

(No Model.)

J. A. CRAWFORD.
GAS BURNER.

No. 538,155.

Patented Apr. 23, 1895.

Fig. 3.

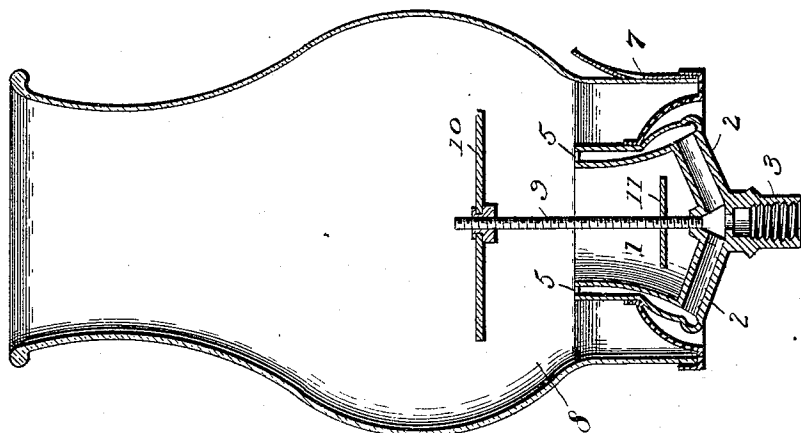


Fig. 2.

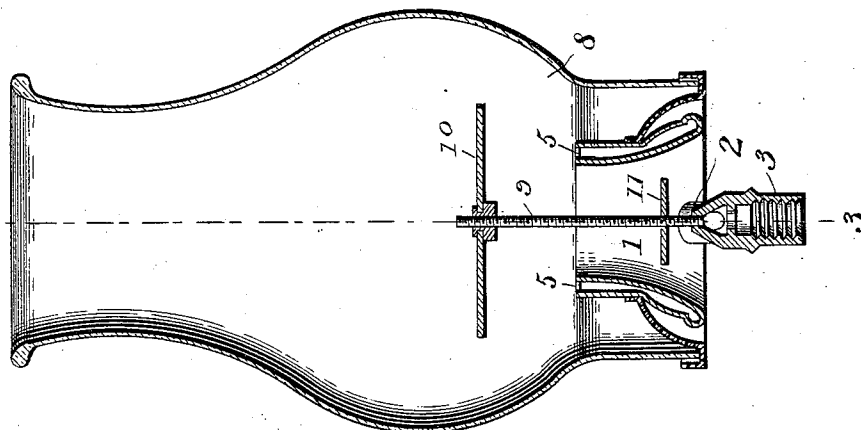
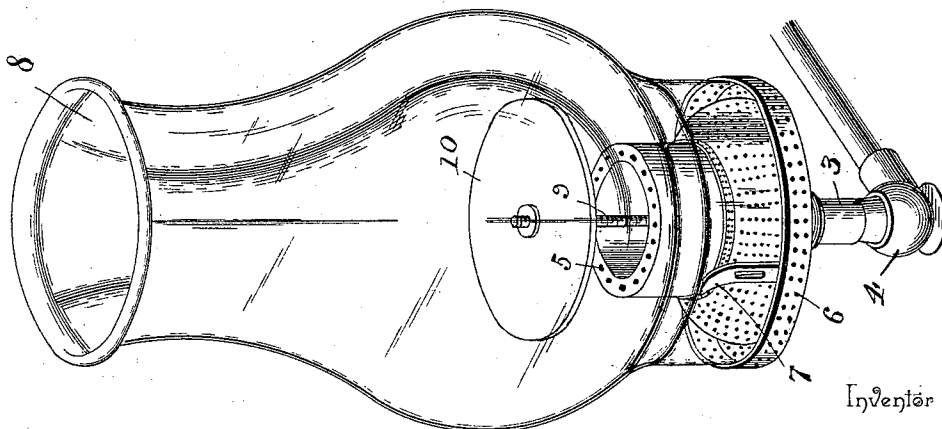


Fig. 1.



Inventor

John A. Crawford

Witnesses

Julius Ulke Jr By his Attorneys.

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

JOHN A. CRAWFORD, OF FINDLAY, OHIO, ASSIGNOR OF ONE-HALF TO
ANNIE WHITEMAN, OF SAME PLACE.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 538,155, dated April 23, 1895.

Application filed July 10, 1894. Serial No. 517,148. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. CRAWFORD, a citizen of the United States, residing at Findlay, in the county of Hancock and State of Ohio, have invented a new and useful Gas-Burner, of which the following is a specification.

My invention relates to burners, and particularly to means for supplying air to support combustion and means for deflecting the flame to produce the maximum illumination, whereby either artificial or natural gas, or fluid fuel may be employed.

In the disclosure of my invention I have shown the same applied to a gas burner, and the special objects in view are to provide a construction whereby the draft may be controlled to supply the necessary amount of air to accomplish complete combustion of the fuel, the outlets of the burner being so disposed as to produce a tubular or hollow flame, and furthermore, to provide means for deflecting or spreading the flame whereby its illuminating power is increased.

