

Oct. 23, 1923.

1,471,784

F. ENGELHARD ET AL

HOT WATER BOILER

Filed Nov. 15, 1921

FIG. 1.

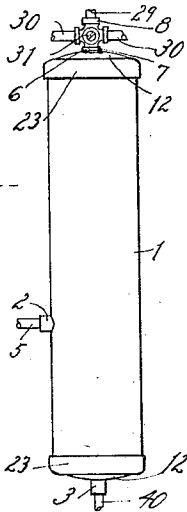


FIG. 2.

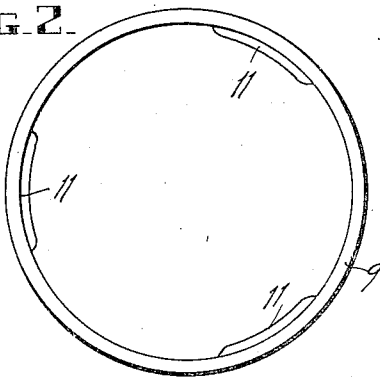


FIG. 3.

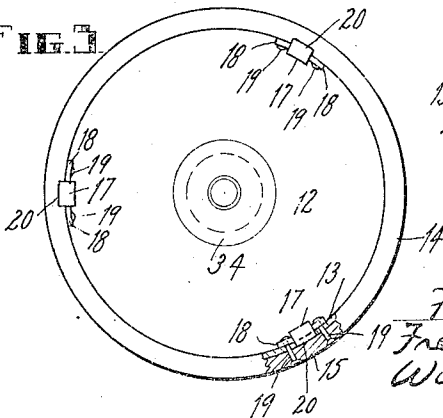


FIG. 4.

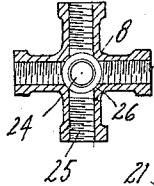


FIG. 5.

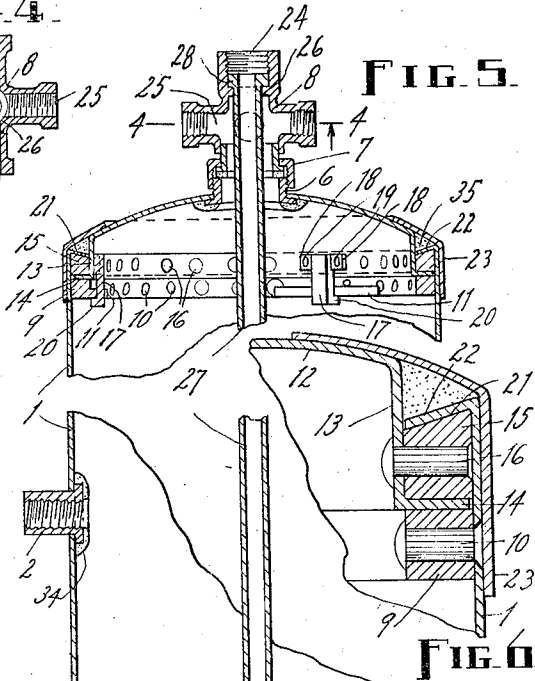
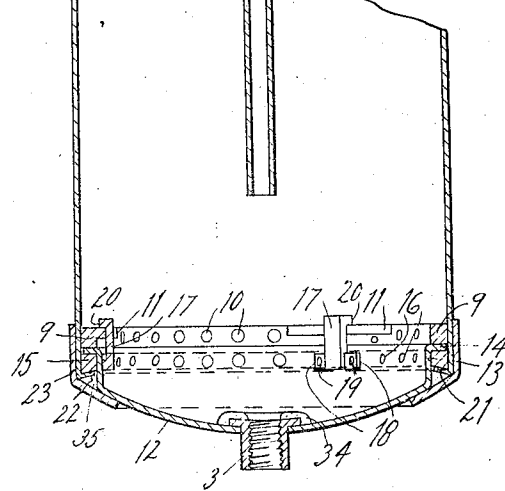


FIG. 6.



