Sept. 4, 1945. C. W. OTIS 2,383,941

ORNAMENTAL ILLUMINATING DEVICE

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Fig. 1.

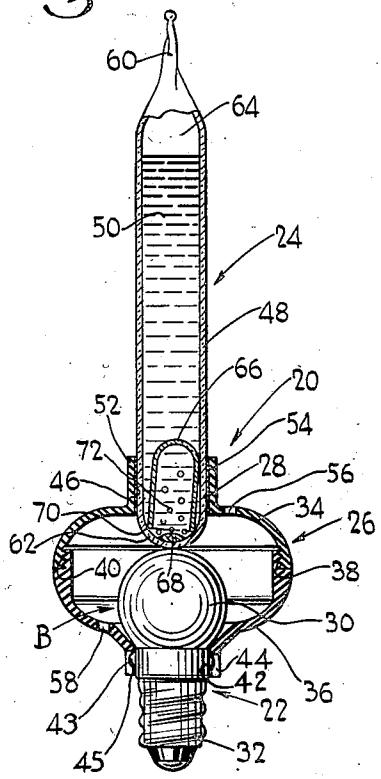


Fig. 2.

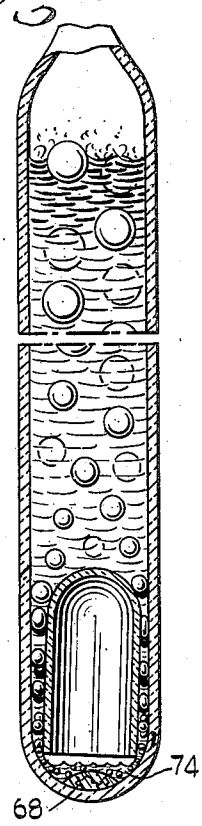


Fig. 3.

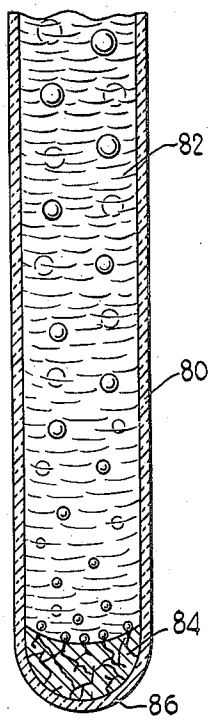


Fig. 4.

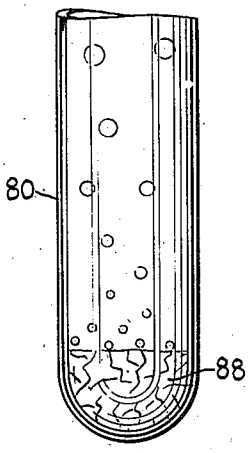


Fig. 5.

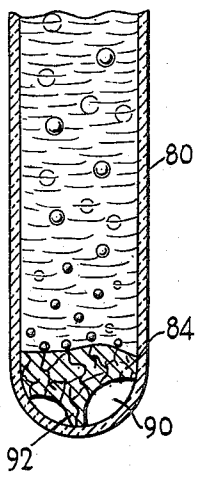
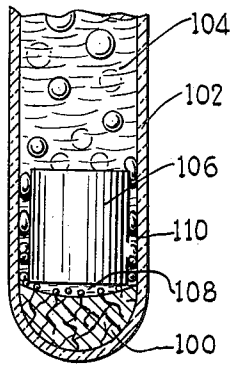


Fig. 6.



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ORNAMENTAL ILLUMINATING DEVICE

Filed Jan. 28, 1942 2 Sheets-Sheet 2

Fig. 7.

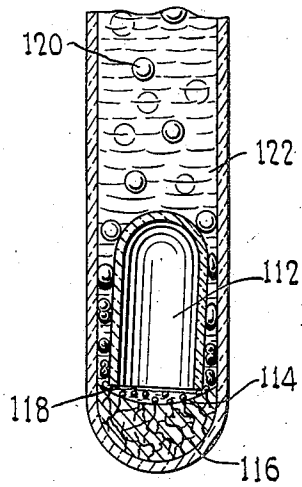


Fig. 8.

