

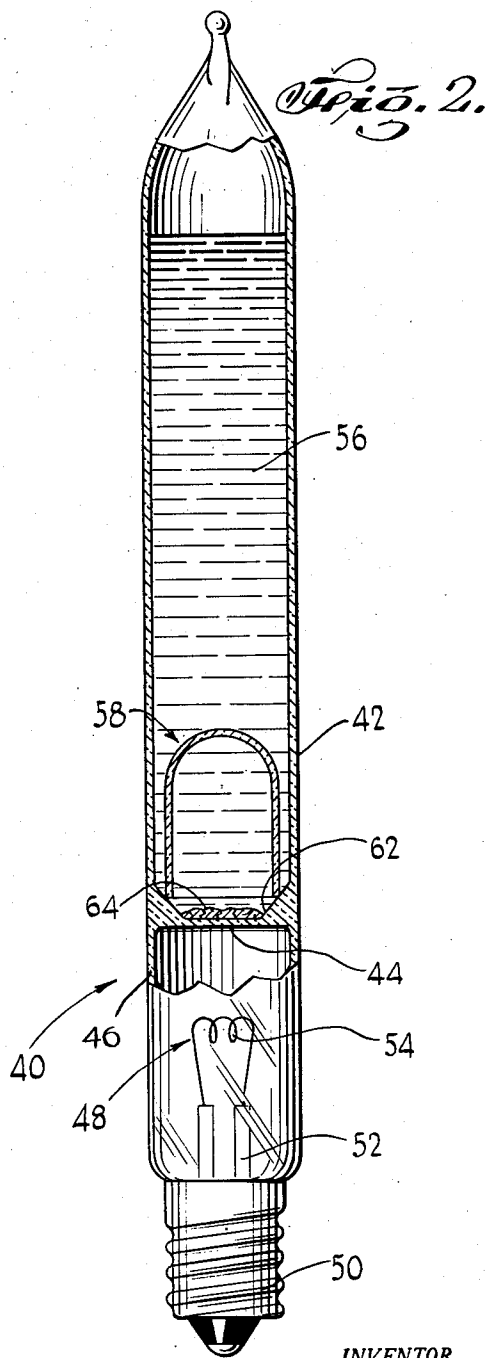
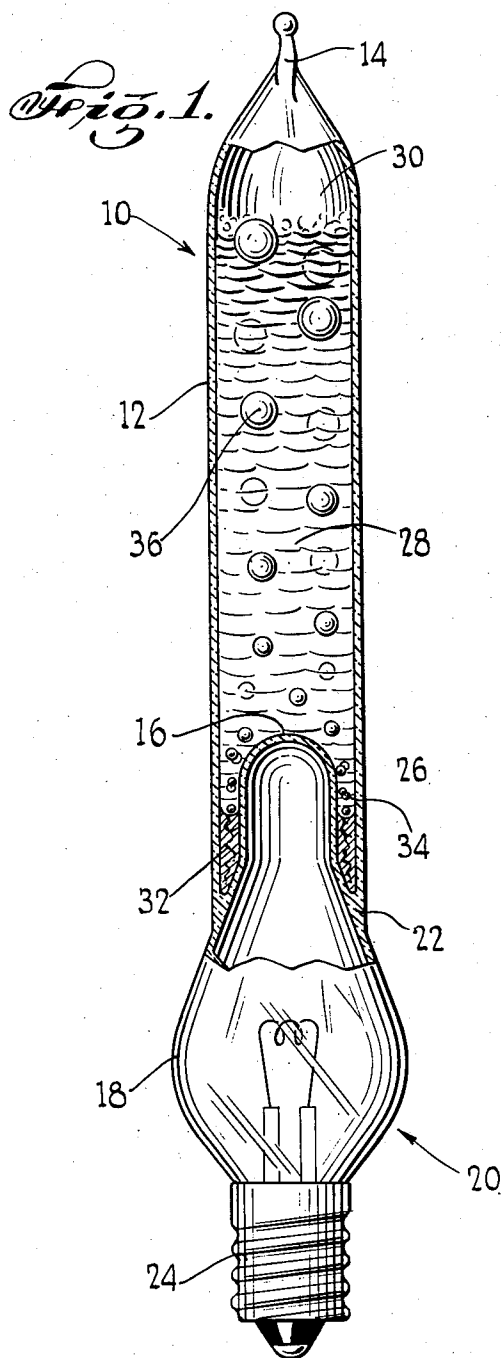
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ORNAMENTAL BUBBLING LIGHT

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ORNAMENTAL BUBBLING LIGHT

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This invention relates to ornamental, illuminating devices.

