

Jan. 8, 1935.

H. W. CHRISTIE

1,987,386

GAS BURNER

Filed Dec. 23, 1930

2 Sheets-Sheet 1

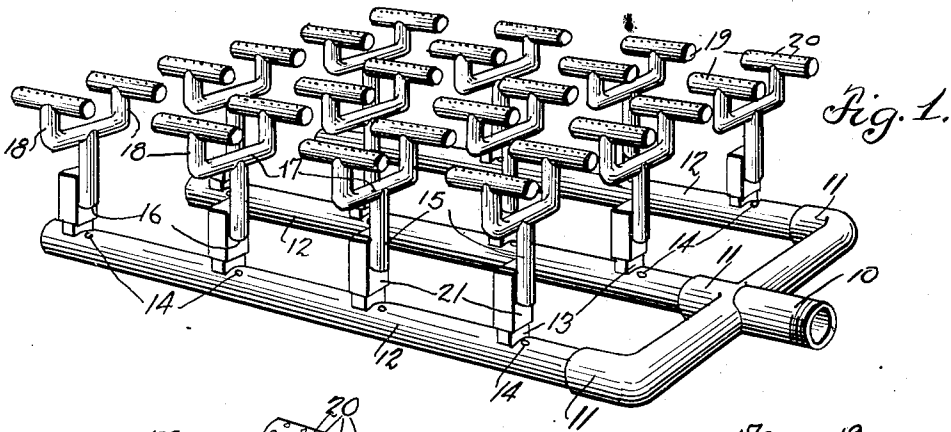
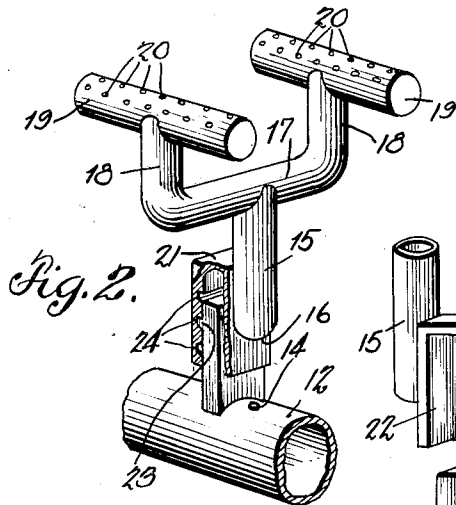


Fig. 3.

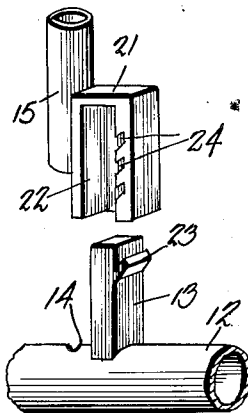
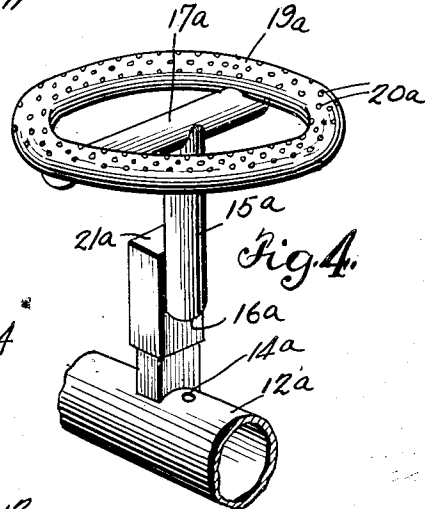


Fig. 5.

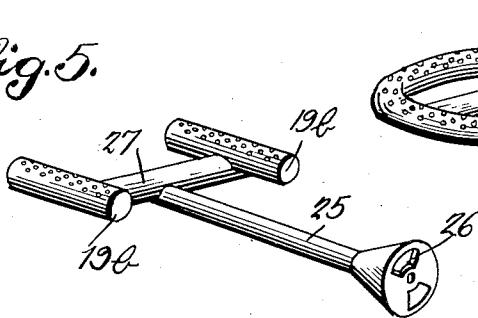
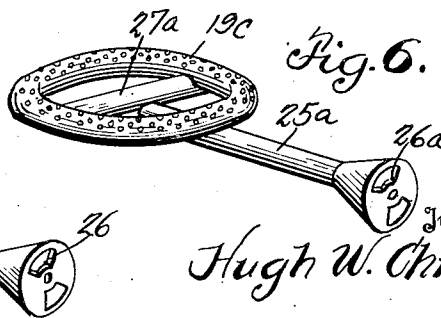


Fig. 6.



