S. J. GOLD.

Chemical Oil Burner.

No. 2,168. Patented July 16, 1841.

Fig: 1.

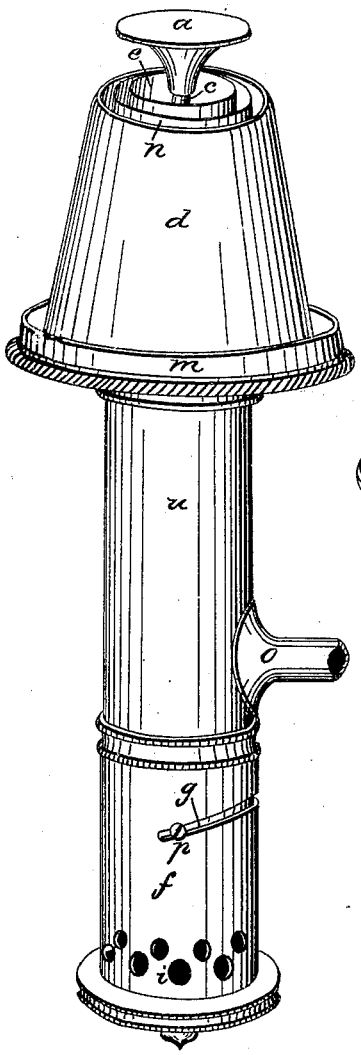


Fig: 3.

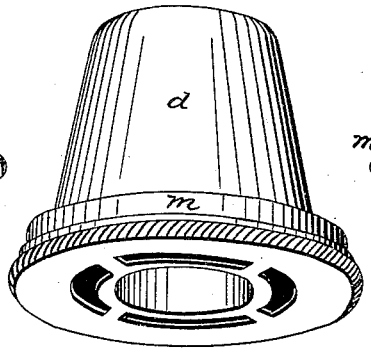


Fig: 4.

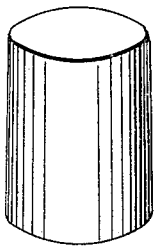
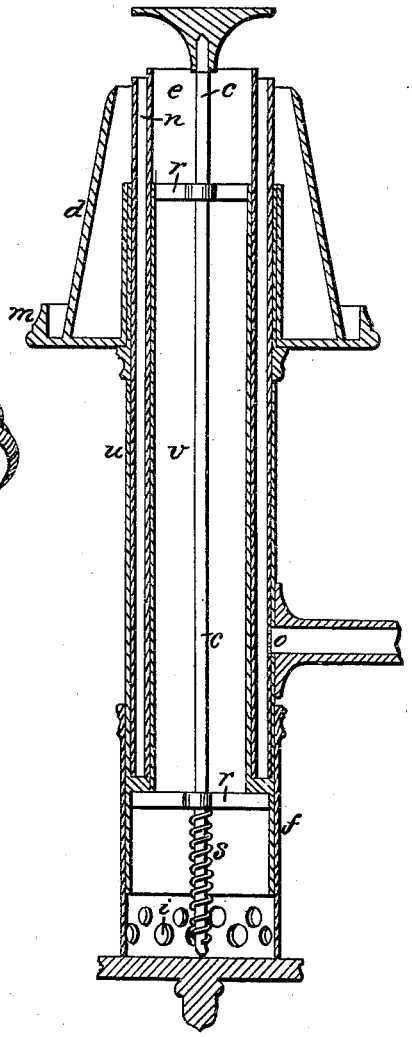


Fig: 2.



UNITED STATES PATENT OFFICE.

STEPHEN J. GOLD, OF CORNWALL, CONNECTICUT.

LAMP FOR BURNING CAMPHENE, &c.

Specification of Letters Patent No. 2,168, dated July 16, 1841.

To all whom it may concern:

Be it known that I, STEPHEN J. GOLD, of Cornwall, in the county of Litchfield and State of Connecticut, have invented new and useful Improvements in Argand Burners for Burning Camphene or other Chemical Oil.

