

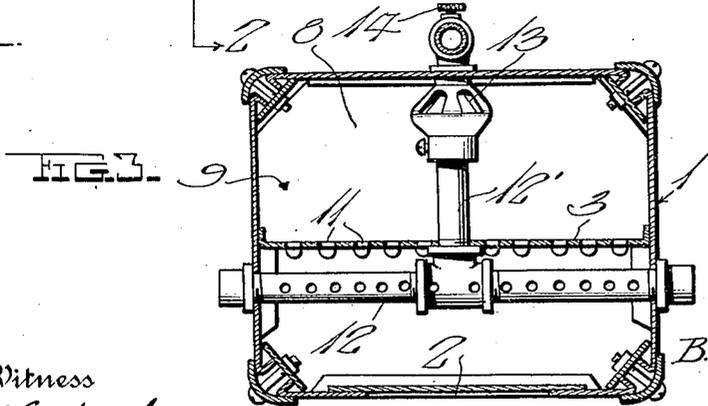
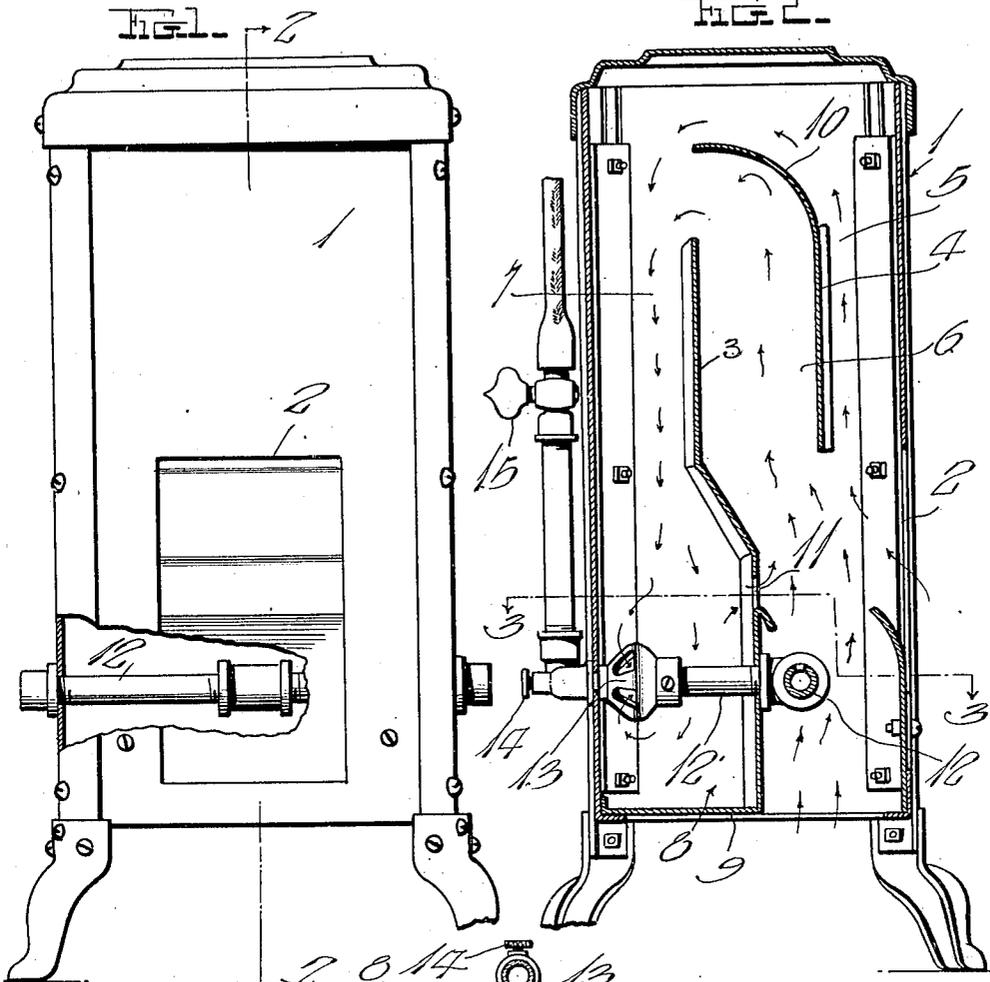
B. C. BARTLEBAUGH.

GAS HEATER.

APPLICATION FILED APR. 11, 1918.

1,298,277.

Patented Mar. 25, 1919.



Witness  
H. Woodards

Inventor  
B. C. Bartlebaugh

By *A. H. Wilson & Co.*  
Attorneys

# UNITED STATES PATENT OFFICE.

BENJAMIN C. BARTLEBAUGH, OF WHEELING, WEST VIRGINIA.

GAS-HEATER.

1,298,277.

Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed April 11, 1918. Serial No. 228,015.

*To all whom it may concern:*

Be it known that I, BENJAMIN C. BARTLEBAUGH, a citizen of the United States, residing at Wheeling, in the county of Ohio and State of West Virginia, have invented certain new and useful Improvements in Gas-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.

My invention has for its object to so improve upon previously devised gas heaters as to greatly increase the efficiency thereof, the improvement residing in placing the air mixer of the gas burner in a chamber at the lower end of the heater in which the unburned gases from the burner are trapped together with hot air, both under pressure. By this arrangement, the mixture of unburned gases and hot air is supplied to the burner with the incoming gas and thus much more perfect combustion takes place, this being caused not only by the fact that the mixture is at a high temperature as it enters and mixes with the incoming gas, but by the fact that said mixture is supplied under pressure, thus causing exceptionally long and hot jets of flame to be projected from the burner.

