Feb. 4, 1936. G. MAISER 2,029,578

FLASHLIGHT

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Fig. 1.

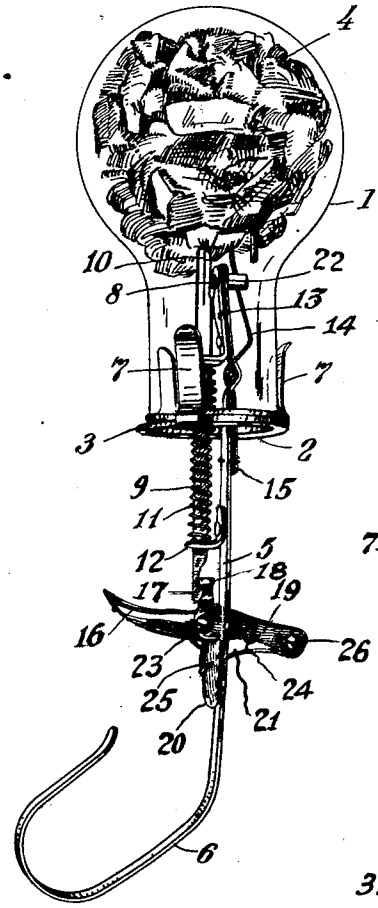
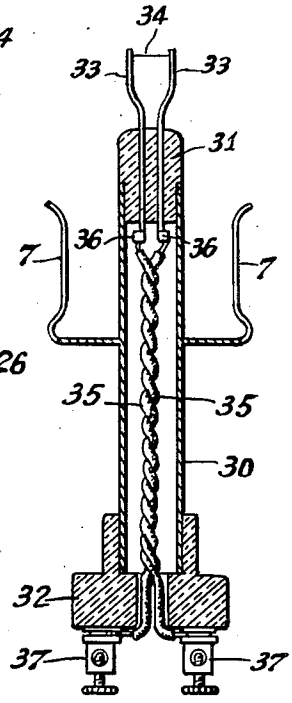


Fig. 2.



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FLASHLIGHT

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5 Claims. (Cl. 67—30)

My present invention relates to the art of making flash light for photographic purposes.

One of its objects is a new material to be used for the production of flash light. Another object is a device suited to be used in connection with the aforesaid material. Further objects will be seen from the detailed specification following hereafter. Reference is made to the accompanying drawing in which

Fig. 1 shows a perspective view of a device provided with frictionally operated igniting device for the production of flash light according to my invention,

Fig. 2 shows an electrically operated igniting device.

It is known to produce flash light with the aid of finely pulverized magnesium, zirkonium or a similar material. The combustion products of such materials, however, form a white cloud of dust which is rather disagreeable. In order to avoid the formation of dust use has been made of a bulb-shaped vessel which after having been evacuated is filled with oxygen and wherein the flash light material, for instance an aluminium foil, is fired by electric ignition. The manufacture of this kind of flash light lamp, however, is rather expensive. Foils of magnesium have hitherto not been used practically for the production of flash light as their speed of combustion was not sufficiently great.

The present invention is based on the discovery that foils of magnesium are well suited for the production of flash light, if the thickness of the foils is inferior to 0.04 mm. and is preferably 0.01–0.001 mm., that is a foil of a thickness which approaches that of a gold beater's skin. The same result is obtainable by using magnesium in the form of a wire, the diameter of which must, however, not exceed 0.1 mm. The material according to this invention may be fired while freely suspended in a space such as a transparent vessel which communicates with the atmosphere. If required the concentration of oxygen may be raised above that which is normal for the atmosphere. The ignition may be achieved, for instance, by means of an incandescent filament having the necessary current supplied, for instance, from a cell such as is used in electric torches, or a device operating in the manner of a so-called gas lighter fitted with a cerium-iron ignition flint. If the magnesium is used in form of a wire the latter may be directly connected with the circuit of an electrically operated ignition device.

Magnesium foil of the thickness required according to this invention has not hitherto been produced. The preparation may be as follows: magnesium, whether in a coid or warm condition, is rolled into a sheet of about 0.06 to 0.02 mm. thickness. The thin foil thus prepared is then beaten, in the manner known for the preparation of silver foils, while inserted in forms of thick oiled paper (or leather). By this treatment the foil is reduced to a thickness of about 0.005 mm. The foils reduced to such a thickness are then cut to pieces and are further beaten according to the process known for the treatment of gold foils. The beating forms used for this purpose are made of very thin paper. In these forms beating is continued, if required in several operations, until the desired thickness of 0.001 mm. or less is obtained. For producing a flash light of normal efficiency, about 750 to 1000 sq. cms. of magnesium foil of 0.001 mm. thickness (about 0.2 gram in weight) are necessary.