Inventor  
Hugh W. Christie

By *F. A. Bryant*  
Attorney

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2 Sheets-Sheet 2

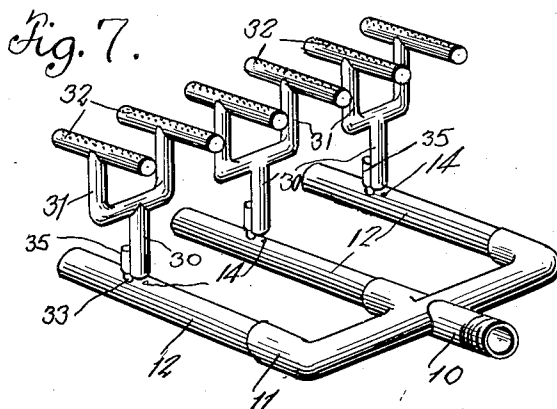


*Fig. 8.*

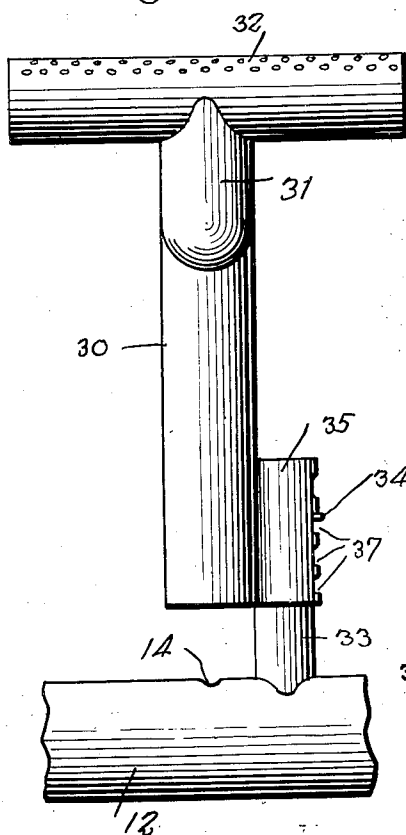


*Fig. 9.*

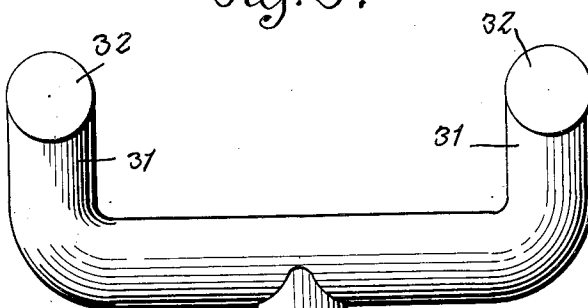


*Fig. 10.*

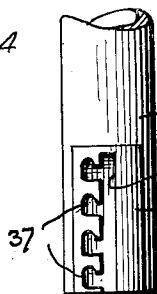


*Fig. 11.*

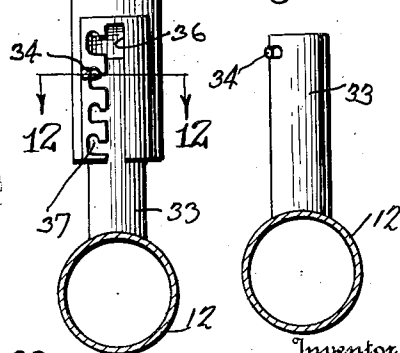
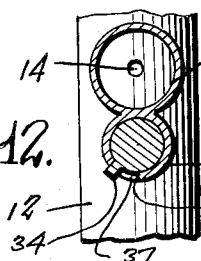


*Fig. 12.*



Inventor  
Hugh W. Christie.

by  
F. H. Bryant  
Attorney.