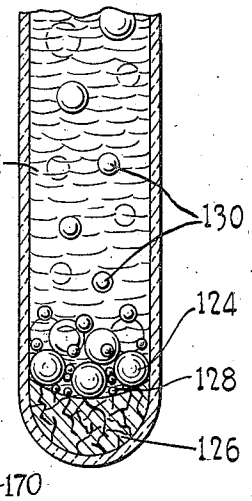


Fig. 11.

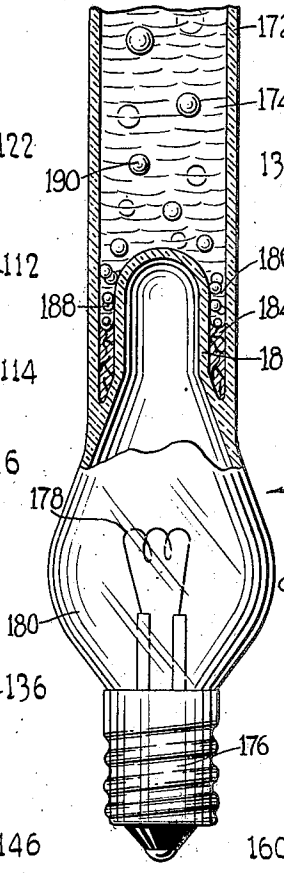


Fig. 9.

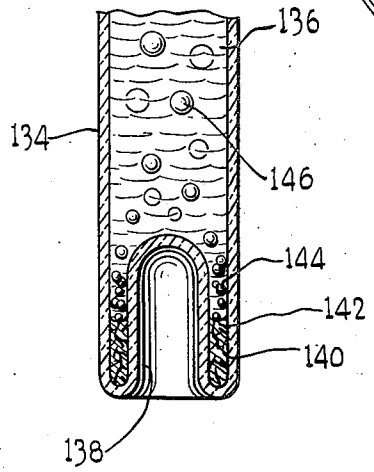
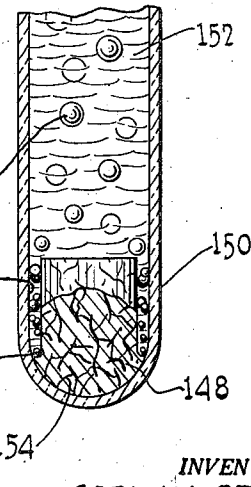


Fig. 10.



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UNITED STATES PATENT OFFICE

2,383,941

ORNAMENTAL ILLUMINATING DEVICE

Carl W. Otis, Rockville Centre, N. Y.

Application January 28, 1942, Serial No. 428,468

20 Claims. (Cl. 240—10)

This invention relates to ornamental illuminating devices.

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

The primary object of my invention is to provide a simple and inexpensive, yet highly improved means for transferring heat to a very thin sheet of liquid in communication with the liquid column. In this manner, I am able to quickly and readily generate bubbles in conjunction with a source of heat supply of low calorific output, i. e. low compared to the rate of calorific output that would be required to boil the liquid column if no such means were employed. This object of my invention is accomplished in general by providing a substance in the form of a coherent mass having a plurality of fissures running therethrough, the mass being adhered to the wall of the housing containing the liquid in the region where heat is applied. Since the liquid permeating the mass through the fissures is thus dispersed in very thin sheets, it tends to be maintained at substantially the temperature of the mass. When the source of heat is energized, the temperature of the mass is raised and the stratified liquid, which in bubbling devices of this nature has a comparatively low boiling point, is almost immediately vaporized so as to quickly begin the generation of small bubbles. These bubbles are driven through the fissures and released from a surface of the mass remote from the surface thereof to which heat is applied.

A heat transferring means of this nature may be put to many uses in bubbling devices of the character described. Thus, if a sufficient amount of the substance is employed, enough small bubbles will be generated to produce a pleasing ornamental effect, and no other instrumentalities need be employed, nor need the substance be of any special shape. Accordingly, it is an object of my invention to provide in a bubbling device of the character described a bubble generating means of the nature set forth and of a sufficiently large size to both initiate the formation of bubbles and satisfactorily operate the bubbling device from the standpoint of the quantity and rate of bubble formation.

Another object of my invention is to provide a device of the character described in which bubble generating means of the nature above set forth is employed in conjunction with auxiliary apparatus to coalesce the small bubbles released from the surface of the substance into larger bubbles which have a different ornamental effect.

