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3,107,316

LAMP DEVICES

Filed June 17, 1959

2 Sheets-Sheet 1

Fig. 1.

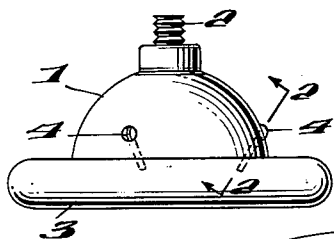


Fig. 2.

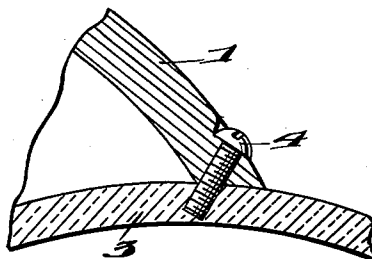


Fig. 3.

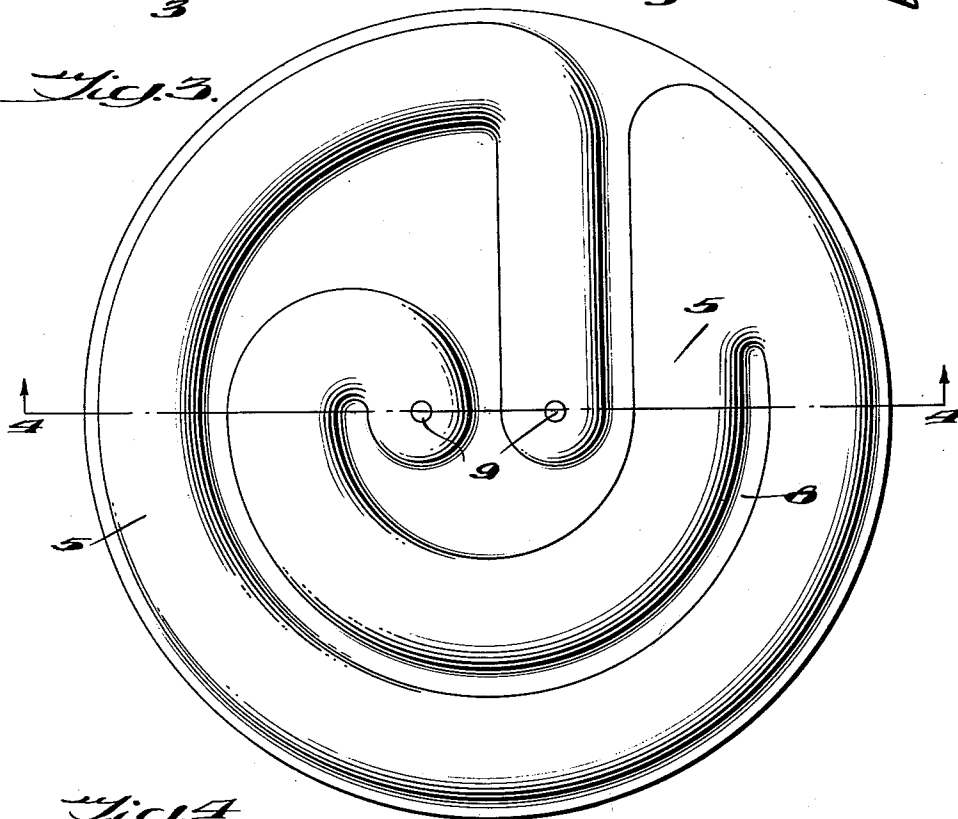
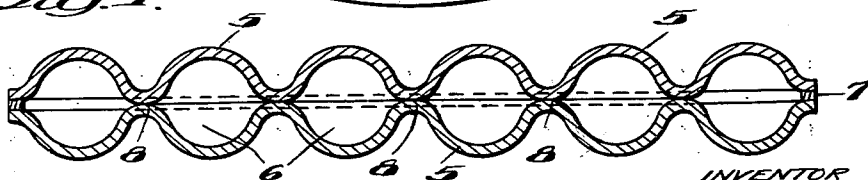


Fig. 4.



