April 19, 1932. E. WILDHABER 1,854,323

GAS BURNER

Filed April 21, 1927

FIG.1

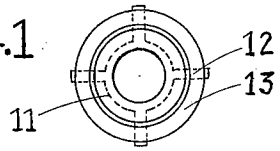


FIG.2

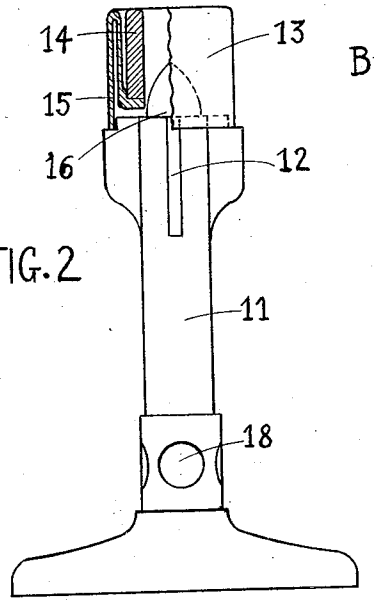


FIG.6

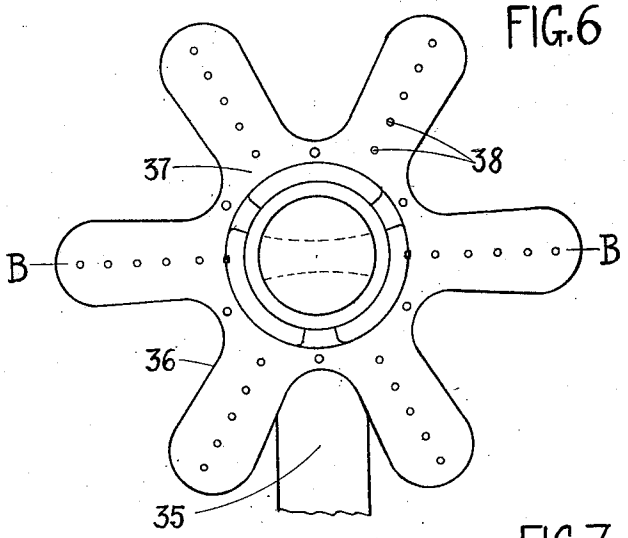


FIG.7

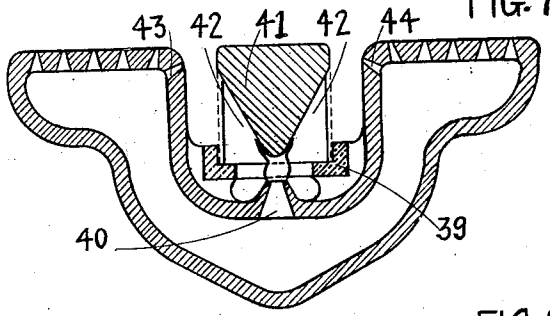


FIG.3

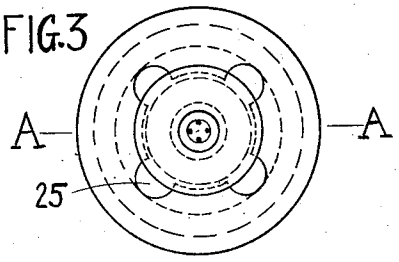


FIG.9

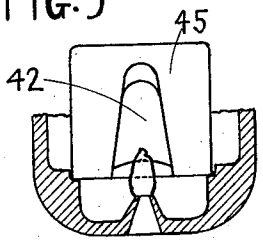


FIG.8

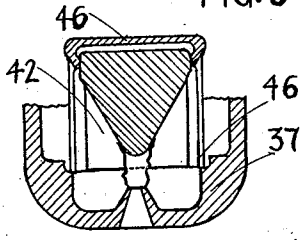


FIG.4

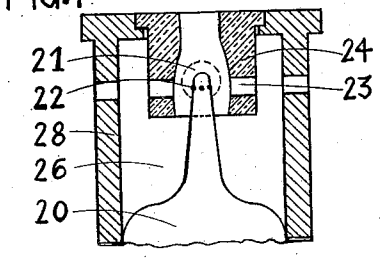
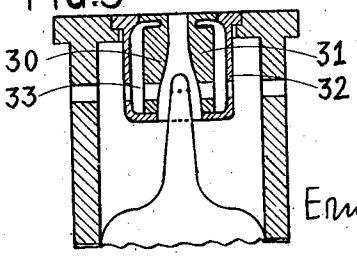


FIG.5



INVENTOR

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UNITED STATES PATENT OFFICE

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GAS BURNER

Application filed April 21, 1927. Serial No. 185,513.

