A. W. FINLAYSON.

GAS WATER HEATER.

APPLICATION FILED NOV. 19, 1908.

1,039,919.

Patented Oct. 1, 1912.

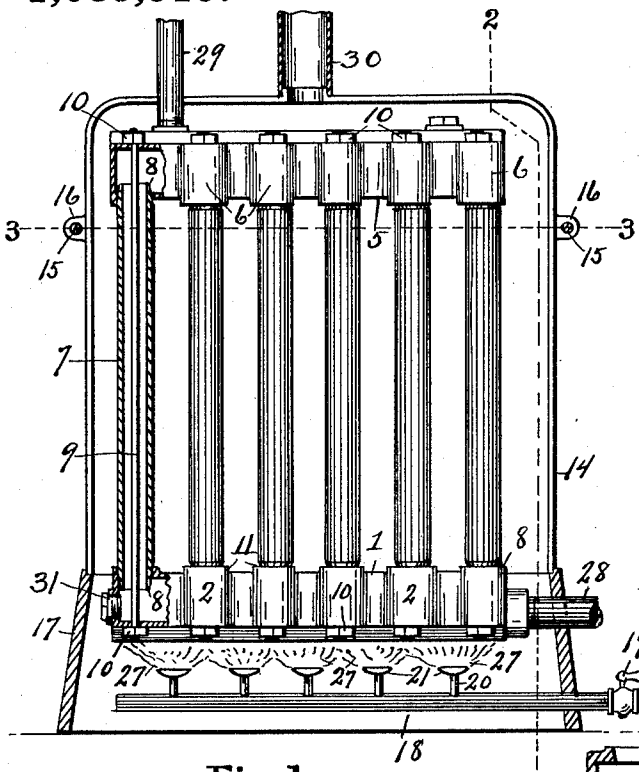

Fig. 1.

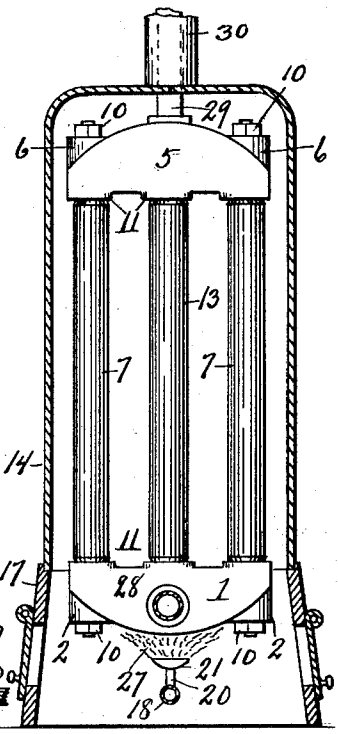

Fig. 2.

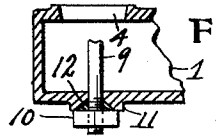

Fig. 5.

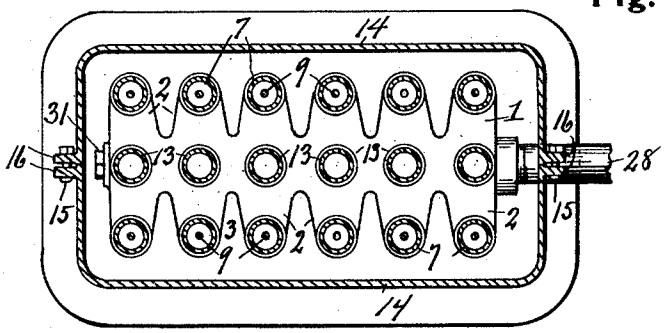

Fig. 3.

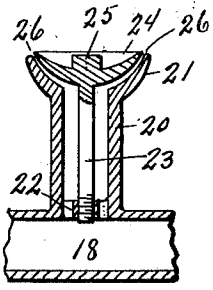

Fig. 4.

Witnesses

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GAS WATER-HEATER.

1,039,919. Specification of Letters Patent. Patented Oct. 1, 1912.

Application filed November 19, 1908. Serial No. 463,359.

To all whom it may concern:

Be it known that I, ALEXANDER W. FINLAYSON, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Gas Water-Heaters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to a gas water-heater, and consists in the construction and arrangement of parts hereinafter more fully set forth and pointed out particularly in the claim.

The object of the invention is to provide a simple, compact, and economical heater, wherein water may be quickly heated from the flame of a gas burner, and of such formation as to enable the parts to be quickly assembled, and rendered secure against liability of leakage.

The above object is attained by the structure illustrated in the accompanying drawings, in which:—

Figure 1 is a view partly in section of a heater embodying my invention. Fig. 2 is a vertical section as on line 2—2 of Fig. 1. Fig. 3 is a horizontal section through the heater as on line 3—3 of Fig. 1. Fig. 4 is an enlarged fragmentary view in section through one of the burners to show the construction thereof. Fig. 5 is an enlarged fragmentary view in section through a portion of one of the hollow heads, showing the tie rod passing through the wall of the head and illustrating the manner of packing said rod to prevent leakage.

Referring to the characters of reference, 1 designates the lower water-head which is cast hollow and is preferably oblong in form, the opposite sides of said head being provided with a plurality of lateral projections 2 separated by the intervening spaces 3. Formed through the upper wall of each of the projections 2 is a reamed or beveled aperture 4.

