T. B. SMITH.

Lamp.

2 Sheets—Sheet 1.

No. 29,831.

Patented Aug. 28, 1860.

Fig. 1.

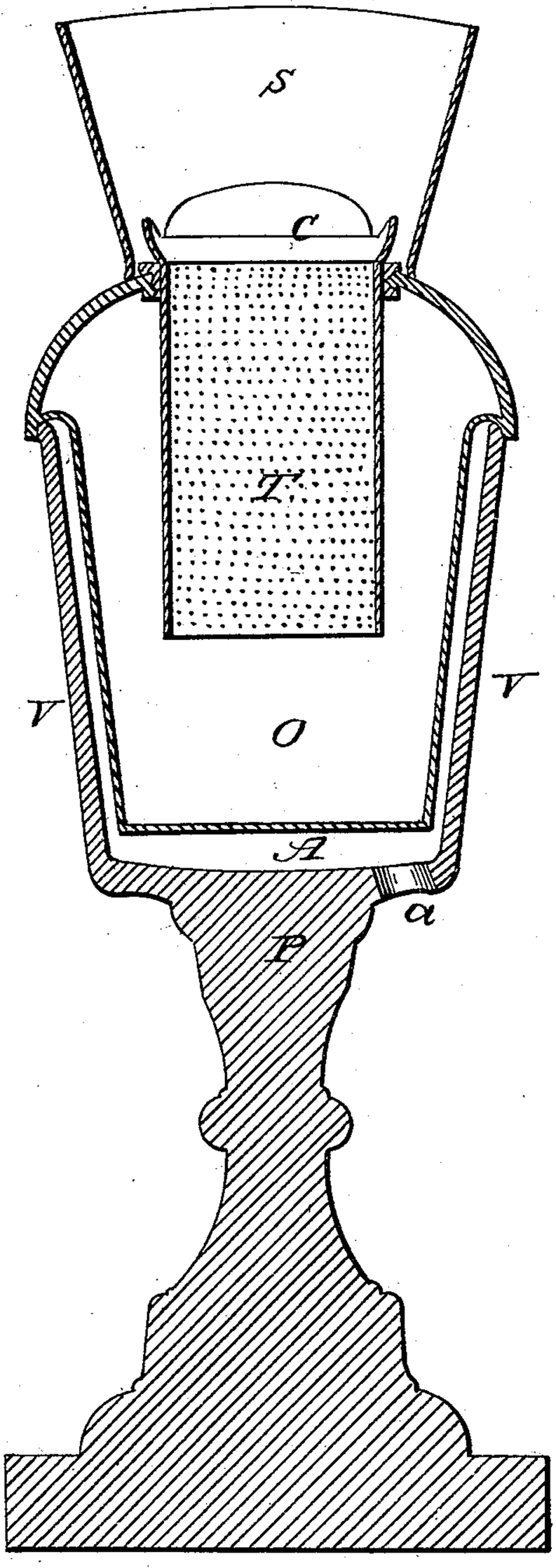


Fig. 2.

