Sheet 1-2 Sheets.

B. F. Greenough,

Lamp,

No. 2,039. Patented Apr. 10, 1841.

Fig. 1.

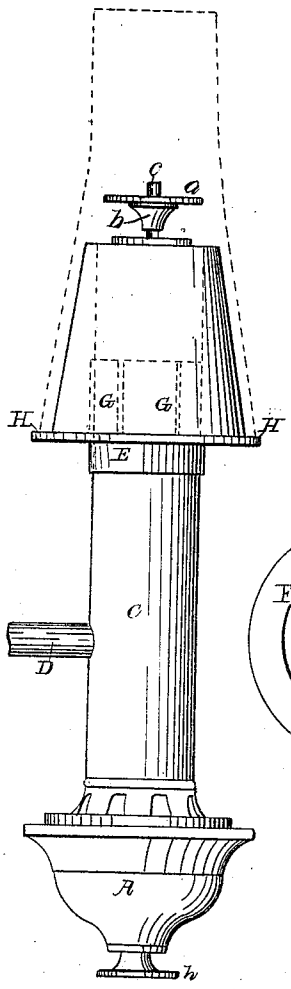


Fig. 3.

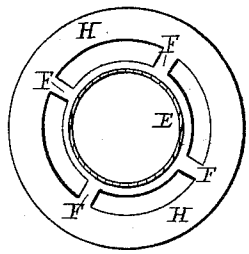
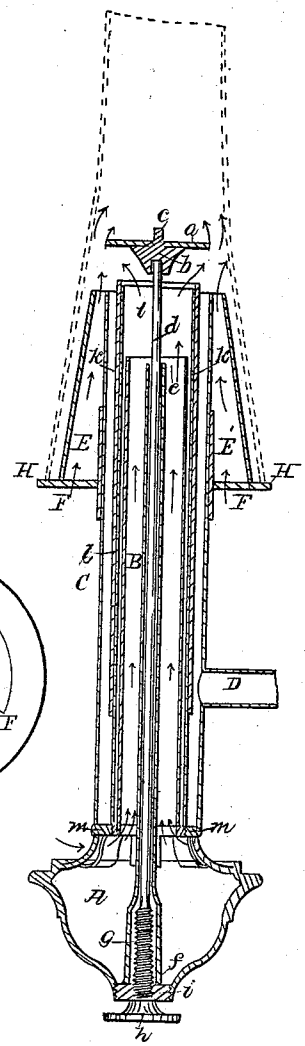


Fig. 2.



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Fig: 3.

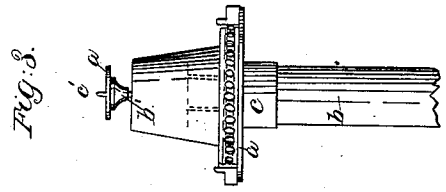


Fig: 2.

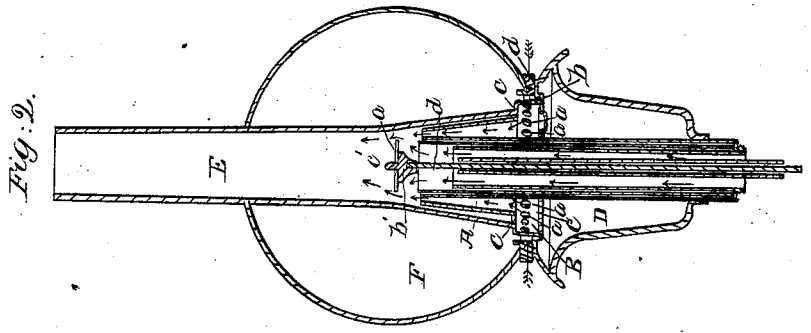
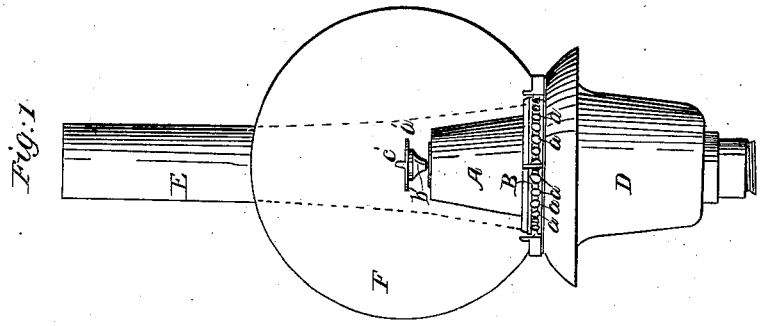


Fig: 1.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. GREENOUGH, OF BOSTON, MASSACHUSETTS.

LAMP.

Specification fo Letters Patent No. 2,039, dated April 10, 1841.