## UNITED STATES PATENT OFFICE

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## GAS BURNER

Hugh W. Christie, Tulsa, Okla.

Application December 23, 1930, Serial No. 504,309

1 Claim. (Cl. 158—106)

This invention relates to certain new and useful improvements in gas burners.

The primary object of the invention is to provide a gas burner comprising a mixing chamber for air and gas and a burner head or tip and wherein the mixing chamber is designed to present curved surfaces or walls to the flow of gas and air therethrough as contrasted with flat abutment walls set in the path of flow to insure a more thorough mixing or carburation of the air and gas for the efficiency of the burner, it having been found by actual tests with burners of the type herein disclosed that the presence of curved surfaces in the mixing chamber, a more perfect carburation is attainable and that by the use of a burner of the type herein disclosed, it is possible to raise water to a boiling point in approximately one-half the time required by the use of burners of other types.

Another object of the invention is to provide a gas burner constructed in a novel manner which varies the mixture of air and gas wherein the burner proper having a gas inlet opening may be bodily adjustable toward and away from a gas supply pipe and a gas supply opening in said pipe.

With the above and other objects in view that will become apparent as the nature of the invention is better understood, the same consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawings and claimed.

In the drawings:—

Figure 1 is a perspective view of a battery of burners constructed in accordance with the present invention;

Figure 2 is a perspective view, partly in section, of a single burner showing the burner head adjustably mounted upon a gas supply pipe with the gas inlet to the burner head spaced from the gas supply opening in the gas pipe;

Figure 3 is a perspective view, showing the burner head separated from the gas supply pipe and the part forming the detachable connection between the burner head and pipe;

Figure 4 is a perspective view, partly in section, similar to Figure 2 showing another form of burner head;

Figures 5 and 6 show perspective views of other forms of gas burners;

Figure 7 is a perspective view of a battery of burners with a modified form of mounting;

Figure 8 is a side elevational view of a single burner;

Figure 9 is an end elevational view of the burn-

er showing a bayonet slot connection between the burner head and support;

Figure 10 is a fragmentary elevational view showing the cylindrical mounting frame detached from the support;

Figure 11 is a cross-sectional view of the gas supply pipe with the cylindrical supporting stud rising therefrom; and

Figure 12 is a cross-sectional view taken on line 12—12 of Figure 9.

The gas burners disclosed herein may be constructed of any desired size or dimension and may also be used either singly or in battery formation and they are capable of use in various arts and wherever gas is used as a heating medium, such as in factories, oil fields or for household use. Referring more in detail to the accompanying drawings, and particularly Figures 1 to 3, there is illustrated a gas burner, Figure 1 showing a battery arrangement thereof, comprising a pipe 10 adapted to be placed into communication with a gas supply pipe, the pipe 10 carrying a plurality of outlet sections 11 in communication with branches or extension pipes 12 upon which the burner heads are mounted.

The mounting of the burner heads upon the extension pipes 12 is shown more clearly in Figures 2 and 3, a block 13 perpendicularly rising from the extension pipe 12 for the support of each burner head while gas outlet openings 14 are formed in the extension pipes 12, one adjacent each block 13.

The form of burner head disclosed in Figures 1 and 2, comprises a tubular pipe section 15 open at the lower end 16 thereof, the burner head being of substantially T-formation having a tubular cross-head 17 circular in cross-section at the upper end of the pipe section 15 with the outer ends of the cross-head 17 directed upwardly as at 18 and carrying at their upper ends cylindrical burner tips 19 provided over their upper surfaces with burner or jet opening 20. A rectangular frame 21 is carried by one side of the pipe section 15, extending below the same as illustrated and has an open side 22 to facilitate lateral positioning thereof upon the block 13 and to accommodate the mounting of the frame 21 at different elevations of the block, an upwardly inclined lug 23 carried by one side of the block 13, adjacent its upper end, is adapted to be selectively received in correspondingly formed grooves 24 in the inner face of one side of the frame 21. When the frame 21 is mounted upon the block 13, the lower open end 16 of the pipe section 15 of the burner head is positioned direct-