In the accompanying drawing there is shown in Fig. 1 a flash light lamp suitable for use with the material according to this invention. This lamp consists of a transparent bulb 1 of glass, cellulose acetate, regenerated cellulose or the like which by the opening 2, covered with a net 3 of wire or tissue, is in contact with the atmosphere. The bulb 1 is charged with the magnesium foil 4. Through the net 3 the ignition device 5 is introduced into the interior of the bulb. This device comprises a handle 6 with an extended piece 5 and means 7 mounted on said extended piece for fastening the device on the bulb 4. On the extended piece of the handle there are furthermore mounted two bent pieces 12 and 13 provided with openings in which glides the rod 9 bearing at one of its ends a hook 17 and at the other a plate 10 of rough steel. The spring 11 surrounding the rod 9 bears with its one end against the bent piece 12 and is with its other end attached to the rod 9 near the bent piece 13. At the end of the extended piece 5, there is mounted the tube 22 containing a pin 8 of cerium-iron pressed against the plate 10 by means of the spring 14 fastened on the extended piece 5 at 15. Near the handle there is mounted on the extended piece 5 the detent mechanism comprising the part 21 fixedly mounted on the extended piece 5, the trigger 16 forming one piece with the part 19 and rotatable about the pin 26 by means of which it is connected with part 21 in a slit of the extended piece 5, the spring 24 is fastened around the pin 26 and grips with its ends the parts 19 and 21 in order to press part 19 and therefore the trigger 16 in the direction of the vessel 1, the part 20 having its end

away from the handle perpendicularly bent to form a hook 18 which engages the hook of the rod 9, the part 20 being connected to the part 19 by means of a pin 23 about which it is rotatable, the spring 25 which is fixedly mounted in the trigger engages the part 20 on the side towards the handle, so that the hook 18 is pressed against the hook 17. When pulling the trigger in the direction of the handle the plate 10 will be pushed back. However, after a certain back movement of the trigger the hook 18 of the part 20 will be pressed towards the extended piece 5 so that it releases the hook 17 of rod 9 and by the action of the spring 11 the rod 9 will be pulled forward so that the plate 10 vehemently rubs against the pin 8 thus producing a gerb of sparks which causes the ignition of the magnesium foil.

In Fig. 2 there is shown a device for electrically igniting the magnesium foil and which may simply be substituted for that shown in Fig. 1. The device consists of a tube 30 provided at both ends with pieces of insulating material 32 and 31. The piece 32 bears two contact-screws 37 which may be connected with a suitable source of electric energy. From the contact-screws 37 two insulated wires 35 lead to the points 36 where they are soldered to two wires 33 embedded in the piece 31 of insulating material. The ends of the wires 33 are connected by a thin wire 34 which is brought to incandescence by the current of the source of electricity. On the tube 30 there are mounted flaps 7 by which the device can be mounted on the vessel 1 of Fig. 1.

In a preferred form the net 3 is connected with the ignition device so as to form one unit; in this case the bulb containing the magnesium foil or wire can be united with and separated from the ignition device without any difficulty. The bulb when separated from the ignition device may for purposes of transport, be closed with a rubber or a cork stopper. In order to assist the combustion of the magnesium foil, the bulb closed with a rubber stopper and containing the magnesium foil may be filled with oxygen. Though, when assembling the bulb and the ignition device, the oxygen will inevitably escape in part yet a certain quantity thereof will remain occluded at the surface of the magnesium foil and assist the combustion. For the production of a normal flash light, however, such filling of oxygen can be dispensed with. If desired, use may also be made of substances which evolve oxygen or substances which promote combustion such as collodium foils or the like.

The advantages involved in the flash light lamp according to this invention may briefly be summarized as follows: Low cost of manufacture neither evacuation nor gas-charging being necessary; no formation of fumes in the space surrounding the lamp occurs as the combustion products are prevented from escape by provision of the net; the material in the lamp can be ignited with certainty also without the use of a cell for electric torches.

What I claim is:

1. A flash light lamp comprising a transparent bulb made of a non-burning material having an opening communicating with the atmosphere, a material of the group consisting of loosely crumpled foil of magnesium having a thickness of less than 0.04 mm. and wire of magnesium having a diameter of less than 0.1 mm. in said bulb, and means for igniting said magnesium.

2. A flash light lamp comprising a transparent bulb made of a non-burning material having an opening communicating with the atmosphere, a material of the group consisting of loosely crumpled foil of magnesium having a thickness of less than 0.04 mm. and wire of magnesium having a diameter less than 0.1 mm. in said bulb, a net of wire or tissue covering said opening, and mechanically operated means for igniting said magnesium protruding through said net into the interior of said bulb.

3. A flash light lamp comprising a transparent bulb made of a non-burning material having an opening communicating with the atmosphere, a material of the group consisting of loosely crumpled foil of magnesium having a thickness of less than 0.04 mm. and wire of magnesium having a diameter less than 0.1 mm. in said bulb, a net of wire or tissue covering said opening, and electrically operated means for igniting said magnesium protruding through said net into the interior of said bulb.

4. A flash light lamp comprising a transparent bulb made of a non-burning material having an opening communicating with the atmosphere, but the concentration of oxygen within the bulb being greater than that in the surrounding atmosphere, a material of the group consisting of loosely crumpled foil of magnesium having a thickness of less than 0.04 mm. and wire of magnesium having a diameter less than 0.1 mm. in said bulb, a net of wire or tissue covering said opening, and mechanically operated means for igniting said magnesium protruding through said net into the interior of said bulb.

5. A flash light lamp comprising a transparent bulb made of a non-burning material having an opening communicating with the atmosphere, but the concentration of oxygen within the bulb being greater than that in the surrounding atmosphere, a material of the group consisting of loosely crumpled foil of magnesium having a thickness of less than 0.04 mm. and wire of magnesium having a diameter less than 0.1 mm. in said bulb, a net of wire or tissue covering said opening, and electrically operated means for igniting said magnesium protruding through said net into the interior of said bulb.

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