J. MUIRHEAD.

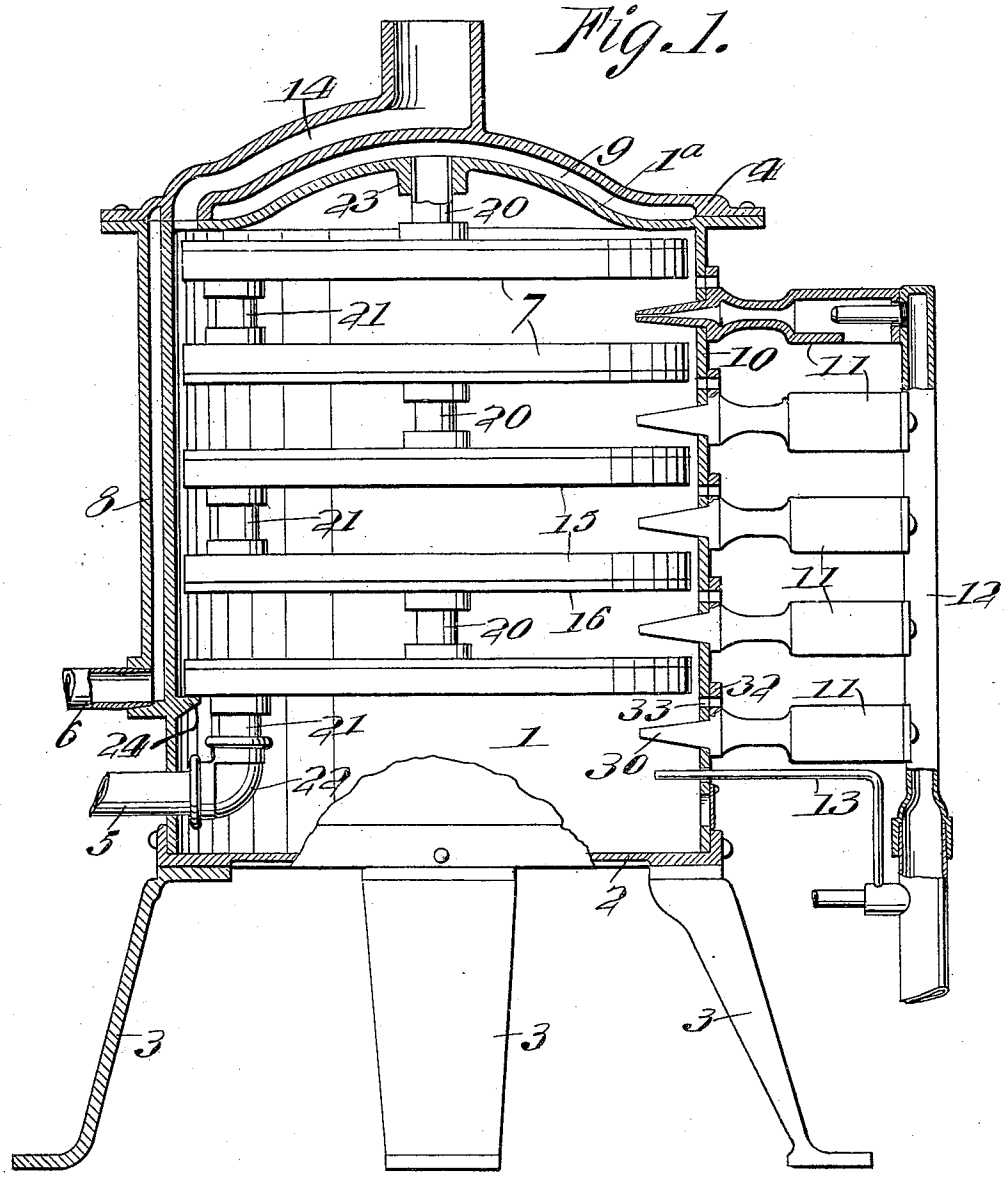
BURNER FOR WATER HEATERS.

APPLICATION FILED JULY 15, 1909.