A further object of my invention is to provide a bubbling device of the character described having simple coalescing means which comprises relatively few parts and which may be formed from the material of the tube housing, the liquid column, or from the material of the bubble generating substance itself.

A further object of my invention is to provide a bubbling device of the character described in which bubble generating means of the nature above set forth is employed only to initiate the formation of bubbles and in which mechanical bubble generating means such as set forth in my copending application, Serial No. 418,027, filed November 6, 1941, which eventuated into Patent No. 2,353,063 on July 4, 1944, or in my Patent No. 2,174,446, issued September 28, 1939, are employed to form bubbles during continued operation of the device.

A further object of my invention is to provide a bubbling device of the character described having improved means for supporting and housing the source of heat supply and the tube in which the liquid column is contained.

A supplementary object of my invention is to provide a device of the character described which is adapted for use in a standard miniature Christmas tree lamp socket, which shall present a neat and attractive appearance, which shall be rugged in construction, economical to manufacture, and highly efficient in use.

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 arrangement of parts which will be exemplified in the constructions hereinafter described, and of which the scope of application will be indicated in the appended claims.

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

Fig. 1 is a vertical sectional view through an illuminating device embodying my invention and showing the electric light bulb lit and the formation of the bubbles as just begun;

Fig. 2 is an enlarged fragmentary view of the liquid column shown in Fig. 1 during operation thereof;

Fig. 3 is a fragmentary vertical sectional view of the liquid column employed in a modified form of my invention, wherein the substance forming the bubble generating means is present in sufficiently large quantities for running operation of the device;

Fig. 4 is a fragmentary side view of the column shown in Fig. 3;

Fig. 5 is a view similar to Fig. 3, but showing a variation in the form of the bubble generating substance which sometimes occurs during continued usage;

Fig. 6 is a fragmentary vertical sectional view of a liquid column embodying another modified form of my invention, wherein a glass cylinder coalesces into larger bubbles the small bubbles liberated from the bubble generating substance;

Fig. 7 is a fragmentary vertical sectional view of a liquid column embodying still another modified form of my invention, wherein a glass cup coalesces into larger bubbles the small bubbles liberated from the bubble generating substance;

Fig. 8 is a fragmentary vertical sectional view of a liquid column embodying a further modified form of my invention, wherein glass beads coalesce into larger bubbles the small bubbles liberated from the bubble generating substance;

Fig. 9 is a fragmentary vertical sectional view of a liquid column embodying still another modified form of my invention, wherein the bottom of the housing for the liquid column is specially shaped so as to coalesce into larger bubbles the small bubbles liberated from the bubble generating substance;

Fig. 10 is a fragmentary vertical sectional view of a liquid column embodying still another modified form of my invention wherein said substance is specially shaped to effect coalescence; and

Fig. 11 is a fragmentary vertical sectional view of an illuminating device embodying still another modified form of my invention.

The bubble generating substance employed in devices embodying my invention is characterized by certain essential properties. In the first place, this substance must be in the form of a coherent mass, or readily reduceable to such form since if the substance is present in a granular state it will be dispersed throughout the liquid column during operation of the device and impair the clarity of the liquid. Secondly, the substance must not dissolve in the bubbling liquid or be chemicaly or physically altered so as to destroy its other necessary properties by action of such liquid, or by the presence of the container for the bubbling liquid, or by action of the heat applied during operation of the bubbling device. Thirdly, the substance must be capable of being readily fissured and preferably fissured simply by cooling after being subjected to a high temperature not above the melting point of the substance comprising the housing for the liquid column. The fissures, moreover, must not destroy the coherency of the mass.

Certain other properties are desirable but not necessary to the operation of the bubbling device. For example, it is preferable to have the substance of such nature that it can be readily self-adhered to the material comprising the housing for the liquid column. However, alternatively, I may employ any suitable adhesive means to perform this function. Also, since the bubbling device is to be used as an illuminated decoration, and since it is desirable to have but a single source of light, which also acts as a source of heat, the substance and the adhesive means, if employed, is preferably transparent or at least translucent. Furthermore, if it is desired to impart a color to the liquid, other than by tinting the liquid itself, the substance may also be colored.

Substances which possess the above characteristics and which I have therefore found desirable to use in practicing my invention are sugar, borax, and table salt. It will be understood, however, that other substances having similar crystalline structure or the necessary characteristics may be employed.

