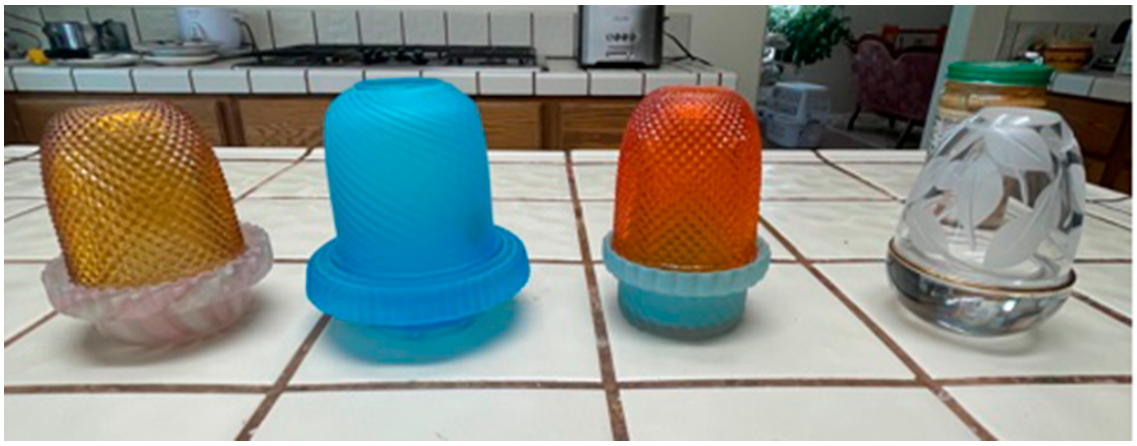
Fairy Lamp Candle burning experiment. **September 2021.**

Experiments were undertaken to demonstrate the effects various “Fairy Lamp” shades and cup configurations would have on the burning of Victorian Clarke candles.

In the first experiment Clarke’s Burglar’s Horror candles were used in conjunction with the following four lamp configurations:



Lamp 1: A ribbon cup with smooth shoulder/flange and diamond point shade;

Lamp 2: A Hobbs cup, with hole in base covered by candle, and twisted rib shade;

Lamp 3: A bohemian cup with smooth shoulder/flange and diamond point shade;

Lamp 4: A heavy duty French lamp with tight seal between lamp and shade.

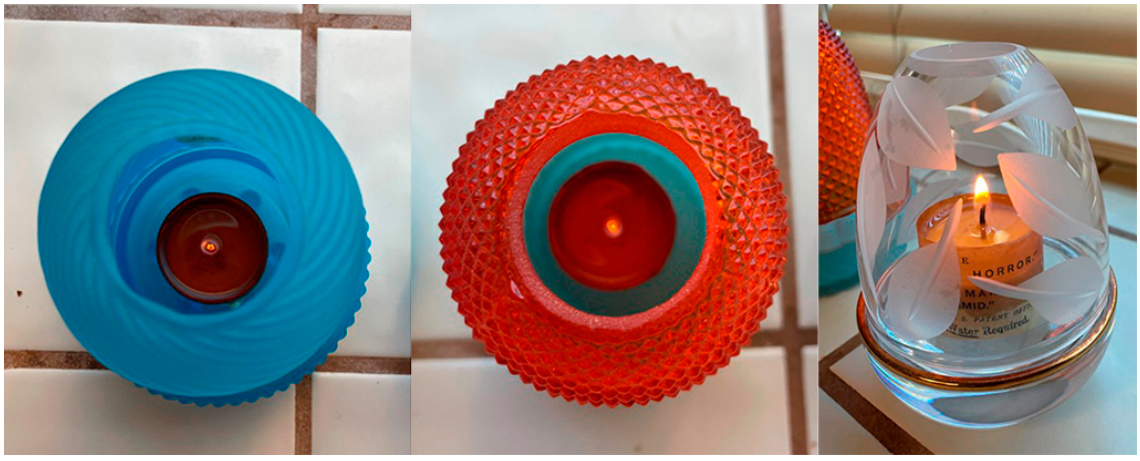
None of these lamps, except lamp 2, have a recognised additional airflow arrangement.

The experiment was started with all candles burning equally bright. After 2 hours there was no perceptible change.

After 2¼ hours the candles in lamps 1, 2 & 3 were starting to fade with the wick burnt down into the fat.

After 2¼ hours lamp 4 is burning well with no reduction in wick length.

After almost 3 hours lamp 1 is out with lamps 2 & 3 barely burning, lamp 4 still burning well.



Before the candles in lamps 2 & 3 went out the shades were removed but no discernible difference to the flame was observed.

After 4½ hours lamps 2 & 3 were out with lamp 4 continuing to burn as before.

Conclusions:

1. The lack of addition ventilation did not impede the burning of the candles.
2. The performance of the candles was most likely due to the deterioration of the candles.
3. Absolutely no smoke or odour was observed at any time.

Part 2:

At this point it was decided to repeat the experiment using a Burglar's Horror candle, a Samuel Clarke patent cup with corrugated shoulder/flange and a diamond point shade.

After ¾ hour of the Clarke configuration burning another arrangement was set up this time using a Bohemian lamp that has no provision for additional air ventilation.

After 1¼ hours from lighting the Clarke lamp it is barely burning, the Bohemian lamp is burning fine and lamp 4 shows no sign of faltering after 5¾ hours.

After 6 hours of burning the good candle in lamp 4 was switched to lamp 3.

After 3¼ hours the Clarke configuration is burnt out, The Bohemian lamp is starting to fade but the new lamp 3 arrangement is still doing well. The good candle in lamp 4 has now been burning for 8 hours.

After a further 30 minutes the Bohemian shade was removed but there was no change to the burning condition of the candle.

The candle in lamp 3 was allowed to continue burning and extinguished after a total of 9½ hours.

Conclusions:

1. The shade and cup configuration was not the deciding factor in the ability of a candle to burn successfully.
2. The Clarke Burglar's Horror candles deteriorate significantly with age; with only one good candle from a batch of six.

Part 3:

In this experiment Clarke's Fairy Lights were used in conjunction with the following six lamp configurations:

Lamp 1: Queens Burmese shade in a Clarke cup.

Lamp 2: Hobbs Firefly lamp with hole in base.

Lamp3: an original Clarke lamp with peripheral holes in the brass base.

Lamp 4: Bohemian cup with diamond point shade, as lamp3 in previous experiment.

Lamp 5: Bohemian lamp with notched shade.

Lamp 6: Bohemian lamp that has no provision for additional air ventilation. See previous experiment.

Very shortly after the lighting the candles the two Bohemian candles went out. The two shades were removed and the candles checked to show that they were not viable.

From this batch of candles there was only one candle that lasted any time and this only lasted 1 hour and 9 minutes. This candle was in lamp 4.

Part 4:

The final part of these experiments used new beeswax candles to demonstrate the effect of the "useful and new improvements in candle lamps" patented by Samuel Clarke in 1886 where corrugations were added to the shoulder to improve airflow.

It can be clearly seen that the improved airflow creates a larger, brighter flame. There was also noticeably less flicker of the flame.

The image demonstrates how the moulded Clarke cup projects light downwards, ideal for use in chandeliers as also identified in the 1886 patent.

This shows that the corrugations are not necessary for candle lamps to function but does provide a superior light.

Additional reading: Candle Science - National Candle Association