(No Model.)

G. B. SNOW.

REGULATING VALVE FOR GAS BURNERS.

No. 382,566. Patented May 8, 1888.

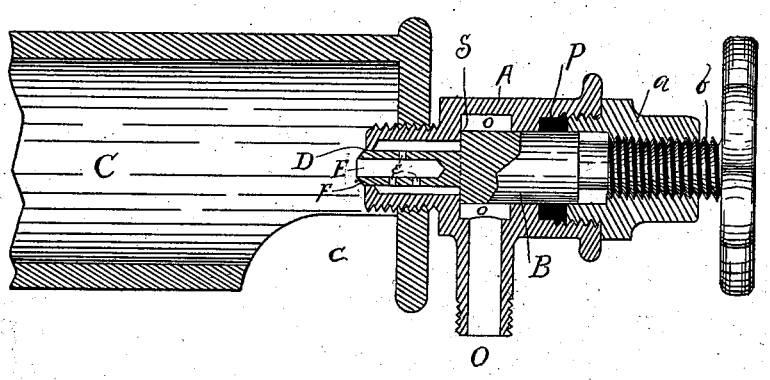

FIG. 1.

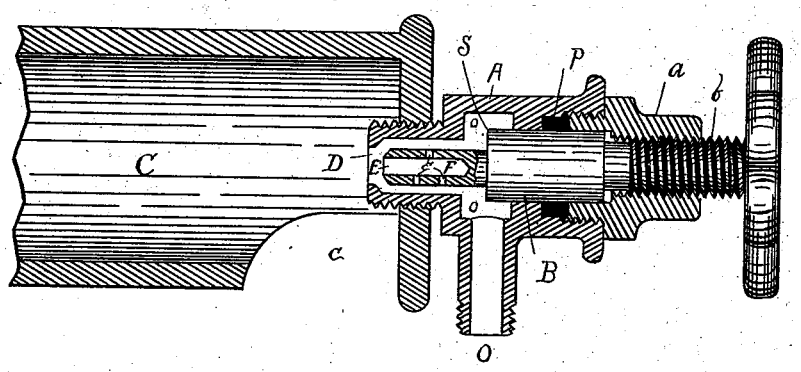

FIG. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE B. SNOW, OF BUFFALO, NEW YORK.

REGULATING-VALVE FOR GAS-BURNERS.

SPECIFICATION forming part of Letters Patent No. 382,566, dated May 8, 1888.

Application filed April 6, 1887. Serial No. 232,886. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. SNOW, of the city of Buffalo, in the county of Erie and State of New York, have invented a new and Improved Regulating-Valve for Gas-Burners, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 represents my improved regulating-valve closed. Fig. 2 represents the same valve fully open.

Both drawings are longitudinal central sections of the valve and mixing-tube.

This invention relates to the proper admission of inflammable gases or vapors into burners, in which they are used as fuel, and the mixture therewith of a sufficient quantity of air to produce a clear, smokeless, non-luminous flame during combustion. It is more especially applicable to the mixture of gasoline-vapor and air produced in so-called "gas-machines," which is much used in country houses and places remote from a supply of coal-gas for illumination. When the storage-tank forming part of one of these gas-machines is freshly filled with gasoline, a very abundant supply of vapor is given off, and the so-called "gas" produced by the machine is very "rich," affording a large, very luminous flame, which smokes easily, and which, if it is to be burned as a fuel, requires the further mixture with it of a very considerable quantity of air to produce the clear blue smokeless flame most suitable for heating purposes. After a time the more volatile portions of the gasoline pass off, and the residue affords less and less vapor, until at last it fails to give a proper light, and a fresh addition of gasoline is required. A special construction of illuminating-burner is necessary to obtain a good light under these varying conditions, and several patents are extant on devices calculated to compass this end.

The present invention consists in applying an efficient adjustment to heating-burners for the purpose of rendering them equally efficient whether the gas-fuel be rich or poor.

