Sept. 8, 1953

N. C. BEESE

2,651,189

PHOTOFLASH LAMP

Filed June 27, 1951

Fig. 1.

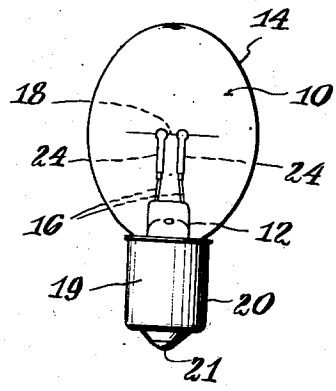


Fig. 2.

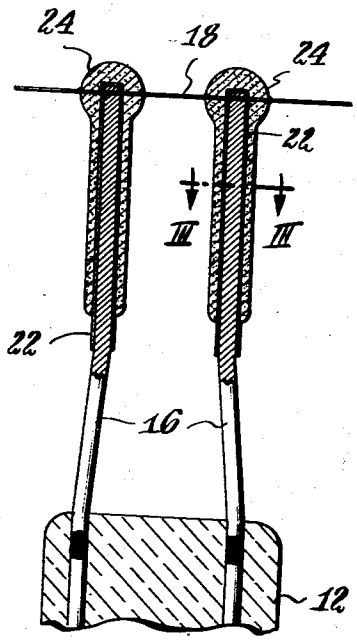
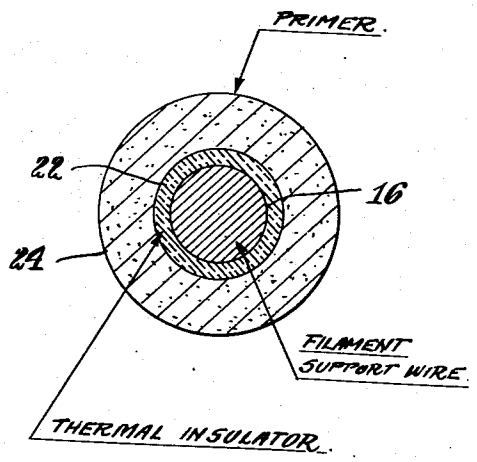


Fig. 3.



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PHOTOFLASH LAMP

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4 Claims. (Cl. 67—31)

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My invention relates to photoflash lamps and, more particularly, to such in which the light output is furnished chiefly by combustion of primer material.

Photoflash lamps are made with a combustible material therein which upon being heated is ignited and burns to produce a flash of light. Heretofore, the combustible material or primer mass which was used has been in the form of a paste around the filament supports; and there has been, after flashing the lamps, a residue of unburned combustible material that adheres to the metal supports. I have found that this material did not reach the kindling temperature because of the cooling effect of the metal support wires.

Therefore, an object of my invention is to provide an improved photoflash lamp.

A further object of my invention is to effect more complete combustion of the primer material within photoflash lamps.

Another object of my invention is to provide a photoflash lamp having a greater light output.

Still another object of my invention is to provide a photoflash lamp whose flash is of increased time duration.

Yet another object of my invention is to provide a photoflash lamp wherein the primer mass is supported by a poor thermal conductor.

More specifically, an object of my invention is to provide a thermal insulating coating between the primer within the photoflash lamp and its support.

The novel features that I consider characteristic of my invention are set forth with particularity in the appended claims. The invention itself, however, together with additional objects and advantages thereof, may be best understood from the following description of specific embodiments when read in conjunction with the accompanying drawing in which:

Figure 1 shows a photoflash lamp in side elevation.

Figure 2 is a vertical sectional view on an enlarged scale, axially of the filament supports of the lamp.

Figure 3 is a cross sectional view of one filament support, on a still larger scale.

