Oct. 30, 1934. W. H. ARMACOST 1,978,560

PORTABLE SUPERHEATER

Filed March 9, 1933 2 Sheets-Sheet 1

Fig. 1.

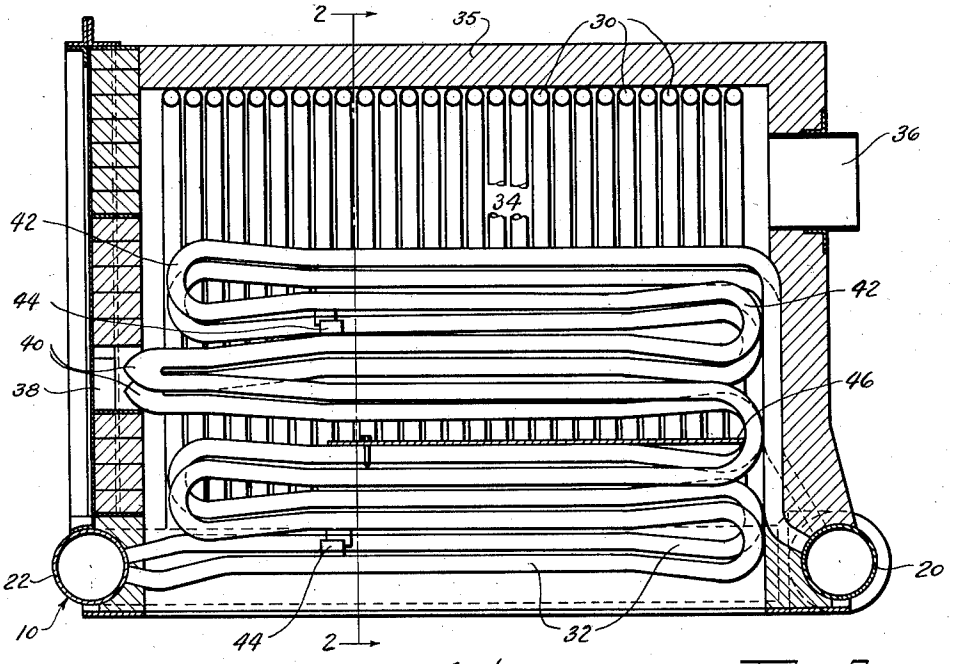
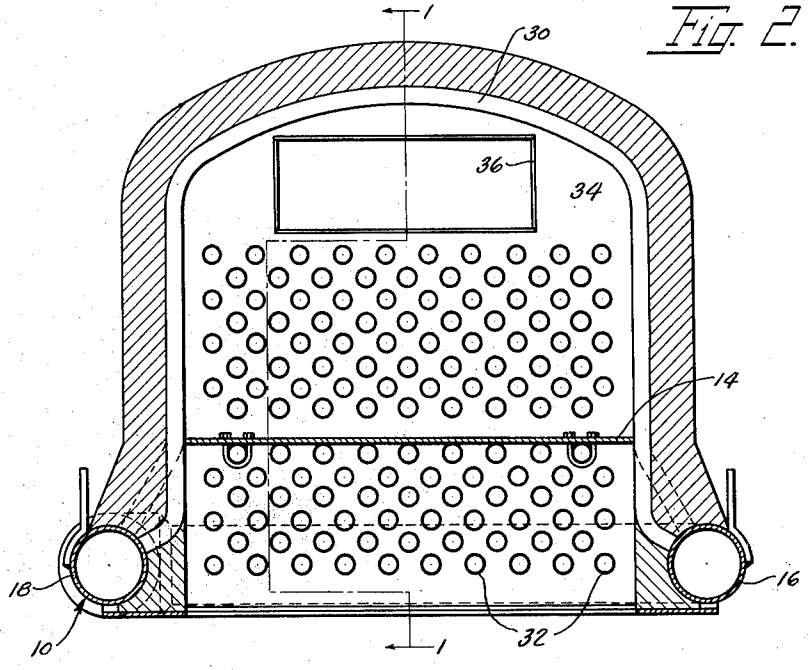


Fig. 2.