The present invention relates to gas burners, and especially to gas ranges, such as are used in households.

Gas burners, especially gas ranges hitherto constructed contain the drawback and danger, that a small flame can be easily blown out. Such an every day occurrence may have sometimes disastrous results, inasmuch as unburnt gas is poisonous to the human organism, as well known.

One main object of the present invention is to provide increased protection of small flames, and to prevent them from being blown out.

Another object is to improve the combustion at low flame.

My invention is exemplified in the accompanying drawings, in which

Fig. 1 and Fig. 2 are a partial plan view and corresponding front elevational view, the latter shown partly in section, of a gas burner according to the present invention. The shown type of gas burner may be used for instance in laboratories.

Fig. 3 and Fig. 4 are a plan view and a corresponding section along lines A—A of an embodiment of the present invention as applied to the starter flame of a gas range.

Fig. 5 is a section of a gas burner, illustrative of a modification as compared with Fig. 4.

Fig. 6 is a plan view of a gas burner, such as may be used in household gas ranges for producing the cooking flame, said gas burner being constructed according to the present invention.

Fig. 7 is a section along lines B—B of Fig. 6.

Fig. 8 and Fig. 9 are a section and a side view of a protective member, showing adjacent parts in section, the protector being illustrative of a refinement as compared with the protector shown as part of the gas burner of Fig. 7.

In the Figures 1 and 2, the numeral 11 denotes the body of a gas burner differing from known types by having ribs 12 provided at the top, and by containing an additional protective member 13. Member 13 contains a central part 14, which is prevented from substantial loss of heat by the configuration of part 15. Member 13 is placed on the top of body 11, and rests with part 15 on the ribs 12. Owing to its protection from loss of heat, part 14 adjacent flame 16 stays very hot, even when the flame is at its smallest.

The proportions are preferably so selected, that the temperature of part 14 exceeds the lowest lighting temperature of gas. A small gas flame will therefore not be immediately cooled (by contact with a cool body as at present), but will stay hot inasmuch as it passes the hot member 14. In this manner duration of combustion is not unduly shortened, and perfect combustion is assured.

A usual gust of wind, it is evident, will not be able to cool the flame 16 sufficiently to blow it out, on account of the hot member 14. And if an exceptionally strong and sudden gust of wind should blow it out an instant, the flame will immediately start burning again, because part 14 is preferably kept hotter than the lighting temperature of gas, and its mass is made sufficiently large, that it retains a temperature in excess of lighting temperature even after being cooled for a moment by wind. Part 14 will then act like a match and start combustion again.

Ribs 12 not only hold member 13, but they also add cooling surface to the top of body 11. It is important that body 11 remains cool, for it contains gas and air already mixed, air entering at 18. If its top should become very hot, combustion might take place in body 11, which is entirely undesirable. This possibility is removed through the additional cooling surface afforded by ribs 12, so that the proximity of the hot part 14 has no harmful influence.

If so desired, member 13 may be removably placed on body 11, so that it can be taken off with one hand. Although member 13 can be easily removed, it is not necessary to do so when a large flame is being used.

An application of the present invention to starter flames will now be described with reference to the Figures 3–5.

20 denotes a conduit admitting gas to a permanent starter flame 21 through small holes 22. When the gas is admitted at full pressure, the flames will shoot out from the small holes, and extend through openings 23 to the

individual burners of the range. Ordinarily however the starter flame 21 will be very small. It is protected by member 24, made of suitable insulating or semi-insulating material. Member 24 is provided with such a configuration, that the inside points of it preferably stay hotter than lighting temperature of the gas. The outside surface of member 24 however, will usually be much cooler.

Member 24 is secured to a substantially cylindrical member 28, which is removably placed around flame 21, and which somewhat protects space 26 from wind.

Air is admitted to the small flame to some extent through holes 23 and especially through openings 25 (see Fig. 3). The combustion air leaves at the top of member 24. It is noted that the points where the air enters and the point where the combustion air leaves space 26 are somewhat close together. Wind will therefore equally affect these points; when causing a suction at the central hole, it will also cause a suction at the openings 25, so that excessive draft will seldom occur.

