view of a blank, on a reduced scale, employed in making the jackets of Figs. 1 and 5, and Fig. 8 is still another modification, wherein provision is made for a flue connection.

The apparatus is shown as applied to a tank 10 having a gas heater 11 for heating water which circulates through the tank 10 and coils 12 in a manner well known, particularly in the domestic water-heating art. The apparatus to be hereinafter described is an improvement on the apparatus described and claimed in my copending application, Serial No. 568,658 filed June 15, 1922.

The principal parts of my apparatus comprise a metal jacket 13 formed of a blank as shown in Fig. 7; an asbestos liner 14 secured to the jacket 13 by cementing or otherwise; a sealing band 15 and straps 16 and 17 for securing the aforementioned parts together and holding them in position upon the tank 10, and a sweat band or pad 40.

The jacket 13 and liner 14 are provided with an opening for the reception of a flue ring 18 of sheet material and the like into which a flue section 19 fits. A flue section 20 has telescopic relation with the section 19 and communicates with the heater 11. This telescopic relation permits the ready adaptation of the device to heaters of varying height.

The lower end of the jacket 13 is provided with a plurality of flexible turned-in tongues so that they may be bent inwardly to form the flange 21. This flange 21 is at such angle that it tends to grip the exterior wall of the tank 10, thus resisting the tendency of the jacket 13 to move downwardly as well as centering the jacket with respect to the tank and insuring a uniform spacing between the interior of the tank and the exterior of the lining 14. Openings 22 are provided near the bottom of the jacket 13 for the exit of burnt gases. A sheet metal band 23 is provided in order to present a finished appearance to the bottom of the jacket, and clamp the jacket in position, also drawing the joint tight.

The sealing ring 15, of asbestos, preferably provided with an exterior coating of asphalt or the like is mounted in a steel band 17, and clamped around the upper end of the jacket 13, and the flange portion 25 thereof, and is slitted as shown in Fig. 2, in a manner similar to the flange portion 25. The upper edge of the slitted portion is clamped tightly against the boiler 10 by the strap 17. The band 16 is provided with inwardly extending tongue portions, at 16^a, struck out from the body thereof and bent backwardly upon the interior of the surface of the ring 16, in the manner shown in Fig. 2.

The inner surface of the sealing member 15, being of asbestos, will not adhere, when heated, to the tank or jacket, but the exterior thereof is coated with asphalt or similar material so that when it becomes heated, the asphalt will soften and cause adherence between superposed flaps of the member 15, adjacent to their edges, to prevent circulation of air therebetween. If the parts should be disassembled and again assembled, the

asphalt will automatically effect a sealing action as in the first instance.

The form of jacket just described permits the jacket to be installed on tanks of varying diameters and in places where the clearance between the tank and the wall of the building is very small, as the flaps and inturned flanges, at top and bottom provide flexibility and the jacket need not be symmetrically disposed around the tank, but may be applied where there is less than an inch of space between the tank and a wall. Heretofore gaskets or rings have commonly been placed around the tank between the outer wall of the tank and the ends of the jacket to effect a sealing and spacing, but such constructions require a fixed clearance space for their installation do not admit of adjustment for variations in the diameter of the boiler, and become loose by expansion and contraction due to heat.

Referring now more particularly to Figs. 6 and 7, the jacket member 13 is provided with tongue portions 27 and 28, bent to the form shown in Fig. 6, so that when the bands 16 and 23 are tightened, the tongue portions 27 and 28 of Fig. 6 will be forced together, forming a V-joint and preventing the loss of heat therethrough. The upper end of the jacket 13 is provided with extensions 29 that may be bent to the form shown in Fig. 4 and be hooked one within the other to assist in holding the upper end of the jacket in position.

These hooks 29 are particularly useful in assembling the jacket to a tank and enable one man to conveniently do the work. Ordinarily one man would have to hold the jacket while another fastens the bands 16. By the use of the hooks 29 particularly at the lower end of the blank (Fig. 7), the lower end of the jacket can be thereby held in position while the workman is fastening the bands. The hooks can be bent over for a greater or less distance to accommodate the jacket to tanks of various diameters.

A band 30 of heat insulating material is disposed about the upper end of the tank 10 and secured in place thereon by straps 17 and a strap 31.

Another feature to which attention is called is the provision of a fire screen 35 in the flue 20 for preventing explosions. The screen is of an area that it may have perforations sufficient to permit the flow of the usual burnt gases. However, the screen mesh is of such fineness that flame from the heater below is prevented from igniting the unburnt gas which may have accumulated in the flue pipes or the jacket.

Referring now to Fig. 5, I show a device that is applicable to a heater which employs a ring burner 36 instead of a heater such as shown at 11 in Fig. 1. In this construction the jacket 13^a is of substantially the same construction as the jacket 13 in Fig. 1, but may be disposed at a higher point on the boiler 10^a. An additional jacket 37, having an asbestos lining 38 is disposed adjacent the bottom of the boiler 10^a, and surrounds the burner ring 36. A sealing ring 39 is provided. The members 37, 38 and 39 may all be of substantially the same construction as the members 13, 14 and 15, of Figs. 1 to 4. This construction conserves the heat which would otherwise be dissipated from the burner ring and circulates it through the flue pipes 20^a and 19^a to the jacket 13^a and downwardly along the boiler as in the case of Fig. 1.