Further objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claim.

In the drawings: Figure 1 is a perspective view of a burner constructed in accordance with my invention. Fig. 2 is a vertical central section of the same. Fig. 3 is a vertical central section at right angles to the plane of Fig. 2, as indicated by the line 3 3 of said Fig. 2.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates an annular or tubular burner which is bell shaped or flared toward its lower end, and communicating therewith by means of the branch-pipes 2 is the supply or inlet pipe 3, which in the construction illustrated in the drawings is adapted to be threaded upon a gas jet-pipe, indicated at 4 in Fig. 1. The burner openings 5 are formed in the upper edge of the annular or tubular burner whereby a tubular or hollow flame is produced. The upper portion of the burner

is cylindrical in form, and fitted thereon is the reticulated guard 6 provided with the upright clips 7 for engagement with a transparent globe 8.

Arranged in coincidence with the axis of the burner, with its lower end seated in and attached to the upper end of the inlet-pipe 3, is a threaded stem 9, which rises above the plane of the upper end of the burner and supports the horizontal deflecting disk 10. This disk is threaded on the stem and may be adjusted vertically to vary its distance from the upper end of the burner, and threaded on the stem within the space inclosed by the burner is a disk-valve 11, which when adjusted upward reduces the annular space or passage between its periphery and the inner wall of the burner, and when adjusted downward enlarges said space or passage. The disk-valve is smaller in diameter than the interior of the burner, whereby in any position a space or passage is provided to supply the burner with air, but when said valve is lowered into the bell-shaped or flared portion of the burner said space or passage is increased in width, and hence a larger column of air is supplied. In this way the supply may be regulated to produce perfect combustion, or approximately perfect combustion, to provide the maximum illumination.

The deflecting disk is larger in diameter than the burner, and hence when the flame comes in contact with its lower surface it is spread, thereby increasing the illuminating power. The disk may be arranged at greater or less distance from the burner openings to suit the supply of fuel.

The deflecting disk, and if preferred the entire burner is constructed of aluminum, and it is obvious that the incandescence of the disk will serve to increase the resulting illumination.

The burner herein described is especially designed for use in burning natural gas, which, being impure by reason of containing a large percentage of sulphur and other gaseous ingredients of crude oil, is difficult to control, is liable to produce a yellowish or colored light rather than the white light desirable for illuminating purposes, usually gives

off an offensive odor due to the sulphur and other impurities, and cannot be discharged through a burner having a foraminous outlet by reason of the clogging of the perforations.

5 In order to overcome these difficulties, I employ the above described arrangement of parts including principally the stem arranged axially in the burner, a valve disposed in the axial air inlet opening whereby draft is supplied to

10 the flame, and a flat deflecting disk which extends at its periphery beyond the annular burner by being of larger area than the space inclosed by the said burner. The effect of this combination of parts is that the center draft of

15 air strikes the flat under surface of the deflecting disk and is checked thereby, and as the disk is maintained at a high temperature by the flame the air also becomes heated, and hence is brought into contact with the flame

20 in that condition, thereby raising the temperature of the flame to such a point as to ignite the sulphurous gas and prevent its escape. In addition to this, the sulphurous gas burns with a brilliant white flame which adds

25 materially to the efficiency of the light and produces an effect which may be compared with the colorless light of a incandescent burner. The outlet perforations at the top of the burner are not exposed to the flame,

30 and hence do not lower the temperature thereof and thereby cause the clogging or choking which is common to those burners having an arrangement of parts in which the foraminous outlet is exposed directly to the ignited gas.

35 In addition to the above it should be noted that the pressure of natural gas is not uniform, varying without any apparent cause, and in order to produce uniformity of illuminating power the valve which is arranged in

40 the throat of the center draft opening is of material importance. By the adjustment of this valve the draft may be varied, at a point near the point of ignition to suit the pressure under which the gas escapes from the an-

45 nular burner.

As above mentioned, the improvement may be applied to lamps as well as gas burners, and therefore it will be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described my invention, I claim—

The combination with a gas burner of tubular construction having an annular gas outlet and a downwardly flared or bell-shaped inner shell open at its upper and lower ends to form a center draft passage, of a fixed vertically threaded stem arranged axially in the center draft passage and extending above the plane of the burner outlet, a disk valve threaded upon the stem within the center draft passage and adapted by vertical adjustment therein to vary the area of the annular passage between its periphery and the flared or bell-shaped shell of the burner, and a deflector threaded upon the stem above the plane of the burner outlet and adapted to be vertically adjusted thereon to vary its distance from the plane of the burner, said deflector being of greater area than the burner whereby it extends at its periphery beyond the same, and having a flat under surface which serves to check and superheat the center draft as it rises through the draft passage and direct it to the incandescent fuel in said heated condition, whereby sulphurous impurities in the gas are maintained at such a temperature as to be consumed and thus add to the illuminating power of the burner and prevent the escape of offensive odors, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN A. CRAWFORD.

Witnesses:

MARION G. FOSTER,
ANNA WHITEMAN.