

Jan. 13, 1942.

M. J. N. DE MARGITTA

2,270,162

PHOTOFLASH LAMP

Filed Jan. 26, 1940

Fig. 1.

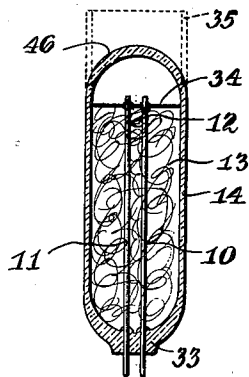


Fig. 2.

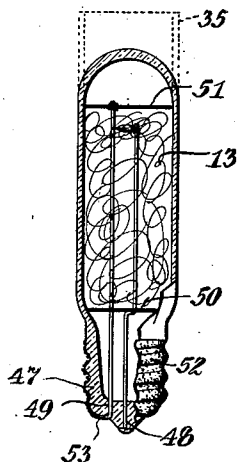


Fig. 5.

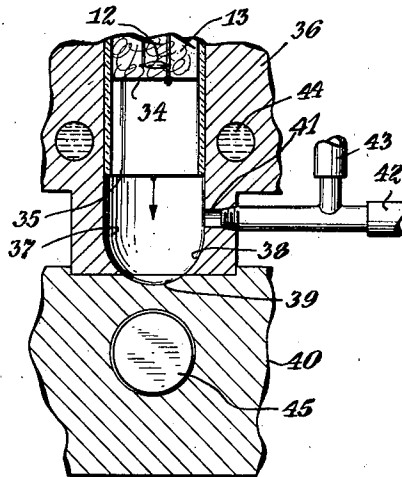


Fig. 3.

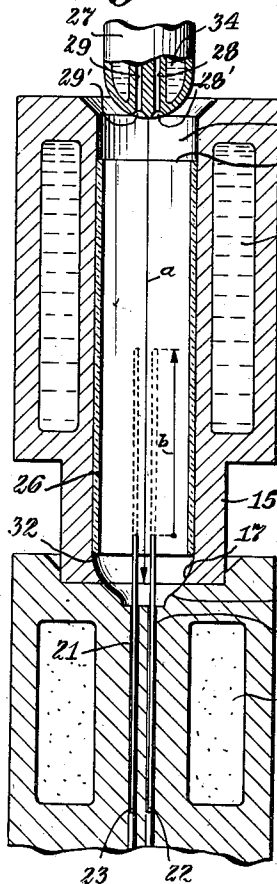


Fig. 4.

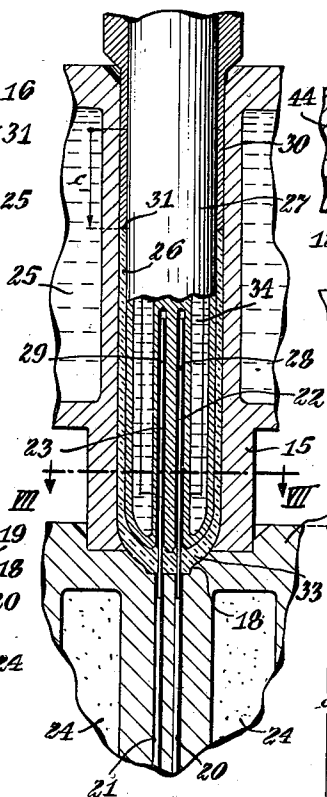


Fig. 6.

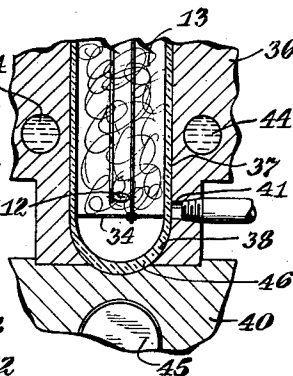
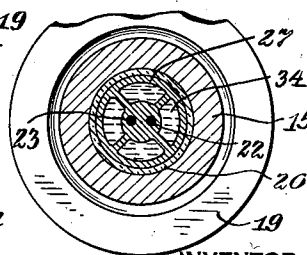


Fig. 7.



