April 15, 1941. C. REITER ET AL 2,238,780

FLASH LAMP

Filed Oct. 4, 1938

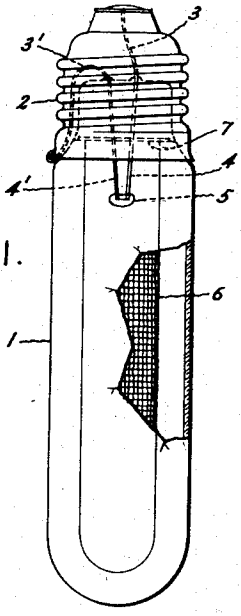


Fig. 1.

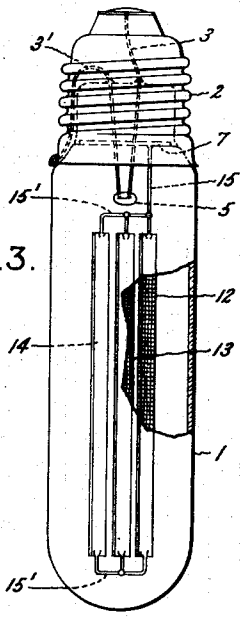


Fig. 3.

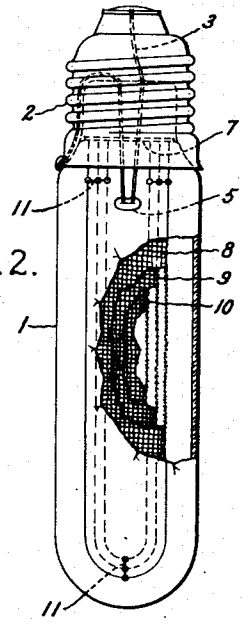


Fig. 2.

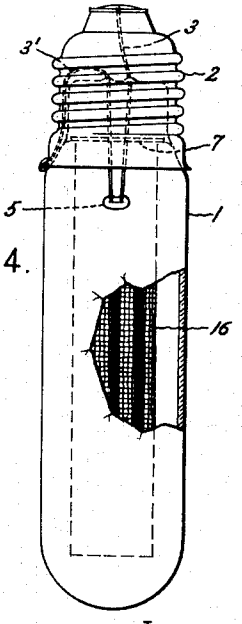


Fig. 4.

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UNITED STATES PATENT OFFICE

2,238,780

FLASH LAMP

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In Germany October 30, 1937

3 Claims. (Cl. 67—31)

Our invention relates to flash lamps which are used for photographic purposes and more particularly to that type of flash lamp which comprises a sealed transparent envelope filled with a gaseous oxygenic substance and containing a readily combustible material which, when ignited, emits a flash of light of high intensity.

In flash lamps of the above type, it has been customary up to the present time to employ combustible material in the form of powder, wire, strip or foil in order to obtain extremely rapid burning of such material and consequently a very short and intensive light action. However, it is quite difficult to distribute such form of material uniformly throughout the lamp envelope. The metal powder was brought into intimate contact with the oxidizing gas only through the combustion itself. Metal wires and strips, placed in the bulb as a wad or as a bunch, do not fill the bulb uniformly with the result that the ignition is irregular, the burning times fluctuate, and the light action is faulty under certain circumstances and non-uniform in any case. In addition, the disadvantage exists that parts of the filling material will lie against the bulb wall and so will not be burned at all due to the cooling action of such wall.

It has been heretofore proposed to overcome the above enumerated disadvantages by arranging metal foils, such as aluminum foil, within the lamp bulb in the form of bodies with a certain shape, for instance, with a hood-like shape. However, such a hood, made of a very thin foil, can contain only a relatively small quantity of the combustible material to be burned. Furthermore, the manufacture of such a hood is quite difficult. When several such hoods are arranged within each other, the danger then occurs that the light may be absorbed by the outside hood. In addition, it is scarcely possible to prevent the several hoods from contacting one another at some points, and this condition in turn may lead to a less intimate contact with the oxygen filling and consequently a less effective combustion.

According to our invention, all the disadvantages referred to above are obviated by arranging the combustible material in the lamp bulb in the shape of a wire or a strip fabric, or in the shape of a body made or braided in some other way from plain wire or strip. Such a wire fabric has a much greater mechanical strength than a wire or a foil. Furthermore it is readily possible, by a suitable shaping of the wire fabric, for instance by forming the fabric into the shape of an open or closed, and preferably hood-like hollow body, to distribute the necessary quantity of combustible material in the desired manner within the lamp bulb and to mount it in a suitable position with respect to the ignition pellet so that the light development of every flash lamp takes place very uniformly. It is also possible to combine several hollow bodies consisting of wire or strip fabrics into a common body by arranging them inside each other. Finally, it is also possible to form a uniform solid woven body, such as by stacking several layers of fabric or by rolling up one strip of fabric. In all the above cases, the mesh in the fabric permits passage of the light produced by the combustion of such fabric without practically any light absorption.