The bubble generating substance may be used in a bubbling device of the character described in accordance with any one of the three general forms of my invention.

In the first form, the substance may be employed merely as a means to initially generate bubbles, and in such form it is combined with another means for generating bubbles, such as for example that shown in my said application, Serial No. 418,027, and Letters Patent No. 2,174,446. The use of such a bubble generating substance greatly facilitates the starting of the bubbling device shown in said application and Letters Patent, since these devices are ordinarily not quick to start. Where the bubbling substance is used as a starting means, only small amounts thereof need be employed, for it is only necessary to generate a few minute bubbles in order to start the operation of the bubble generating means employed to continuously run the bubbling device. This first form of my invention is shown in Figs. 1 and 2.

In the second form of my invention, I employ a substantial quantity of the bubbling substance which ordinarily fills the entire bottom of the container for the liquid column. A large number of rather small bubbles are liberated with such a quantity of the bubble generating substance, and these bubbles will impart a pleasing ornamental effect to the liquid column. The second form is illustrated in Figs. 3 through 5.

The third form of my invention is employed where small bubbles generated in accordance with the second form of my invention are not desired, and it is desired instead to form bubbles of a larger cubic capacity. To provide such bubbles, I employ a coalescing means in combination with a large quantity of the bubbling substance. Such coalescing means may take various forms, several of which are shown in Figs. 6 through 11.

Referring now to the drawings, in Figs. 1 and 2, I have shown an illuminating device **20** constructed in accordance with the first form of my invention and especially adapted for use in connection with Christmas tree decoration. The device **20** comprises in general a source **22** of illumination and heat, a column **24** of liquid, a housing **26** for the liquid container and for said source of heat and illumination, and bubble generating means **28** contained within the liquid column **24**.

In accordance with my invention, I can use in my device a source of heat supply and illumination which has a low calorific output, although during operation it is maintained at a relatively high temperature. The calorific output of the source of heat supply may be much lower than that required to generate bubbles within said liquid column **24** if the bubble generating means **28** were not included in the said device **20**. Such source of heat supply and illumination preferably comprises a low voltage bulb B which operates on about 15 volts, so that it may be used in conjunction with a Christmas tree series lighting outfit of standard construction.

The glass envelope **30** of the bulb B may be made squat, so as to be disposed within a relatively low housing **26** and thus enhance the aesthetic appearance of the device. The screw

plug portion 32 of the bulb B is of standard construction. The housing 16 comprises upper and lower thin-walled, bell-like halves 34 and 36. The said halves 34 and 36 are preferably fabricated from materials such as tinted celluloid or a formaldehyde condensate, in order to provide a suitable colored, semi-opaque wall around the glass envelope 30.

Mating threads 38 and 40 may be moulded in the halves 34 and 36, to facilitate their assembly into an integral housing. Suitable ornamentation may be imprinted upon the outer surface of the said housing 26, which may be of any desired shape.

The lower half 36 of the housing is provided with an aperture 42 wherethrough the plug portion 32 of the bulb B projects. The bulb B is secured in said half 36 by two drops 43 of solder adhered to the screw plug 32 and disposed at the upper end of slots 44 which extend from the bottom of a sleeve 45 depending from the housing half 36. The base of the bulb engages the half 36 adjacent the aperture 42. The upper cup 34 is also provided with an aperture 46 co-axial with the aperture 42. Snugly received in said aperture 46 is the lower end of a pellucid tube 48 in which a bubbling liquid 50 is contained.

In order to more firmly support the said tube 48 and prevent same from shifting during transportation and use of the device 20, I may provide an integral annular flange surrounding the aperture 52. Furthermore, a thin layer of adhesive 54 may be disposed between the flange 52 and the tube 48. Small vents 56 and 58 are formed in the upper and lower halves of the casing to allow a slight circulation of air through the housing.

The tube 48 in which the liquid 50 is disposed is fabricated from a pellucid material, such as for example glass, cellulose acetate or the like which is unaffected by the liquid employed. The tube may be made straight or fashioned into any desirable ornamental shape. Its upper end is hermetically sealed off by the gradually tapered, twisted portion 60. The lower end is closed by the rounded portion 62 and is disposed immediately adjacent or in contact with the glass bulb envelope 30 to facilitate heat exchange therebetween.