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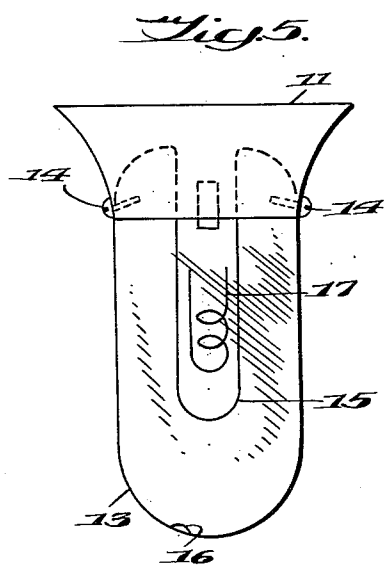
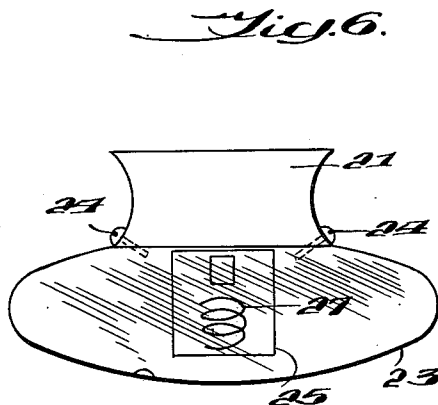
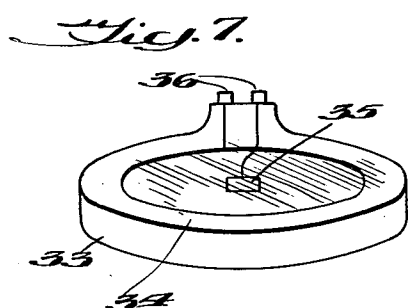
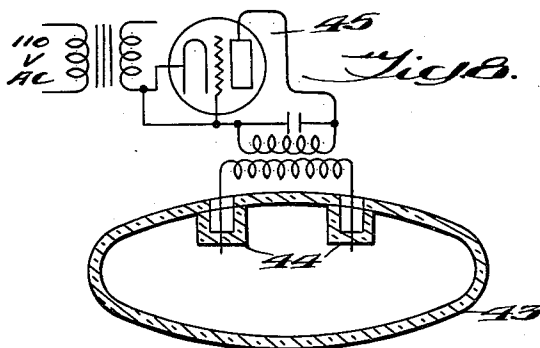
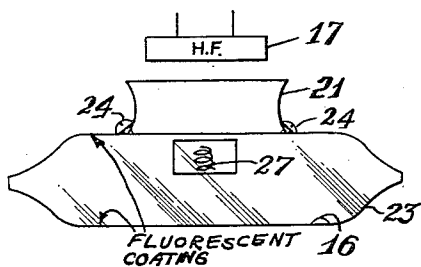
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LAMP DEVICES

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2 Sheets-Sheet 2



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3,107,316

LAMP DEVICES

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6 Claims. (Cl. 315-248)

This invention relates to improvements in lamp devices of the character used for producing illumination.

Most lamp devices as used heretofore have required both a source of illumination and a fixture of suitable form or character for supporting the source of illumination, such as a base and reflector. These separate units add to the complexity and expensiveness of the construction, as well as difficulty of assembly.

One object of this invention is to overcome these objections and to improve the construction of lamp devices for producing illumination.

Another object of the invention is to combine, in one unit, both a source of illumination and a fixture or support therefor, so as to eliminate the necessity for an extra base, reflector and other part of the assembly, and to utilize one unit suitably supported as the sole means of producing illumination and controlling the effect thereof.

These objects may be accomplished, according to certain embodiments of the invention, by providing a suitable source of illumination, with a base or fixture attached thereto as a single unit and capable of mounting on a suitable support for holding the source of illumination and controlling the effect of the light produced thereby. This does not require a separate fixture, but the entire unit may be assembled by the manufacturer and remain in unitary condition through transmission to the user and during service thereof, thereby assuring that the same will function properly and uniformly.

These embodiments of the invention are illustrated in the accompanying drawings, in which:

FIG. 1 is a side elevation of one form of light unit or assembly;

FIG. 2 is a detail cross section through one of the fastening portions of the unit, on the line 2-2 in FIG. 1;

FIG. 3 is a top plan view of the light section;

FIG. 4 is a cross section therethrough, on the line 4-4 in FIG. 3;

FIG. 5 is a diagrammatic view, showing a modified form of lamp device;

FIG. 6 is a diagrammatic view, showing another form thereof;

FIG. 7 is a diagrammatic view, showing still another form thereof;

FIG. 8 is a similar view, showing still another embodiment thereof; and

FIG. 9 is a diagrammatic view showing still another form of the invention.