One object of our invention is to provide uniformly performing flash lamps in which the flashes of light produced thereby have substantially the same characteristics and development.

Another object of our invention is to provide flash lamps having the combustible material therein so arranged as to effect uniformity in the flashes of light produced by the combustion of such material.

Still another object of our invention is to provide a flash lamp having the combustible material therein arranged in the form of a fabricated structure of wire or ribbon whereby masking of the light produced by combustion of said material is entirely prevented.

A further object of our invention is to provide a flash lamp having the combustible material therein arranged in the form of a plurality of concentrically disposed and spaced bodies or mantles of wire or strip fabric.

Further objects and advantages of our invention will appear from the following description of species thereof taken in conjunction with the accompanying drawing, in which

Fig. 1 is a front elevation of a flash lamp comprising our invention; Fig. 2 is a front elevation of a modified form of flash lamp according to our invention; and Figs. 3 and 4 are similar views of two further modifications of our invention.

Referring to Fig. 1, the flash lamp there shown comprises a tubular sealed transparent bulb or envelope 1 which contains a filling either of pure oxygen, an oxygen containing gaseous mixture, or an oxygen-producing substance. One end of the lamp bulb 1 is provided with a conventional screw-thread base 2. The end contact and shell portions of said base 2 are connected by leading-in wires 3, 4 and 3', 4' respectively to the lamp ignition means 5, which preferably comprises a

short filament embedded in a bead of a suitable fulminating substance.

The lamp bulb 1 contains, in addition to the gaseous filling, a quantity of combustible material consisting of metallic filamentary material in the form of wire or ribbon, preferably of aluminum or its alloys. This filamentary material is made into a loosely-braided or gauze-like sheet of wire or strip fabric having the shape approximately of a hollow body or mantle preferably disposed symmetrically about the longitudinal axis of the bulb 1 and mounted on a support member 7 located in the neck portion of the bulb. To flash the lamp, a current is passed through the filament of the ignition means 5 so as to ignite the fulminating substance thereon which then ignites the fabricated mantle 6 of combustible material.

Referring to the modification shown in Fig. 2, the combustible material in this case is arranged in the form of three mantles or hood-shaped bodies 8, 9 and 10 of a wire fabric or gauze similar to that employed in the Fig. 1 lamp which are placed inside each other in nested relation and which are also fastened to a suitable support member 7. As in the previous form of the invention, the combustible material employed is preferably of aluminum or alloys thereof. The wire fabric hoods 8, 9 and 10 are secured in spaced position with respect to each other by means of spacing wires 11 located at various points.

In the modified form of lamp shown in Fig. 3, the combustible material is formed of several rectangular pieces or strips 12, 13 and 14 of a wire or strip fabric or gauze similar to that employed in the previous forms of the invention. The several strips 12, 13 and 14 are supported from the support member 7 by means of a wire 15, and are secured in spaced position with respect to each other by suitable spacing elements 15' fastened to the opposite ends of said strips.

In the modification illustrated in Fig. 4, the combustible material consists of a corrugated wire fabric or gauze strip 16 formed into the shape of a cylinder mounted on a suitable support member 7. As before, the combustible material employed is preferably of aluminum or its alloys.

It is evident that in all of the above forms of the invention the combustible material employed consists of a woven or braided gauze-like body of wire or strip. Such a body can be readily prefabricated into a definite and regular shape possessing a certain amount of mechanical strength so that the handling thereof, and its insertion in the lamp bulb 1, is comparatively simple. Also, because of its regular shape and its self-supporting character, the location and disposition of the combustible material within the bulb 1 can be definitely controlled. Such control over the disposition of the combustible material within the lamp bulb 1 therefore enables the manufacture of uniformly performing flash lamps, the light development of which progresses uniformly. Furthermore, the multiplicity of openings in the fabricated combustible body eliminates masking of the light by the unconsumed portions of the flash material when the lamp is flashed.

If desired, the ignition of the combustible material may be accomplished by an impact or blow, or by the influence of heat or actinic radiation from without the lamp bulb, instead of by an electric current. Also, the base end of the lamp bulb 1 may be sealed by means of a conventional lamp stem or by means of a bead, instead of by the flat bottom wall shown in the drawing.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A flash lamp comprising a sealed transparent container filled with a gaseous oxygenic substance, and a body of combustible material within said container, said body being formed of a woven gauze-like sheet composed of metallic filamentary material and having a multiplicity of openings therein.

2. A flash lamp comprising a sealed transparent container filled with a gaseous oxygenic substance and containing a readily combustible material, said combustible material comprising a woven gauze-like sheet composed of metallic filamentary material and having a multiplicity of openings therein, said sheet being formed in the shape of a hollow body.

3. A flash lamp comprising a sealed transparent container filled with a gaseous oxygenic substance and containing a readily combustible material, said combustible material comprising a plurality of hollow bodies disposed in spaced nested relation, each of said bodies being formed of a gauze-like sheet composed of metallic filamentary material and having a multiplicity of openings therein.

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