With the foregoing in view, the invention resides in the novel features of construction and unique combinations of parts to be hereinafter fully described and claimed, the descriptive matter being supplemented by the accompanying drawing which forms a part of this specification and in which:

Figure 1 is a front elevation of the improved heater with parts broken away and in section;

Fig. 2 is a vertical transverse section on the plane of the line 2—2 of Fig. 1; and

Fig. 3 is a horizontal section on the line 3—3 of Fig. 2.

In the drawing above briefly described, the numeral 1 designates an appropriate casing having in its front an opening 2, the interior of said casing being partitioned off by a fire wall 3 and a draft board 4 into a front vertical channel 5, an intermediate vertical channel 6 and a rear vertical channel 7. The upper ends of the three channels 5, 6 and 7 are in communication with each other and the lower end of channel 7 is enlarged to provide a collecting chamber 8 closed at its lower end by a suitable bottom

9. The lower ends of the channels 5 and 6 are located in proximity to the upper end of the opening 2 and said ends are open as seen clearly in Fig. 2. The arrangement so far briefly described is very similar to a well known heater, but the shape of the fire wall 3 has been changed and the mineral wool previously employed has been omitted. Instead of using this material, the fire wall is constructed of copper or of any other suitable metal to serve as a heat reflector. Another change is in the upper end of the draft board 4, this end being now curved rearwardly as seen at 10 rather than having an abrupt angle, since it is found that this new arrangement operates to better advantage.

At their lower ends, the channels 6 and 7 communicate through a plurality of openings 11 formed through the fire wall 3 and immediately beneath these openings and in front of said fire wall, a horizontal perforated burner 12 is provided, said burner being preferably of the simple and inexpensive construction shown with its gas supply pipe 12' passing across the chamber 8 and having an air mixer 13 located in said chamber. The outer end of this pipe is provided with a needle valve 14 and with a gas cock 15 which require no description or illustration in detail.

The unburned gases together with hot air from the burner 12 pass upwardly from said burner through the channel 6 and turn rearwardly into the rear channel 7, while the air entering through the opening 2 and through the lower end of the casing passes upwardly through the channel 5 and also turns rearwardly into the channel 7. The air traveling in this manner is comparatively cool but when it mixes with the hot air and unburned gases from the channel 6, the temperature of the mixture as a whole is maintained at a rather high degree. This mixture descends through the channel 7 into the collecting chamber 8 and prevails in this chamber under considerable pressure, the result being that some of this mixture will jet through the openings 11 to be consumed by the flames of the burner while the remainder thereof will be forced under pressure into the gas supply pipe 12', by way of the air mixer 13. The efficiency of the burner is thus greatly increased by supplying a mixture of hot air, hot unburned gases, and hot fresh gas thereto, and at the same time the jets of flame

from the burner are increased in length and intensity by the pressure entering through the air mixer 13.

The improved heater has been found to be extremely efficient and to absolutely consume all poisonous gases which usually escape into the room. No carbon monoxid gas can be found after burning of the gas in the improved heater. This has been proven by an analysis from Cornell University, one from Los Angeles, and one from Cleveland, Ohio.

These excellent results are due to some extent to the openings 11, but principally to the coaction of these openings with the air mixer 13 with its inlets disposed in the chamber 8 as described.

Since probably the best results are obtained from the details shown and described, these details are preferably employed, but within the scope of the invention as claimed, numerous minor changes may well be made.

I claim:

1. A gas heater comprising a casing closed at its upper end and divided by a pair of vertical partitions into a front, an intermediate and a rear channel, all communicating at their upper ends, the lower end of said rear channel being closed and the lower ends of said front and intermediate channels being open, a horizontal one-pipe burner at the lower end of said intermediate channel, said burner being adapted to supply hot air and unburned gases to said front and intermediate channels, so that the combined action of the two will force said hot air and gases downwardly in the rear channel, said intermediate and rear channels communicating at their lower ends immediately above said burner, a single gas supply pipe for said burner extending across the lower end of said rear channel and a single air mixer in said pipe located in said lower end of the rear channel whereby to supply the hot unburned gases and hot air from this channel to said burner with force.

2. In a gas heater, a vertically elongated casing having in its front an opening spaced upwardly from its lower end, a front partition in said casing having its upper end curved rearwardly and terminating in

spaced relation with the top and back of the casing, the lower end of said partition terminating even with the upper end of said opening, a rear partition in said casing with its upper end spaced downwardly from said upper end of the front partition, substantially the upper half of said rear partition being strictly vertical and located substantially midway between the front partition and the back of the casing, and approximately the lower half of said rear partition being also truly vertical, being located below said front partition, being offset forwardly on an inclined line, and extending to the extreme lower end of the casing, a plate extending from the lower end of said rear partition to the back of the casing and forming the only bottom of the latter, the lower end of said casing being open in front of said rear partition to admit air, a perforated horizontal burner pipe in the space between said front partition and the front of the casing and located below the aforesaid opening in said casing front, said rear partition having a series of openings slightly above said burner pipe to cause the heat rising from said pipe to exert a force tending to induce a downward current of air in rear of said rear partition, the ascending currents of hot air and unburned gases in front of the front partition and between the two partitions combining in force with each other and with said inducing force to cause said hot air and unburned gases to travel downwardly behind said rear partition, a gas supply pipe passing through the rear side of the casing and through said rear partition for supplying gas to said burner pipe, and a single air mixer in said gas pipe located between said rear partition and the back of the casing for mixing the aforesaid hot air and unburned gases with the fresh gas passing to the burner.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

BENJAMIN C. BARTLEBAUGH.

Witnesses:

HAZEL BARTLEBAUGH,  
J. H. SUCKLE.

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