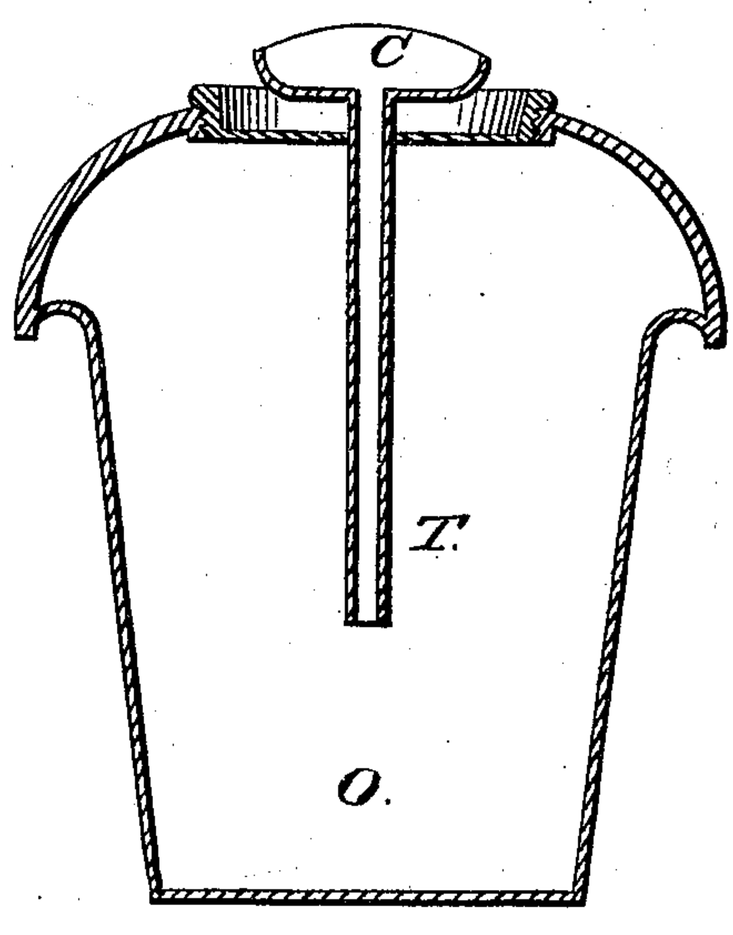
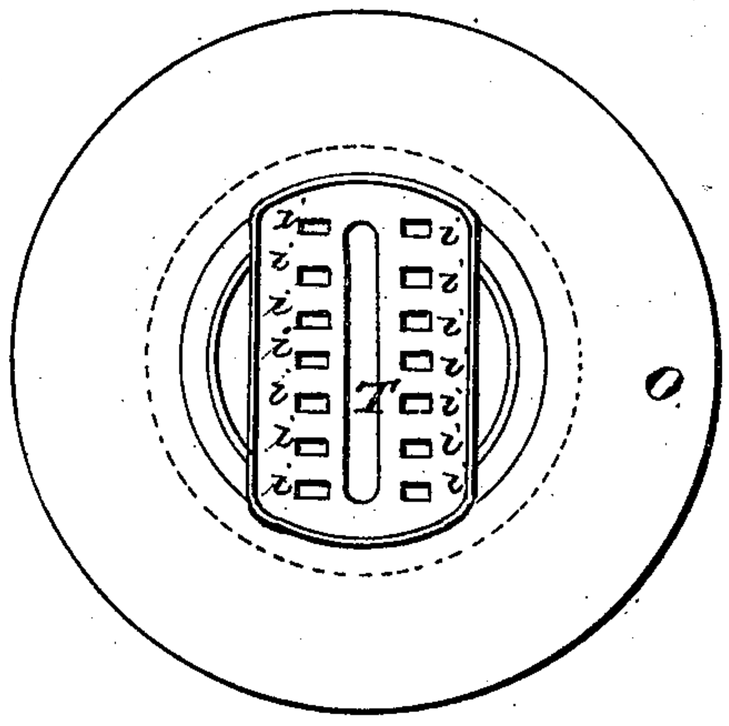


Fig. 3.



E. Pugh
F. W. Hayward

J. Briggs Smith
by his attorney.
Chas. F. Jansbury.

T. B. SMITH.

Lamp.

2 Sheets—Sheet 2.

No. 29,831.

Patented Aug. 28, 1860.