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2,270,162

PHOTOFLASH LAMP

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Application January 26, 1940, Serial No. 315,739
In Hungary September 5, 1939

10 Claims. (Cl. 67—31)

This application is a continuation in part of my two co-pending applications on "Improvements in flashlamps," Serial No. 298,276, filed Oct. 6, 1939, and Serial No. 302,023, filed Oct. 30, 1939.

The invention relates to lamps, and especially to photoflash lamps.

An object of the invention is to provide a cheap and easily manufactured photoflash lamp.

Another object of the invention is to provide a method of assembling photoflash lamps for quantity production.

Other objects and advantages of the invention will be apparent from the following description and drawing, in which:

Fig. 1 is a cross-section through a preferred embodiment of the invention.

Fig. 2 is a modification of the embodiment in Fig. 1.

Figs. 3 and 4 are cross-sectional views of a preferred type of mold for forming one end of the flashlamp having conductors sealed therein.

Figs. 5 and 6 are cross-sections through a preferred type of mold for forming the other end of the lamp.

Fig. 7 is a cross-sectional view on lines VII—VII of Fig. 4.

The present commercial type of photoflash lamp has glass casings which have to be carefully handled, formed and sealed with a resultant price which is high in comparison with the cost of the filament.

Furthermore, these glass case flashlamps always present a possible danger of broken glass, especially in the disposal of them. It is one of the objects of my invention to provide a photoflash lamp having a casing in which there will be no danger of broken glass from handling, use or disposal, and also one that can be very easily and cheaply manufactured, as illustrated on the drawing, and described below.

In Fig. 1 I have illustrated a preferred type of photoflash lamp having two conductors 10 and 11 therein, with an igniting element 12, such as a filament coated with zirconium, aluminum or phosphorous powder, and a filling of combustible material 13, such as a foil or a bundle of fine wires of aluminum or magnesium. The casing 14 in my preferred embodiment, is an integral piece of plastic material. These plastic materials comprise the group of cellulose acetates, phenol-formaldehyde and urea-formaldehyde resins, casein, pyroxylin, shellac, rubber, acryl and vinyl compounds having a translucency or transparency suitable for the passing of light therethrough. Cellulose acetate is my preferred

material because it is tough, hard to burn and can stand careless handling. I do not prefer the cellulose that has to be constantly protected by a special casing except when actually made ready for use.

In Fig. 3 I have illustrated the first step in the preferred preparation of my flashlamp. A two-part mold is disclosed in which the upper part 15 has a cylindrical opening 16 of the desired outside diameter of the photoflash lamp extending therethrough, except that the lower portion 17 of the cylindrical hole 16, is gently tapered to the desired contour of the lower portion of the lamp. The very bottom portion of the lamp, however, is formed by the contour 18 in the upper portion of the lower mold 19. The lower mold 19 has two centrally located openings 20 and 21 for the passage of the conductors 22 and 23 into the space 16. The lower mold has passageways 24 therethrough, for the application of a heating medium, which is preferably steam, although other forms of heating energy might be supplied to the lower mold. The upper mold has passageways 25 therethrough, especially for a cooling liquid such as water, although at other times steam may be sent therethrough if heat energy is desired.

After the two conductors 22 and 23 have been projected part way into the upper mold, the plastic material 26, such as cellulose acetate, is inserted in the upper mold. This plastic material may be conveniently inserted in the form of a hollow tube with an outside diameter to fit in the hole 16, and thus substantially coincide with the desired diameter of the completed flashlamp.

A forming member 27 is now inserted into the central portion of the opening 16. This forming member 27 has a shape and diameter corresponding to the shape and inner diameter of the completed flashlamp. In the center of this forming member are two holes 28 and 29 for the purpose of holding the conductors 22 and 23 in position while the lower end of the flashlamp is being formed. The bottom portion 28' and 29' of these holes are slightly enlarged to guide the conductors into the openings when the inner member 27 is lowered. This member 27 is lowered the distance (a), illustrated in Fig. 3, and then the two conductors 22 and 23 are pushed up into these holes 28 and 29, as illustrated in Fig. 4.

