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ABSTRACT

A burner assembly for a gas fire providing a simulated log burning effect where there is a ceramic member positioned but spaced apart from and above a burner outlet where the ceramic member has an aperture therethrough so that flame from the burner outlet will induce further air into the burning gas and such that the rim of the aperture in the ceramic member will be adapted to have its temperature raised to the extent of effecting visible radiant light.
TECHNICAL FIELD

This invention relates to gas fires and, in particular, to gas fires providing simulated burning logs.

BACKGROUND ART

The problem to which this invention is directed is the difficulty of providing a gas fire that is both efficient in terms of its efficient use of gas to create heat, and at the same time, provides as realistically as possible, the appearance of conventional burning wooden logs.

Many attempts have been previously made to achieve these competing requirements of burning efficiency and realistic appearance.

In order to achieve efficient burning of gas, an air/gas mixture needs to be such that the gas flame itself will be a "blue" flame.

However, in order to hitherto obtain a visually realistic appearance of burning logs, the flame needs to be yellow which is an inefficient burning process.

There are further problems, however.

A first of these is to provide apparatus which is both economic to manufacture and which will be long lasting in use.

An object of this invention then is to provide efficient burning with realistic natural wooden log burning appearance.

Other objects and advantages of the present disclosure will become apparent from the following description, taken in connection with the accompanying drawings, wherein, by way of illustration and example, an embodiment of the present invention is disclosed.

DISCLOSURE OF THE INVENTION

In one form of this the invention this can be said to include a burner assembly for a
gas fire providing a simulated log burning effect, the assembly including a ceramic member positioned above but spaced apart from a burner outlet, the ceramic member having an aperture there through which is substantially aligned with the burner outlet so that flame from the burner outlet will induce further air into the burning gas, and such that a rim of the aperture through the ceramic member will be adapted to have its temperature raised to the extent of effecting visible radiant light.

In a further form this can be said to reside in a burner assembly for a gas fire providing a simulated log burning effect, the assembly including a ceramic member positioned above but spaced apart from a burner outlet where the ceramic member has an aperture there through, the arrangement being such that an air/gas mixture, in a first instance, will be caused to pass through the burner outlet and produce a blue flame and then, by virtue of the arrangement being adapted to effect induction of additional air around an outer burning cone of the blue flame, create a further visual effect where the ceramic member will then be heated with at least some partial yellow flame but also such that it will be heated to a temperature which is above red heat levels.

In preference, the arrangement is such that the air/gas mixture, in the first instance, through the burner port would conventionally produce a blue flame and then, by having this effect the induction of additional air around the outer burning cone, creates this further visual effect where the ceramic member can then be heated with at least some partial yellow flame but also such that it can be heated to a very high temperature such that the temperature can be above what might be termed red heat levels.

In preference, above the ceramic member, there is a simulated log or logs but such that, at least along most of the simulated log, a lowermost edge of this is spaced apart from and above the upper level of the ceramic member.

Further, this is located in the vicinity of the exiting flame above the aperture in the ceramic member so that the flame issuing above the ceramic member will then be further induced as in a funnel or as in a chimney effect through the gap defined by the underneath edge of the simulated log and the upper level of the ceramic member.

In practice this can then provide very significant increases in temperature so again
we have very high temperatures so that the ceramic materials have the appearance by light red or white heat.

In preference, the ceramic member is a planar sheet of ceramic material which has the advantage of being very economic to manufacture.

In preference, the ceramic member has a plurality of apertures matching at least the respective apertures in an underneath burner outlet ports.

In preference, the ceramic member is positioned at a forward position with respect to the gas fire overall so that the effect which is intended to be visual can be at the forward location where it will be therefore visually discernable.

In preference, the burner chamber receiving, in the first instance, an air/gas mixture is made from metal with outlet ports through an uppermost wall distributed in accordance with a selected distribution.

It has been found to be of advantage to use metal in this position insofar that it is both economic and further, the outlet ports can be made so as to provide a relatively smooth edge which assists, in the first instance, to provide an efficient burning flame.

In preference, the aperture in the ceramic member can indeed be a channel aligned with respect to one or more of the burner ports but such that, in each case, the width of the channel is chosen so as to achieve the effect described.

Experimentation may be necessary in order to get the best effect in a particular circumstance.

In a further form the invention can also be said to reside in a gas fire with simulated burning logs including a gas supply conduit providing for an air/gas mixing, a gas chamber to receive the air/gas mixture, an upper wall of the chamber having at least one uppermost aperture for directing the air/gas mixture there through to maintain a burning exiting mixture thereafter, a member comprised of ceramic material positioned above at least one of the uppermost apertures with an aperture there through aligned with the said uppermost aperture so that a flame issuing from the uppermost aperture will pass through the said aperture in the ceramic material, the ceramic material at least in the vicinity of the aperture being
spaced with its lowermost surface spaced apart from an upper rim of the uppermost outlet so that air will be additionally impinged as the burning mixture passes into the aperture in the ceramic member.