Frank Engelhard,
Frederick H. Engelhard,
William A. Engelhard,
INVENTORS.
BY

Frank A. Cutter,
ATTORNEY.

UNITED STATES PATENT OFFICE.

FRANK ENGELHARD, FREDERICK H. ENGELHARD, AND WILLIAM A. ENGELHARD, OF
SPRINGFIELD, MASSACHUSETTS; SAID FREDERICK H. ENGELHARD AND SAID WIL-
LIAM A. ENGELHARD EXECUTORS OF SAID FRANK ENGELHARD, DECEASED.

HOT-WATER BOILER.

Application filed November 15, 1921. Serial No. 515,199.

To all whom it may concern:

Be it known that we, FRANK ENGELHARD, FREDERICK H. ENGELHARD, and WILLIAM A. ENGELHARD, all citizens of the United States of America, and residents of Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Hot-Water Boiler, of which the following is a specification.

Our invention relates to improvements in hot-water boilers or tanks which are designed to be connected with kitchen ranges or gas heaters for the purpose of heating water to be distributed to different parts of the house, and resides in certain peculiar features of construction, and in a special top connection or fitting, all as hereinafter set forth.

One object of our invention is to produce a boiler or tank, of the character described above, which possesses degrees of strength and durability that materially prolong the life of the tank and enhance the value thereof. The weakest portions of an ordinary tank are the joints near the top and bottom thereof, where there is great liability of the seams opening and the tank becoming useless, and where repairs are most frequently needed, although such repairs as a rule only prolong the life of the tank a comparatively short time. In our tank the seams or joints at the top and bottom are so formed or constructed as to render these portions of the tank even stronger and more durable than the other portions thereof.

Another object is to provide the tank with an adjustable coupling or fitting at the top, whereby is removed most of the difficulty heretofore experienced in connecting the outlet or distribution pipes with the tank.

Other objects and advantages will appear in the course of the following description.

We attain the objects and secure the advantages of our invention by the means illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a tank which embodies a practical form of our invention; Fig. 2, an enlarged, top plan of one of the two upper joint-forming rings; Fig. 3, an enlarged, top plan of the end unit at the bottom of the tank; Fig. 4, an enlarged, horizontal section through the top fitting,

taken on lines 4—4, looking in the direction of the associated arrow, in Fig. 5; Fig. 5, an enlarged, central, vertical section through said tank, portions of the same being broken away, and, Fig. 6, a sectional detail of a portion of the upper joint, on a greatly enlarged scale as compared with the other views.

Figure 2 would also serve as a bottom plan of the corresponding ring in the lower joint; Fig. 3 would serve equally well as a bottom plan of the end unit at the top of the tank, except that the nipples in the two units are somewhat different, and Fig. 6, if inverted, would then become a detail of a portion of the lower joint.

Similar reference characters designate similar parts throughout the several views.

This tank comprises a hollow cylindrical body 1, and top and bottom, end units which latter will presently be described. The body 1 is provided in one side with a nipple 2, and the end unit at the bottom is provided in the center with a nipple 3, as is customary. A pipe, as 40, is connected with the nipple 3 and leads to the water-back in a stove or to a gas heater (not shown), and a return pipe from said water-back or heater, as 5, is connected with the nipple 2, all in the usual and well-known manner.

The end unit at the top of the tank is provided in the center with a nipple 6. This nipple is externally screw-threaded to receive a nut 7 by means of which a connection or fitting 8 is attached to said nipple.

Securely riveted on the inside of the body 1, some little distance in from the ends of said body, are reenforcing, joint-forming rings 9—9 of comparatively heavy or substantial construction. One of the rivets by means of which the rings 9 are secured to the body 1 is clearly shown in full at 10 in Fig. 6. Projecting inwardly from each ring 9 is a plurality of arcuate lips or flanges 11, there being three in the present case. The flanges 11 extend inwardly from the bottom of the upper ring 9 and from the top of the lower ring 9. The inner edges of the flanges 11 are concentric with the rings 9. The flanges on each ring are equi-distant apart.