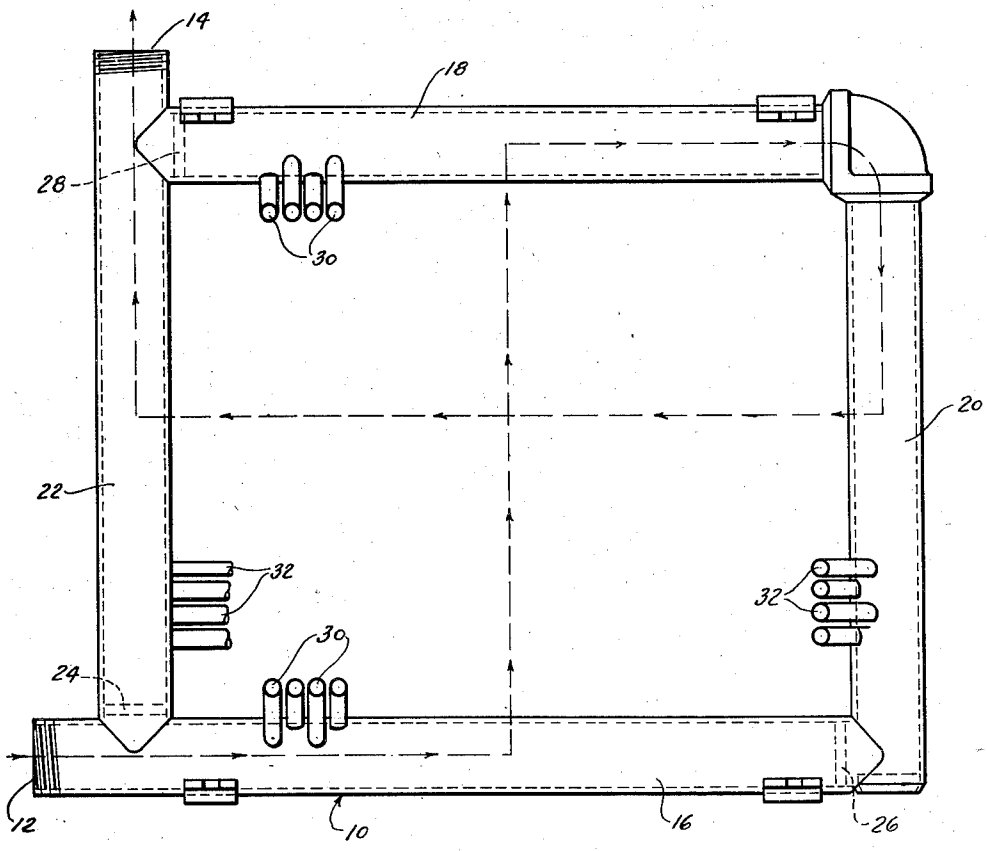
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Fig. 3.



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1,978,560

PORTABLE SUPERHEATER

Wilbur H. Armacost, New York, N. Y., assignor to The Superheater Company, New York, N. Y.

Application March 9, 1933, Serial No. 660,109

2 Claims. (Cl. 122—485)

My invention relates to heaters of the portable type.

In certain arts, considerable numbers of portable boilers are used. The drilling of wells is one such art. Such portable boilers often are not supplied with superheaters when built and the persons operating such boilers have sometimes added a separate portable superheater to the installations connected into the line between the boiler and the engine of the drilling rig. Many such superheaters have been quite heavy in proportion to their heating surface.

It is an object of my invention to provide a novel portable heater adapted for such use and which shall be rugged and economical to construct. A further object of my invention is to provide a portable heater having a large amount of heating surface in proportion to its weight. In order that my invention, together with its objects and advantages, may be clearly and fully understood, I will now describe in detail by way of example and in connection with the accompanying drawings a portable heater selected from a number of possible embodiments of my invention. In the drawings,

Fig. 1 is a vertical sectional view on a line 1—1 of Fig. 2 of a heater in accordance with my invention.

Fig. 2 is a vertical section on a line 2—2 of Fig. 1.

Fig. 3 is a plan view of a base ring of the heater shown in Figs. 1 and 2 having a flow diagram superimposed thereon, fragments of the units being included for purposes of illustration.