The liquid 50 is of low boiling point, and I may employ fluids such as for example wood alcohol, ether, or methylene chloride. If it is desired to enhance the ornamental effect, the liquid 50, tube 48, or both, may be colored, or a thin film of pellucid coloring matter coated on the inner or outer surfaces of the tube 48. Alternatively, as already noted, the bubbling substance may be tinted or naturally of the desired color.

As indicated in Figs. 1 and 2, only a portion of the tube 48 is filled with liquid, the balance of the tube being evacuated so as to provide a partial vacuum 64, in which vapor, generated in the lower end of the tube as hereinafter described, may condense and return to the body of the liquid 48.

Mechanical bubble generating means, such as the transparent cup 66, is provided to separate the body of liquid 50 into two disparate portions, one above and one below said cup. In this manner, when heat is applied to the smaller body of liquid below the cup 66, such heat will not be dissipated by convection throughout the overlying larger body of liquid, and I am thus able to raise the lower liquid body to its boiling point, under the conditions present within the tube 48.

Although the bubble forming means 66 has proved highly satisfactory in the continued or running operation of the bubbling device 20, I have often found it necessary to provide some stimulus to initiate the generation of bubbles after the underlying mass of liquid has been raised to a sufficiently high temperature for vaporization to commence. For example, such stimulus may be provided by tapping the tube 48.

In accordance with the present invention, however, I supply means to automatically initiate the formation of bubbles upon the mere energization of the electric light bulb B. This means comprises a small mass 68 of a bubble generating substance hereinbefore described, which is disposed in the lower end 62 of the tube 48. The size of the said mass is considerably smaller than the diameter of the cup 66 and is below the portion 70 of the tube 48 which acts as a seat and cooperates with the cup 66 in maintaining the upper and lower halves of liquid separate.

The mass 68 may be introduced into the tube as a loose granular substance, such for example as common table sugar, table salt or borax with waters of crystallization. The tube is then subjected in the region where the powder is located to a temperature sufficiently high to melt or fuse the powder. In the case of sugar, this temperature is rather low and must be carefully controlled to prevent caramelization of the sugar.

After fusion or melting, the tube and substance, which is now a coherent mass, is allowed to cool off. During cooling, it will be noticed that a great number of fissures or cracks are developed throughout the body of the mass, which has become self-adhered to the tube 48. 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.

When it is desired to start the device 20, the bulb B is energized and almost immediately minute bubbles 72 will be ejected from the upper surface of the mass. Shortly thereafter, the liquid underlying the cup 66 will reach its vaporizing temperature and substantially all of said liquid will be driven into the overlying liquid body. However, a small amount 74 of the liquid will remain adjacent the end 68, where it will be vaporized during operation of the device and cause bubbles to be released between the seat 70 and cup 66. During such continued operation of the device, liquid will continually flow down from the overlying body of liquid to replenish the small reservoir 74 of liquid at the bottom of the tube 48. This reservoir is sufficiently large under ordinary circumstances to have a considerable portion thereof in contact with the walls of the tube 48, and will thus be acted upon directly by the source of heat supply B. Thus, during continued operation of the bubbling device, the mass 68 is not the prime source of bubbles.

In Figs. 3 through 5, I have shown only the tube 80 of a bubbling device constructed in accordance with the second form of my invention. This tube and the liquid 82 therein contained may be used with any suitable housing and source of heat and light. In this form of my invention I employ a large mass 84 of a bubble generating substance, which mass substantially fills the lower portion 86 of the tube. Said mass may be inserted into the tube in the form of a powder, as in the first form of my invention, and subsequently fused or melted in the manner hereinabove described.

In the operation of this form of the invention, great numbers of very small bubbles will be released from the upper surface of the bubbling sur-

face 84 very shortly after heat is applied in the region of the bottom 86 of the tube 80. The bottom 86 of the tube has a peculiar external appearance when such large amounts of bubbling substance 84 are incorporated in the tube 80. This portion 86 of the tube will seem to have a large number of intersecting cracks 88, which are, however, only the fissures formed throughout the mass 84.