More particularly, the invention concerns illuminating devices of the type wherein vapor bubbles ascend through a column of liquid.

It is an object of the invention to provide an illuminating device of the character described which comprises relatively few parts and which shall be inexpensive to manufacture.

Other objects of the invention will, in part, be obvious and, in part, hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the appended claims.

Certain novel features shown and described, but not claimed herein, are shown, described and claimed in my copending application Serial No. 428,468, filed January 28, 1942, for Ornamental Illuminating Devices, issued as United States Letters Patent No. 2,383,941 on September 4, 1945, of which the present application is a continuation-in-part.

In the accompanying drawings, in which are shown various possible forms of my invention,

Fig. 1 is a side view in partial section of an illuminating device embodying my invention, and

Fig. 2 is a similar view of a different form of the invention.

Referring now in detail to the drawings and more particularly to Fig. 1, 10 denotes an illuminating device embodying my invention. Said device comprises a pellucid tube 12 whose upper end is hermetically sealed off by a tapered twisted portion 14 and whose lower end is closed by the upper end 16 of the envelope 18 of a low voltage (e. g. 15 volts) electric light bulb 20. The bulb envelope likewise is pellucid and desirably is formed of the same material as that of the tube 12, glass for example, so that an autogenous joint 22 may be employed to interconnect the envelope and tube.

The envelope is evacuated and is provided with a standard filament and a conventional mount which connects the filament ends to a suitable screw plug base 24. The upper end 16 of the envelope 18, which comprises the base of the tube 12, may be in the form of any one of diverse shapes shown in my copending application, for example, said upper end 16 may provide a curved bottom for the tube which presents a concave surface to the interior of the tube as illustrated in Figs. 1 through 8 of said copending application.

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Alternatively, the glass envelope may be so fashioned as to close off the lower end of the tube with a re-entrant coaxial tube such as shown in Fig. 9 of said application. This latter form is illustrated herein. Thus, as shown in the accompanying drawing the portion 16 is in the shape of an inverted pellucid glass cup having an outer diameter smaller than the inner diameter of the tube 12. Said portion 16 extends only a short distance into the tube 12, leaving most of the tube clear. This construction provides an annular space 26 at the base of the tube 12 adjacent the source of light and heat.

The tube 12 contains a body 28 of a bubbling liquid which, when the bulb 20 is lowermost, fills the tube almost to the top. The space 30 above the liquid is at subatmospheric pressure when the device is idle. This enables the vapor to be generated at low temperatures to permit such vapor to condense at the upper end of the tube and return to the body of the liquid.

Said liquid has a low boiling point and typical of the materials which may be employed are wood alcohol, ether and methylene chloride.

The liquid 28, tube 12 or both may be colored, or a thin film of pellucid coloring matter may be coated on the inner or outer surfaces of the tube to enhance the ornamental effect.

Pursuant to my invention there is furnished in the tube 12 adjacent the bulb 20 a bubbling or ebulliating means, which, if desired, may be of the type shown in my said copending application. A means of this type comprises a substance in the form of a coherent mass 32 which will not dissolve in or be chemically or physically altered by the bubbling liquid so as to destroy its necessary physical properties. Moreover, this mass is of such nature that the physical properties which make its use desirable will not be affected by the presence of the material of which the tube or bulb is formed or by the action of heat applied during the operation of the device. Additionally, the substance should be capable of being easily fissured, e. g., simply by cooling after being subjected to a high temperature not above the melting point of the substance comprising the tube or bulb. The fissures, however, must not destroy the coherency of the mass.

Furthermore, it is desirable that the substance can be readily self-adhered to the material comprising the tube and bulb although, if it is not, suitable adhesive means may perform this function. Also, since the device is to be used as an illuminated decoration and since, as already seen, it has but a single source of light which also acts

as a source of heat, the substance in the adhesive means, if such is employed, is preferably transparent or at least translucent. If it is desired to impart a color to the liquid without tinting the same or tinting the envelope, the substance comprising the coherent mass may itself be colored. Substances which possess the above characteristics and which are, therefore, desirable to use, if an ebulliating means such as described in my copending application is to be employed, are sugar, borax and table salt.