Fig. 4

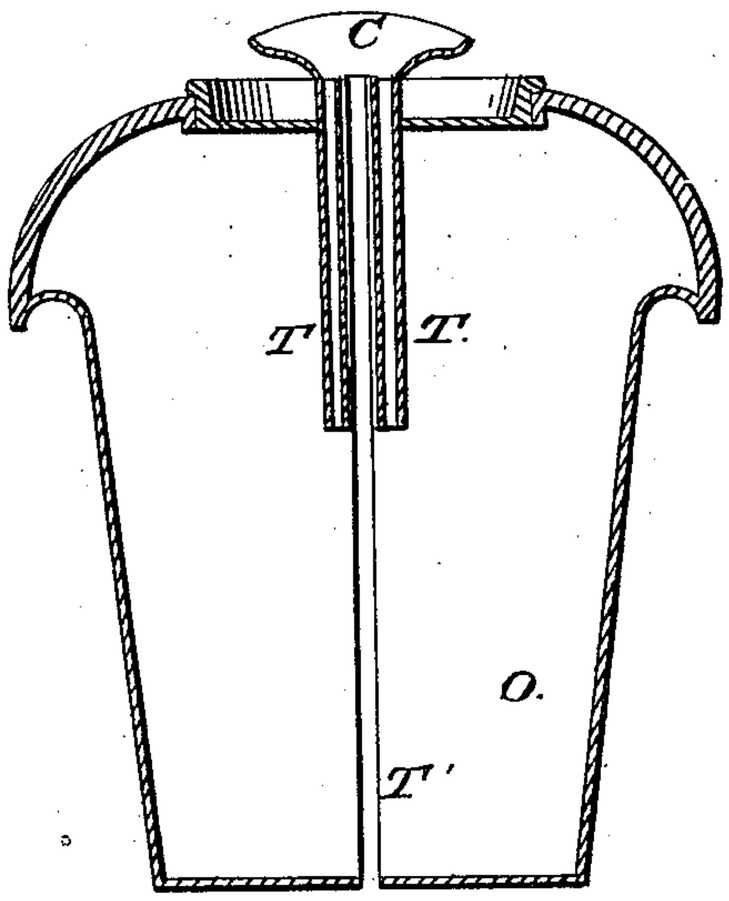


Fig. 6

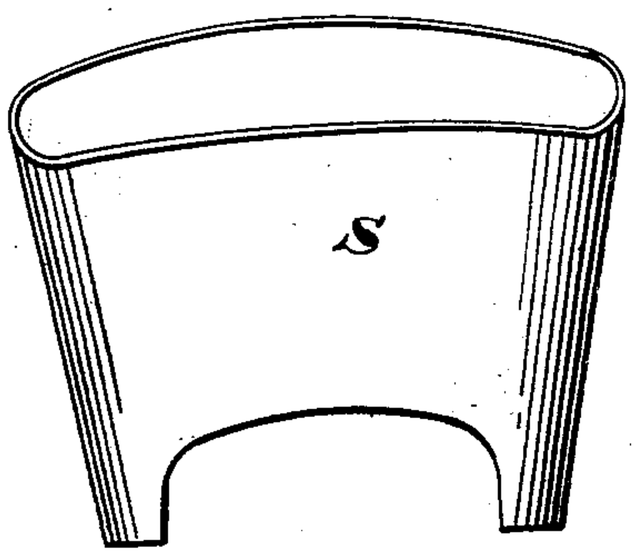
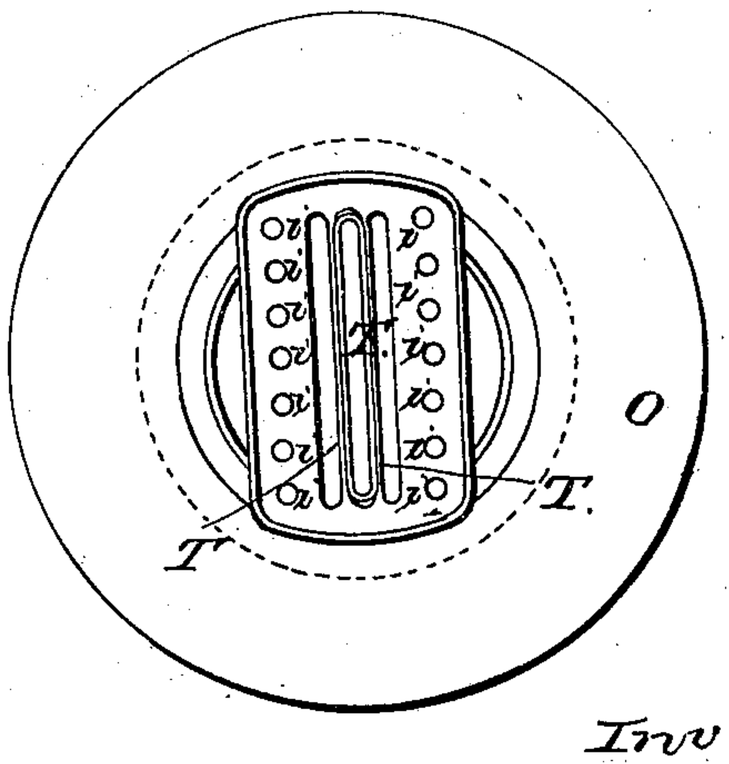


