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H. H. SWEET

1,978,177

GAS BURNER

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Fig. 1.

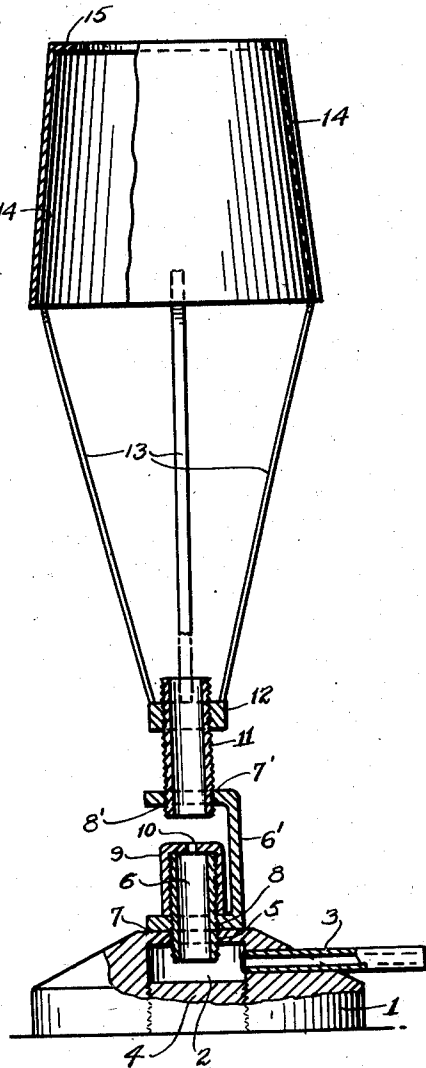


Fig. 2.

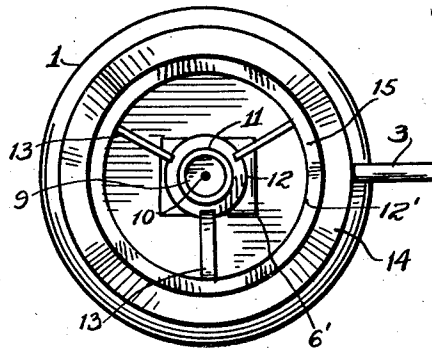


Fig. 3.

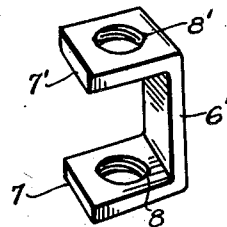


Fig. 4.

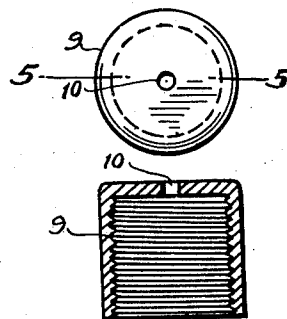


Fig. 5.

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UNITED STATES PATENT OFFICE

1,978,177

GAS BURNER

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3 Claims. (Cl. 158—111)

This invention relates generally to gas burners, and, or more particularly to attachments for gas burners of the Bunsen type, for generating, especially from natural gas, such high temperatures as are necessary and desirable in laboratories, jewelers and dental offices and the like, and also such other industrial or domestic uses to which the burner might be adaptable.

The main object of the invention is to provide a burner construction in which the several elements are adjustable relative to each other, and are designed so that they can be manufactured very cheaply, and readily assembled for use.

A further object of the invention is to provide an attachment for burners of this type in which an intense heating flame is obtained when the gas issues from the burner at high speed and in which the attachment prevents the flame from blowing away from the burner and becoming extinguished.

One sheet of drawings accompanies this specification as part thereof, in which like reference characters indicate like parts throughout:

Figure 1 is a side elevation, partly in section of the improved burner;

Figure 2 is a plan view of the assembled burner;

Figure 3 is a perspective view of the bracket member;

Figure 4 is a plan view of a thimble which is adjustably mounted on the base of the burner and serves as a lock nut in addition to its function of providing an orifice for the emission of the gas; and

Figure 5 is a vertical transverse section taken on the line 5—5 of Figure 4.

Referring to the drawing, the reference numeral 1 designates a base having a chamber 2 formed therein and communicating with a gas supply pipe 3. The chamber 2 may be formed by boring a cylindrical recess into the base; and the depth of the chamber may be regulated by a screwthreaded plug 4 threaded into the said recess. The upper end of the chamber 2 is formed by a wall 5 centrally apertured to permit the emission of gas from the chamber 2; and the aperture in the wall 5 is screwthreaded to receive the externally screwthreaded nipple 6.

A U-shaped bracket 6' has internally screwthreaded apertures 8 and 8' formed in the parallel legs 7 and 7' respectively. Either of these apertures is adapted to engage the external screwthreads of the nipple 6 in order that the bracket 6' may be clamped on the top of the wall 5 of the base member 1. Thimble 9 of the same internal

diameter as the external diameter of the nipple 6 is internally screwthreaded for adjustment on the nipple 6, and this thimble 9 is provided with a central orifice 10 through which the gas emerges from the chamber 2.

