

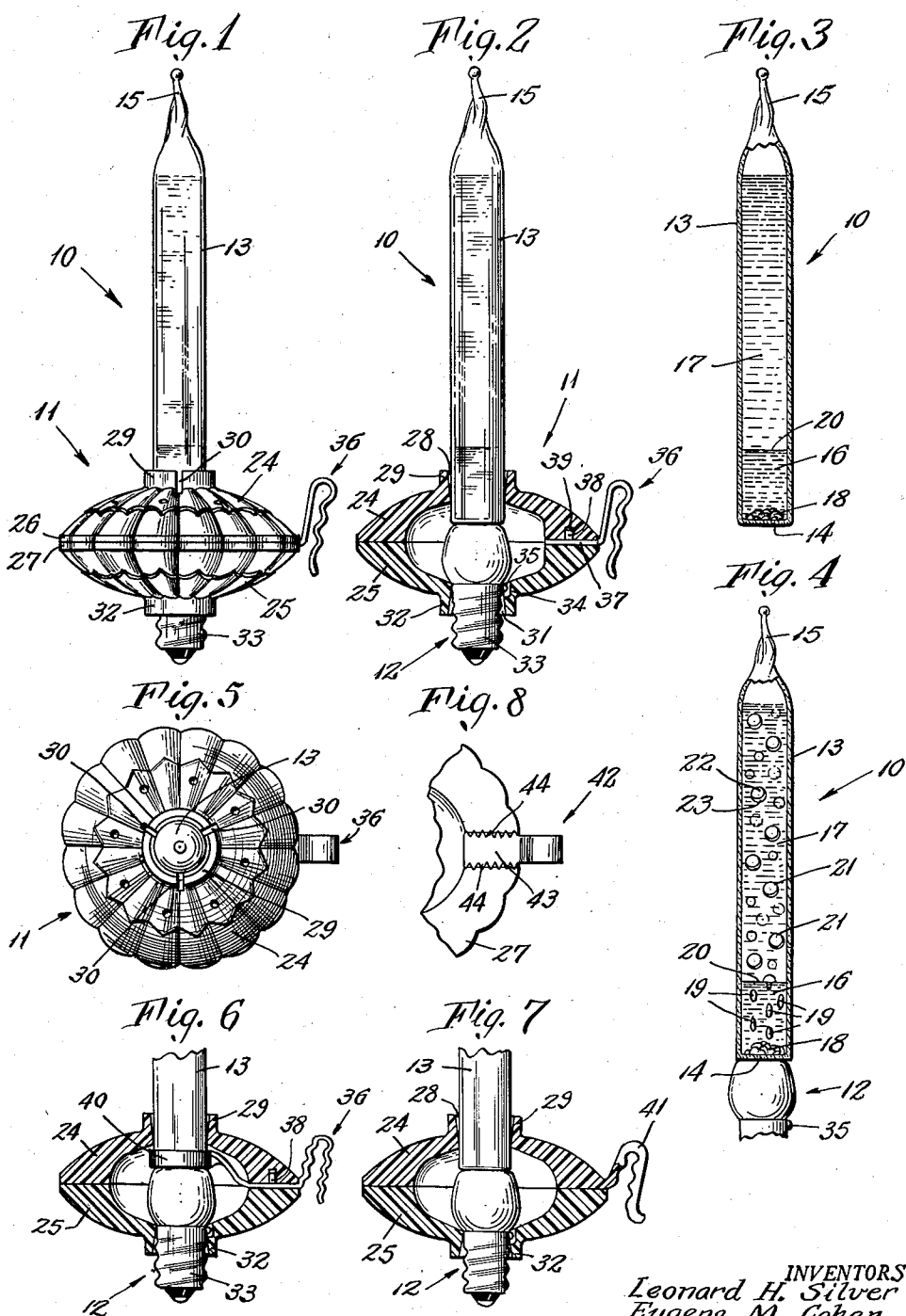
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SUPPORT FOR BUBBLE LIGHT DEVICE

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SUPPORT FOR BUBBLE LIGHT DEVICE

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This invention relates to devices which produce ornamental and decorative bubble lighting effects, and more particularly to devices of this type as adapted for use as Christmas tree ornaments.