In preference there is a ceramic simulated log positioned so as to have at least a lowermost surface spaced above the uppermost surface of the ceramic member to leave a gap therethrough and defining a passageway from the upper rim of the uppermost aperture through which a flame issuing from the uppermost aperture can spread.

In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawing. The invention is capable of embodiments in addition to those described and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein, as well as the abstract, are for the purpose of description and should not be regarded as limiting.

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate certain embodiments of the invention, and together with the description, serve to explain the principles of the invention.

Those skilled in the art will appreciate that the conception upon which this disclosure is based may readily be utilised as a basis for designing other structures, methods, and systems for carrying out the several purposes of the present invention. It is important, therefore, to recognize that the claims should be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of this disclosure it will now be described with respect to an exemplary embodiment which shall be described herein with the assistance of drawings wherein:
FIG. 1 is a cross sectional view of the arrangement according to the exemplary embodiment;

FIG. 2 is a perspective view with part cut away of a fire place incorporating a gas fire with simulated burning logs showing, again, this with the feature of the invention according to this embodiment; and

FIG 3 is a perspective of a portion of the arrangement with part cutaway.

DETAILED DESCRIPTION OF THE INVENTION

Now referring in detail to the drawings, there is a fireplace 1 which includes a burning arrangement 2, which includes a means to supply gas into a chamber 3 where there is a conventional jet air induction arrangement so that a best air mixture for efficiency purposes is achievable.

The air/gas mixture in the chamber 3 is supplied at a pressure so that it will appropriately issue from outlet ports 5 which are located in distributed manner in an upper wall 6 of the chamber 3.

Positioned above the upper wall 6 and spaced apart from it is a ceramic member 7 which is shown as a planar sheet of ceramic material having therethrough a plurality of channels 8.

The outlet burner ports 5 are aligned with the channels 8 which are in the form of apertures in the ceramic member 7.

Positioned to rest on the upper ceramic member 7, are simulated logs 9 which have an external rough and log like appearance which, in this case, are positioned so that at least a substantial portion of a lowermost edge 10 of at least one of the simulated logs 9 is in the vicinity of any outlet flame from at least one of the apertures 8 in the ceramic member 7.

This lowermost edge 9 is spaced above and apart from an uppermost surface 12 of the ceramic plate so as to provide a passageway 13 therebetween and such that when there is a burning flame, there will be caused a funnelling effect as perhaps in a chimney so as to induce some of the burning gas therebetween.
This effect then results in somewhat higher temperatures being achieved in the vicinity and further, there is then in the practical examples, achievement of white heat which can visually be seen by a user which also provides radiant heat output.

Where the efficient blue flame air/gas mixture is caused in the first instance to exit from the outlet burner port 5 as a blue flame, by having the implicit roughness of side walls of ceramic material defining the aperture of the member 7 through which the gas then further passes, will have a tendency to create turbulent flow which then implicitly captures and mixes with air that can be induced into the outer edge of the burning gas.

By careful regulation of the air/gas mixture pressure, there can be a wispy flame issuing from the burner port which is found to provide the best effect.

The use and choice of a ceramic material above the burner outlet port has been found to be of great advantage in achieving the result, both from the point of view that the material provides the ability to be heated to be at least substantially hotter than purely ruby red heat and includes white heat at some points and it is also useful because of the implicit characteristics of ceramic materials providing a slightly roughened edge.

Further, by providing the “chimney effect” by having one or more simulated logs in the vicinity but lifted with the lowermost edge leaving a gap above the upper surface of the ceramic member then allows at a proportion of the issuing flame to be drawn thereinto with the result that there is significantly improved higher temperatures reached with subsequent advantages both from the point of view of visual effect and from radiant heat being provided.

The choice of a ceramic material in this application has been discovered to be of particular benefit in solving the problem.

Ceramic material implicitly has a low thermal heat and also has high heat resistance.

What this means is that as the flame passes through the ceramic material the localized heating very quickly reaches very high temperatures indeed which is not then lost because of conduction to other parts of the same member.

Accordingly, this is why for the same heating that you might apply to typically a
metal member, the ceramic material will reach very much higher temperatures therefore being either very light red or white hot.

By having this very highly visible effect, therefore to a large extent hides the existence of the blue flame which is nonetheless there providing efficient conversion of the energy value of the gas to heat.

In the application described therefore, the surfaces immediately adjacent the flame are caused to light up quite spectacularly in the preferred examples and this is very significant in relation to providing this simulated natural log burning effect while still maintaining efficient and, therefore, economic conversion of gas.

A description now will be provided in relation to a specific arrangement that has been found to be effective including the specific sizes and placements of the elements.

This is given to illustrate a best method of performance known to the applicant at this time but it should not be assumed that this is the only way to achieve the inventive steps and carry out the invention.

