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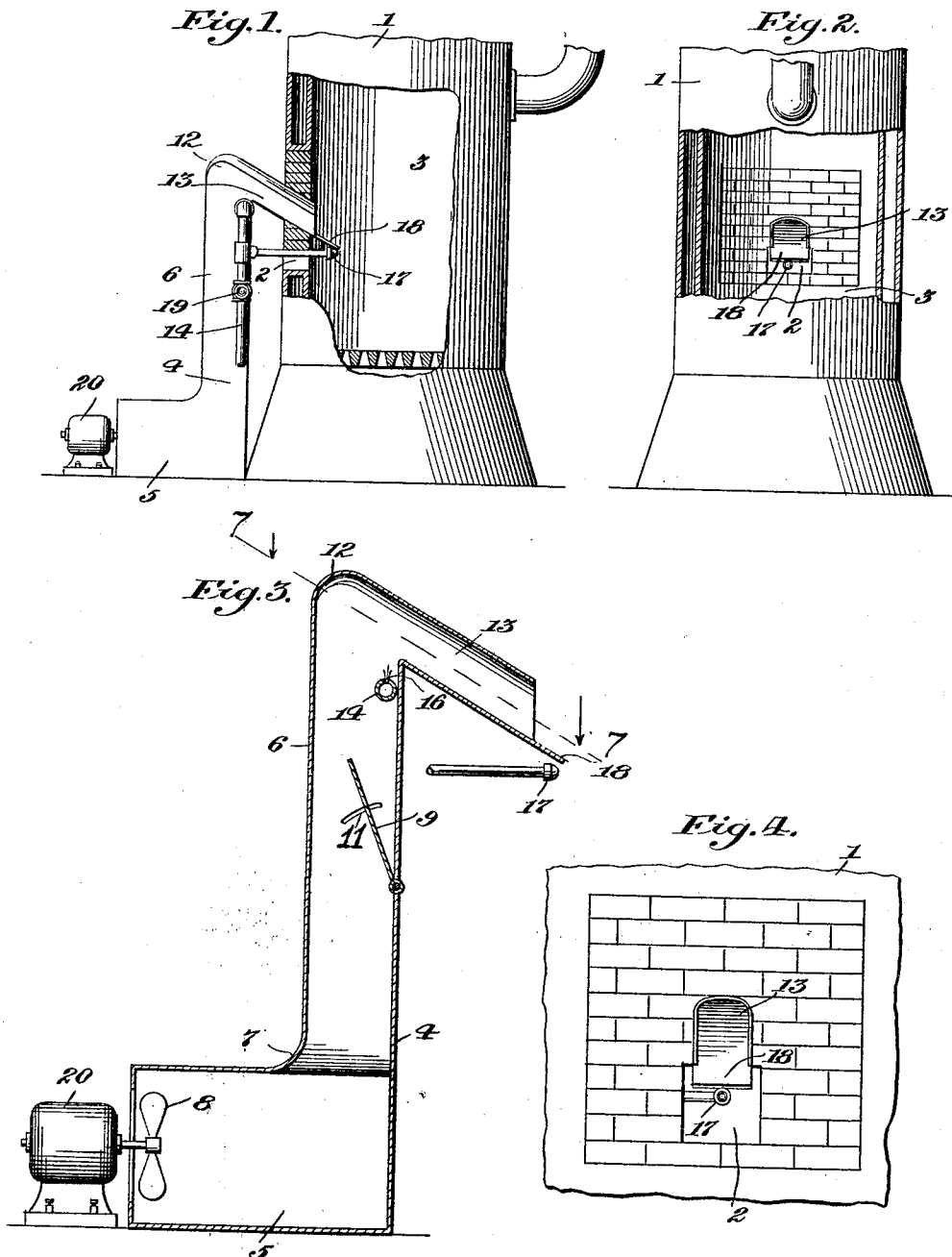
S. H. GRIFFITHS

