F. DARRACOTT.

ILLUMINATING APPARATUS.

No. 181,252. Patented Aug. 22, 1876.

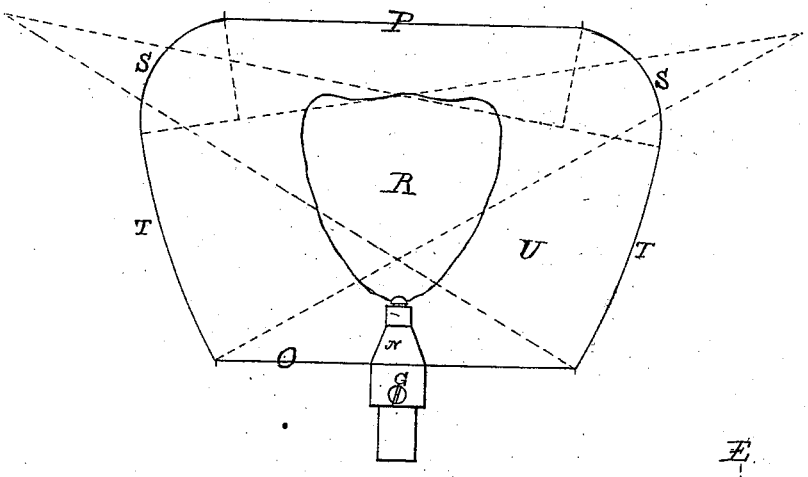

Fig. 6.

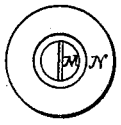

Fig. 4.

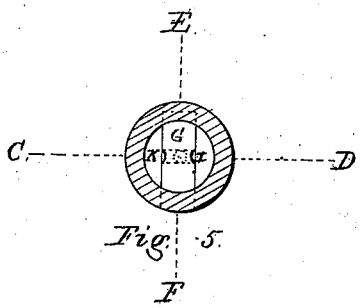

Fig. 5.

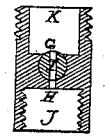

Fig. 1. a.

Fig. 1. b.

Fig. 1. c.

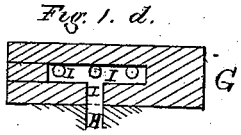

Fig. 1. d.

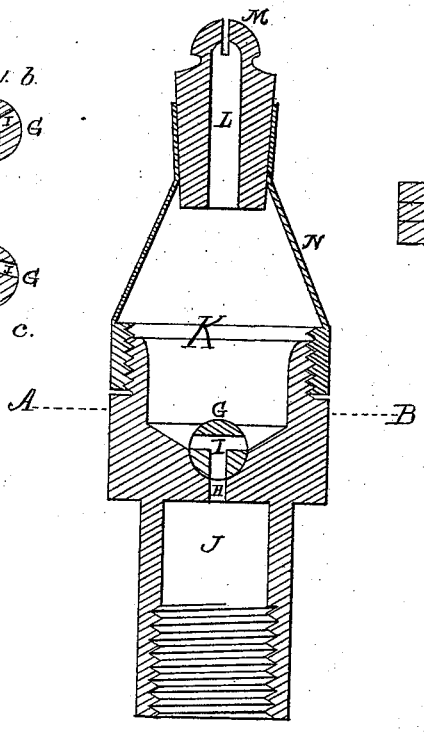

Fig. 1.

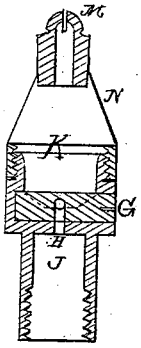

Fig. 2.

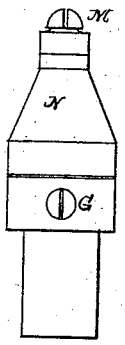

Fig. 3.

Witnesses.
A. M. Darracott

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UNITED STATES PATENT OFFICE.

FRANKLIN DARRACOTT, OF BROOKLINE, MASSACHUSETTS.

IMPROVEMENT IN ILLUMINATING APPARATUS.

Specification forming part of Letters Patent No. **181,252**, dated August 22, 1876; application filed February 17, 1876.

To all whom it may concern:

Be it known that I, FRANKLIN DARRACOTT, of Brookline, in the county of Norfolk, and State of Massachusetts, have invented a new and useful Improvement in Illuminating Apparatus, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

The object of my invention is to regulate, check, expand, and direct the current of gas, and control and direct the current of air, both before and after their mixture, in such manner as will bring the required amount of expanded gas, at a low pressure, without disturbing currents, to the position where it becomes admixed with the requisite amount of atmospheric air for perfect combustion, and will also control the motion of the air toward the flame resulting from combustion of these two elements, so as not to disturb the expansion and form of flame, or the uniform admixture of the elements, as above; and this I do by means of the devices and apparatus herein set forth, and illustrated by drawings.