977,214. Patented Nov. 29, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



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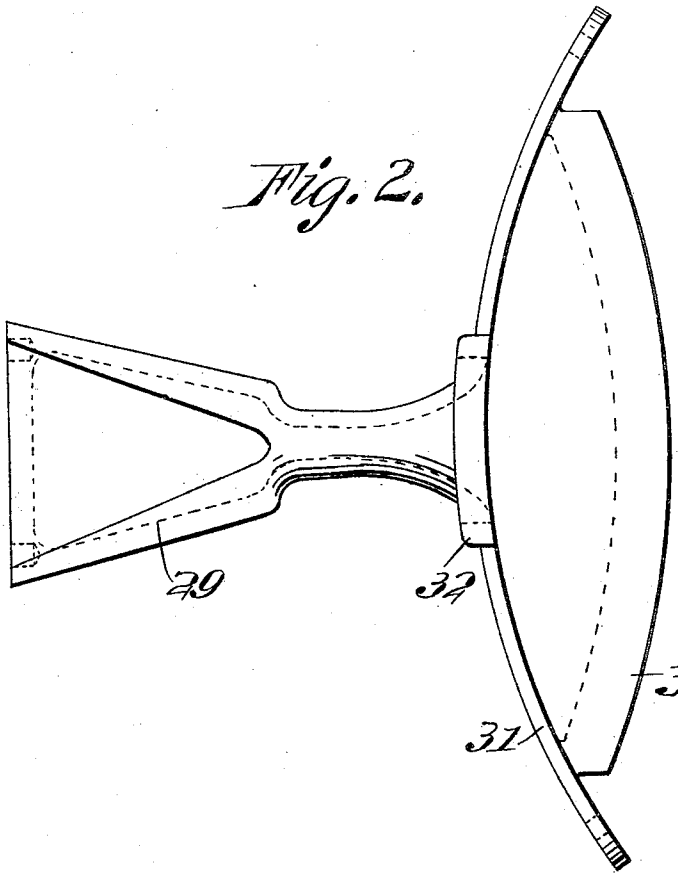
2 SHEETS—SHEET 2.

Fig. 2.



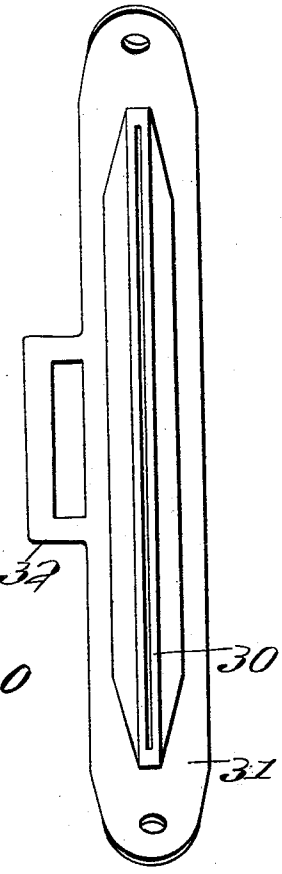
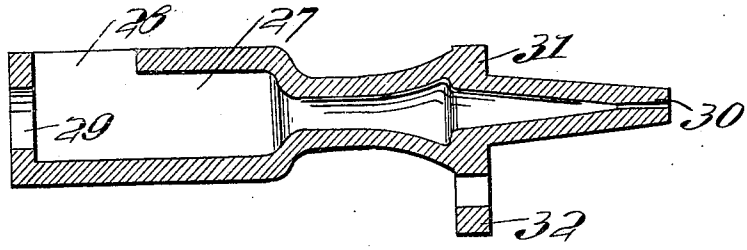


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES MUIRHEAD, OF PAWTUCKET, RHODE ISLAND.

BURNER FOR WATER-HEATERS.

977,214. Specification of Letters Patent. Patented Nov. 29, 1910.

Application filed July 15, 1909. Serial No. 507,879.

To all whom it may concern:

Be it known that I, JAMES MUIRHEAD, a citizen of the United States, residing at Pawtucket, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Burners for Water-Heaters, of which the following is a specification.

This invention relates to new and useful improvements in burners for water heaters and it has more particular reference to a structure in which the heating effect is very quickly produced through the agency of one or a series of gas burners. Heaters of this type are of especial advantage in those places wherein gas is relied upon mainly for the purposes of fuel and they are also of advantage in other places under circumstances requiring that a supply of heated water be quickly produced.

The object of the invention is to provide burners of simple, novel, inexpensive and economical construction, which may be easily applied to or detached from the water heater.

Further and other objects will later appear.

In the accompanying drawings I have illustrated by way of example a preferred and advantageous embodiment of the invention.

In the drawings: Figure 1 is a central vertical section of a heater showing more particularly the burner connections. Figs. 2, 3 and 4 are respective top plan, end elevational, and longitudinal sectional views of one of the burners.