The upper head 5 is similar in formation to the lower head having the lateral projections 6 which register with the projections 2 of the head 1 and which are provided with reamed or beveled apertures through the lower walls thereof, similar to apertures 4 in the upper wall of the lower head.

Connecting the upper and lower heads and extending between the lateral projections 2 and 6 thereof, are a number of water tubes 7 whose ends are tapered, as shown at 8, in Fig. 1, to fit the reamed apertures in said heads.

To draw the water heads firmly onto the ends of said tubes and effect a water tight joint between the tapered ends of the tubes and said heads, tie rods 9 are employed which pass through said heads and extend longitudinally of said tubes, the ends of said rods projecting through the outer walls of the heads and being threaded to receive the nuts 10. A boss 11 (see Fig. 5) is formed around the openings in the heads through which said rods pass and said openings are countersunk to hold a quantity of packing 12 which is placed therein around the ends of said rods, whereby when the nuts are screwed into place, the heads are not only drawn together upon the tapered ends of the tubes, but said packing is compressed around the ends of the rods in a manner to prevent leakage. By providing a separate tie rod for each of the tubes in the outer rows thereof, any desired pressure may be exerted to effectually seat the tapered ends of the tubes in the beveled openings in said heads.

To increase the heating surface of the heater, a middle row of tubes 13 is employed, the tubes of said middle row having tapered ends which enter reamed apertures in the respective heads. The length of the middle row of tubes is such as to cause their outer ends to become firmly seated in the apertures in the heads when said heads are drawn together by means of the tie rods, as before described.

Embracing the heads and tubes is a suitable casing 14 which is preferably rectangular in shape and is formed in two parts which may be secured together by means of bolts 15 which pass through suitable ears 16 thereon, as clearly shown in Fig. 3. The casing 14 is supported upon a suitable base 17 and extending longitudinally of said base centrally thereof is a fuel supply pipe or gas pipe 18 having a controlling valve 19 therein. Rising from the pipe 18 are a number of short stand pipes 20 which communicate

with the pipe 18 and each of which is provided at its upper end with a flaring circular flange 21 which is concaved to form a saucer shaped receptacle at the upper end thereof. Crossing the opening of each of the pipes 20 is a bar 22 having a tapped aperture therethrough into which is screwed the lower threaded end of a stem 23 whose upper end carries a cap 24 which is concavo-convex and which is adapted to lie within the concaved seat or receptacle formed by the flange 21. Upon the upper end of the cap is formed a square lug 25 for the application of a wrench through the medium of which the stem may be screwed into or out of the tapped aperture in the bar 22, whereby an adjustment of the cap with respect to the flange 21 is made possible for the purpose of regulating the annular space 26 between the margins of the flange and cap through which gas is permitted to escape to maintain a flame under the lower head of the heater, as shown at 27 in Fig. 1, the stand pipes and adjustable caps in the upper ends thereof forming in effect gas burners which may be regulated according to the quantity of flame desired for heating the contents of the heater.

Communicating with the lower water head is a supply pipe 28 and leading from the upper water head is an educt pipe 29 which may be carried to any desired point and from which the heated water may be drawn.

The caloric current generated by the gas burners passes around the lower water head and upwardly through the openings 3 between the lateral projections 2 thereof, thence upwardly around the pipes 7 and 13 and around the upper head 5 between the lateral projections 6 thereof when it is permitted to escape through the flue pipe 30.

It will be observed that by means of this construction and arrangement of parts, an extensive heating surface is provided which enables the water within the tubes and heads to be quickly heated to a high temperature. By joining the tubes to the water heads by means of the tapered joints, the expense incident to thread cutting is obviated and the liability of leakage around the threads is overcome, and by employing the tie rods and nuts with which to connect the tubes with the water heads of the heater, said tubes may be readily removed by simply unscrewing said nuts. This provision for detaching the tubes from the heads, greatly facilitates the removal from said tubes of any accumulated dirt or scale.

A screw plug 31 is secured in the end of the lower head opposite to the induct water pipe 28, whereby provision is made for blowing out said head or otherwise removing any collected dirt or foreign matter.

Having thus fully set forth my invention, what I claim as new and desire to secure by Letters Patent, is:—

In a water heater the combination of hollow water heads in superimposed relation, each head being oblong in form and having spaced lateral projections extending from the opposite sides thereof and each of said projections on said heads having a beveled aperture through the lower and upper wall thereof respectively, each of said heads also having a single water chamber common to and in communication with all of said lateral projections, a plurality of rows of water tubes having tapered ends, the outer rows of said tubes being seated in the beveled apertures in the projections on said heads and the inner row being seated in the beveled apertures in the heads between said projections, said tubes being arranged in longitudinal and transverse alinement, tie-rods passing through the lateral projections on the water chambers and through said tubes to connect said parts, a casing embracing said heads and tubes, the lower portion of the casing forming a combustion chamber, and a burner in said chamber below the lower head.

In testimony whereof, I sign this specification in the presence of two witnesses.

ALEXANDER W. FINLAYSON.

Witnesses:

O. B. BAENZIGER,

I. G. HOWLETT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."