In Figs. 1 and 5, 40 is an evaporating pad disposed around the bottom of the tank and serves to prevent dripping of condensed moisture to the floor of the room in which the tank may be mounted. The pad is made of porous or perforated material as asbestos, copper screen or the like so that it prevents free flow of condensate and will absorb and spread it to such degree that all of the condensate normally formed during the heating of a cold tank will be evaporated instead of dripping to the floor. When the pad becomes warm the evaporation from the pad 40 is of course hastened. This arrangement permits the installation of a heater in a kitchen or other room without the necessity of employing a drip pan.

Where it is desired to conduct the burnt and cooled gases from the interior of the jacket 13^a to the chimney instead of permitting them to exit into the room through the openings at the bottom of the jacket, a flue band 23^a may be provided, (Fig. 8) covering the openings 22, and a flue pipe having its ends communicating with said flue band and a chimney, respectively, may be connected thereto as at 23^b. In this case the bottom of the jacket 13 would be left open substantially as shown, as well as the lower edge of the flue band, so that draft to the chimney would not be so great as to cause such rapid flow of burnt gases through the flue pipes 20 and 19, that the heat of the combustion gases would not be absorbed when passing downwardly along the surface of the tank.

It will be noted that the flue opening 23^b is below the lower edge of the jacket 13. This is to insure that the flow of burnt gases from the flue 19 will not follow the shortest path between the upper end of said flue and the flue opening 23^b, as would be the case if a flue hole were merely in the lower end of the jacket.

I claim as my invention:

1. A jacket for vertically disposed hot water tanks and the like, comprising a metallic shell having a liner of heat insulating material surrounding the tank in spaced relation thereto, and a sealing ring tightly fitting the upper edge of said shell and ta-

pering inwardly into engagement with said tank, the upper edge of said shell being provided with a tapering flange portion fitting against the tapering portion of said sealing ring.

2. A jacket for vertically disposed hot water tanks and the like, comprising a metallic shell having a liner of heat insulating material surrounding the tank in spaced relation thereto, and a sealing ring fitting the upper edge of said shell and tapering inwardly into engagement with said tank, the upper edge of said shell being provided with a tapering flange portion fitting against the tapering portion of said sealing ring, the said sealing ring being composed of longitudinally slitted heat-insulating material to form flaps which may lie in overlapping relation to permit the convenient formation of the tapering portion referred to.

3. A jacket for vertically disposed hot water tanks and the like, comprising a metallic shell having a liner of heat insulating material surrounding the tank in spaced relation thereto, and a sealing ring tightly fitting the upper edge of said shell and tapering inwardly into engagement with said tank, the upper edge of said shell being provided with a tapering flange portion fitting against the tapering portion of said sealing ring, the said sealing ring being composed of longitudinally slitted heat-insulating material to form flaps which may lie in over-lapping relation to permit the convenient formation of the tapering portion referred to, and being provided with cementitious material upon one side thereof so that the overlapping flap portions will adhere one to the other.

4. A jacket for vertically disposed hot water tanks and the like, comprising a metallic shell having a liner of heat insulating material surrounding the tank in spaced relation thereto, and a sealing ring tightly fitting the upper edge of said shell and tapering inwardly into engagement with said tank, the upper edge of said shell being provided with a tapering flange portion fitting against the tapering portion of said sealing ring, the said sealing ring being composed of longitudinally slitted heat-insulating material to form flaps which may lie in overlapping relation to permit the convenient formation of the tapering portion referred to, and being provided with cementitious material which softens in the presence of heat from the tank.

5. A jacket for hot water tanks having substantially uniform cross sectional area throughout its body portion, and having one end slitted longitudinally to form flaps which may overlap to permit the formation of a snugly fitting inwardly turned end portion, and having cut-out portions at its other extremity to provide for the formation of inturned flange portions.

6. A jacket for tanks of cylindrical form, comprising a body portion having end seals provided with infolded tongues whose free extremities engage the boiler, and means for clamping said extremities to the boiler, the tongues being flexible to permit floating adjustment of the jacket with respect to the boiler.

7. A heating and heat retaining jacket for vertical boilers, comprising an end seal having a flat flexible band clamped around the body of said jacket and having infolded tongues whose opposite ends are clamped around the boiler, said tongues containing a cementitious material which, when acted on by the heat of the boiler or jacket will automatically seal the folds thereof.

8. The combination with an upright heating tank, of a relatively short jacket surrounding the same in spaced relation thereto and open at its bottom, and a moisture-distributing pad snugly fitting the boiler beneath the open end of said jacket.

9. The combination with an upright heating tank, of a jacket surrounding the same in spaced relation thereto, a combustion heater for said tank, a flue leading into said jacket at its upper end, circumferentially disposed openings provided at the lower end of said jacket, a chamber surrounding said openings, and a flue connection leading from said chamber.

10. The combination with an upright heating tank, of a jacket surrounding the same in spaced relation thereto and open at its bottom, a combustion heater for said tank, a flue leading into said jacket at its upper end, and a flue connection leading from the lower end of said jacket.

11. The combination with a hot water tank, of a combustion heater therefor, a jacket surrounding a portion of said tank and in spaced relation thereto, a flue leading from said heater into the upper end of said jacket, and a flue connection in the lower end of said jacket.

12. The combination with a hot water tank, of a combustion heater therefor, a jacket surrounding a portion of said tank and in spaced relation thereto, a flue band disposed concentrically of the lower end of the jacket to form a chamber for burnt gases, and provided with a flue connection, the said flue band being adjustable in a direction circumferentially of said jacket.

In testimony whereof I, the said ROBERT E. NEWELL, have hereunto set my hand.

ROBERT E. NEWELL.