The end unit at the top of the tank comprises a plate 12, in the form of a spherical segment, which has a downwardly-extend-

ing side member 13, and an outwardly-extending flange 14 at the bottom of said side member, and a reenforcing, joint-forming ring 15 that is received on said flange and riveted to said side member, one of the rivets employed in this case also appearing in full in Fig. 5, at 16. The ring 15 also is of comparatively heavy or substantial material.

Depending from the vertical part 13 of the plate 12 is a plurality of lugs 17, which lugs are equi-distant apart, and correspond in number with the flanges 11 on each ring 9. Each lug 17 has at the upper terminal thereof on the outer side a pair of ears 18, and these ears are riveted, as at 19, against the inner face of the vertical part 13. The rivets 19 extend through the ears 18, the part 13, and the ring 15. At the bottom of each lug 17 is an outwardly-turned lip 20. The lips 20 are designed to engage the under sides of the flanges 11 on the upper ring 9 when the parts are assembled, the proportions and positions of said lugs being such as to enable the aforesaid engagement to be made, as will hereinafter be more fully explained.

The end unit at the bottom of the tank is exactly like the end unit at the top of the same, which has just been described, except that the parts and members are inverted. In Fig. 3 a portion of the ring 15 therein appearing is broken out to disclose in full the two rivets 19 which hold one of the lugs 17, with which this unit is provided, in place.

Preferably the top of the upper and the bottom of the lower rings 15 converge from the outside peripheries to the inside peripheries, as indicated by the numeral 21. The body 1 extends over the outer ends of the flanges 14 and the outer peripheries of the rings 15 and beyond the latter, and such projecting, upper and lower edge portions of said body are turned inwardly over and onto the inclined surfaces 21 of the rings 15, as shown at 22.

Covering the joints between the body 1 and the end units are two exterior bands 23. Each band 23 extends onto the contiguous plate 12 and the upper portion of the body 1. These bands are securely held in place by means of soft solder which is poured in between contiguous portions of the plates 12, the body 1, and the bands. The solder also fills the annular spaces between the overturned edges or rims 22 of the body 1, the vertical portions 13 of the plates 12, and the inclined portions of the bands 23, thus adding another element of strength and security to the joints.

In assembling the elements which constitute the tank proper, the end units are introduced into the open ends of the body 1, before the edges which form the rims 22 are bent inwardly, until the flanges 14 of said

units come into contact with the rings 9. In order to do this it is necessary that the end units be so positioned that the lugs 17 do not encounter the flanges 11. After the end units have been inserted in the foregoing manner, they are partially rotated to cause the lugs 17 to engage with their lips 20 the inner sides of the flanges 11. With the lugs 17 in engagement with the flanges 11 it is, of course, practically impossible to remove or separate the end units or either of them from the body 1. Next the edges of the body 1 are bent inwardly to form the rims 22. Then the bands 23 are placed in position. And finally the solder is introduced in and around the joint-forming members just united, to complete the joints.

From the foregoing it is plainly seen that the parts and members, by means of which the ends are secured to the body of the tank, are so tightly, securely, and rigidly united as to produce joints that possess the desired and required strength, durability, and security, whereby are eliminated all danger or liability of rupture or leakage at such joints.

The fitting 8 is provided with a vertical passage 24, and with two horizontal passages 25, all of which extend clear through the fitting. In the passage 24, above the intersection therewith of the passages 25, is a flange 26, and this flange supports a pipe 27, there being an external flange 28 on said pipe at the top thereof to rest on said internal flange. The pipe 27 extends downwardly through the fitting 8 and the nipple 6 into and nearly to the bottom of the tank. A pipe, as 29, is connected with the fitting 8 above the pipe 27, and supplies cold water to the tank through said last-named pipe.