Bubble lights as used on Christmas trees generally comprise a bubble unit in the form of an upright glass tube having a low boiling point solution in it, and a holder usually formed of molded plastic parts encasing the lower portion of the glass tube and also encasing an electric bulb which supplies light, and supplies heat to the lower end of the glass tube. The parts of the plastic holder are usually translucent and ornamental in design to provide an attractive lighting effect, and the bubbling of the solution in the glass tube produces an animated effect which is considered to be attractive and ornamental, and well adapted to decorate the tree.

An object of the present invention is to provide an improved illuminated bubbling device for producing a novel, very attractive and decorative effect characterized by slow-moving, suspended composite bubbles, which effect is extremely interesting to observe, and which provides a highly desirable ornamentation for a Christmas tree or the like.

Another object of the invention is to provide improved bubble light devices as above, which are uniform in their operation and readily respond to the moderate amounts of heat from small Christmas tree bulbs.

A further object of the invention is to provide an improved bubble light characterized as above, which is economical to manufacture.

Yet another object of the invention is to provide an ornamental Christmas tree bubble light having improved and inexpensive means whereby it may be readily secured or clipped to a branch of the tree.

In accomplishing the above objects there is provided by the invention a novel bubble unit by which certain artistic and attractive effects are obtained, in conjunction with an improved holder for the unit whereby a very advantageous and at the same time economical-to-produce device is had. The bubble unit comprises an upright transparent tube having two immiscible liquid bodies therein, together with means for facilitating bubbling, whereby numerous attractive composite bubbles having pleasing light-reflecting qualities are produced in the tube and remain suspended therein in slow movement, to effect an attractive and striking appearance. The bubbles are each composed of two

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parts, a gaseous part and a liquid part, the gaseous part being small and being contained within the other part, and both said parts having generally spherical peripheries. The bubbles collect in substantial quantities in the transparent tube, and move relatively slowly first up and then down in the uppermost of the liquid bodies, appearing to be suspended therein. By virtue of their two-part makeup, they present light-reflecting surfaces which give them a somewhat pearly, attractive appearance.

Various liquids may be employed in the tube to produce the above effect, according to the invention, the liquids however having different densities whereby one liquid occupies the lowermost portion of the glass tube and the other liquid body occupies a position above the first body. The lowermost liquid has a lower boiling point than the upper liquid, and the latter preferably has a substantial degree of viscosity.

The liquid of the lower body, having the high density and high boiling point, may be methylene chloride or Freon, or may be a mixture of these two. The upper body of liquid, having the lower boiling point and lower density, according to the invention is an aqueous solution preferably containing a wetting agent of substantial viscosity, and may comprise a mixture of glycerine and water, or of sugar and water, or of glycol and water. We have found that the use of methylene chloride for the heavier liquid and a solution of fifty-five per cent glycerine and forty-five per cent water for the lighter solution is advantageous to produce the attractive bubbling effect outlined above.

To facilitate the bubbling action a granular substance is disposed in the glass tube to rest on the bottom thereof, and this substance may advantageously be an especially treated sand, or it may be salt, or particles of pumice. Where granules of salt are used to facilitate the bubbling, the aqueous solution comprising the lighter body of liquid is also preferably saturated with salt, to prevent the salt granules in the bottom of the tube from being absorbed and losing their granular condition.

The improved bubble unit is carried by a two-part plastic holder provided with a novel resilient clip means whereby the bubbling device may be quickly and conveniently mounted on a Christmas tree by clipping it to a branch thereof.

In one embodiment of the invention the resilient clip means includes an extension within the plastic holder, having a circular configuration and surrounding the glass tube of the bubble

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unit to provide for a sturdy support of the tube in its proper vertical position on the holder.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Figure 1 is a side elevational view of an improved bubble light embodying the invention.

Fig. 2 is a view like Fig. 1 but showing the holder in axial section.

Fig. 3 is an axial sectional view of the tubular bubble unit of the device in a cold condition wherein no bubbles are produced.

Fig. 4 is a view like Fig. 3 but showing the bubble unit in operation producing bubbles in response to heat from an incandescent electric bulb.

Fig. 5 is a top view of the device of Figs. 1 and 2.

Fig. 6 is a fragmentary view partly in section and partly in elevation, of the lower portion of a device illustrating a modification of the invention.

Fig. 7 is a view like Fig. 6 but of a device illustrating another modification of the invention, and

Fig. 8 is a detail of a device illustrating still another modification of the invention, showing in plan view a portion of the lower member of a holder, and showing a novel resilient clip means for the device.