Sometimes, during operation of a bubbling device incorporating a large mass 84 of a bubbling substance, the mass will become softened and will be partially displaced upwardly to leave cavities 90 adjacent the bottom of the tube 80. However, it will be found that the mass 84 will still adhere to the tube and that a portion of the mass will still contact the tube at or near the bottom and this contacting portion of the mass will have fissures 92 therein which communicate directly or indirectly with the upper surface of the mass, thereby disposing thin sheets of the bubbling liquid adjacent the source of heat supply, where such liquid may be quickly vaporized to initiate the generation of bubbles.

During operation of any of the tubes shown in Figs. 3, 4 and 5, replenishing liquid will flow down from the body of liquid overlying the mass 84 and into the fissures 92 throughout the mass.

The third form of my invention, which in general provides coalescing means to merge smaller bubbles liberated by the bubble generating substance into larger bubbles, is shown in Figs. 6 through 11.

In Fig. 6, a large mass 100 of a bubble generating substance prepared in the same manner as described in connection with Fig. 3 is disposed inside a tube 102, in which there is also contained a quantity of a bubbling liquid 104. Overlying the mass 100 is a cylinder 106 of a transparent or translucent material, such as for example glass, whose outer diameter is slightly smaller, (on the order of about two millimeters) than the inner diameter of the tube 102.

In the operation of this device, the minute bubbles 108 released from the upper surface of the mass 100 will move radially outwardly and then upwardly between the cylinder 106 and tube 102. While they are confined in this small space, these bubbles will tend to travel towards one another. This action is believed to be due to the capillary nature of the body of liquid intermediate the said cylinder and the said tube; and in any event the minute bubbles 108 coalesce into larger bubbles 110 as they ascend through the annular space surrounding the said cylinder, and are subsequently released as relatively large bubbles which travel upwardly through the body of liquid 104. The liquid is replenished in the crevices of the mass 100 in a manner similar to that described in connection with the mass 84 in Fig. 3.

In Fig. 7 the coalescing means comprises a cup 112 similar to the cup 66 shown in Figs. 1 and 2. In this latter figure, however, the cup does not act as a mechanical bubble generating means, but only functions to permit the minute bubbles 114 released from the bubble generating substance 116 to gather inside of the said cup 112 before being released around the lower edges 118 of the cup. If desired, the outer diameter of the said cup 112 may be made of the same dimensions as the cylinder 106, to insure that only a minimum size of the large bubbles 120 will ascend through the bubbling liquid 122.

In Fig. 8, the coalescing means comprises a plurality of glass balls 124 disposed above the mass 126 of a bubble forming substance. The minute bubbles 128 released from the mass during operation of the device coalesce during passage between the balls 124 into large bubbles 130 which ascend through the bubbling liquid 132.

In Fig. 9 the coalescing means comprises the tube 134 in which the bubbling liquid 136 is contained. The lower end of said tube 134 is formed with a re-entrant coaxial tube 138 of smaller diameter than the diameter of the tube 134. In the annular space 140 thus provided at the base of the tube 134, there is disposed a large quantity of a bubble generating substance 142. Such substance, however, only fills up the lower part of the annular space. The minute bubbles 144 released from the bubbling substance 142 coalesce during passage through the upper part of the annular space into the large bubbles 146 desired.

In Fig. 10 the coalescing action is performed by cooperation between the bubbling substance 148 and the walls of the tube 150 in which the bubbling liquid 152 is housed. To this end, the mass 148 is fashioned in the special shape, as shown. The mass 148 may be so formed prior to insertion into the tube 150. For example, such a mass may be formed by crystallizing rock-sugar in a rod-like formation having a diameter slightly smaller than the inner diameter of the tube 150. Such a rod is cut off into short lengths which are dropped within the tube 150. Upon the application of heat, the lower end of the rod will fuse and become adhered to the bottom of the tube 150. Upon cooling, fissures 154 will appear. The minute bubbles 156 released from the side surface of the rod-like mass 148 will be coalesced in the narrow annular space 158 between said mass and the walls of the tube 150 into the large bubbles 160 desired.