Particular attention is directed to the fact that the thimble 9 not only provides the emission orifice for the gas but also serves as a lock nut for securing the bracket 7 in any desired position of adjustment on the nipple 6. Preferably this thimble 9 not only locks the bracket 7 to the nipple 6 but also locks the nipple 6 to the base member 1 when the bracket 7 is in the position shown in Figure 1 of the drawing. In other words, the thimble 9 has a two fold function: It serves as a means for providing the emission orifice for the gas and also serves as a lock nut for clamping the bracket 7 and nipple 6 in position on the base member.

The upper aperture 8' has a second nipple 11 screwthreaded thereinto, in order to provide for any desired adjustment of the nipple 11 relative to the orifice 10 at the upper part of the thimble 9. It is to be noted that the nipples 6 and 11 and the orifice 10 are coaxial so as to provide a straight line flow for the gas emerging from the base member.

The most important part of this invention is a blast chamber adjustably mounted by means of the nut 12 on the upper nipple 11. This nut 12 has two or more rods extending upwardly and outwardly therefrom and forming a spider to be connected to the lower end of the blast chamber 14. This blast chamber 14 is shaped as a truncated cone having its narrow end remote from the burner itself, and is provided at its upper end with an inwardly directed flange 15. It is immaterial just what shape the outer surface of the blast chamber 14 assumes. It is however, essential that the inner surface thereof be formed as a truncated cone having its axis coaxial with the axes of the nipples 6 and 11. As is well known to users of the ordinary types of gas burners utilizing natural gas, the flame issues from the tip corresponding to the nipple 11 and will continue to burn there so long as the pressure and volume of gas is comparatively low. With increase of pressure and volume, however, the flame blows away and the burner becomes extinguished notwithstanding the fact that the gas still issues therefrom at high speed.

The blast chamber is designed to prevent extinction of the flame and to secure an increase in temperature. This chamber has a flange 15 at the top thereof forming a trap for the gas emerg-

ing from the nipple 11. The comparatively wide top and wider base of the chamber provide a means whereby sufficient air may be drawn into the blast chamber to effect complete combustion of the elements of the gas entrapped in the chamber 14.

When the gas flowing through the nipple 11 is ignited at the upper end of the nipple 11, the gas continues to burn as in any other Bunsen burner. If the volume and pressure is increased, however, the flame detaches itself from the top of the nipple 11 and travels up into the blast chamber 14 where it continues to burn with a blast like noise and develops very high temperature.

It thus appears that up to and including the nipple 11, the invention is somewhat similar to the ordinary Bunsen burner, and operates in the same manner. The addition of the blast chamber 14 enables these ordinary burners to be used for the purpose of obtaining temperatures which can not possibly be obtained by the use of the burner itself. This is particularly true when the fuel is natural gas, although it operates quite efficiently with any other gas adapted for use in this type of burner.

It may be well to state here that a blast chamber of cylindrical type is useless because the flames continue to blow away, and the cylinder merely forms a somewhat large extension of the nipple 11. The truncated form is essential, because this form retards the flow of gas away from the burner sufficiently to insure its combustion. The flange 15 is also beneficial because it serves still further to retard the flow of gas through the blast chamber by reducing the opening at its top and thereby entrapping the flame. In use, the blast chamber will be adjusted toward and from the nipple 11 to secure the most efficient results. The nipple 11 may also be adjusted toward and away from the orifice 10 at the top of the thimble 9 for the same purpose.

Varying with the different sizes of the apparatus, there is a critical distance between the upper end of the nipple 11 and the lower wide end of the blast chamber. In other words, for proper operation of the device, there is a certain minimum distance which must intervene between the upper end of nipple 11 and the wide end of

the blast chamber. Beyond this critical distance, a small adjustability takes care of small variations in gas pressure.

While I have described my invention as embodied in concrete form and as operating in a specific manner in accordance with the provisions of the patent statutes, it should be understood that I do not limit my invention thereto, since various modifications thereof will suggest themselves to those skilled in the art without departing from the spirit of my invention, the scope of which is set forth in the annexed claims.

What I claim is:

1. The combination with a gas burner comprising a base having a gas nipple extending upwardly therefrom, a bracket adjustably secured to said nipple, a second nipple adjustably secured to said bracket and in axial alignment with the first named nipple, an open ended blast chamber formed as a truncated cone, and means for adjustably supporting said blast chamber on the second nipple.

2. The combination with a gas burner comprising a base having a gas nipple extending upwardly therefrom, a bracket adjustably secured to said nipple, a second nipple adjustably secured to said bracket and in axial alignment with the first named nipple, an open ended blast chamber formed as a truncated cone, means for adjustably supporting said blast chamber on the second nipple, and a flange extending inwardly from the upper open end of said cone.

3. A gas burner comprising a base provided with a gas chamber, a nipple screwthreaded into said base and in communication with said chamber, a U-shaped bracket secured to said nipple, a thimble provided with a central orifice and screwthreaded into said nipple to form a means for locking the bracket to the nipple, a second nipple adjustably secured to said bracket in axial alignment with the first named nipple and a blast chamber adjustably secured to the second nipple, said chamber being formed as a truncated cone having the wide end thereof positioned toward said second nipple, and a gas retarding flange extending inwardly from the upper open end of said blast chamber.

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