One type of photoflash lamp, commonly made has a combustible material therein called a primer which, when subjected to heat, ignites spontaneously with a violent exothermic chemical reaction to produce a flash of light for a short duration of time. A photoflash lamp 10 is shown generally in Figure 1, which lamp has

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a re-entrant stem 12 sealed into one end of its envelope 14. Sealed through the stem 12 and extending into the lamp 10 are two metal wire filament supports 16. These supports also function as lead-in conductors to filament 18, preferably of tungsten, which is supported therebetween. The lead-in conductors 16 are connected to a cup-shaped base 19 which is cemented to the lamp envelope 14 at the stem end thereof. One of the lead-in conductors 16 is connected to the metal shell 20 of the base 19 while the other lead-in conductor is connected to a metal button 21 in the bottom of the base, which button is insulated from the shell 20. The shell of the base and the metal button constitute the two outside terminals for supplying power to the filament 18. The lamp envelope is filled with a combustion supporting gas, such as oxygen, at a pressure of approximately 110 mm. of mercury.

It has been the practice in the past to apply a coating of combustible material, known as the primer, around the filament end of the filament supports. The primer may be zirconium powder mixed with oxidizing agents, such as potassium perchlorate and sodium chlorate, and coalesced into small match-head like masses which are caused to adhere to the filament support tips with a nitrocellulose lacquer. I have found that the performance of the lamp may be improved if the primer material is insulated from direct contact with its support. To do this I provide on the filament end of the support 16 a thermal insulating coating 22 on the top of which is the primer material 24, as is best shown in Figures 2 and 3. The insulating material itself may be any suitable substance such as silica, alumina or talc. As pointed out above, the insulator may be applied to the supports 16 in the form of a coating. This coating may be applied to the supports by dipping them into the insulating mixture in the form of a viscous paste which comprises the insulating material in powdered form suspended in nitrocellulose lacquer. After the insulating coating 22 has dried, the primer material 24 may be applied thereto in the normal manner. The primer mass is the sole source of light within the lamp.

In operation, radiant heat from the incandescent tungsten wire filament 18 raises a small section of the primer to its ignition point which causes a reaction that spreads through the entire mass. As pointed out above, the thermal conductivity of the support wires, if no insulating coating is used, is sufficient to keep that part of the primer mass in contact with the wires at a

temperature below the ignition point during the brief chemical reaction; consequently, part of the primer remains unburned. However, if an insulating coating is applied between the primer and the support, the temperature of the primer close to the support will reach the ignition point, resulting in more complete combustion of that part of the primer, with an increase of 10 to 15% in the light output of the lamp. The increase in the light output results from a flash of longer duration. The peak light intensity remains approximately the same, as well as the time to initiate the ignition, and the length of time to peak light output. Therefore, I have lengthened the duration of the flash by effecting a more complete combustion of the primer material, and have thereby increased the light output of the lamp for a given amount of combustible material.

The essence of my invention lies in supporting the primer mass on a body which is a poor thermal conductor, thereby assuring combustion of the entire mass. The method of supporting the primer as outlined above is preferred since it is simple and inexpensive. While the above description has been directed toward a photoflash lamp wherein the light is furnished solely by the primer mass, the thermal insulator not being oxidized, the invention itself is not so limited and may also be applied to any type of photoflash lamps where it is desirable to effect better combustion of the primer mass.

It will be readily seen from the above that I have provided an improved photoflash lamp having increased light output and efficiency as a result of improved combustion of the primer material resulting in a flash of longer time duration.

While I have shown and described a specific embodiment of my invention, I am fully aware that many modifications thereof are possible. I do not intend to be restricted therefore, except as is necessitated by the scope and the spirit of the appended claims.

I claim:

1. A photoflash lamp having a light transmitting envelope and a pair of spaced metal supports therein, a thermal insulating coating on said supports, a primer coating supported by said insulating coating whereby said primer coating is prevented from direct contact with said supports, an incandescent filament bridging said supports and adapted to heat part of said primer mass to ignition temperature, and a combustion supporting gas within said envelope.

2. A photoflash lamp comprising a light transmitting envelope and having combustible material therein to be oxidized for the production of light, means to ignite said material, a metallic support for said material, and a thermal insulator between said material and said support.

3. A photoflash lamp comprising a light transmitting envelope and having combustible material therein, a filament adapted to heat said material, a heat conductive support for said material, and a thermal insulator between said material and said support.

4. A photoflash lamp comprising a light transmitting envelope and having combustible material therein is the sole source of light, a filament adapted to heat said material to cause oxidation thereof, a metal support for both said material and said filament, and a thermal insulator between said material and said support.

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