It is well known, that if the ordinary Argand burner, for camphene, is put in such order as to burn the proper flame, the burner will become highly heated. This high temperature will cause rosin to be collected on the burner, by causing the ascent or flow of more oil than can be consumed. It will also frequently make smoke, which will be condensed into lamp-black in the room, and when the flame is enlarged with smoke the button will be rapidly destroyed by oxidation and in no other case will the button be injured.

My improvement consists in such a construction as will keep the burner cool and maintain a proper and uniform supply of oil for combustion; also in the construction of the fixtures for increasing and diminishing the light with greater precision. Also in the particular construction of the wick tubes in reference to wicking and trimming the lamp; and lastly in the application of a preservative cap to the burner to keep the oil pure and wick clean, when not in use. Such being the nature of my improved burner I will now give a full and exact description of its construction and operation, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a perspective view, Fig. 2 a vertical section, Fig. 3 the glass holder and cone for the exterior draft, and Fig. 4 the preservative cap.

Construct as follows: Make two cylinders of sheet brass or other suitable metallic substance, the length of one of the cylinders being about four and a half inches, the diameter outside three-fourths of an inch; this being the inner cylinder and air tube of the burner, (letter *v*.) The other cylinder is five and a half inches long and one and one-sixteenth of an inch in diameter inside, this being the outer cylinder of the burner (letter *u*). Upon the lower end of the smallest cylinder is made a rim, letter *x*, which is made fast to the inner side of the large cylinder, one inch and one-sixteenth above the lower end of it, forming a base upon which the wick tubes (hereafter to be described) will stand. Upon the exterior cylinder *u*, is placed a conical air tube (letter *d*) attached to the glass holder (letter *m*,) resting on a bead about one inch from the top, of cylinder *u*. The upper end of the cone *d*, is about one and one-fourth inches diameter inside, the lower end about two inches diameter, where it is connected with an extended base *m*, for a glass holder, with arms reaching inward to a collar, which is fitted to the exterior cylinder *u*, and rests on the bead or shoulder (see Fig. 3,) so that the top of the cone *d* will project about seven-eighths of an inch above the top of the cylinder *u*. Over the center of the burner is the ordinary button (letter *a*), the diameter of which is about equal to the inside diameter of cylinder *u*. This button is to direct and regulate the inner draft of air, and control the combustion of the oil by its being raised or depressed. This button is supported by the rod, (letter *c*) extending down through the center cylinder *v*, and resting on a point as seen in Fig. 2. This rod is kept to its place by small bars across cylinder *v* (see letter *r*). These bars, *r*, are thin, but of sufficient depth to give them strength, thin that they may not obstruct the draft. As it is absolutely necessary that the button, *a*, be placed and kept over the center of the burner, I accomplish this more perfectly and easily, as well as substantially, by not having it revolve while it is raised and lowered by application of screw power. To effect this I construct the cyindrical cup (letter *f*, see Figs. 1 and 2) about two inches high, fitting so as to revolve easily around the cylinder, *u*. In this cylinder *f*, is a narrow cut or groove (letter *s*) of such inclination, that by revolving the cylinder *f*, on the pin *p*, which is fastened in cylinder *u*, the rod and button resting on the bottom of the cylindrical cup *f*, as seen in Fig. 2, may be raised or lowered, as more or less flame is required, the rod *c*, being kept down upon the bottom of the cup *f*, by the spiral spring *s*, which is attached to the rod and rests against the cross bar *r*. Below the bottom of the cylinders *u*, and *v*, in the cylinder *f*, are the openings, (letter *i*,) for the admission of air through the cyl-