Steam is then admitted into the passageways 24, so that the lower mold 19 becomes very hot. At the same time, a sleeve 30 is lowered around the forming member 27 and presses upon the upper end 31 of the cylindrical plastic tube so that

its lower edge 32 is pressed downward into the heated space 18 at the top of the lower mold 19.

The plastic material softens under the heat supplied by the steam and forms a solid portion 33, filling the space at the top of the mold 19 about the two conductors 20 and 21. Considerable pressure is exerted on the plastic material to completely fill this space by the sleeve 30 which fills the clearance space between the inner forming member 27 and the outer diameter of the opening 16 in the upper mold. This sleeve presses down the plastic tube the distance (c) illustrated in Fig. 4.

The slight clearance between the conductors 22 and 23 and the rim of the openings 20 and 21 permits the escape of the imprisoned air, but this clearance is not sufficient to allow the plastic material to flow therein.

The steam is then shut off and cooling material sent through the passageways 25 in the upper mold 15, and also preferably through passageways 34 in the inner forming member 27. The plastic material 26 under the influence of this cooling means through 25 and 34, hardens into a closed end tube sealed about the conductors 28 and 29. The lower mold 19 is removed, and the inner forming member 27 and sleeve 30 raised and the partially formed closed end tube 26, with its conductors sealed therethrough, removed from the upper mold 15 by pressing upon the newly formed projecting portion 33, illustrated in Fig. 4.

An alternative method is to place or pour softened plastic material between the heated surfaces of the former and mold members of Fig. 4 and, after pressing into shape, to cool and remove the tube and conductors sealed therethrough.

A combustible material 13 is inserted in this tube and the igniting means 12 connected across the top portion of the conductors. If desired, a thermal shield 34, such as an asbestos disc or mica disc, may be secured to the top of the conductors. The appearance of the tube is now that of Fig. 1 except that the top portion of the container 14 is that illustrated in dotted lines. The tube is then preferably inserted in the apparatus illustrated in Fig. 5, with the open end 35 of the tube facing downward in an upper mold 36. The central opening 37 of the mold, in which this tube has been inserted, has a curved bottom portion 38 corresponding to the desired shape of the top portion of the tube, except for the very top portion whose contour 39 is made in the lower mold 40.

A side opening 41 in the upper mold 36 extends to a two-way valve opening to an exhaust port 42 and also to an oxygen or other active gas supply port 43. The upper mold 36 contains passageways 44 therethrough for a cooling liquid, such as water, and the lower mold 40 has passageways 45 therethrough, for a heating medium which, in this case, is that of an electric heater wire. When the partly finished flashlamp has been inserted, as illustrated in Fig. 5, the tube is exhausted by means of the port 42, and then an oxygen supply is passed in by means of the port 43 to fill the inner portion of the container to any desired pressure of below, at, or above atmospheric pressure.

The heating means at 45 in the lower mold is then actuated and the tube pressed downward until its edge passes the opening of the exhausting and oxygen supply port 41. Under the influence of the heating means 45, the open edge 35 of the tube becomes soft because of the pres-

sure and heat. The softened plastic is then shaped by the hot walls of the mold into a closed end 46, illustrated in Fig. 6. The heating medium in 45 is shut off and a cooling medium passed through the openings 44 in the upper mold to harden the plastic material at the top of the lamp 46. The lower mold 40 is then removed and the complete tube pushed out from the upper mold 36.

In Fig. 2 I have illustrated a modification in which the lower portion of the lamp 47 is molded as the screw-threaded base with a central conductor 48 extending therethrough. Asbestos or mica discs 50 and 51 help support these conductors in the tube with the combustible material 13 around them. A conductive metal coating 52 is then sprayed over the screw mold 49 down to the portion 53 where the wire 49 extends through the casing.

Fig. 2 illustrates a very cheaply formed screw-threaded type of flashlamp.

Although I have described certain embodiments and also certain steps in the manufacture of these embodiments, it is apparent that many modifications and changes in the form of the device and in the steps of manufacture can be made. Accordingly, I desire only such limitations on my invention as are necessitated by the spirit and scope of the following claims.