The heater shown in Figs. 1, 2 and 3 comprises a base ring 10 having an inlet at 12 and an outlet at 14. Ring 10 comprises four sections, namely: sections 16, 18, 20, and 22. Sections 16 and 18 lie on opposite sides of the ring from each other, so also do sections 20 and 22. Within ring 10 are three stops, namely: stops 24, 26 and 28. Stop 24 is near the inlet 12 of the ring so that fluid entering at the point 12 must flow along the section 16 without branching near the inlet. Stop 26 is at the end of section 16. In order to conduct fluid away from section 16 I provide a group of tubular units 30, 30 which connect into section 16 at one end and into the opposite section 18 at their other ends. Stop 28 is so placed that fluid in section 18 must flow out thereof into section 20 in the direction toward stop 26. In order to conduct fluid from section 20 I provide a group of units 32, 32. In the arrangement shown units 32 lie in planes substantially at right angles to those of units 30. Units 32 connect into section 20 at one end and into section 22 at their other ends so as to deliver fluid into section 22 from which it is free to flow out at the point 14.

While I have shown ring 16 as having a plan view which is rectangular, I do not limit myself to this.

In the arrangement shown, the units 30 form two opposite sides and the roof of the chamber 34 while the units 32 are of a serpentine form and lie within such chamber. The roof of the heater as well as the four vertical sides is also enclosed by suitable structure 35 to prevent the escape of gases except through the desired opening shown at 36. Preferably one of the end walls of the refractory structure 3 has a recess 38 therein into which the mid-portion of units 32 project at bends 40, 40 at which points it is convenient to make the units 32 somewhat wider than at the bends 42, 42. The weight of units 30 and 32 rests on ring 10 altho it is preferable to connect adjacent runs of units 32 in places by tongue and groove slip spacers 44, 44 in order to stiffen such units. Preferably also a baffle plate 46 is employed which may be conveniently supported on a horizontal row of the tubes forming parts of the units 32. As illustrated, baffle 46 is placed about one-third of the distance between the plane of ring 10 and the top points of units 30 and directs the gases toward the end wall of the heater opposite the one in which the outlet 36 is placed.

It may be understood that the structure illustrated in Figs. 1 and 2 can be placed above a pit which will serve as a fire-box or combustion chamber. I therefore do not provide room for combustion within the structure illustrated. It will be seen that the structure disclosed is rugged and economical to construct as well as readily portable. It has also a good heat efficiency and a large amount of surface in proportion to its weight.

While I have described my invention in connection with a steam heater, I do not limit myself to any particular field of use. Furthermore, I do not limit myself to the details of the description, but desire that the appended claims be construed broadly.

What I claim is:

1. A portable type heater having a base ring, said ring having an inlet, a stop in said ring adjacent said inlet for preventing branching flow of fluid entering the ring, a second stop in said ring spaced from said inlet and on the other side thereof from said first stop, units arranged to convey fluid from the section of the ring between

said two stops to the opposite section thereof, a third stop for directing the fluid discharged by said units into a section adjacent said first section, and units arranged to conduct fluid from said third mentioned section of the ring to the section of the ring opposite such third section, said ring having an outlet from said last mentioned section, one of said group of units extending on two vertical sides and the roof of a chamber and the other set of units having a serpentine form and lying within the said chamber.

2. A portable type heater having a rigid uniplanar four sided base ring composed of four sections of tubing, each such section arranged to occupy one side of said ring, one of said sections having an inlet, stops in said ring approximately at the corners at which said inlet section connects with the remainder of the ring, units arranged to convey fluid from the said inlet section to the section of the ring opposite thereto, a third section intermediate said inlet section and the one opposite thereto and connected to receive fluid at one end directly from such opposite or second mentioned section, a third stop substantially at the corner of the ring between said second mentioned section and the one opposite said third mentioned section whereby the entire flow directed by said units into said second section is directed into said intermediate or third section, and other units arranged to conduct fluid from said third mentioned section of the ring to the fourth section thereof, said fourth section lying opposite said third section and the ring having an outlet therefrom.

WILBUR H. ARMACOST.