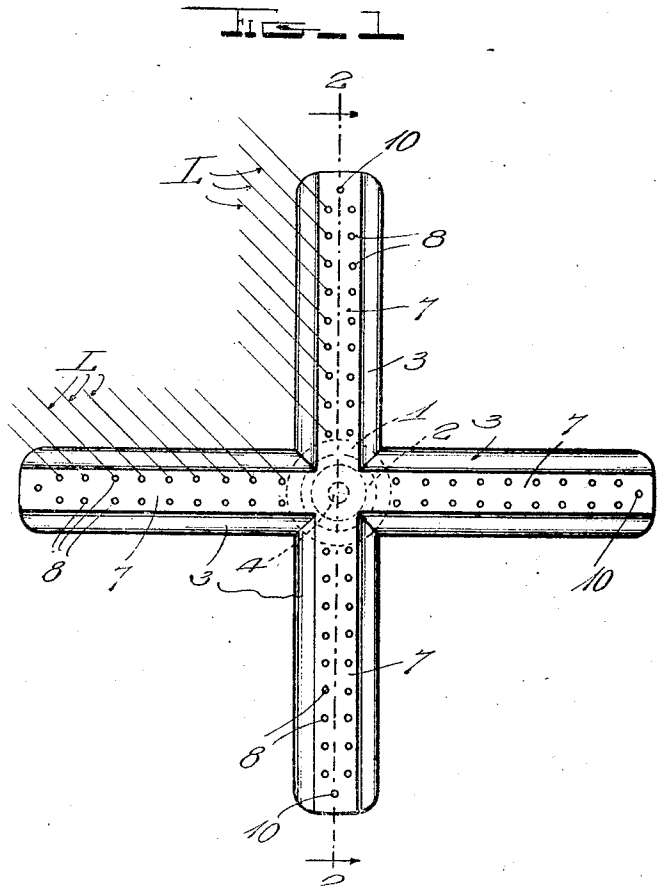
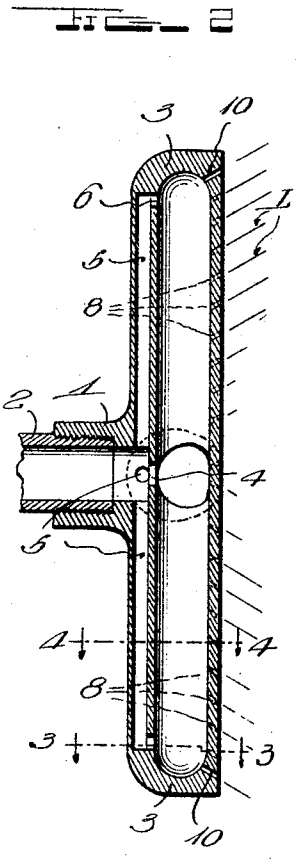
March 23, 1926. 1,578,210

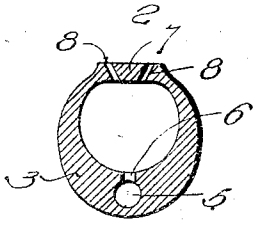
H. D. SCHRADER

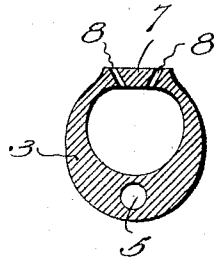
LOW PRESSURE GAS BURNER

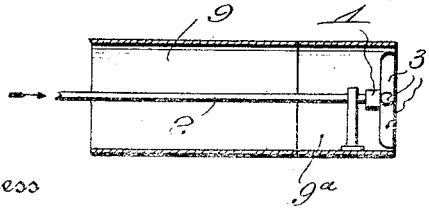
Filed August 17, 1925











Witness

Inventor

Harold D. Schrader

By H. B. Williamson & Co

Attorneys

Patented Mar. 23, 1926. 1,578,210

UNITED STATES PATENT OFFICE.

HAROLD D. SCHRADER, OF MIDWEST, WYOMING, ASSIGNOR OF ONE-HALF TO LEO MAYNARD STAUFFER, OF MIDWEST, WYOMING.

LOW-PRESSURE GAS BURNER.

Application filed August 17, 1925. Serial No. 50,751.

To all whom it may concern:

Be it known that I, HAROLD D. SCHRADER, a citizen of the United States, residing at Midwest, in the county of Natrona and State of Wyoming, have invented certain new and useful Improvements in Low-Pressure Gas Burners; 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.

My invention aims to provide a new and improved form of gas burner which, even though the gas pressure may be low, will evenly distribute the gas in the arms or legs of the burner, thereby overcoming the liability of dust and carbon being deposited in and clogging the outlet perforations from portions of said arms or legs, insuring even temperature of gas and also insuring that no dead space shall exist in the burner with the possibility of burning the latter out.

A further aim is to so position the discharge perforations of the burner that they will induce the flow of air around all of the burner arms and around the outer extremities of the latter, so that the burner head is kept at a comparatively low temperature, the arrangement of perforations also serving to induce the flow of air through an air admission cylinder, in whose inner end the burner head is located. The arrangement of perforations also serves to induce flow of air into the fire box through any other admission passage which may be provided, and the burner may be used with any other forced draft or induced draft system if desired, in order to obtain high ratings for boilers. From my experience with this burner, it will develop 150% boi er rating with natural draft and by applying forced draft, it has developed as high as 300% boiler rating, on a 1300 H. P. Babcock and Wilcox boiler, one hundred burners being used.