I claim:

1. The method of making a flashlamp which comprises inserting a plastic material in a mold, placing conductors therein, applying heat to the plastic material, pressing the plastic material into a closed end tube about said conductors, inserting igniting means across said conductors and combustible material in said tube, exhausting the tube, filling the tube with a combustion-supporting gas, and sealing the open end of the tube.

2. The method of making a flashlamp which comprises inserting a plastic material in a mold, placing conductors therein, applying heat to the plastic material, pressing the plastic material into a closed end tube about said conductors, inserting igniting means across said conductors and combustible material in said tube, exhausting the tube, filling the tube with a combustion-supporting gas at more than atmospheric pressure, and sealing the open end of the tube.

3. The method of making a flashlamp which comprises inserting conductors in an open end of a tube of plastic material, heating said open end of plastic material to flow about said conductors and be sealed thereto to form a closed end tube, connecting igniting means to said conductors, placing combustible material in said tube, inserting a combustion-supporting gas in said tube and sealing the open end of said tube.

4. The method of making a flashlamp which comprises inserting a tube of plastic material in a mold, locating conductors at one open end of said tube, applying heat to the region of said conductors, pressing said tube into said heated region to seal the plastic material into a closed end tube about said conductors, connecting an igniting device to said conductors within the tube, placing combustible material around the igniting device, and sealing the open end of the tube.

5. The method of making a flashlamp which comprises placing a tube of plastic material in a cylindrical mold, locating conductors in the bottom of said mold, applying heat to the bottom portion of said mold and pressing downward on said tube to mold said plastic material about said conductors, connecting an igniting device to said

conductors within said tube, placing combustible material about said igniting device and sealing the open end of said tube.

6. The method of making a flashlamp which comprises placing a tube of plastic material in a cylindrical mold, inserting a former within said tube, holding conductors by said former, applying heat to said tube to mold one end of the tube into a closed end tube between the mold and former and sealing the conductors through said closed end, connecting an igniting means to said conductors within the tube, surrounding the igniting means with a combustible material and sealing the open end of said tube.

7. The method of making a flashlamp which comprises placing a tube of plastic material in a cylindrical mold, having the desired contour of the outside of one end of the flashlamp, inserting a former having the desired contour of the inside of one end of the flashlamp, holding conductors extending through said former and mold, applying heat and pressure to said tube to form a closed end of the tube between the mold and former and sealing the conductors therethrough, removing the former and then the tube from the mold, connecting an igniting device to said conductors within the tube, placing combustible material about said igniting device and sealing the other end of said tube.

8. The method of making a flashlamp which comprises sealing conductors through the closed end of a tube of plastic material, connecting an igniting device to said conductors within said tube, placing combustible material about the igniting device, inserting the open end of said tube within a tight-fitting mold, exhausting the at-

mosphere from said tube and replacing it with a combustion-supporting gas, heating the end of said tube and sealing the open end thereof in said mold.

9. The method of making a flashlamp which comprises sealing conductors through the closed end of a tube of plastic material, connecting an igniting device to said conductors within said tube, placing combustible material about the igniting device, inserting the open end of said tube within a tight-fitting mold, exhausting the atmosphere from said tube and replacing it with a combustion-supporting gas at greater than atmospheric pressure, heating the end of said tube, and sealing the open end thereof in said mold.

10. The method of making a flashlamp which comprises placing a tube of plastic material in a cylindrical mold having the desired contour of the outside of one end of the flashlamp, inserting a former having the desired contour of the inside of one end of the flashlamp, holding conductors extending through said former and mold, applying heat and pressure to said tube to form a closed end of the tube between the mold and former sealing the conductors therethrough, removing the former and then the tube from the mold, connecting an igniting device to said conductors within the tube, placing combustible material about said igniting device and sealing the other end of said tube by inserting the end in a tight-fitting mold, heating the plastic edge until it shapes into a closed end conforming to the contour of the mold, hardening the tube and withdrawing it from the mold.

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