To all whom it may concern:

Be it known that I, BENJAMIN F. GREENOUGH, of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful improvements in lamps for burning chemical mixtures or compositions of alcohol, spirits of turpentine, and such other matters or fluids as are generally substituted for common oil, and that the following is a full and exact description of the same, reference being had to the accompanying drawings, which, taken in connection herewith, form my specification setting forth the principles of my invention, by which it may be distinguished from others of a like character, and such parts or combinations thereof as I claim and for which I solicit an exclusive property to be secured to me for fourteen years by Letters Patent.

Figures 1, 2, 3, Plate 1, represent the burner of a lamp with my improvement applied thereto. Fig. 1, being an elevation and Fig. 2, a vertical transverse section of the same. Fig. 3, is a horizontal section of the burner inverted exhibiting the lower part of the cone and spring slide, by which it is adapted to the exterior tube of the burner, as will be hereinafter described.

My first improvement consists in the construction of the button *a*, Figs. 1 and 2, which serve to spread the flame of the wick. The heat caused by the current of air passing over both sides of the flame is so intense as to often melt down, or soon burn out or destroy the button, if the same is made of brass, iron or copper in the usual manner. The button *a* is a small thin circular plate of platina, or other suitable material, having a hole bored through its center, so that when it is placed on a shoulder *b*, Fig. 2, a small square or circular projection *c* from the top of the shoulder may pass through the same and retain it in place on said shoulder. The shoulder is a conical or other proper shaped piece of metal, fixed on the top of the adjusting rod *d*, by having a hole in its lower side, and inserting the rod therein as seen in Fig. 2. The shoulder *b* being smaller in diameter than the circular platina plate *a*, it is therefore situated at such a distance from the flame as not to be liable to serious injury therefrom. Should it ever be necessary to renew the plate, the same can be easily effected at any time, by removing it and substituting another, as will be seen by the peculiar construction of the shoulder sustaining it. It is found, that the conical shoulder so formed, is a great preservative of the button, as when simply laid upon the same, it does not oxidate so soon as when attached to the top of the rod which supports it in the usual way.

My second improvement consists in supporting and guiding the adjusting rod *d* upon which the button is placed by passing the same through a tube *e f*, Fig. 2, whose lower end *f* is screwed, soldered or otherwise properly attached to the bottom of the oil cup A as seen at *i*, Fig. 2. By turning a milled head *h* on the lower extremity of the screw *g* of the rod, the rod, and consequently the button *a* is elevated or depressed at pleasure. Heretofore it has been customary to guide the upper part of the rod *d*, by inserting the same through a hole in a small circular piece of metal, which latter was attached to the inner tube B of the oil chamber, by two or more bars or arms or projections proceeding therefrom and attached to the inner circumference of the tube. The cylindrical current of air, in passing upward around the rod *d* had to pass through the spaces between the arms above mentioned and therefore was divided into two or more currents with such intervals between them, as produced a great irregularity or inequality in the height of the flame. This evil is corrected by supporting the rod by means of a tube *e f* in manner above described. The current of air, rushing through the tube B, being uninterrupted acts equally on the whole interior of the flame, and thus causes a more brilliant light to proceed therefrom than can otherwise be produced. The exterior tube C of the burner is somewhat larger in diameter than the interior and concentric tube B. They are properly connected together at bottom and have the oil cup A attached to them in the usual manner. The oil or chemical mixture to be burned, is introduced into the space between the tubes B and C through a pipe D, Figs. 1, and 2, proceeding from the fountain or reservoir and inserted in the outer tube. The wick *k k* is passed rather tightly over the outer circumference of a tube, *l*, a very little larger in diameter than the tube B, and the said tube *l* being dropped into the space between the tubes B, C, rests on the bottom *m m* of said space, its top projecting about one-sixteenth of an

inch above that of the outer tube C, as seen in Fig. 2.

My third improvement consists in the method of adapting the cone or conductor (through which the exterior current of air rushes which impinges on the flame), to the tube C, by which the position or elevation of the top of said cone, with respect to the button *a*, may be easily adjusted. This is effected by applying a short spring tube E, Figs. 1, 2, 3, Plate 1, upon the outside of the exterior tube C of the burner and connecting the cone to the tube C by a series of arms F F, Fig. 3, extending from one to the other. The air rushes upward through the spaces between the arms. The tube E fits closely upon the tube C, and has several slits G G, as seen by dotted lines in Fig. 1, cut vertically in its circumference, so as to convert the tube into a spring, by the pressure of which, upon the outer tube of the burner, the cone is sustained at any elevation thereon. The above adaptation of the cone is of peculiar importance; when used in connection with the adjusting button *a*, whether constructed of platina or in the usual manner, for the elevation of the button, determining the divergence of the frame, the cone requires to be raised or lowered in accordance therewith to such distances as will cause the outer current of air to impinge upon the flame in such manner as to produce the greatest effect. Therefore it will be seen that a movable cone is essential to an adjusting button, and the combined action of the two produces better light than when the cone is fixed or rests on a shoulder as in ordinary lamps. The cone has a shelf or rim H H, around its lower edge, upon which the glass chimney is placed in the usual manner.

