Jan. 31, 1956 B. J. CALL 2,733,331

RADIANT ENERGY CIGARETTE LIGHTER

Filed June 5, 1953

Fig. 1.

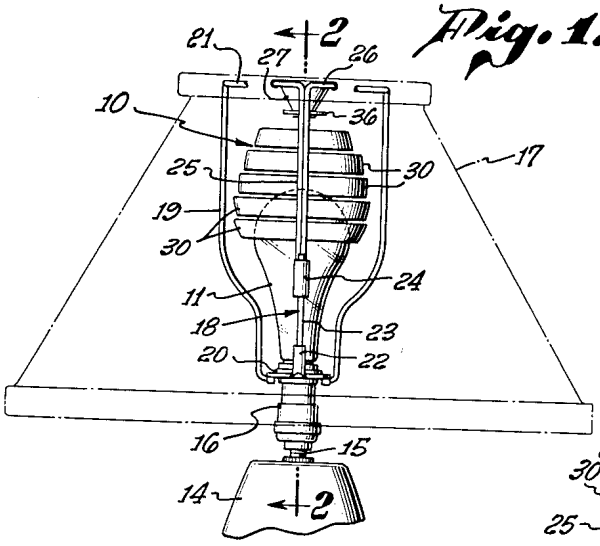


Fig. 2.

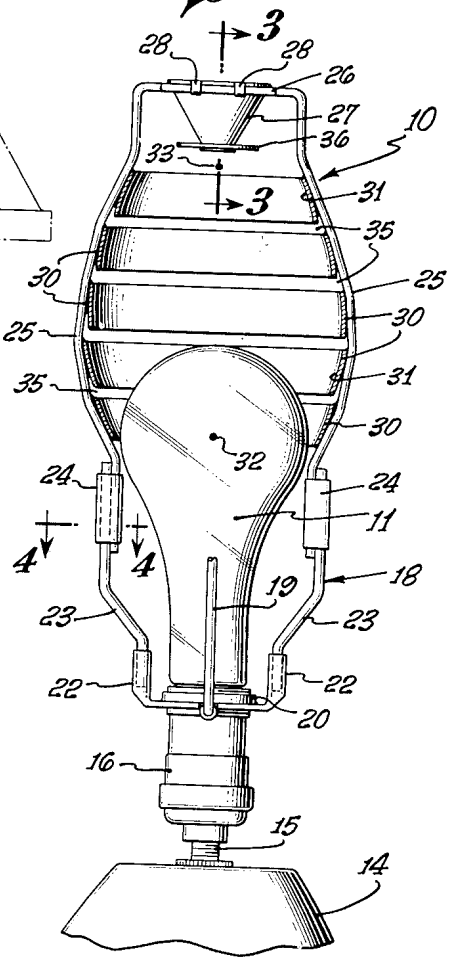


Fig. 3.

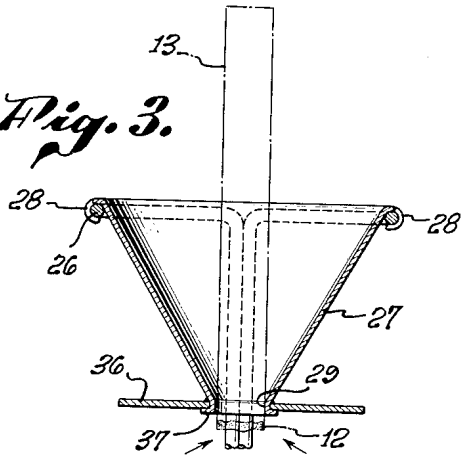


Fig. 5.

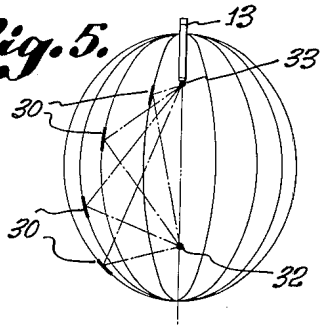
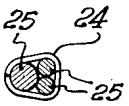


Fig. 4.



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RADIANT ENERGY CIGARETTE LIGHTER

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11 Claims. (Cl. 219—32)

The present invention relates to devices for effecting the ignition of cigarettes, and the like.

An object of the present invention is to provide an improved device capable of transmitting and focusing heat rays from a source of heat energy, such as an electric incandescent light bulb, onto a cigarette, or the like, for the purpose of igniting the latter.