1,869,359

AIR AND GAS BURNER

Filed Nov. 21, 1930

2 Sheets-Sheet 1



Inventor:
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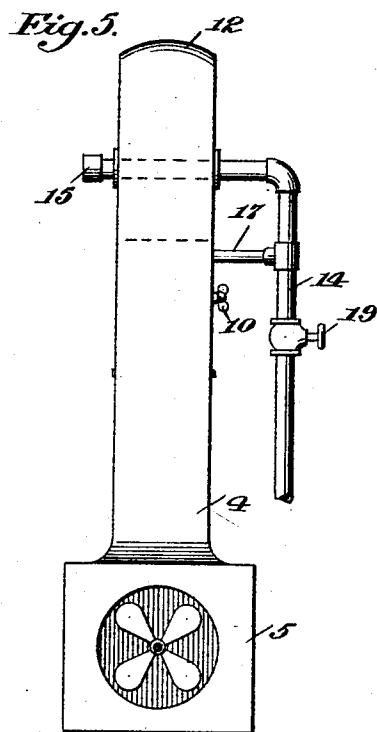
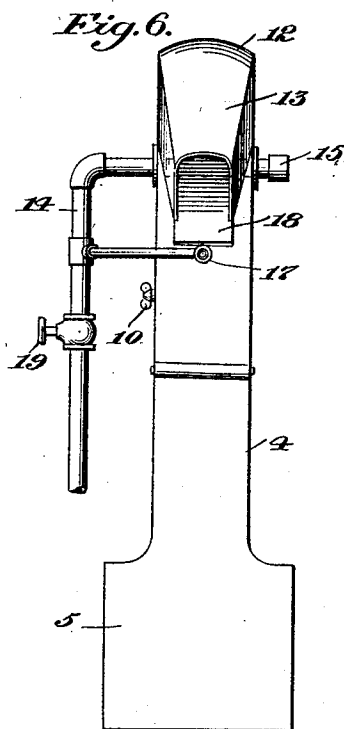
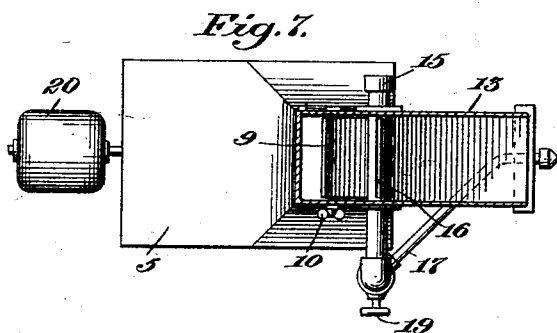
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UNITED STATES PATENT OFFICE

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AIR AND GAS BURNER

Application filed November 21, 1930. Serial No. 497,321.

This invention pertains more particularly to burners using natural gas and air as a fuel for producing a bright luminous flame, such burners being installed in connection with warm air, hot water and steam heating furnaces or boilers usually employed for heating various types and constructions of buildings, and said burners being also capable of advantageous use for a great variety of other purposes, where heat is required and within the limits of a device of this kind to produce the required amount of heat, and are especially designed to be used in connection with furnaces utilized for the heating of dwellings, stores, and like building structures.

The prime object of the invention is to provide simple, durable, economical, practical and thoroughly efficient means that serves to produce a bright luminous flame and furnishes the necessary heat for the purposes for which it is intended to be employed.

Another object of the invention is to provide means that may be easily and readily connected with any ordinary furnace or boiler now commonly employed for heating buildings without dismantling or damaging the furnace or boiler to any extent whatever.

Further objects of the invention are to so construct my improved burner that a regulated volume of air and a regulated amount of gas are fed simultaneously through the fire door of the furnace, and as the combined volume of air and gas is caused to enter the fire chamber it is ignited and merges into a luminous flame thus producing a maximum amount of heat units for the purpose for which it is employed; that the air is forced through a metallic tubing and into the discharge portway; that the discharge portway is substantially twice the area at its outer end portion than it is at its inner discharge end portion; that the upper surface of the discharge end portion is arch shaped, and that the device may be easily and readily disconnected from the furnace by any one unskilled in this particular art, when it is desired to discontinue the use of this particular type of burner.

The foregoing and such other objects as may appear from the ensuing description are accomplished by the construction, combination, arrangement and location of the several parts hereinafter more fully described, illustrated in the accompanying drawings, and more particularly set forth in the claims appended hereto, it being understood that slight changes in the precise form, proportions and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings forming a part of this specification it will be seen that:

Figure 1 is an elevation of the improved burner embodying my invention connected with a furnace, showing the furnace broken away in parts and partly in section.