The lamp device which is illustrated as an embodiment of the invention comprises a source of illumination combined with a fixture or base as a mounting therefor and which will be combined as a unitary assembly at the place of manufacture, so as to maintain the relation therebetween uniformly during transportation and service.

In the embodiment shown in FIGS. 1 to 4, the base or fixture is illustrated generally by the numeral 1 and may be made in the form of a metallic shield, although any suitable material may be used for forming this base member. It is shown as hollow and provided with suitable supporting means, such as a screw plug 2, that may be screwed into a suitable socket, as a simple means of supporting the lamp device. Contacts or terminals may be connected with the plug 2 for the purpose of making electrical connection with the source of illumination in the usual manner of electrical lighting fixtures.

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Suspended from the base section 1 is a light source member 3, securely and permanently attached to the base 1. These parts are usually formed of separate materials and any suitable means may be used for attaching the parts together in permanent rigid relation. In the example illustrated, the attaching means is shown in the form of screw fastenings 4, illustrated in detail in FIG. 2, and which extend through the skirt portion of the base section 1 into the upper surface of the light section 3.

While the light section 3 may be formed in different ways, I have shown in FIGS. 3 and 4 one method of forming this light section. In this example, the section is formed from a pair of sheets 5 of uniform thickness molded or pressed to provide grooves 6 in the opposing surfaces thereof, which are circular or substantially spiral, as illustrated in FIG. 3. It is preferred that the sheets be pressed to the desired configuration by sucking into grooves by vacuum. Then they can be fitted together, and sealed. Thin pressed sheets may be used for this purpose, to provide a light weight lamp. Molded lamps are heavier with thicker walls.

The inner surfaces of these grooves may be provided with a fluorescent coating, if desired.

These sheets 5 may be formed either of transparent or translucent material, such as a suitable moldable plastic, glass, or the like, and are either sealed, or are fitted together, at their peripheries at 7, as well as between the grooves 6, as indicated at 8. The contiguous portions of the molded plates 5 may be flattened to facilitate sealing. The sealing relation may be accomplished in any suitable manner, as, for example, by an adhesive or a sealing glass between the flattened surfaces or by adhesion of the surfaces directly together. Instead of sealing, however, these parts may be fitted together less than the mean free path length of the gas.

While the light source may be provided in any suitable manner, as, for example, by incandescence, space discharge, etc., I have shown, in FIG. 3, a pair of electrodes 9 in the opposite ends of the spiral grooves 6 to form a continuous arc, as illustrative of the manner in which illumination may be provided. These electrodes may be connected with contacts on the base member 2 or with a suitable source of electrical supply, and preferably a gaseous medium or mercury vapor is provided in the spiral channels 6.

The mercury vapor or other gaseous filling for the lamp may be ionized in any suitable manner, as, for example, by high frequency current or a suitable source of electric current connected directly or indirectly with the electrodes 9. Examples are described hereinafter of several ionizing means, any of which may be used in connection with the form of the invention shown in FIGS. 1 to 4. The high frequency or other current supply means can be enclosed within the base or fixture 1 and connected as a part of the unitary lamp. If desired, however, the mercury vapor or gaseous filling can be excited from a high frequency field originating either inside or outside the lamp. Where the high frequency field originates from outside the lamp, it may be passed through the glass or body of the lamp by capacitors located, respectively, inside and outside thereof.

Another embodiment is illustrated in FIG. 5, in which the base section 11 is connected with a light section 13 through suitable fastenings 14, so as to form one unitary assembly. The light section 13 is in the form of a hollow globe having a reentrant portion 15 spaced from the wall of the light section to provide a gaseous chamber therebetween. The opposed surfaces of this chamber preferably are formed with fluorescent material thereon and mercury vapor may be used in the chamber, if needed, as indicated at 16, or other gaseous filling.

Located within the receptacle formed by the reentrant

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portion 15 of the light section 13 is an energizing unit 17, such as an auxiliary high frequency circuit that may be energized from any suitable external source. The high frequency current may be passed through the wall of the lamp to a capacitor therein associated with the coil of the energizing unit 17. This method makes unnecessary a direct electrical connection with electrodes in the lamp. Upon energizing of the high frequency unit 17, the gaseous medium within the light section 13 will be energized and caused to emit a source of light.