A relief valve (not shown) may be connected with the fitting 26 at one end of one of the passages 25, and pipes, as 30, may be connected with one or more of the other outlets of said connection, which outlets are at the ends of said passages. These pipes are the conduits through which the hot water from the boiler is distributed to different parts of the house. Two of the pipes 30 are represented in Fig. 1, and there is also represented in that view a plug 31, and similar plugs by means of which may be closed any outlet or outlets of the fitting 8 which may not be needed.

There is an external flange 32 at the bottom of the fitting 8, and a packing-ring 33 is interposed between the top of the nipple 6 and said flange. The nut 7 has an internal flange to engage the flange 32 and force the same tightly onto the packing-ring 33, when said nut is screwed down on the nipple 6.

Upon loosening the nut 7, the fitting 8 may be rotated to position said fitting to accommodate the pipes 30 however they may be disposed horizontally. After proper adjustment has been made the nut 7 is again

tightened. This provision for the adjustment of the fitting 8 is of great importance and value, inasmuch as it is possible therewith to make straight-away connections in cases where without such provision it would be necessary to make angular connections.

The hot water passes from the tank proper through the nipple 6 and packing-ring 33 into the fitting 8, and through one or more of the horizontal passages therein to the point or points of discharge. This is possible because the pipe 27 is smaller in diameter than the passage in which it is located below the supporting flange 26.

In order to connect the internally-flanged nut 7 with the base of the fitting 8 above the flange 32, it is necessary to make said fitting in two parts and to unite such parts after said nut has been connected. The parts of the fitting 8 which originally are separate from each other are securely and permanently joined together by means of a tight or drive fit, soldering, or brazing, or in any other usual manner.

This tank including its fittings is employed in substantially the same manner as any other tank for a similar purpose.

At 34 is represented the solder by means of which the nipples 6, 2, and 3 are held in place and tight joints around them insured, and about which there is nothing unusual; while the solder employed at, in, and around the joints between the body 1 and the top and bottom of the tank is indicated at 35.

More or less change in the shape, size, construction, and arrangement of some or all of the parts of the tank may be made without departing from the spirit of our invention or exceeding the scope of what is claimed.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. As an improved article of manufacture, a hot-water boiler comprising a body having interior rings affixed thereto, and end units having exterior rings which are affixed thereto and receivable in said body in contiguity with said body rings, and secured to the latter, said end-unit rings being out of contact with said body rings.

2. As an improved article of manufacture, a hot-water boiler comprising a body having interior rings affixed thereto, end units consisting in part of exterior rings affixed thereto and receivable in said body and into contiguity with said body rings but without contacting therewith, and interlocking fastening means between said units and said body rings.

3. As an improved article of manufacture, a hot-water boiler comprising a body having interior rings affixed thereto, adjacent to the ends thereof, end units consisting in part of rings affixed thereto and re-

ceivable in said body in contiguity with said body rings, the edge portions of said body being turned over said end-unit rings, and portions of contiguous rings having like diameters.

4. As an improved article of manufacture, a hot-water boiler comprising a body provided with interior rings adjacent to the ends thereof, end units consisting of plates having approximately vertical and outwardly-extending edge portions, and of rings set into the angles formed by said edge portions, said last-named rings and said edge portions being receivable in said body in contiguity with said first-named rings, and means to secure said end units to said body rings.

5. As an improved article of manufacture, a hot-water boiler comprising a body provided with interior rings adjacent to the ends thereof, end units consisting of plates having approximately vertical and outwardly-extending edge portions, and of rings set in the angles formed by said edge portions, said last-named rings and said edge portions being receivable in said body in contiguity with said body rings, and the edge portions of said body being bent over said end-unit rings, and means to secure said end units to said body rings.

6. As an improved article of manufacture, a hot-water boiler comprising a body provided with interior rings adjacent to the ends thereof, and end units consisting of plates having approximately vertical and outwardly-extending edge portions, and of rings set into the angles formed by said edge portions, said last-named rings having outer sides that converge from the outer to the inner peripheries thereof, and with said edge portions being receivable in said body in contiguity with said body rings, the edge portions of said body being bent over onto said converging sides.