As shown in Figs. 1, 2 and 3, the improved bubble light of this invention comprises an upright tubular bubble unit 10 which is carried at its lower portion in a holder 11, the holder also enclosing an incandescent electric bulb 12 which provides the light and heat for operating the device.

According to the invention, the bubble unit 10 is formed in a novel manner whereby when it responds to heat from the bulb 12 it produces a large number of bubbles each of composite makeup, which move relatively slowly in an upper liquid body in the unit, appearing to be suspended therein, the bubbles being of a nature such that they reflect light from the bulb 12 so as to have an attractive pearly or jewel-like appearance.

As shown in Fig. 3, the bubble unit 10 comprises a transparent upright tube 13 which is preferably formed of glass, having a generally flat bottom wall 14 and a pointed upper end or tip 15 at which the tube is sealed. In the tube 13 a lower liquid body 16 is provided, and also a second, upper liquid body 17, the two bodies being immiscible and the body 16 having a greater density and lower boiling point than the body 17. We have found that the body 16 may be formed of methylene chloride or of Freon, or of a mixture of Freon and methylene chloride. The body 17, according to the invention is a viscous aqueous solution, and may comprise water mixed with a wetting agent, as for example, glycerine. The aqueous body 17 may also be a solution of water and glycol, or of water and sugar.

We have found that by the use of the above liquids for the bodies 16 and 17, in conjunction with a granular substance 18 carried on the bottom 14 of the tube to facilitate the bubbling action, a novel and very attractive effect is obtained when heat from an electric bulb is applied to the bottom of the tube as shown in Fig. 4. In response to such heat, the lower body of liquid 16 is caused to boil, gaseous bubbles 19 are formed

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in the lower body, and these quickly ascend to the interface 20 between the liquid bodies 16 and 17. Upon the gaseous bubbles 19 entering the upper liquid body 17 they are slowed down considerably, and attain a globular shape and a composite structure, being shown as the spherical bubbles 21.

A partial condensation of the gas of the bubbles 21 takes place due to the lower temperature of the upper liquid body 17, thereby resulting in a novel bubble formed of two distinct parts, a gaseous part 22 and a liquid part 23. If the lower liquid body 16 is methylene chloride, the liquid part 23 of each globule 21 will be liquid methylene chloride and the gaseous part 22 of each globule 21 will be gaseous methylene chloride, and a similar condition will result where Freon is used instead of methylene chloride, the parts 22 and 23 of the globules 21 being then formed of gaseous Freon and liquid Freon. The bubbles 21 will remain in the upper liquid body 17 for a time and will slowly move about in the upper body, gradually condensing more and more, insofar as the gaseous portions of the bubbles are concerned; after reaching a certain stage in this condensation, and becoming smaller in size the bubbles 21 will increase in density, resulting in their traveling downward and eventually again rejoining the lower liquid body 16.

We have found that a solution of fifty-five percent glycerine by weight and forty-five percent water by weight is advantageous for the upper liquid body 17, and is effective in producing bubbles as above described. As at present understood, the liquid portions 23 of the bubbles 21 have a spherical periphery, as do also the gaseous portions 22 of the bubbles, the gaseous portions however being of smaller diameter and being entirely contained within the liquid portions. The light from the electric bulb 12 passes upward through the liquid bodies 16 and 17 and is reflected from the spherical surfaces of the parts 22 and 23 of the bubbles, and produces a novel and attractive effect whereby the bubbles have a pearly or jewel-like appearance, and this effect is also obtained when the upper liquid body 17 is formed of an aqueous solution containing sugar, or containing glycol.

The granular substance 18 may be of sand, which is preferably especially treated to prevent its adhering together and also clinging to the walls of the tube 13. We have found that by baking the sand at a high temperature, for example 400° F., for a period of time the sand attains a character whereby the granules do not cling together or to the walls of the tube 13, but instead may be readily agitated by the bubbling action resulting from the heat of the bulb 12. The sand granules may be painted or pigmented prior to the baking, to provide different coloring effects or to produce a silvered appearance if desired.

Instead of sand for the granules 18 particles of activated alumina, or of pumice may be used. Also granules of sodium chloride may be used, in which case it is desirable that the upper solution 17 be saturated with sodium chloride to prevent its absorbing the salt granules.