In a first example, where it is designed for natural gas, the burner chamber is constructed of a mild steel base with a stainless steel top. There are 6 mm spaces on which a ceramic sheet having a 10 mm thickness is therefore appropriately located.

The "ceramic "logs" " are vacuum formed and are shaped so as to provide a simulated log appearance.

The gas supply in the first instance has two jets supplied by a three/eight tube where the burner ports are, in this case, 17 slots each of 1.6 mm by 60 mm. A 6 mm spacer separates the top of the burner to the underneath surface of the ceramic 10 mm thickness sheet.

The channel defining the aperture in the ceramic plate is, in each case, 13 mms wide by 55 mms long.

A range of widths for the size burner where the burner is medially located might be from 10 to 20 mms as a range although the 13 mms has been found to be best.
Although the invention has been herein shown and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures can be made within the scope of the invention, which is not to be limited to the details described herein but is to be accorded the full scope of the appended claims so as to embrace any and all equivalent devices and apparatus.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS

1. A burner assembly for a gas fire providing a simulated log burning effect, the assembly including a ceramic member positioned above but spaced apart from a burner outlet, the ceramic member having an aperture there through which is substantially aligned with the burner outlet so that flame from the burner outlet will induce further air into the burning gas, and such that a rim of the aperture through the ceramic member will be adapted to have its temperature raised to the extent of effecting visible radiant light.

2. A burner assembly for a gas fire providing a simulated log burning effect, the assembly including a ceramic member positioned above but spaced apart from a burner outlet where the ceramic member has an aperture there through, the arrangement being such that an air/gas mixture, in a first instance, will be caused to pass through the burner outlet and produce a blue flame and then, by virtue of the arrangement being adapted to effect induction of additional air around an outer burning cone of the blue flame, create a further visual effect where the ceramic member will then be heated with at least some partial yellow flame but also such that it will be heated to a temperature which is above red heat levels.

3. The burner assembly for a gas fire as in either one of the preceding claims, wherein there is a simulated log or logs above the ceramic member such that, at least along most of the or each simulated log, a lowermost edge of this is spaced apart from and above an upper level of the ceramic member.

4. The burner assembly for a gas fire as in the immediately preceding claim, wherein said lowermost edge of the or each simulated log is located to be in the vicinity of any exiting flame above an aperture in the ceramic member so that flame issuing above the ceramic member will then be further induced as in a funnel or as in a chimney effect through any appropriately positioned gap or gaps defined by the said underneath edge of the or each simulated log and an upper level of the ceramic member.

5. The burner assembly for a gas fire as in any one of the preceding claims, wherein the ceramic member is a planar sheet of ceramic material.
6. The burner assembly for a gas fire as in any one of the preceding claims, wherein the ceramic member has a plurality of apertures matching in relative location and approximate size at least some respective apertures in the underneath burner outlets.

7. The burner assembly for a gas fire as in any one of the preceding claims, including a burner chamber arranged to receive, in a first instance, an air/gas mixture, is made from metal with outlet ports through an uppermost wall distributed in accordance with a selected distribution.

8. The burner assembly for a gas fire as in any one of the preceding claims, wherein the aperture in the ceramic member is a channel aligned with respect to one or more of the burner ports.

9. A gas fire with simulated burning logs including a gas supply conduit providing for an air/gas mixing, a gas chamber to receive the air/gas mixture, an upper wall of the chamber having at least one uppermost aperture for directing the air/gas mixture there through to maintain a burning exiting mixture thereafter, a member comprised of ceramic material positioned above at least one of the uppermost apertures with an aperture there through aligned with the said uppermost aperture so that a flame issuing from the uppermost aperture will pass through the said aperture in the ceramic material, the ceramic material at least in the vicinity of the aperture being spaced with its lowermost surface spaced apart from an upper rim of the uppermost outlet so that air will be additionally impinged as the burning mixture passes into the aperture in the ceramic member.

10. The gas fire as in claim 10 further characterized in that there is a ceramic simulated log positioned so as to have at least a lowermost surface spaced above the uppermost surface of the ceramic member to leave a gap therethrough and defining a passageway from the upper rim of the uppermost aperture through which a flame issuing from the uppermost aperture can spread.

11. The gas fire with a burner assembly for a gas fire as in any one of the preceding claims 1 through 9, further characterized in that the ceramic member is positioned at a forward position with respect to the gas fire overall.
12. A method of effecting a simulated log fire which includes the steps of effecting a burning of gas using the burner assembly as described in any one of the preceding claims 1 through 9.

13. A burner assembly substantially as described in the specification with reference to and as illustrated by the accompanying illustrations.

14. A gas fire substantially as described in the specification with reference to and as illustrated by the accompanying illustrations.

15. A method of burning substantially as described in the specification with reference to and as illustrated by the accompanying illustrations.