In Fig. 11 I have shown an illuminating device wherein a source of illumination and heat 170 is integrally formed with the housing 172 for the liquid column 174. Said source of illumination and heat 170 comprises a screw plug 176 of standard construction having suitable means well known in the art for supporting a filament 178. An evacuated glass envelope 180 is secured to the plug 176 in any customary manner. The upper end of said enevelope 180 is integrally attached to the housing 172 for the liquid column so that said upper end forms the base of the housing. As will be appreciated from the preceding descriptions of the various devices embodying different forms of my invention, the base of the housing and the bubble generating mass may assume diverse shapes. By way of example and without limiting this form of my invention to the following construction, I have illustrated a housing base 182 and bubble generating mass 184 constructed similar to the tube and bubble generating mass disclosed in Fig. 9. Said housing base 182, which also forms the tip of the glass envelope 180, comprises an inverted glass cup having an outer diameter smaller than the inner diameter of the tubular housing 172. In the annular space 186 thus provided there is disposed a large quantity of the bubble generating substance 184. Such substance, however, only fills the lower part of the annular space 186. The minute bubbles 188 released from the bubbling substance 184 coalesce during passage through the upper part of the annular space 186 into the desired large bubbles 190.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is 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 herein set forth 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 a substantially semi-elliptically shaped housing including a pair of semi-opaque halves, said halves having threaded rims for easy connection and disconnection, an electric light bulb having a threaded plug member and a glass envelope which is disposed in said housing, said plug member projecting through an aperture in one of said halves, the other of said halves having an aperture coaxially disposed with respect to said first aperture, said other half having a tubular flange surrounding a second aperture and extending outwardly away from said housing, and a hollow elongated pellucid member snugly received in said second aperture and said flange and extending beyond the end of said flange, the bottom of said member being disposed in contact with the glass envelope of said bulb to directly receive heat therefrom, said member containing a body of a vaporizable liquid and bubbling means adjacent the bottom of said member in the region where heat is applied by said bulb, whereby said bubbling member is activated when the bulb is lit.

2. In combination, a body of a vaporizable liquid, a container for said body of liquid, said container being adapted to be disposed adjacent a source of heat, and means in contact with said body of liquid and disposed in the region where heat is applied for providing thin distinct interconnected zigzag interstitial passageways extending through said means from said region to said body to form a portion of the liquid in said region into distinct interconnected sheets.

3. In combination, a body of a vaporizable liquid, a container for said body of liquid, said container being adapted to be disposed adjacent a source of heat, and means in contact with said body of liquid and disposed in the region where heat is applied for providing thin distinct interconnected zigzag interstitial passageways extending through said means from said region to said body to form a portion of the liquid in said region into distinct interconnected sheets, said means being secured to said container.

4. In combination, a body of a vaporizable liquid, a container for said body of liquid, said container being adapted to be disposed adjacent a source of heat, and a fissured, coherent mass in contact with said body of liquid and said container, said mass being disposed in the region where heat is applied.

5. In combination, a body of a vaporizable liquid, a container for said body of liquid, said container being adapted to be disposed adjacent a source of heat, and a fissured, coherent mass in contact with said body of liquid and said container, said mass being disposed in the region where heat is applied and being unaffected chemically or physically by contact with said liquid and said container.

6. For use in an ornamental bubbling device having a source of heat, the combination of a hollow pellucid member, a body of a low boiling point liquid contained within said member, and means in contact with the body of liquid and disposed in the region where heat is applied for providing thin distinct interconnected interstitial passageways extending through said means from said region to said body to form a portion of the liquid in said region into distinct interconnected sheets.

7. For use in an ornamental bubbling device having a source of heat, the combination of a hollow pellucid member, a body of a low boiling point liquid contained within said member, and means in contact with the body of liquid and disposed in the region where heat is applied for providing thin distinct interconnected interstitial passageways extending through said means from said region to said body to form a portion of the liquid in said region into distinct interconnected sheets, said means being secured to said member.

8. For use in an ornamental bubbling device having a common source of heat and light, the combination of a hollow pellucid member, a body of a low boiling point liquid contained within said member, and pellucid means in contact with the body of liquid and disposed in the region where heat is applied for providing thin distinct interconnected interstitial passageways extending through said means from said region to said body to form a portion of the liquid in said region into thin distinct interconnected sheets, said means being secured to said member.

9. For use in an ornamental bubbling device having a common source of heat and light, the combination of a hollow pellucid member, a body of a low boiling point liquid contained within said member, and pellucid means in contact with the body of liquid and disposed in the region where heat is applied for providing thin distinct interconnected interstitial passageways extending through said means from said region to said body to form a portion of the liquid in said region into thin distinct interconnected sheets, said means being self-adhered to said member.