Figs. 1 and 2, Plate 2, represent a lamp with other improvements, the former being an elevation and the latter a vertical section of the same.

In this kind of lamp it will be perceived that the cone A has a very extended base B, arranged on the lower part of the same, the said base being cylindrical and in diameter somewhat larger than the lower part of the cone where the same is cemented to it. Through the entire circumference of this base a series of holes *a*, *a*, *a*, is bored very close to each other. The cone, thus formed, is placed on the top C of the oil fountain D, as seen in the drawings, and is sustained in position by being dropped into a circular socket *h h*, formed or cut down in the top C to the depth of about one-sixteenth of an inch. The chimney E placed on the outside of the cone rests on the shelf *c c* or top of the extended base B as seen in Fig. 2.

As the top of the ground glass globe or shade fits rather closely around the chimney, the bottom of the globe or shade should be supported somewhat above the top C or on a level with the top of the holes *a*, *a*, *a*, by small studs or bent standards *d d* or other similar contrivances affixed on the top C of the oil fountain. From the above it will be seen that the air rushes under the glass globe, and thence passing through the holes *a*, *a*, *a*, as denoted by arrows, Fig. 2, and taking a direction toward the center or axis of the cone unites in a circular column, as it reaches that part of the lower portion of the cone, which causes it to pass upward. It thus rushes toward and impinges on the exterior of the flame in an uninterrupted circular current, a desideratum highly desirable in lamps of this kind, as it will be perceived by inspection of Fig. 3, Plate 1, that the arms F F divide the current of air.

In order that the several currents of air passing through the holes *a*, *a*, formed around the circumference of the cylinder B, attached to the lower part of the cone may properly unite together in one circular current as they bend upward to pass toward the flame, the circumference or rim of the cylinder B, should be of such size that the sum of the widths of all the holes, bored at regular distances apart through the same, shall equal the inner circumference of the cone where it is joined to the cylinder B. Therefore the several currents would meet together as they pass into the cone. The cone is represented above as stationary, but it can be easily adapted to a lamp, so as to be movable up and down, or adjusted as regards its position. In this case, the cone should be formed in all respects substantially as seen in Figs. 1, 2, Plate 2, and should rest on a circular shelf *a*, Fig. 3, Plate 2, which is adapted to the outer tube *h* of the burner by a circular tube spring *c*, arranged and operating like the spring E, Fig. 1, Plate 1. The circular shelf *a* is solid or has no air passage through the same, so that the air of which the external current is composed rushes through the holes of the cone and unites as before described. If the lamp is also constructed with an adjusting button guided by a tube in manner as before mentioned, the flame will be supplied with an external and internal uninterrupted current of air, by which its brilliancy will be much improved.

Having thus described my invention I shall claim—

1. The placing of a shoulder on the rod by which the button is supported, said shoulder being so constructed as to set loosely on said rod, and adapting the button to a projection on said shoulder in a similar manner, by means of which combined arrangement the rapid oxidation of the disk is prevented, all as herein set forth.

2. Guiding the adjusting rod of the button by passing the same through a tube

whose lower end is attached to the bottom of the oil cup, or otherwise similarly arranged, the said tube extending upward into and through the central part of the interior tube of the burner, the whole being for the purpose of permitting an uninterrupted current of air to act on the inner surface of the flame as above set forth.

3. The combination of an adjusting cone, (applied to the exterior tube of the burner by a circular spring or other contrivance substantially the same, by which its altitude can be regulated), with the adjusting button, or one whose elevation may be varied at pleasure, the whole being arranged substantially in manner and for the purpose above mentioned.

4. Lastly I claim a cone constructed with an extended cylindrical base, having a series of radial holes through the circumference of the same, and made so as to be adjusted in height on the exterior tube of the burner by means of a circular shelf and spring, in combination with a movable button, whose rod is supported and guided by a tube, connected with the oil cup and whose elevation can be regulated by a screw or other suitable contrivance, the whole being constructed and arranged substantially in manner and for the purpose of supplying the flame with an uninterrupted circular current of air on each side thereof, as above set forth.

In testimony that the above is a true description of my said invention and improvements I have hereto set my signature this seventeenth day of March in the year eighteen hundred and forty-one.

B. F. GREENOUGH.

Witnesses:

R. H. EDDY,

EZRA LINCOLN, Jr.