Capacitors are not needed in this embodiment, as the coil can be connected directly through lead wires to an oscillator outside, or the oscillator may be located in the reentrant portion 15, with 60 cycle leads running to it.

The base section 11 may be mounted in any suitable manner, as, for example, on a ceiling or wall of a room, or any other suitable support, so as to hold the lamp device in proper position for use.

A modification is shown in FIGS. 6 and 9 in which a base section 21 supports a light section 23 by suitable fastening devices 24 connecting the parts together. Mounted within the light section 23 is a separate receptacle 25 enclosing a high frequency unit or coil 27. This form of the invention is constructed otherwise in the same manner and operates similarly to that shown in FIG. 5 and described above in connection therewith.

A further modification is shown in FIG. 7, in which the base section is not illustrated, but any suitable form may be used, such, for example, as that shown in FIG. 1 or in FIGS. 5 and 6. In this form, the light section 33 is hollow or in the form of a glass globe having an internal coating of fluorescent material and enclosing a mercury vapor or other gaseous medium. Space discharge is accomplished between an annular wire electrode 34 and a second electrode 35 connected with terminals 36 that extend to connections in the base section.

A further modification is shown in FIG. 8, in which the light section 43 is also shown as a hollow glass globe containing a fluorescent coating on the inner surface thereof and may be provided with a mercury vapor or other gaseous medium. Here again, the base section is not shown, but any suitable base section, such, for example, as described above, may be used in connection therewith. The gaseous medium is energized from electrodes inserted in reentrant portions 44 in the top portion of the light section 43 from a suitable high frequency unit, indicated generally at 45, which may be mounted within the base section or connected therewith.

As set forth in the foregoing description, the lamp may utilize any suitable ionizing means for the gas, either a direct connection of the source of electric current thereto or by means of high frequency current or a high frequency field. Moreover, the high frequency field may be connected directly with electrodes in the gaseous area, as in FIG. 8, or connected thereto through capacitors located externally and internally of the lamp, as in FIGS. 5 and 6. Any such means may be used as found desirable.

While the invention has been illustrated and described in different embodiments, it is recognized that other variations and changes may be made therein without departing from the invention, as set forth in the claims.

I claim:

1. A lamp device comprising a base section, a light section, means connecting said base section and light section together for supporting the light section from the base section, said light section including a pair of plates molded with a space therebetween forming a gaseous chamber, said gaseous chamber having a fluorescent coat-

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ing applied to the inner walls thereof and containing an ionizable gas, and high frequency means confined solely within the lamp device for ionizing said gas.

2. A lamp device comprising a base section, a light section, means connecting said base section and light section together for supporting the light section from the base section, said light section including a pair of plates molded with a space therebetween forming a gaseous chamber, and high frequency means for ionizing the gas within the chamber, said high frequency means including a coil and capacitor located in the light section adjacent the chamber and energized solely through means located externally of the light section.

3. A lamp device comprising an envelope having a gaseous filling, a receptacle having a coil therein and located in the envelope, a high frequency oscillator circuit exterior to the envelope and means for ionizing the gas in the envelope upon energizing the oscillator circuit.

4. A lamp device comprising a base, an envelope having a gaseous filling, a receptacle having a coil therein and enclosed within the envelope, a high frequency oscillator circuit in the base, said circuit including a coil adjacent the envelope oriented to induce a current in the envelope coil through the wall of the envelope, and means for ionizing the gas in the envelope upon energizing the envelope coil.

5. A lamp device comprising a base section, a light section, means connecting said base section and light section together for supporting the light section from the base section, said connecting means including fasteners extending from the base section into the light section and securing the sections together, said light section including a pair of plates molded with a space therebetween forming a chamber having a gaseous filling, said chamber having a fluorescent coating applied to the inner walls thereof a receptacle having a coil therein and enclosed in the chamber, a high frequency oscillator circuit in the base section, said circuit including a coil exterior to the chamber, and means for ionizing the gas in the chamber upon energizing the chamber coil.

6. A lamp device comprising an envelope having a gaseous filling, said envelope including a pair of plates molded with a space therebetween forming a chamber, a fluorescent coating applied to the walls of the chamber and a receptacle having a coil therein and enclosed in the chamber whereby the gas is ionized by current induced in the coil by an external high frequency means for illumination.

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