In the accompanying drawings, A is a valve-casing; B, a valve, with its screwed stem *b* operating in a nut, *a*, which also serves to retain packing P in the casing A to prevent leakage around the valve B or its stem *b*. The gas enters by the passage O into an annular chamber, *o*, formed in the casing A and encircling the valve B. The shoulder S on the valve B fits tightly against the side of the chamber *o*, which forms the seat of the valve, which, so far as it has been described, resembles closely in construction the ordinary globe-valve.

C represents a mixing-tube forming a part of any suitable gas-burner. Air enters this tube at the opening *c*, and is carried along by a jet of gas proceeding from the valve casing A, which traverses the center of the mixing-tube and becomes gradually mixed with the current of air it produces as it passes along the tube to the burner.

If the gas or the mixture of gasoline-vapor and air used as a fuel is rich, burning with a smoky flame, the opening from which it escapes from the valve-casing A into the mixing-tube C should be small, so that a large proportion of air shall be mixed with the gas in the tube and the flame therefrom be blue and smokeless. If the gas is poor or deficient in carbon, the opening for its escape should be larger.

To afford a convenient means of varying the size of the gas-jet and for insuring the proper flame under all circumstances, I attach to the valve B a tubular stem, F. This is large enough to completely fill the escape-opening D in the valve-casing when the valve is closed or nearly so. The central passage, E, in the stem F communicates by side holes, *e e*, with the space around the stem F, so that when the valve B first leaves its seat the gas will pass out through the passage E only, forming a jet of small diameter in the mixing-tube, producing a proper mixture for a blue flame with the richest gas the burner is likely to use. The short longitudinal bearing of the end of the stem F in the escape-hole D allows the valve to be opened sufficiently to produce a strong jet from the orifice E. If the valve is farther opened, a part of the gas escapes around the end of the stem F, its withdrawal forming an annular opening between it and the hole D, and the gas escaping will be drawn into and form part of the jet from the opening E. When

the valve B is fully open, the stem F is so far withdrawn as to leave the opening D fully open, forming a jet in the mixing-tube C of a size suitable for producing a proper mixture with the poorest gas the burner is likely to use.

It is apparent that for a grade of gas between the richest and poorest a proper adjustment can be made by partially opening the valve B and partially withdrawing the stem F, allowing a partial escape of the gas around it.

I am aware that a conical point, sometimes termed a "needle-valve," has been used in vapor-burners for varying the area of the opening of escape; but I am not aware that the peculiar arrangement of parts hereinbefore set forth has been used.

Without a strong central jet the escaping-gas often fails to traverse the center of the mixing-tube, the current sometimes even striking its side, in which case the requisite amount of air is not drawn in at the opening *c*.

The stem F may be made and operated independently of the valve B, which may be omitted and an ordinary throttle placed at any convenient place in the supply-pipe.

This means for regulating the size of the escaping jet, while especially designed for use with "gasoline-gas," may be used with good effect with ordinary coal-gas, as it will remedy the fault of burners with a plain unchangeable jet of giving a better flame when the gas is full on than when it is partially turned off. If properly proportioned and constructed, my device will insure an even quality of flame whatever the size within the limits of the burner's capacity.

I claim as my invention—

1. The combination, in a heating-gas burner, of a mixing-tube, a valve-casing, a shut-off valve, a perforated tubular stem connected to said valve and provided with a central passage, and an opening, D, smaller than the interior of the valve-casing, in which the tubular stem has a cylindrical fit, whereby the flow of gas through the opening D is regulated, substantially as described.

2. In a heating-gas burner, the combination of a mixing-tube, a valve-casing extended into the mixing-tube and provided with the escape-opening D, a shut-off valve, a tubular stem connected therewith and provided with the passage E and orifices *e*, said stem being arranged in the casing to leave a space around it and having a cylindrical fit in the escape-opening, whereby when the valve is opened a jet of gas will pass into the mixing-tube from the central passage, E, and also from the space around the tubular stem, substantially as described.

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Witnesses:
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