Similar characters of reference designate corresponding parts throughout the several views.

The heater, in its general organization, consists of a shell as 1, preferably a cylinder, having a lower head 2, provided with supporting legs 3, and an upper head 4; the shell is provided with an inlet connection, as 5, and with an outlet connection as 6, and incloses a battery of heating units, as 7, which are connected as a series in conterminous relation, the respective end units 7 being in communication with the aforesaid inlet and outlet connections.

The shell 1 is provided with a partially circumscribing water jacket, as 8, to which the outlet connection 6 is directly joined, and which is in communication with a jacket space 9 in the head 4 with which jacket space 9 the upper unit is also in direct communication. The interrupted annular form of the jacket 8 affords an unjacketed clearance portion as 10, of the wall of the shell, through which burners 11 extend. The burners 11 correspond in number to the heating units and each burner heats one of the units. The burners 11 are joined to a gas supply pipe 12 and also to the cylinder in a manner to be described. The supply pipe 12 may be provided with a pilot extension as 13 which passes through the wall portion 10 at a point below the lower-most burner, and serves to light the entire series of burners when the gas is turned on. The head 4 is provided with a passage 14 through which the heated air and products of combustion pass from the shell 1 to the atmosphere.

Each heating unit 7 consists essentially of two parts, a circulation member 15 and a closure member 16. The units 7 are horizontally disposed in the shell 1, in spaced relation and in such manner that the members 15 of mutually adjacent units alternately face one another. This allows of the use of alternate coupling sections 20 and 21. The section 21 of the lowermost unit is joined to the inlet pipe connection 5 by means of an elbow, as 22, and the section 20 of the uppermost unit is joined to a central boss 23 of the top plate 1^a of the shell 1, the said top plate forming the lower wall of the jacket space 9 and having an opening alining with the passageway 14. The uppermost section 20 and the lowermost section 21 constitute efficient supports for the circulating battery but, if desired, a ledge as 24 may be provided for the lowermost unit to rest on.

Each burner 11 has at its rear end a mixing chamber 27, having an air opening 28. The feed jet from the pipe 12 projects axially into the mixing chamber through an opening as 29, in the end wall thereof. Each burner 11 has at its forward end a widened burner nozzle as 30 which is of narrow vertical dimension and adjacent to which a flange as 31 for connection to the wall portion 10, is provided, the nozzle 30 projecting through said wall portion into the shell and under the unit which it heats. The flange 31 has at its upper side a slotted extension as 32, with which is alined an opening 33 in the wall portion 10 as a sight means and in which a piece of mica or other

transparent substance may be secured and through which the flame of the burner may be seen. The provision of a burner 11 for each heating unit assures of the uniform heating of all the units and consequently the temperature of the water in any one of the units cannot become sufficiently low to neutralize or modify the temperature of the water in the other units.

Having thus described my invention, I claim as new and desire to secure by Letters Patent;—

1. The combination, with the shell of a water heater, said shell having an opening and a slot formed therein adjacent each other; of a burner projecting through said opening into the interior of the shell; and a flange formed upon said burner and adapted for attachment to said shell, said flange being formed with a slot registering with the first-mentioned slot, the pair of slots constituting a sight-opening to allow for inspection of the burner flame.

2. A burner for water heaters composed of a body provided at its rear portion with a mixing chamber having separate air and fuel inlets, and at its front portion with a flange adapted for attachment to the shell of the heater, said flange having an elongated nozzle projecting forwardly therefrom, the sides of the nozzle being spaced from the longitudinal edges of the flange.

3. A burner composed of a body provided at its rear portion with a mixing chamber, and at its forward portion with an elongated attaching flange, said flange having a flat longitudinally arranged nozzle projecting forwardly therefrom, the sides of said nozzle being spaced from the longitudinal edges of the flange.

4. A burner for water heaters composed of a hollow body having a gas opening in its rear end, and an air opening in its bottom adjacent the rear end of the body, an attaching flange secured to the body, and a nozzle connected to the body and extending on the front side of said flange.

5. In combination with a water heater having a series of openings, a series of burners, each burner consisting of a nozzle projecting through one of said openings and a hollow body portion connected to the nozzle, the hollow body portion of each burner having an opening for the ingress of air in its bottom side and having an opening in its rear end, and a gas supply pipe arranged at the rear ends of the burners and having connection with said rear ends of the burners through said openings thereat.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES MUIRHEAD.

Witnesses:
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