

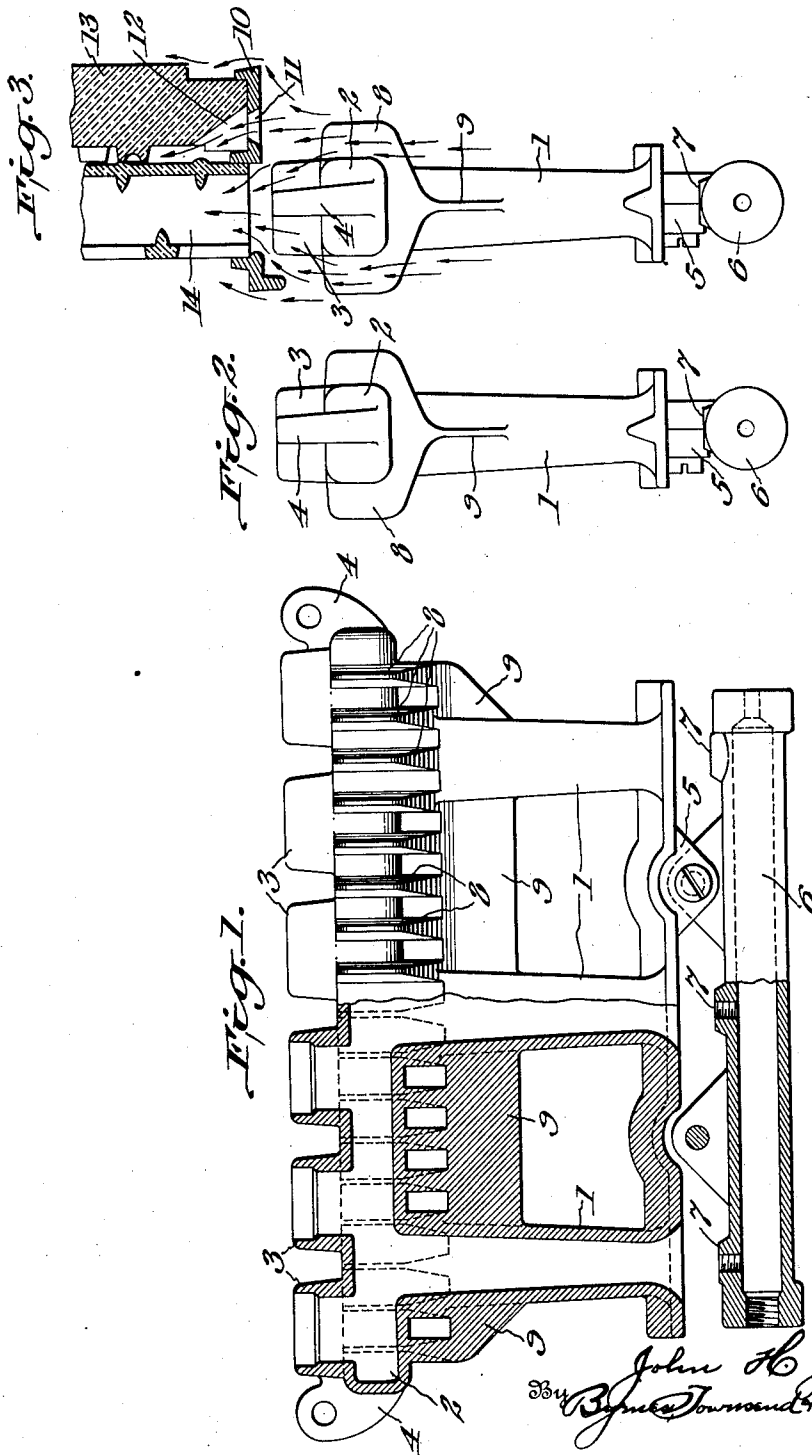
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J. H. GRAYSON

GAS BURNER

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UNITED STATES PATENT OFFICE.

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GAS BURNER.

Application filed August 4, 1924. Serial No. 730,059.

This invention relates to gas burners, and particularly to a burner manifold for use in gas heaters of the radiant type.

When gas heaters of the radiant type are provided with flues for carrying off the products of combustion, incomplete combustion will reduce the efficiency of the heater but will not ordinarily result in the discharge into the room of asphyxiating gases. With all portable heaters, however, and with many fixed heaters, the products of combustion are discharged into the room, and safety from asphyxiation requires that complete combustion take place under all conditions of fuel supply which may be encountered in a given locality. In some localities the pressure and B. t. u. content of the gas may vary from time to time, but whether or not these properties of the gas vary, the heating of the burner manifold affects the operation of a heater by causing a material reduction in the air-gas ratio.