7. As an improved article of manufacture, a hot-water boiler comprising a body provided with interior rings adjacent to the ends of said body, and end units consisting of plates and attached exterior rings fitting within said body outside of said first-named rings, the latter and said end units having interengaging fastening members.

8. The combination, in a hot-water boiler, with a body provided with interior rings which have interior flanges, said rings being adjacent to the ends of said body, of end units consisting of plates and attached exterior rings, and having lugs to engage said flanges, the end portions of said body being turned over onto said last-named rings.

9. As an improved article of manufacture, a hot-water boiler comprising a body

provided with interior rings adjacent to the ends thereof, end units consisting of plates having approximately vertical and outwardly-extending edge portions, and of rings set in the angle formed by said edge portions, said end-unit rings and said edge portions being receivable in said body in contiguity with said body rings, and the edge portions of said body being bent over the end-unit rings, fastening means between said body rings and said end units, and bands around the outside of the joints at the ends of said body.

10. As an improved article of manufacture, a hot-water boiler comprising a body provided with interior rings adjacent to the ends thereof, end units consisting of plates having approximately vertical and outwardly-extending edge portions, and of rings set in the angles formed by said edge portions, said end-unit rings and said edge portions being receivable in said body in contiguity with said body rings, and the edge portions of said body being bent over the end-unit rings, and bands soldered over the joints at the ends of said body.

11. As an improved article of manufacture, a hot-water boiler comprising a body provided with interior rings riveted thereto adjacent to the ends thereof, end units consisting of plates having approximately vertical and outwardly-extending edge portions, and of rings set in the angles formed by said edge portions and riveted to the approximately-vertical parts thereof, said end-unit rings and said edge portions being receivable in said body in contiguity with said body rings, and the edge portions of said body being bent over the end-unit rings, and fastening means between said body rings and said end units.

12. The combination, in a hot-water boiler, with a tank provided on top with a nipple, of a fitting having vertical and horizontal passages therethrough, and provided with an internal flange above said horizontal passages, means to secure said fitting to said nipple and to permit the former to be adjusted on the latter and a pipe having a flange to rest on said first-named flange, said pipe extending downwardly into said tank.

13. The combination, in a hot-water

boiler, with a tank provided at the top with a nipple, of a fitting having a flanged base, vertical and horizontal passages there- 55 through, and an interior flange above the horizontal passages, a flanged nut to engage said flanged base and adapted to be screwed onto said nipple, a packing-ring between 60 said nipple and said base, and a pipe having a flange to rest on the flange in said fitting, said pipe extending downwardly into said tank.

14. The combination, in a hot-water 65 boiler, of a body, interior rings riveted to said body somewhat remote from the ends thereof, said rings having interior flanges, end units consisting of plates having ap- 70 proximately vertical and outwardly-extending edge portions, rings set in the angles formed by said edge portions and riveted to the approximately-vertical parts of said plates, said second-named rings and said 75 edge portions of said plates being receivable in said body in contiguity to said first-named rings, and lugs carried by said approximately-vertical parts and said second-named rings, and adapted to engage said 80 flanges, the edge portions of said body being bent over said second-named rings.

15. The combination, in a hot-water boiler, of a body, interior rings riveted to said body somewhat remote from the ends thereof, said rings having interior flanges, 85 end units consisting of plates having approximately vertical and outwardly-extending edge portions, rings set in the angles formed by said edge portions and riveted to the approximately-vertical parts of said 90 plates, said second-named rings and said edge portions of said plates being receivable in said body in contiguity to said first-named rings, lugs carried by said approximately-vertical parts and said second- 95 named rings, and adapted to engage said flanges, the edge portions of said body being bent over said second-named rings, and bands soldered to said body and plates over the joints between the same.

FREDERICK H. ENGELHARD.
WILLIAM A. ENGELHARD.
FRANK ENGELHARD.

Witnesses:

ALFRED C. FAIRBANKS.
FRANCES I. TEED.