Preferably the density of the upper liquid body 17 is not greatly less than the density of the lower liquid body 16, so that the bubbles 21 remain in suspension in various parts of the upper liquid body 17 instead of collecting at the top and quickly condensing and disappearing.

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By forming the upper liquid body 17 to have a relatively high viscosity, the bubbles will also tend to be retained in suspension for an appreciable time.

The vapor pressure of the upper liquid is preferably less than that of the lower liquid, to prevent gas bubbles composed of vapor from the upper liquid being formed at the interface 20 of the liquid bodies.

By the provision of the glycerine or other wetting agent in solution with the water in the upper liquid body 17 the surface tension at the interface 20 of the liquid bodies is reduced, and the gas bubbles 19 in the lower liquid body 16 may break through the interface readily.

Any suitable coloring agents may be used in the liquid bodies 16 and 17, or either one or both of the bodies may be clear as found desirable.

The improved holding device 11 of the present invention comprises an upper cup-shaped part 24 and a lower cup-shaped part 25, the said parts having rim portions 26 and 27 respectively which are adapted to be secured together face-to-face as by use of a suitable adhesive, the cups 24 and 25 forming a casing or enclosure. The upper part 24 of the holder has a central opening 28 surrounded by an upstanding flange 29 which is provided with a plurality of cuts or slots 30, the size of the opening 28 being such as to enable the lower portion of the tube 13 of the bubble unit to be inserted into the holder. The lower part 25 of the holder has a central opening 31 surrounded by a depending flange 32, the opening 31 being sufficiently large to admit the screw base 33 of the bulb 12. A small recess 34 is formed in a wall of the opening 31 to provide clearance for the blob of lead 35 which is usually found on the base 33 of the bulb.

In accordance with the invention an improved resilient clip means is provided whereby the bubble light may be readily secured to a branch of a Christmas tree. This clip means comprises a U-shaped metal clip 36 having a flat supporting portion 37 which extends inwardly of the holder 11 between the rim portions 26 and 27 thereof, and preferably the latter rim portion has a shallow recess in its face to accommodate the supporting portion 37 of the clip. Also, a projection 38 is provided on the lower part 25 of the holder in the said recess thereof, and the supporting part 37 of the clip is apertured to receive the projection whereby the clip is securely locked in place on the holder. The upper part 24 of the holder may have a recess 39 to provide clearance for the projection 38. In assembling the bubble light, after the bulb 12 and clip 36 are set in place, the holder parts 24 and 25 are cemented together.

A modification of the invention is shown in Fig. 6 wherein the supporting portion 37 of the clip 36 is extended inward into the holder 11 and is formed into a ring shape 40 so as to encircle the lower portion of the glass tube 13 and provide a further support for the said tube.

Another modification of the invention is shown in Fig. 7, wherein the upper part 24 of the holder 11 is provided with an integral U-shape exten-

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sion 41 forming a spring clip whereby the holder may be secured to the branch of a Christmas tree.

Instead of the anchorage means comprising the pin 38 and the aperture in the supporting portion 37 of the clip 36, a mounting clip 42 may be provided as shown in Fig. 8, having a base portion 43 the opposite edges of which have points or projections 44. When this clip is applied to the rim portion 27 of the lower holder part 25 in the recess thereof, the points 44 will cut into the opposite walls of the recess and act to securely lock the clip in place.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

We claim:

1. A bubble light ornament for use with Christmas trees, comprising an elongate bubble unit having a bubbling solution therein, said unit including a tubular transparent envelope adapted to be supported in an upright position; a molded plastic holder encasing the lower end portion of the envelope; an electric bulb in said holder, in close proximity to the lower end of the envelope; and a support means, comprising a metal ring within the holder, receiving the lower end of the envelope and disposed above said bulb, said support means also comprising an extension from said ring, passing through the said holder and terminating in a clip to mount the ornament on the branch of the Christmas tree.

2. A bubble light ornament for use with Christmas trees, comprising an elongate bubble unit having a bubbling solution therein, said unit including a tubular transparent envelope adapted to be supported in an upright position; a molded two-part plastic holder encasing the lower end portion of the envelope; an electric bulb in said holder, in close proximity to the lower end of the envelope; and a support means, comprising a metal ring within the holder, receiving the lower end of the envelope and disposed above said bulb, said support means also comprising an extension from said ring passing through the said holder between the parts thereof and terminating in a clip to mount the ornament on the branch of the Christmas tree.

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