Another object of the invention is to provide a reflecting and focusing device operable in cooperation with a standard type of electric incandescent light bulb for effecting the ignition of a cigarette, or the like.

A further object of the invention is to provide a generally ellipsoidal reflecting device for focusing the heat energy from a heat source on a cigarette, or the like, to effect its ignition, in which the width of the device is minimized, to reduce its space requirement.

Still a further object of the invention is to provide a generally ellipsoidal reflecting device for focusing the heat energy from a heat source upon a cigarette, or the like, to effect its ignition, in which air currents can pass through the device for convection cooling purposes. Light from the source can also pass through the device to furnish desired illumination.

Yet another object of the invention is to provide a reflecting and focusing device adapted to be incorporated in a light producing lamp, in which the heat energy from the incandescent lamp bulb is reflected and focused by the device upon a cigarette, or the like, to ignite the same.

This invention possesses many other advantages, and has other objects which may be made more clearly apparent from a consideration of a form in which it may be embodied. This form is shown in the drawings accompanying and forming part of the present specification. It will now be described in detail, for the purpose of illustrating the general principles of the invention; but it is to be understood that such detailed description is not to be taken in a limiting sense, since the scope of the invention is best defined by the appended claims.

Referring to the drawings:

Figure 1 is a side elevational view of the invention as applied to an electric table lamp;

Fig. 2 is a longitudinal section, on an enlarged scale, taken along the line 2—2 on Fig. 1;

Fig. 3 is a enlarged longitudinal section taken along the line 3—3 on Fig. 2;

Fig. 4 is an enlarged cross-sectional view taken along the line 4—4 on Fig. 2;

Fig. 5 is a diagrammatic view illustrating the manner of reflecting and focusing the rays from a source upon the end portion of a cigarette.

As disclosed in the drawings, the device 10 receives heat and light rays from a suitable source of heat energy, such as an electric incandescent light bulb 11, and reflects the rays towards a focus at which the end portion 12 of a cigarette 13 is located, for the purpose of igniting the latter. As specifically disclosed in the drawings, the reflecting and focusing device 10 is associated with a

lamp, such as a table lamp. This lamp includes a suitable base 14, from which a stem or pipe 15 projects in an upward direction. A light socket 16 is attached to the stem and may have the light bulb 11 threaded thereinto.

A lamp shade 17 may be supported by the lamp base in any suitable manner. As particularly disclosed in the drawings, the lower or base portion of a frame 18 is threaded onto the upper portion of a light socket 16, in a known manner. A harp 19, or shade support, which may be made of suitable wire, is secured to the frame base 20, extending upwardly around the incandescent light bulb 11, the side portions of the harp being secured to a suitable upper ring or frame portion 21, on which the lamp shade 17 may rest, the shade enclosing the electric light bulb to minimize light transmission in a lateral outward direction.

The device 10 for reflecting and focusing the heat rays emanating from the incandescent light bulb 11 is also carried by the lamp base 14, stem 15 and light socket 16. As specifically shown, the frame base 20 has a pair of diametrically opposed sockets 22 extending upwardly therefrom, which receive the lower ends of opposed lower side members 23, which may be made of suitable wire, fitting firmly into the sockets, the upper ends of the lower side members extending into sleeves 24 which frictionally engage these side members. The sleeves are attached to upper side members 25 extending thereinto, these upper side members extending upwardly and terminating in a generally circular head 26, from which a frusto-conical guide and support 27 for the cigarette 13 is mounted, as by securing tabs 28 to the upper end of the guide 27 and bending them around the wire head member 26. The frusto-conical guide 27 converges in a downward direction and has a lower opening 29, which may be slightly smaller than the diameter of the cigarette, so as to frictionally hold the latter when it is forced thereinto.

A generally ellipsoidal reflecting and focusing device is carried by the side members 25. As specifically disclosed, the reflecting and focusing is accomplished by a plurality of longitudinally spaced, ring-like members 30 suitably secured, as by welding or soldering, to the upper side members 25. The inner surfaces 31 of these members are actually portions of ellipsoids, preferably having common foci 32, 33. The inner surface 31 of each ring-like member is made reflecting, as, for example, by depositing a chromium coating thereon. Light and heat rays from a suitable source, such as an incandescent light bulb 11, will strike the ellipsoidal reflecting surfaces 31 of the longitudinally spaced ring members 30 and will converge at a particular general location 33.