Fig. 5 illustrates an embodiment, in which protective member 30 is made of metal, that is of a good conductor of heat. In order to keep the central part 31 at the desired high temperature, means are preferably provided for reducing loss of heat, such as a second part 32, surrounding part 31, and holding it along small areas only. Part 32 may also be made of metal, as shown. An air space 33 is left between parts 31 and 32, except at the points of contact. The points of contact of part 31 may be kept cooler than the other part by such means as shown at the top of part 31. A circular groove is there provided, which hampers convection of heat to the points of contact with part 32.

Starter flames are usually supplied with pure gas, and do not contain admission of air before the flame, as do the cooking flames. According to the present invention combustion may be made perfect nevertheless, by providing means for heating the air prior to its admission to the flame. The air is heated by the same members 24 and 31 respectively, which protect the flame from sudden extinction.

An embodiment of the present invention as applied to cooking flames of gas ranges will now be described, referring to the Figures 6 and 7.

Gas mixed in known manner with air is admitted through the arm 35 and passes to arms 36 of a distributor 37. It leaves the distributor through holes 38 of the arms 36, and burns up after having left the holes. In a case such as the one illustrated I preferably confine protection to one or a few of the individual flames, and dispose the holes in such manner, that a protected flame or the few protected flames can light the other flames again after sudden extinction. Extinction should be prevented, when the flame is in actual use, while little attention needs to be given to the case of an open flame. An open and unused flame is seldom left without attention.

In the embodiment shown in Figs. 6 and 7 a central gas hole 40 heats up a protector 41 of substantially cylindrical form, resting on a ring 39 of suitable insulating material. Protector 41 contains two symmetrically placed slots 42, which lead the hot combustion air past the two gas holes 43, 44 respectively. Protector 41 and especially its slots 42 assume a high temperature, which is preferably kept above the lighting point of gas, but, even if kept below, the protector will have a beneficial influence.

The individual flame at 40 will be prevented from extinction by the hot protector 41; and its hot combustion air will relight the flames at 43, 44. Then the fire will gradually reach the other holes.

The Figures 8 and 9 illustrate a slightly modified embodiment of the protector of the flame at hole 40. This protector 45 is prevented from undue loss of heat, by being surrounded by a part 46 which holds it in points only, and keeps a separating air space between, except at the points of contact. Fig. 9 is a side view showing the slot 42 from the front. A protector 45 as indicated in the Figures 8 and 9 can be kept at a temperature above the lighting point of gas with less difficulty than protector 41, and constitutes therefore a refinement in the design of a protector. Inasmuch as part 46 is not very hot at its lower end, it may be set directly onto the distributor 37. It is noted that the protector is placed between the distributor 37 and the heat consumer, such as a cooking pan, and out of contact with the heat consumer. While it can be made in one piece with one of the present known parts, it is preferably embodied as a separate member, as has been illustrated in the drawings.

It is understood that my invention is capable of further embodiments within the scope of the appended claims.

What I claim is:

1. A gas burner containing in combination, a nozzle facing upwardly for emitting gas, a member disposed adjacent said nozzle for protecting a small flame from extinction by wind, said member containing a channel exposed to the gas flame emitted from said nozzle, and insulation for restricting convection of heat away from said channel.

2. A gas burner containing in combination, a gas jet facing upwardly, a replaceable protective member disposed concentric with said jet, said member containing a channel exposed to the gas flame emitted from said jet, and insulation for restricting convection of heat away from said channel.

3. In a gas burner, a part containing a plurality of nozzles for emitting gas, a protective member disposed on said part, said member having a surface exposed to the gas flame emitted from a fraction only of the whole number of said nozzles, and means for restricting convection of heat away from said surface.

4. In a gas burner, a part containing a plurality of nozzles for emitting gas, a recess provided in the center of said part, a nozzle provided in said recess, a replaceable protective member disposed in said recess and having a surface exposed to the gas flame emitted from the last named nozzle, means for restricting the conduction of heat from said member to the part containing the gas nozzles, and a groove formed in said member and leading from the last named nozzle towards other nozzles of said part.

5. In a gas burner, a part containing a plurality of nozzles for emitting gas, a replaceable member for protecting said nozzles, said member being disposed adjacent a nozzle and having a surface exposed to the gas flame emitted from the last said nozzle, insulation means for restricting the conduction of heat from said member to the part containing the gas nozzles, and a channel provided in said member and leading from said adjacent nozzle towards other nozzles of said part.

6. In a gas burner, a nozzle for emitting gas, a removable protective member disposed adjacent said nozzle, said member containing a channel exposed to the gas flame emitted from said nozzle, and insulation means for restricting convection of heat away from said channel, said insulation means being disposed in the path of heat flowing from said channel to the part containing said nozzle.

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