A still further object is to provide a burner which will be simple and inexpensive, yet will be exceptionally efficient and desirable, whether used in large furnaces or in small domestic heating plants, or in any other connection to which it is suited.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, the description being supplemented by the accompanying drawing.

Figure 1 is a front elevation of a burner constructed in accordance with my invention.

Figure 2 is a vertical sectional view on line 2—2 of Fig. 1.

Figures 3 and 4 are detail transverse sections on lines 3—3 and 4—4 of Fig. 2.

Figure 5 is a side elevation of the burner arranged in the air admission cylinder.

In the drawing above briefly described, the numeral 1 designates a hollow hub which is connected with a gas supply pipe 2 in any suitable manner, for instance by threading the pipe into the rear end of the hub. Integral with the front end of this hub and radiating therefrom, are a number of arms 3 which are disposed in a common plane, said arms being in communication with each other at a central point. At this point, the inner ends of the arms have restricted communication with the interior of the hub 1, by a port 4. Formed longitudinally in the rear or inner walls of the arms, are fuel ports 5 which lead from the interior of the hub 1, the outer ends of these ports being in communication with the outer ends of the arms 3, by ports 6. This arrangement of passages and ports, insures an even distribution of gas throughout the length of each of the arms 3, even though such gas may be under rather low pressure.

The front wall of each arm 3 is preferably flat, whereas the remaining exterior portion of each arm is preferably rounded as shown, to offer minimum resistance to the passage of air around all portions of the burner head. Each front wall 7 is formed with two parallel rows of gas escape perforations 8. These perforations are formed on such angles as to discharge the gas between the arms of the burner head on lines which are parallel with each other, as indicated at L in Figs. 1 and 2, said lines widely diverging from the plane of the burner head or arms, toward the outer ends of the latter. By having the gas discharge on these lines and the flame burning on such lines, an abundant supply of air is induced to travel around the arms, particularly when the burner is located in the inner end of an air admission cylinder, such as that disclosed at 9 in Fig. 5. This cylinder may of course

be formed of any desired material or materials, and it is preferably provided with a separate end section 9^a, which may be renewed when it becomes burned, without disturbing the furnace front setting. Tile or any other refractory material is suitable for this cylinder. The ends of the arms 3 are then in spaced relation with the cylinder wall and passage of air around said ends is induced by perforations 10, one of which is located in the outer end of each wall 7, said perforations 10 being located to discharge the gas outwardly on lines which widely diverge with the plane in which the burner head is located.

The improved burner may be installed in connection with numerous forms of furnaces or other heating devices and when it is used with a long fire box, the gas discharge perforations may be disposed at such angles to the burner arms as to direct the gas almost straight inwardly, but when a larger and shorter fire box is to receive the flame from the burner, the perforations are preferably drilled to give the flame more spread, and it will be obvious that the burner may be constructed in numerous sizes and with more or less perforations according to the conditions to be met. In all instances, the device will be highly efficient and desirable, will give uniform discharge of air throughout the length of the arms, will not clog up, will be uniformly heated, and will induce the entrance of an abundance of fresh air both between the burner arms and around the ends of the latter, insuring that the burner head shall remain comparatively cool and shall not be in danger of burning out.

As excellent results are obtainable from the details disclosed, they are preferably followed. However, within the scope of the invention as claimed, slight modifications may of course be made.

I claim:—

1. A gas burner comprising an air admission cylinder, and a burner head in the delivery end of said cylinder having a plurality of radial arms disposed in a plane at right angles to the axis of said cylinder and terminating in spaced relation therewith, each of said arms having two parallel longitudinal rows of perforations, the perforations along any two adjacent portions of any two arms being arranged to discharge gas between said arms on lines which are parallel with each other and diverge widely from the aforesaid plane toward the wall of the cylinder, the outer ends of said arms each having a central perforation also disposed to discharge the gas on a line which diverges widely from the aforesaid plane toward the cylinder wall.

2. A gas burner comprising a head having a plurality of radial arms disposed in a common plane, each of said arms having two parallel longitudinal rows of perforations, the perforations along any two adjacent portions of any two arms being arranged to discharge gas between said arms on lines which are parallel with each other and diverge widely from the aforesaid plane toward the periphery of the head, the outer ends of said arms each having a central perforation also disposed to discharge gas on a line which diverges widely from the aforesaid plane toward the periphery of the head.

3. A burner head comprising a hollow hub having a gas inlet, and a plurality of hollow arms integral with and radiating from the front end of said hub, said arms being in communication with each other at a central point and at said point having direct communication with said hollow hub by means of a port, the rear walls of said arms being formed with longitudinal fuel passages leading from the interior of said hub, said passages and arms being in communication at the outer ends of the latter by means of ports, said arms being provided with fuel escape perforations.

In testimony whereof I have hereunto affixed my signature.

HAROLD D. SCHRADER.