An object of the invention is to provide a gas burner manifold which will give a lower reduction in the air-gas ratio than can be obtained with present day constructions. A further object of the invention is to provide a gas burner manifold which is cooled by secondary air supplied to the heater.

These and other objects of my invention are attained by the embodiment of my invention which is illustrated in the accompanying drawings in which,

Fig. 1 is an elevation, partly in central longitudinal section, of a burner manifold constructed in accordance with my invention;

Fig. 2 is an end elevation of the manifold; and

Fig. 3 is an elevation similar to Fig. 2, but showing associated portions of the heater in vertical section.

In the drawings, which illustrate a three tube burner manifold, the tubes which are designated by the numeral 1 discharge into the horizontal passage 2, with which the burner tip openings 3 communicate. The combustible mixture manifold is provided with the usual lugs 4 for attachment to the body of the heater and with depending lugs 5 which carry the gas supply manifold 6. The gas manifold is provided with threaded openings 7 in alignment with the tubes 1 for receiving the usual nozzles.

The construction, so far as described above, may be considered as typical of present day practice. The manifold is of course heated

by the flames issuing from the burner tips and by radiation from the incandescent glowers. To keep the temperature of the burner manifold as low as possible, I provide a plurality of heat dissipating fins 8 which extend around the sides and bottom of the passage 2. The fins are preferably tapered towards their outer edges and are joined, at their bottom edges, by longitudinal fins 9, which extend between the tubes 1 and project from the end faces of the outer tubes.

A burner manifold of this construction is particularly efficient when used in connection with the heater described in my copending application, Ser. No. 698,552, filed March 11, 1924. As shown in Fig. 3, the supporting plate 10 is provided with openings 11 which communicate with recesses 12 in the firebrick 13 to permit the passage of secondary air in large quantities between the firebrick and the glower 14. Secondary air also enters the base of the glower through the space between the top of the manifold and the plate 10. With this construction a large quantity of air passes over the fins of the manifold, and the preliminary heating of the secondary air reduces the danger of chilling the flame which would result in a lowering of the flame temperature. The path of the air which cools the manifold, and which when heated, serves as a supply of secondary air is indicated by the arrows in Fig. 3.

The dissipation of heat keeps the burner tips cool and prevents premature ignition of the fuel mixture. The cooling of the entire manifold and Bunsen tubes results in a higher primary air injection than is attained with the usual constructions. Combustion is further assisted by the large quantity of heated air which mixes with the flame and hot gases but which does not chill the same. It is, therefore, apparent that both the direct and the secondary effects produced by the cooling fins on the burner manifold are of assistance in securing complete combustion.

It is to be understood that the invention is not limited to the specific embodiment herein shown and described, as many changes in the parts, their relative size, shape, position and location may be made without departing from the spirit of my invention.

I claim:

1. A burner manifold for use in a radiant heater comprising a plurality of Bunsen tubes, walls defining a horizontal passage at

the tops of and communicating with each of said tubes, means on the top wall of said passage for receiving burner tips, and air cooling fins on the walls of said passage and said tubes.

2. The invention as claimed in claim 1, wherein the fins on the walls of said passage comprise vertical fins extending around the side and bottom walls of said passage.

10 3. A burner manifold for use in a radiant heater, said manifold comprising a horizontally arranged gas supply conduit having a plurality of threaded openings in the upper wall thereof for receiving nozzles, Bunsen
15 tubes arranged over said openings and with their lower ends spaced from said conduit, walls defining a horizontal passage at the tops of and communicating with each of said tubes, and air cooling fins on the walls of said
20 passage and on said tubes, the fins on said tubes being arranged below the fins on said

passage and merging into the lower edges thereof.

4. In a radiant heater, an apertured plate for supporting a plurality of glowers and a firebrick, a burner manifold supported below said plate and comprising walls defining a horizontal passage positioned below the apertures of said plate, burner tip openings extending above said passage to deliver a combustible mixture through said apertures, a plurality of Bunsen tubes for delivering the combustible mixture to said passage, a gas conduit for projecting a stream of gas into each of said tubes, and means on said manifold for reducing variations in the air-gas ratio of the combustible mixtures, said means comprising air cooling fins on the walls of said passage.

In testimony whereof, I affix my signature.

JOHN H. GRAYSON.