It is a known property of an ellipsoid that if waves are derived from a source placed at one of its foci, such waves will strike all portions of the ellipsoid and will converge at the other focus of the ellipsoid. This phenomenon is taken advantage of in the present instance by locating the ellipsoidal reflecting and focusing rings 30 with respect to the filament of the incandescent light bulb or envelope 11 such that the filament lies at one of the foci 32 for all of the ellipsoidal members. In view of the fact that the lower side members 23 are frictionally held in the sleeves 24, suitable adjustment may be made to locate the filament of the incandescent lamp bulb at focus 32 of the ellipsoidal members 30. The sleeves 24 actually provide frictional slip joints with the lower side members 23, and allow the sleeves 24 and the upper side members 25 to be moved with respect to the lower side members 23, for the purpose of adjusting the ellipsoidal rings 30 until the lamp filament lies at approximately one of the foci 32 for all of the ellipsoidal members.

The guide and receptacle 27 is so related to the reflect-

ing and focusing ring members 30 that a cigarette 13 inserted in the guide, with its lower end 12 projecting slightly below the lower end of the guide (see Fig. 3), will have such lower end located at approximately the other focus 33 of all of the ellipsoidal members. Thus, heat rays emanating from the incandescent lamp bulb filament will strike all surfaces 31 of the ring members 30 and will be reflected and converged by the inner surfaces of such ring members onto the lower end 12 of the cigarette 13, concentrating and focusing an exceedingly large amount of heat from the lamp bulb 11 on this lower end, securing full ignition and burning of the end of the cigarette in a comparatively short time, depending, of course, upon the design of the apparatus and the power of the light bulb. As an example, assuming the light bulb to be rated at 150 watts, a cigarette can be completely ignited within about ten seconds.

Inasmuch as the ellipsoidal ring members 30 do not transmit any light therethrough, they tend to baffle the incandescent light bulb 11 to some extent. To minimize such baffling action, the ellipsoidal ring members 30 are preferably longitudinally separated from one another, providing spaces 35 through which a substantial amount of the light rays from the lamp can pass. Such longitudinal spacing also permits the ambient air to pass through and between the ring-like members 30, for the purpose of cooling them. The action of the air in cooling the members 30 is preferably retarded, however, by a baffle or retarding disc 36 on the lower end of the frusto-conical guide member 27, which is suitably secured thereto by a lower flange 37 on the latter engaging the undersurface of the disc 36.

The ellipsoidal reflecting ring members 30 preferably do not all lie upon a common ellipsoid having their two foci 32, 33 at the filament of the incandescent lamp bulb 11 and at the lower end 12 of the cigarette. All of the ring members 30 could lie on a single ellipsoidal surface, but the over-all lateral size of the reflecting and focusing device would be enlarged considerably over that disclosed in the drawings. For example, if the ellipsoid of the lowermost ring member 30 extended upwardly to the location of the uppermost ring member 30, then the minor axis of such an ellipsoid would extend laterally outward from the longitudinal axis of the device to a much greater extent than illustrated in the drawings, making the device comparatively bulky. The size of the device is reduced, while retaining the heat reflecting and focusing capacity of a single ellipsoidal member extending along the whole length of the device, by forming each ring member as a portion of an ellipsoid having a different major and minor axis from the other ring members, but all of such ellipsoids possessing the same foci 32, 33. Thus, the lowermost ring member 30 will lie on an ellipsoid having a particular major and minor axis, whereas the next uppermost ring member 30 will lie on an ellipsoid having a lesser minor axis, but the same foci as the lower member. In similar fashion, the minor axes of the next succeeding ring members will progressively decrease in length, all of which has the effect of reducing the distance across each ring member 30 in a direction at right angles to the longitudinal axis of the device, while still providing ellipsoidal reflecting surfaces that will reflect and focus the heat waves emanating from the light bulb 11 to the other focus 33 at which the end 12 of the cigarette 13 is located. Since the minor axes of the ring members 30 are progressively being reduced in an upward direction, as shown in the drawings, the over-all transverse dimensions of the apparatus can be reduced substantially. The foregoing features are represented diagrammatically in Fig. 5.

It is, thus, apparent that a radiant energy ignition device for cigarettes, and the like, has been provided which is adaptable to standard incandescent light bulbs, requiring no change whatsoever in the latter. The ring-like members 30 may all lie on different ellipsoidal members, all of which have the same foci, so as to reflect heat waves from the incandescent lamp source onto the lower end of the cigarette. The provision of the separate ellipsoidal ring members 30 allows them to lie on different ellipsoids to reduce the over-all size of the apparatus, while allowing air to pass through the device for the purpose of cooling it. At the same time light rays can also pass through the device.