Figure 2 is an elevation partly in section of a furnace showing the discharge end portion of the discharge portway and the pilot light end portion of the burner.

Figure 3 is a slightly enlarged sectional elevation of my improved burner disconnected from the furnace, and showing in elevation an electric motor for driving the air forcing fan.

Figure 4 is an enlarged inside view of the fire door space of the furnace closed with fire brick, showing the furnace wall broken away and the discharge end portion of the burner connected therewith.

Figure 5 is a front elevation of the burner detached from the furnace.

Figure 6 is a rear elevation of the burner detached from the furnace, and

Figure 7 is a plan view of the burner showing the discharge portway thereof in longitudinal section taken in the plane of the dotted line 7-7, Figure 3.

In the embodiment of my invention as illustrated, it will be seen that the numeral 1 designates a furnace or heating boiler which may be of the usual type now employed for heating purposes, 2 is the fire door opening leading to the fire chamber 3 of the furnace, and 4 indicates the readily attachable and detachable burner structure, comprising a hollow metallic casing preferably of rectan-

gular formation in cross-section having a base member 5 which is adapted to rest or be seated on the floor adjacent to and in front of the said furnace, and leading from said base member is an upright member 6 having a sloping or curved portion 7 at its lower end to permit the easy flow of the air upwardly as it is forced into the said upright member by an electrically operated fan 8 disposed within the open end portion of the base member 5, and intermediate the ends of the upright member 6 is disposed a damper 9 to regulate the volume and path of air that is forced in strata formation upwardly into the discharge end of the burner, said damper being secured at any suitable angle by a suitable thumb screw 10 which is passed through the curved slot formation 11 in the said upright.

It will be perceived that the upper end portion of the upright is rounded or so sloped at 12, as to permit the air to freely flow in a downwardly inclined direction to and through the discharge end of the portway member 13, said portway being so constructed as to possess substantially twice the capacity area at its outer end that it has at its discharge end, since the said portway member is sloped or inclined inwardly from its extreme outer end portion to its discharge end portion, and terminates at its extreme discharge end portion with an arch-shaped or rounded surface at its upper end, as shown in Fig. 6.

By reference to Figs. 5, 6 and 7 it will be seen that the natural gas supply pipe 14 is passed through the upright member 6 adjacent to the path of the air supply and terminates with the closure cap 15 fixedly secured thereto, said pipe 14 being provided with a slot 16 formed therethrough within the upright for the discharge of a regulated amount of gas within the said upright 6, said slot 16 extending substantially entirely across the entire width of the upright. Leading from the gas pipe 14 through the fire door and terminating immediately below the discharge end of the portway 13, is a pilot light member 17, which is provided with a suitable protecting member 18 disposed above said light member to prevent accidental extinguishing of the pilot light.

It will be seen that the fire door opening in the furnace is suitably closed with ordinary fire brick, or in any other suitable or desirable manner, leaving a sufficient opening for the passage through said opening of a lighted piece of paper or other lighted material of the hand gas lighter type for igniting the pilot light, after which the said opening may be closed by a suitable cover or closure of any desirable type.

It will be obvious that as the air is forced by the fan to the upper rounded end of the upright member, owing to the air regulating

means 9 disposed intermediate the height of said member it will form a layer or stratum of air as it is forced to follow the rounded and downwardly inclined upper portion of the discharge portway, thus preventing the mixing of the gas therewith, said gas being supplied adjacent to the layer of air, until it is discharged into the fire chamber of the furnace, when the combined air and gas will be instantaneously ignited, and will produce a luminous flame possessing the maximum amount of heat units for the purpose intended.

The gas supply pipe 14 is provided with a regulating valve 19 to properly regulate the proper amount of gas desired with relation to the amount of air forced into the discharge portway.

It will be understood that any suitable means may be employed for regulating both the amount of air and gas used with relation to each other, as is required or desired to suit the various requirements necessary to meet varying conditions and heating capacities required.

It will be evident that while it is preferred to use natural gas in connection with my improved burner when convenient for utilization, nevertheless, any ordinary lighting and heating gas such as is commonly used may be readily employed in connection with this particular type of burner.