Fig. 5.



Witnesses
E. Pugg
J. M. Howard

Inventor
T. Boggs Smith.
by his attorney
Chas. F. Fansbury.

UNITED STATES PATENT OFFICE.

T. BRIGGS SMITH, OF MARIETTA, OHIO.

LAMP.

Specification of Letters Patent No. 29,831, dated August 28, 1860.

To all whom it may concern:

Be it known that I, THOMAS BRIGGS SMITH, of Marietta, in the State of Ohio, have invented certain Improvements in Lamps; and I do hereby declare the following to be a correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1, is a vertical central section of the lamp and shade, taken longitudinally as regards the shade and burner; Fig. 2, is a transverse section of the oil chamber and burner; Fig. 3, is a top view or plan of the same; Fig. 4, is a transverse section of an oil chamber and burner of a modified form; Fig. 5, is a plan of the same; and Fig. 6, is a side view of the lamp shade.

The nature of my invention consists in giving to a lamp a burner of peculiar construction, and capable of saving and conducting down into the illuminating material, contained in the oil chamber, such a quantity of heat as will readily melt, and keep in a state of fusion, and, at the proper point, volatilize even such hard substances as paraffin wax, tallow &c. and render them entirely suitable fuel for use in lamps.

My invention further consists in surrounding the oil chamber of a lamp with a confined stratum of air, to act as a non conductor of heat, and prevent the temperature of said chamber, and of its contents, from being materially lowered by contact with a colder medium.

My invention further consists in the employment of a glass shade, or chimney, of new and peculiar form, for the purpose of condensing, and giving shape and brilliancy to the flame, all as hereinafter more particularly set forth.

When hard, or semi hard materials, such as wax, tallow, and paraffin, are to be used as fuel for lamps, they require to be reduced to a state of fluidity, and kept in that condition as long as the lamp is in use. To do this, a high degree of heat is required; and, unless it is attained, the illuminating material is only partially consumed, a shell of varying thickness being left unmelted and adhering to the walls of the oil chamber. To prevent this, I intensify the heat applied to the interior of the chamber, and prevent the escape of heat from the outside by surrounding the chamber with a non conducting medium, thus making the lamp capable of being used in the open air, in the coldest weather, without danger of the melted material being congealed, or the brilliancy of the flame much affected. Whatever tends to carry off heat from the flame, has the effect of diminishing its brilliancy; and it therefore becomes important, both to the ready and continuous melting of the illuminating material, and to the quality of the light, that the escape of heat, either by radiation or convection, should be as much as possible prevented.

It is laid down as a principle in *Knapp's Technology*, that "the quantity of air conducted to the flame in lamps is, without exception, too great. The flame has, consequently to warm a portion of this air at the expense of its own temperature and intensity, and from this portion it can derive no advantage." Heat should be applied sufficient to volatilize the illuminating material just previous to the instant of combustion, and no more air should be admitted than is necessary to keep up a perfect combustion without smoke.

To get rid of the cooling effect of air currents, I remove the projecting portion of the common wick tube, and burn the wick at the level of the top of the oil chamber. Further to intensify the heat, I employ a dish-shaped reflector to throw back the radiated heat of the flame upon itself, and I perfect the combustion by the peculiar form of the glass shade or chimney which controls the direction and quantity of air admitted to the flame. The combination of these principles of construction I find to produce a light of intense brilliancy and whiteness, from paraffin, or other crude material, such as common fat and grease, wax, tallow, &c.