The substance may be introduced into the tube in a loose, granular state, for example, as common table sugar, table salt or borax with waters of crystallization. At such time it is the upper end of the tube which is open, the tube originally being supplied with its bottom-end integrally connected to the glass envelope of the bulb as shown. Then the tube, in the region where the powder is located, is subjected to a temperature sufficiently high to melt or fuse the same. In the case of sugar, this temperature is rather low and must be controlled carefully to prevent caramelization thereof. After fusing or melting, the tube and the substance, which latter is now a coherent mass, are allowed to cool off. During cooling, it will be observed that a great number of fissures or cracks are developed throughout the body of the mass which has become self-adhered to the walls of the tube 12 and to the portion 16 of the bulb 20. However, these fissures are not sufficiently developed to cause the mass to lose its coherency and allow any portion thereof to break away from the mass. Said fissures provide direct or indirect communication from the surface of the envelope to the body of liquid, thereby providing thin, distinct interconnected zig-zag interstitial passageways extending through the substance from the region where heat is applied to the body of liquid so as to form a portion of said liquid in said region into distinct interconnecting sheets. These liquid sheets will be quickly vaporized to initiate rapidly the generation of bubbles as soon as the bulb is vaporized.

The mass 32, which is of tubular configuration, because of its disposal in the annular space 26, only fills a portion of said space adjacent the bottom of the tube 12. This leaves the upper part of the space clear, as shown in the drawing.

The bubbles 34, which are generated within the mass 32 and which leave the mass from the upper surface thereof, are minute, and when said bubbles are released into the upper portion of the annular space 26 they will coalesce, due to the restricted nature of the space, and form large bubbles 36 of the desired size.

It will be understood that other types of coalescing devices may be employed, or that, if only small bubbles are desired, the mass 32 may fill substantially all of the annular space 26. Alternatively, if it is only desired to have the mass 32 initiate bubbling, and to have the bubbling function carried out by mechanical means during the operation of the device (as shown in Figs. 1 and 2 of my copending application), the mass may be reduced in size and the portion 16 of the envelope of the bulb fashioned into the proper shape to function as part of or cooperate with a mechanical bubbling means within the tube 12.

Such a modified form of the invention is shown in Fig. 2. In this embodiment the illuminating device 40 includes a hermetically closed clear glass tube 42 whose lower end comprises a flat portion 44 of a glass envelope 46 of a low voltage electric heating means 48. Said envelope is

closed by a conventional screw plug 50 which carries a mount 52 for furnishing current to an electric resistance heater 54 of such design that it will furnish sufficient heat to operate the device 40. If it is desired to have the heating means 48 supply light as well the heater 54 should be designed to incandesce under normal operating conditions and the envelope 46 should be evacuated.

The flat portion 44 may either be a metallic insert or a glass panel, in which latter case it preferably is an integral part of the envelope 46 and tube 42. For aesthetic reasons said panel lies in a plane perpendicular to the longitudinal axis of the tube.

Said tube contains a body 56 of a volatile liquid, such as mentioned earlier, which fills nearly the entire tube, the free space at the top of the tube being at sub-atmospheric pressure when the device 40 is not in use.

The ebulliating means 58 within the tube is mechanical in nature and comprises an inverted glass cup 60 of slightly smaller diameter than the tube. The rim of the cup is adapted to seat on the flaring internal side wall 62 of the tube adjacent the flat portion 44.

Means may also be provided to accelerate initiation of ebulliation by the mechanical bubbling means. Such accelerating means includes a small mass 64 of the same characteristics as the mass 32. This small mass is disposed at the bottom of the tube 62 on the flat portion 32 and may be below the part of the flaring portion 44 engaged by the cup 60. The operation of the foregoing combined starting and ebulliating means is fully described in my application Serial No. 428,468.

It will also be understood that still other types of bubbling means may be used, and that these need not necessarily include a mass, such as the mass 32, of the peculiar characteristics described herein. Examples of such other kinds of bubbling means are shown and described in my Letters Patent Re. 22,289.

It will thus be seen that I have provided devices which achieve the several objects of this invention, and which are well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter included in the within description or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. An ornamental illuminating device comprising an electric light bulb having a pellucid envelope, a hollow pellucid member integrally attached to said envelope in such manner that a common wall forms a portion of said envelope and the base of said member, a low boiling point liquid contained within said member and a pellucid, fissured, coherent mass in contact with said liquid and contacting at least portions of said common wall.