It will be seen that I have shown a small economical type of electric motor 20 for driving the fan disposed within the base member, said fan being employed for forcing the desired amount of air through the upright member and discharge portway.

This particular type of burner may be successfully operated with or without the use of the electrically operated fan 8, since it has been demonstrated that when using a comparatively small amount of gas the use of the fan may be dispensed with, but when a considerable amount of gas is utilized it is necessary to operate the fan in connection with said burner.

Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. An air and gas burner comprising a base member having an open end and formed with an upright member provided with a rounded portion at its upper end, an electrically operated fan disposed at said open end of the base member for forcing air through the upright member, a gas supply pipe passing through the upright member adjacent the air supply and near the upper end portion of said member, and a downwardly inclined discharge portway at the top of the member formed with double the capacity at its rear end than it has at its discharge end.

2. An air and gas burner comprising a base member formed with an open end, an upright

member connected with the base member and provided with a rounded portion at both its lower and upper portions, an electrically operated fan disposed at the open end of the
 5 base member for forcing a layer of air through the upright member, a gas supply pipe in the upper part of the upright member disposed adjacent to the layer of air, and a discharge portway forming the upper
 10 end of the upright member and provided with double the area at its outer end than it has at its inner discharge end.

3. An air and gas burner comprising a base member formed with an open end, an
 15 upright member connected with the base member, an electrically operated fan disposed within said open end for forcing a stratum of air through the upright member, a gas supply pipe disposed within the upright
 20 member adjacent said strata of air near the upper end portion of the member, and a discharge portway forming the upper end portion of the upright member and provided with double the area at its outer end portion
 25 than it has at its inner end, said portway being rounded at its rear end and inclined downwardly and inwardly from its outer to its inner end terminating with an arch-shaped discharge end.

30 4. An air and gas burner comprising a base member having an open end, an upright member connected with the base member, an electrically operated fan disposed at the open end of the base member for forcing a layer
 35 of air through the upright member, air regulating means for forming a layer of air within the upright member as the air is forced therethrough, a gas supply pipe disposed within the upright member near the upper
 40 end thereof, and adjacent to the layer of air, a rounded downwardly and inwardly discharge portway forming the upper end of the upright member, and means for regulating the supply of gas fed into the discharge port-
 45 way.

5. An air and gas burner comprising a base member formed with an open end, an upright member connected with the base member having a rounded portion at its lower
 50 and its upper end portions, an electrically operated air supply fan disposed at said open end, air regulating means disposed within the upright member intermediate its height for forming a layer of air as it is forced
 55 through the upright member, a gas supply pipe within the upright member adjacent the layer of air, a discharge portway at the top of the upright member terminating with an arch-shaped discharge end, and means for
 60 regulating the volume of gas fed to said portway.

6. An air and gas burner comprising a base member formed with an open end, an electrically operated fan disposed at said open end,
 65 an upright member connected to the base

member and provided with a rounded portion at both its upper and lower end portions, a gas supply pipe disposed within the upright member near its upper end, air regulating means disposed intermediate height of
 70 the upright member, a discharge portway forming the upper end of the upright member, and an arch-shaped portion formed at the discharge end of the portway.

7. An air and natural gas burner comprising a base member having an open end, an upright member connected to the base member, an electrically operated fan disposed within said open end for forcing a layer of
 75 air through the upright member, means disposed within and intermediate the height of the upright member for forming and regulating the volume of air in said layer, a gas supply pipe within the upright member adjacent the layer of air at the upper portion
 80 of the upright member, means for regulating the volume of gas discharged within the upright member, and a discharge portway forming the upper end of the upright member and terminating with a restricted arch-
 85 shaped discharge end.

8. An air and gas burner of the character described, comprising a base member formed with an open end, an upright member connected with the base member, an electrically
 90 operated fan disposed within the open end for forcing a stratum of air through the upright member, a discharge portway forming the upper end of the upright member, means disposed intermediate the upright member
 95 to form a strata of air at one side of the upright member, a gas supply pipe disposed within the upright member near its upper end and at one side of the strata of air, thereby preventing the mixing of the air and gas
 100 until it is discharged from the portway for producing a luminous flame possessing the maximum amount of heat units.

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