To enable others to make and use my improved lamp, I will proceed to describe its construction with reference to the drawings, in which the same part, wherever it occurs, is marked by the same letter of reference.

P marks the pedestal of the lamp which may be of any desired form. The upper portion V, which is in the shape of a cup or tumbler, I usually make of glass. It receives the oil chamber O which rests by a shoulder on its upper rim, and descends into the cup so far as to leave a small space for air below and around the oil chamber as seen at A, Fig. 1.

When a central air tube, as T′, is used in the lamp an aperture *a* is provided which admits air into the air chamber A.

The oil chamber O may be made of silvered tin or any other suitable material. It can be removed from the cup V at pleasure when the lamp requires cleaning or trimming. A top of the usual form is screwed into the upper part of the chamber O, and the wick tube, or tubes, T, passed down into the chamber through a slot in said top as shown. If preferred, the slot may be made directly in the top of chamber O, and the screw top omitted, the mode of attaching the wick tube being immaterial.

The burner consists of the wick tube T, and its cup C. The wick tube, which is flat, is made of two concentric tubes of perforated metal, one within the other. At the top of the tube is attached the cup C, the upper end of the tube being on a level with the bottom of the cup. The cup has the dish form shown, being turned up on both sides and ends, the ends being higher than the sides. The bottom of the cup is perforated with small holes *i* for the admission of air.

When only one wick tube is used, as in Figs. 1, 2, and 3, no air passage is required in the interior of the oil chamber, nor is the aperture *a* required; but where two tubes are employed as in Figs. 4 and 5, an air passage T′ is introduced between them to supply air between the two wicks. This air is drawn from the air-chamber A, which is supplied through the aperture *a*. With the exception of the employment of the air tube T′ and the two wick tubes T, the lamp represented in Figs. 4 and 5 does not differ from that shown in Figs. 1, 2 and 3.

I surmount the lamp with a glass shade S of the peculiar oval and flaring form represented in Fig. 6, and having elongated semi-elliptical openings in its sides, as shown, for the admission of air. The shape of the shade and its openings has been determined experimentally, and I have found that the size and shape of the flame could be controlled by the form and size of the shade and of its side openings. The shade represented in Fig. 6, gives a fan-shaped flame resembling that of an ordinary gas burner. The tendency of the flame to assume a pointed form, and smoke from the apex, is controlled partly by the elevated ends of the cup C, and completely by the addition of the shade S.

The operation of my lamp will be inferred from the principles of its construction as hereinbefore explained. The wick tube, which I prefer to make of copper, conducts heat from the flame down into the oil chamber, and melts the illuminating material. No considerable escape of heat by radiation takes place, and hence the entire contents of the chamber is reduced to a fluid state and kept in that condition as long as the lamp is burning. As the wick tube does not extend above the surface of the cup, it is not exposed to cooling air currents, and hence is kept intensely hot at top, so that the illuminating material is actually brought to a boiling state as it approaches the top of the tube and is converted into a gaseous form as it comes into contact with the flame. The temperature of the flame is still further enhanced by the heat reflected upon it from all sides by the cup C; and the perfect combustion of the illuminating material is secured by the admixture of a due proportion of atmospheric air, entering through the holes *i* at the moment of the ignition of the escaping gases.

I have described and represented a lamp with two wick tubes, and an intervening air passage, merely for the purpose of showing that my invention is applicable to such a lamp; but I do not claim the arrangement as forming any part of my invention. On the contrary, I distinctly disclaim it as a device well known and in common use in various forms of lamps.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The peculiarly constructed burner hereinbefore described, consisting of the wick tube T, and cup C, constructed and united in the manner set forth.

2. The shade S formed and operating as described.

The above specification, signed and witnessed this twelfth day of June, A. D. 1860.

T. BRIGGS SMITH.

Witnesses:

CHAS. F. STANSBURY,

EDM. F. BROWN.