ly above the gas outlet opening 14 in the extension pipe 12. By the selective positioning of the lug 23 in the desired groove 24, the distance between the lower end of the pipe section 15 and the extension pipe 12 may be varied to regulate the admixture of air and gas as will at once be evident from an inspection of Figure 2. The adjustment to accomplish the proper mixture of air and gas, is performed in the absence of the usual wing valve or adjusting screws and as the casing 21 may be constructed to be of slightly oversize relative to the block 12, easy positioning or mounting thereof upon the block is possible and return to their proper positions is maintained by the inclination of the lugs 23 and correspondingly formed grooves 24. The flow of gas through the opening 14 in the extension pipe 12 enters the lower end of the pipe section 15 carrying therewith air at atmospheric pressure through the lower open end of the pipe section 15 to be carbureted in the burner head and close to the cross head 17 and end extensions 18 to the burner tips 19. It will be observed from an inspection of Figure 2, that the entire inner area of the mixing chamber of the burner head presents all curved surfaces to the flow of gas and air therethrough which enhances more perfect carburation, as contrasted with flat abutment surfaces or walls which would tend to disintegrate or deter proper mixture.

In the form of the invention shown in Figure 4, the pipe section 15a carries a tubular cross-head 17a to the outer ends of which a circular tubular burner head or tip 19a is secured, this form of the invention also presenting all curved surfaces to the form of carbureted gas and air through the burner head, the mounting of the burner head shown in Figure 4, upon the extension pipe 12 being similar to the mounting disclosed in Figure 3.

Another form of burner head is shown in Figure 5, in which the burner head presents all curved surfaces to the flow of gas therethrough and comprises a pipe section 25 having the usual air inlet control 26 at one end with a tubular cross-head 27 at its other end to the ends of which 19b of the form illustrated in Figure 2, are attached.

The form of invention shown in Figure 6, is comparable with the forms shown in Figures 4 and 5 and includes the pipe sections 25a having the usual air inlet control 26a at one end, a tubular cross head 27a at its other end and a circular perforated burner head or tip 19c secured to the ends of the cross head 27a in communication therewith.

Another form of adjustable mounting for the burner head is disclosed in Figures 7 to 12, the burner head being associated with a piping arrangement including the pipe 10 in communication with a source of gas supply, having a plurality of outlet sections 11 attached to branch or extension pipes 12. The extension pipes 12 have gas outlet openings 14 with which the burner heads are associated, the latter including a pipe 30 having a forked upper end 31 carrying perforated burner tips 32.

A cylindrical block or stud 33 rises perpendicularly from the extension pipe 12 at one side of the gas outlet opening 14 and at its upper end carries a laterally directed pin 34. A frame or tubular casing 35 open at its lower end is laterally carried by the pipe 30 and has a vertical slot 36 opening at the lower end thereof with one vertical side wall of the slot 36 provided with a series of spaced notches forming bayonet slots 37. The casing 35 is mounted upon the cylindrical stud 33 by aligning the slot 36 with the pin 34 and upon partial rotary movement of the casing 35, the pin 34 may be received in the chosen bayonet slot 37 for supporting the burner head upon the stud 33 with the lower end of the pipe 30 spaced the desired distance from the gas outlet 14 in the extension pipe 12. With this form of the invention, it is possible to vary the mixture of gas and air without the necessity of completely removing the burner head from its support.

While there are herein shown and described the preferred embodiments of the invention, it is nevertheless to be understood that minor changes may be made therein without departing from the spirit and scope of the invention as claimed.

I claim:—

In a gas burner of the character described, a gas pipe having an upstanding block thereon of rectangular form, on which is mounted a vertically adjustable burner; said burner having a vertically depending mixing tube open at its lower end, with a frame carried at one side thereof, said frame having an open side and having the inside of one wall formed with notches, the upstanding block on the gas pipe fitting within the frame and being provided with a projection interlocking with any one of the notches to adjust the mixing tube vertically with respect to the pipe, the block and frame being laterally adjustable and detachable, and an orifice in the said pipe in vertical alignment with said mixing tube.

HUGH W. CHRISTIE. 55