10. For use in an ornamental bubbling device having a common source of heat and light, the combination of a hollow pellucid member, a low boiling point liquid contained within said member, pellucid means in contact with the liquid and disposed in the region where heat is applied for forming a portion of the liquid in said region into sheets, said means being self-adhered to said member, and means to coalesce bubbles issuing from said sheet forming means into larger bubbles.

11. For use in an ornamental bubbling device having a common source of heat and light, a combination of a hollow pellucid member, a body of a low boiling point liquid contained within said member, and a pellucid, fissured, coherent mass in contact with said body of liquid and secured to said member in the region where heat is applied.

12. For use in an ornamental bubbling device having a common source of heat and light, a combination of a hollow pellucid member, a body of a low boiling point liquid contained within said member, and a pellucid, fissured, coherent mass in contact with said body of liquid and adhered to said member in the region where heat is applied.

13. For use in an ornamental bubbling device having a source of heat, a combination of a hollow pellucid member, a low boiling point liquid contained within said member, a fisured, coherent mass in contact with said liquid and secured to said member in the region where heat is applied, and means to coalesce bubbles issuing from said mass into larger bubbles.

14. For use in an ornamental bubbling device having a source of heat, the combination of a hollow pellucid member, a body of a low boiling point liquid contained within said member, means within said member in the region where heat is applied for forming bubbles during running operation of said device, and means to initiate the formation of bubbles by said bubbling means, said second named means comprising a second bubbling means also within said member in the region where heat is applied and below, separate and distinct from the first bubbling means, both said bubbling means being so relatively proportioned that said second bubbling means generate bubbles at a slower rate than said first bubbling means and of such physical characteristics that said second bubbling means initiates the generation of bubbles more rapidly upon the application of heat than said first bubbling means.

15. For use in an ornamental bubbling device having a common source of heat and light, a combination of a hollow pellucid member, a body of a low boiling point liquid contained within said member, mechanical means for forming bubbles during running operation of said device, and means to initiate the formation of bubbles, said last named means comprising a pellucid, fissured, coherent, small mass in contact with said body of liquid and secured to said member under said mechanical bubble forming means and in the region where heat is applied.

16. For use in an ornamental bubbling device having a common source of heat and light, a combination of a hollow pellucid member, a body of a low boiling point liquid contained within said member, mechanical means for forming bubbles during running operation of said device, and means to initiate the formation of bubbles, said last named means comprising a pellucid, fissured, coherent, small mass in contact with said body of liquid and adhered to said member under said mechanical bubble forming means and in the region where heat is applied.

17. For use in an ornamental bubbling device having a common source of heat and light, a combination of a hollow pellucid member, a body of a low boiling point liquid contained within said member, and a pellucid, fissured, coherent, large mass in contact with said body of liquid and secured to said member in the region where heat is applied.

18. For use in an ornamental bubbling device having a source of heat and light, a combination of a hollow pellucid member, a low boiling point liquid contained within said member, a pellucid, fissured, coherent, large mass in contact with said liquid and secured to said member in the region where heat is applied, and means to coalesce bubbles issuing from said mass into larger bubbles, said last named means comprising an imperforate member overlying said mass, said imperforate member having a lesser sectional area than the inside of said pellucid member located immediately above said mass.

19. For use in an ornamental bubbling device having a source of heat and light, a combination of a hollow pellucid member, a low boiling point liquid contained within said member, a pellucid, fissured, coherent, large mass in contact with said liquid and secured to said member in the region where heat is applied, and means to coalesce bubbles issuing from said mass into larger bubbles, said last named means comprising an imperforate solid member overlying said mass, said imperforate member having a lesser sectional area than the inside of said pellucid member located immediately above said mass.

20. For use in an ornamental bubbling device having a common source of heat and light, a combination of a hollow pellucid member, a body of a low boiling point liquid contained within said member, a pellucid, fissured, coherent, large mass in contact with said body of liquid and secured to said member in the region where heat is applied, and means to coalesce bubbles issuing from said mass into larger bubbles, said last named means comprising a re-entrant tube in the region where heat is applied, said tube being integral with said pellucid member, said mass being disposed between said tube and said member.

CARL W. OTIS.