2. An ornamental illuminating device comprising an electric light bulb having a pellucid envelope, a hollow pellucid tube integrally attached to said envelope so that a portion of the wall of said bulb forms the base of said tube, said tube being hermetically closed, a low boiling point liquid within said tube and filling all ex-

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cept the upper portion of said tube and bubbling means within said tube near the portion of the wall of the bulb which forms the base of the tube, said bubbling means comprising a fissured coherent mass in contact with the liquid and the base of the tube and providing thin, distinct interconnected zig-zag interstitial passageways extending through the mass from the base of the tube to the liquid whereby to form a portion of the liquid near the bulb into distinct interconnected sheets.

3. An ornamental illuminating device comprising a hermetically closed hollow pellucid tube, an electric light bulb having a pellucid envelope integrally attached to said bulb and forming the base of said tube, a portion of said bulb extending into said tube to cause the inside of the tube adjacent the base thereof to have an annular shape, a low boiling point liquid within said tube and filling all except the portion of said tube remote from said bulb and bubbling means adjacent the bottom of said annular space, said bubbling means comprising a fissured coherent mass in contact with the liquid and the bulb envelope and providing thin, distinct interconnected zigzag interstitial passageways extending through the mass from said envelope to the liquid whereby to form a portion of the liquid near the bulb into distinct interconnected sheets, the portion of said annular space above said space serving to coalesce the bubbles issuing from said mass into layer bubbles.

4. An ornamental illuminating device comprising an electric light bulb having a pellucid envelope, a hollow hermetically closed pellucid member alongside of said envelope and integrally attached to a portion of said envelope at the side where said member is disposed, said device being adapted to be arranged with the bulb lowermost and the major portion of the member above the bulb, whereby a common wall forms a portion of said envelope and the base of said member, a low boiling point liquid contained within and partially filling said member whereby the upper end of said member is free of the liquid and provides a space above the liquid in which vapor arising from the liquid may condense and return to the body of the liquid, and bubbling means within said member and in contact with said liquid, said bubbling means being disposed in the region of the heat emanating from said bulb.

5. An ornamental illuminating device comprising an electric light bulb having a pellucid envelope, a hollow pellucid hermetically closed elongated member integrally attached at one end thereof to said envelope, said device being adapted to be arranged with the bulb lowermost and the major portion of the member above the bulb, whereby a common wall forms a portion of said envelope and the base of said member, a low boiling point liquid contained within and partially filling said member whereby the upper end of said member is free of the liquid and provides a space above the liquid in which vapor arising from the liquid may condense and return to the body of the liquid, and bubbling means within said member and in contact with said liquid, said bubbling means being disposed in the region of the heat emanating from said bulb.

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6. An ornamental illuminating device comprising an electric light bulb having a pellucid envelope, a hollow pellucid hermetically closed elongated member integrally attached at one end thereof to said envelope, said device being adapted to be arranged with the bulb lowermost and the major portion of the member above the bulb, whereby a common wall forms a portion of said envelope and the base of said member, a low boiling point liquid contained within and partially filling said member whereby the upper end of said member is free of the liquid and provides a space above the liquid in which vapor arising from the liquid may condense and return to the body of the liquid, bubbling means within said member and in contact with said liquid, said bubbling means being disposed in the region of the heat emanating from said bulb, and means to coalesce into larger bubbles the bubbles issuing from said bubbling means.

7. An ornamental illuminating device comprising an electric heating means having an electric heating element within an envelope, a hollow hermetically closed pellucid member alongside of said envelope and integrally attached to a portion of said envelope at the side where said member is disposed, said device being adapted to be arranged with the envelope lowermost and the major portion of the member above the envelope whereby a common wall forms a portion of said envelope and the base of said member, a low boiling point liquid contained within and partially filling said member whereby the upper end of said member is free of the liquid and provides a space above the liquid in which vapor arising from the liquid may condense and return to the body of the liquid, and bubbling means within said member and in contact with said liquid, said bubbling means being disposed in the region of the heat emanating from said heating means.

8. An ornamental illuminating device comprising a light and heat generating means having a pellucid envelope, a hollow pellucid member integrally attached to said envelope in such a manner that a common wall forms a portion of said envelope and the base of said member, a quantity of vaporizable liquid contained within said member, and a bubble generating means positioned within said member.

9. An ornamental illuminating device comprising a light and heat generating means having a pellucid envelope, a hollow pellucid member integrally attached to said envelope in such a manner that a common wall forms a portion of said envelope and the base of said member, a quantity of vaporizable liquid contained within said member, and a pellucid bubble generating means positioned in said member adjacent said common wall.

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