The apparatus is illustrated in detail in Figure 1, a vertical section of a burner with its devices drawn on the line C D; (Figs. 1^a, 1^b, 1^c, 1^d illustrate and exhibit modifications or equivalents of the device G, all, however, effecting the same result by the same principle of action;) in Fig. 2, a vertical section on the line E F; in Fig. 3, a vertical elevation; in Fig. 4, a plan view; in Fig. 5, a horizontal section on the line A B; in Fig. 6, a projection, showing a burner and shade combined, the latter exhibiting by dotted radii the formula by which the necessary form is projected which will secure the desired effects and results, the outlines of the flame and the lines of the shade being substantially parallel.

The burner, as illustrated in the several drawings, is provided with a device, G, which combines the operations of regulating and checking the flow of, and diffusing, the gas. Preferably this is situated at the base of and partly within the expansion-chamber, constructed in manner to regulate the amount of gas passing by turning the plug or barrel G, by means of a screw-driver or equivalent, so that the inlet passage or passages I in the plug, and the passage H in the body of the burner above the chamber J, are not in exact correspondence, thereby shutting off to any requisite degree the supply of gas. This device is provided with one or more outlets of the passage I, the upper portion or portions, outlet or outlets, of the passage being formed in the plug G, as exhibited in either Fig. 1, Fig. 1^a, Fig. 1^b, Fig. 1^c, Fig. 1^d, receive the current of gas in a vertical direction, checking its force, and diverting its direction in the body of the plug G, so as to diffuse and expand the gas through the lower portion of the expansion-chamber K, causing it to pass slowly, and without disturbing currents, to the flame. By this arrangement the regulator is brought as near to the flame as is practicable, and the expansion made at the most remote point possible within the burner, and without the gas being disturbed subsequently by other devices, as in some other burners. Economy of manufacture is also secured. This arrangement will secure, in large degree, exemption from clogging, and provide, by the turning of the plug and by unscrewing the upper portion of burner, ready access for cleaning. The upper portion N of the body of the burner is made a frustum of a cone, into the upper part of which the burner-tip is inserted, and properly directs and controls the gas in its passage to the flame, by its form serving to direct and steady the internal current, and, as will be noticed after, exercising a similar influence, in connection with the shade, upon the air in its passage to the flame.

The effect of the above devices is to cause combustion under those circumstances which produce the greatest degree of illumination by a uniform and perfect mixture of gas with air under low pressure and with undisturbed currents, when seconded by proper regulation of the air in its flow toward the flame. This last is effected by combining with the burner, as above, the shade U, of the form and substantially in the position illustrated in Fig. 6. The openings O and P in this shade are the same at top and bottom, the plane of the lower opening O to be at, or nearly at, the level of the base of the frustum of a cone N forming the upper part of the expansion-chamber of the burner. The inclined surface of the cone guides the air directly toward the flame

R without impediment. The walls of the shade, formed on lines parallel to the outline of the flame issuing from the burner, guide the air to the flame without disturbance to the spreading of the flame, and without causing wavering, flickering motions along its edges, completing the results begun within the burner.

I claim as my invention—

1. The combination, substantially as described, of a combined regulator, check, and diffuser, G, an expansion-chamber, K, with conical roof N, and a shade, U, having equal openings O and P at top and bottom, with walls formed on curves S T, substantially parallel with the outlines of the flame R of burner, the plane of the lower opening P being on, or nearly on, a level with the base of the frustum of a cone N, all for the purposes set forth.

2. The combination of the combined device G, for regulating, checking, and diffusing the gas, with the conical-roofed expansion-chamber K, for the purpose of regulating, checking, expanding, and controlling the current of gas, substantially as described, illustrated, and set forth.

3. The combination of the frustum of a cone N with the shade U, having walls S T formed on curves substantially parallel with the outlines of the burner-flame R, for the purpose of controlling and directing the current of air, substantially as described, illustrated, and set forth.

4. The combination of the combined device G, of a burner for regulating, checking, and diffusing the gas, with an inlet-passage, H, and an expansion-chamber, substantially as and for the purposes set forth, described, and illustrated.

FRANKLIN DARRACOTT.

Witnesses:

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F. M. DARRACOTT.