inder *v*, to the wick (see Figs. 1 and 2.) The wick tubes (letters *e*, and *n*,) are made as follows: The best metal of which to construct these wick tubes, is tin, iron which should be very thin particularly for the post which is above the cylinders *u*, and *v*, the object being to have them so thin, that their conducting power may be overcome by the passage of the air over them; and to prevent these wick tubes from yielding on account of being so lightly made they are supported effectually within the cylinders *u*, and *v*. The tube *n*, is therefore made to fit properly to the cylinder *u*, and the tube *e*, to the cylinder *v*, (see Fig. 2,) so that they will be kept to their places, and yet so that they may be easily inserted or removed. The tube *n*, projects one-sixteenth of an inch and the tube *e*, one-eighth of an inch above the top of the cone, *d*, (see Figs. 1 and 2.) The oil is admitted into the burner at the hole *o*, when the burner is used for a side lamp and differently for different lamps as may be necessary. This burner should be wicked and trimmed, as follows: Using the ordinary cylindrical wick, first, insert into the exterior wick tube *n*, the wick, then slip the inner wick tube *e*, through the wick, the lower end of the wick and wick tubes, being even; the upper end of the inner tube *e*, projecting one-sixteenth of an inch, will be the gage, to which the wick must be cut even, the wick tube *n*, keeping the wick in its place. The difference in the length of the tubes, will show the length of the wick, exposed to the flame. The wick tubes now confining and protecting the wick, are inserted together into the burner. Put the button on the rod. The glass, only, is now wanting as a chimney, to effect the complete combustion of the oil. The glass should be about ten or eleven inches high, fitting the glass holder *m*, at the bottom, and about 1½ inches in diameter at the top. Holding the glass in the hand, now light the lamp, and immediately put the glass in its place. To increase the flame raise the button, to diminish the flame lower the button.

The effect of the above construction will be as follows. The action of the exterior and interior currents of air upon the exposed upper parts of these thin metallic wick tubes overcoming their conducting power, will keep them and the wick cool; therefore as the heat cannot be conducted down to the heavy metallic part of the burner, on account of the upper construction of the wick tubes, the wick which is in them will not be so heated as to accelerate the flow of oil, consequently the flame of the lamp will be increased or diminished only as the button is raised or depressed. The lamp may therefore be left to burn a full and beautiful flame till the oil is exhausted, without any tendency to smoke. If there is a forced and over supply of oil for combustion as when the burner is highly heated, the resinous part of the oil will rapidly collect on the metal near the flame, instead of being consumed as it comes up. Therefore the above construction of the wick tubes, which in their combination keep the burner and the metal adjacent to the flame cool, preventing the too rapid flow of the oil to the top of the wick, will prevent this collection of rosin, which frequently takes fire and causes smoke, in addition to making the burner foul.

To trim the lamp after being burned, first remove the glass button and cone *f*. Then draw out the wick tubes with the wick, raise the inner wick tube and wick sufficiently so that the soiled part of the wick may be cut off, when the tube *e*, is pressed back to its place the wick being kept up by the greater friction of the outer tube *n*. These tubes enveloping the wick and pressing it slightly, will prevent the dripping while being trimmed, and keep the wick from getting uneven when again put back into its place in the burner, all tending to the more perfect and acceptable operation of the lamp when lighted.

To be applied to the above described burner, I construct what I call a preservative cap, (see Fig. 4,) made of tin or other suitable material as follows. About one and one half inch high, slightly conical closed at the small or upper end and of proper size at the larger end to fit over the exterior cylinder *u*, closely, the size of the upper end of the cap being sufficiently large not to interfere with the button. This cap I apply when the lamp has oil in it, and is not burning. It is well known that camphene or oil of turpentine evaporates rapidly when exposed in the open air—producing many evils, the principal of which is rosin in the wick and about the burner, which arises from the oils becoming inspissated by evaporation and unfit for use. This close cap prevents such effects, keeping the oil pure, and also the wick clear from dust, so that the lamp may stand trimmed for a long time and no evil results.

What I claim as my invention, and desire to secure by Letters Patent in the above described improved lamp, is,

1. The mode of compressing the wick by means of two thin movable metallic cylindrical tubes, combined with the wick case, as herein set forth; the two cylinders, or wick tubes, with the wick compressed between them being inserted into the annular space between the two cylinders of the wick case, with a portion of said wick tubes extending above the wick case, to allow of their being kept cool by the draft, all as herein set forth.

2. I claim in combination with the outer

cylinder of the burner and the rod supporting the button, a movable cylinder or screw, disconnected from the rod but having a bottom plate which, when the cylinder is turned up, presses against the rod and elevates it, and allowing it when turned down, to return either by its own weight, or by the action of a spring, as set forth; the whole being constructed and operating substantially as described.

STEPHEN J. GOLD.

Witnesses:

THOS. P. JONES,

CHRISTOPHER MORGAN.