The inventor claims:

1. In ignition apparatus for cigarettes and the like: a support; a generally ellipsoidal member carried by said support and having an inner reflecting surface; an incandescent light bulb separate from said member carried by said support and having a light source disposed substantially at one focus of said member; and means carried by said support for holding a cigarette with the end portion of the cigarette located at substantially the other focus of said member, the ellipsoidal portion of said member terminating in a plane adjacent said other focus of said member.

2. In ignition apparatus for cigarettes and the like: a support; an envelope carried by said support and containing a source of heat energy; a generally ellipsoidal member carried by said support and having an inner reflecting surface and disposed externally of said envelope and with said source located at substantially one focus of said member carried by said support; and means for holding a cigarette with the end portion of the cigarette located at substantially the other focus of said member, the ellipsoidal portion of said member terminating in a plane adjacent said other focus of said member.

3. In ignition apparatus for cigarettes and the like: a support; an envelope carried by said support and containing a source of heat energy; a reflecting and focusing device carried by said support and comprising a plurality of generally ellipsoidal members spaced from each other to provide air spaces therebetween and having inner reflecting surfaces and disposed externally of said envelope and with said source located at substantially a common focus for all of said members; and means carried by said support for holding a cigarette with the end portion of the cigarette located at substantially the other common focus of all of said members, said ellipsoidal members extending from and between planes adjacent said common foci.

4. In ignition apparatus for cigarettes and the like: an envelope containing a source of heat energy; a reflecting and focusing device comprising a plurality of ellipsoidal members longitudinally spaced from each other and having inner reflecting surfaces; the longitudinal spacing of said members from each other providing spaces therebetween through which air can circulate; said members being disposed externally of said envelope and with said source located at substantially a common focus for all of said members; and means for holding a cigarette with the end portion of the cigarette located at substantially the other common focus of all of said members.

5. In ignition apparatus for cigarettes and the like: an envelope containing a source of heat energy; a reflecting and focusing device comprising a plurality of generally ellipsoidal members having inner reflecting surfaces and disposed externally of said envelope and with said source located at substantially a common focus for all of said members; and means for holding a cigarette with the end portion of the cigarette located at substantially the other common focus of all of said members; said generally ellipsoidal members having different minor axes.

6. In ignition apparatus for cigarettes and the like: an envelope containing a source of heat energy; a reflecting and focusing device comprising a plurality of ellipsoidal members longitudinally spaced from each other and having inner reflecting surfaces; the longitudinal spacing of said members from each other providing spaces therebetween through which air can circulate; said members being disposed externally of said envelope and with said

source located at substantially a common focus for all of said members; and means for holding a cigarette with the end portion of the cigarette located at substantially the other common focus of all of said members; the minor axes of said generally ellipsoidal members decreasing in length from said source toward said holding means.

7. In ignition apparatus for cigarettes and the like: an electric lamp adapted to receive an incandescent light bulb having a light source; a generally ellipsoidal member separate from the light bulb and supported by said lamp and having an inner reflecting surface; means carried by said lamp for holding a cigarette with the end portion of the cigarette located at substantially one focus of said member; said light source being disposed at substantially the other focus of said member when received in said lamp, the ellipsoidal portion of said member terminating in a plane adjacent said one focus of said member.

8. In ignition apparatus for cigarettes and the like: an electric lamp adapted to receive an incandescent light bulb having a light source; a reflecting and focusing device comprising a plurality of ellipsoidal members longitudinally spaced from each other and having inner reflecting surfaces; the longitudinal spacing of said members from each other providing spaces therebetween through which light can pass; means carried by said lamp for holding a cigarette with the end portion of the cigarette located at substantially one common focus of said members; said light source being disposed at substantially the other common focus of said members when received in said lamp.

9. In ignition apparatus for cigarettes and the like: an electric lamp adapted to receive an incandescent light bulb having a light source; a reflecting and focusing device comprising a plurality of ellipsoidal members longitudinally spaced from each other and having inner reflecting surfaces; the longitudinal spacing of said members from each other providing spaces therebetween through which light can pass; means carried by said lamp for holding a cigarette with the end portion of the cigarette located at substantially one common focus of said members; said light source being disposed at substantially the

other common focus of said members when received in said lamp; the minor axes of said generally ellipsoidal members decreasing in length from said source toward said holding means.

10. In ignition apparatus for cigarettes and the like: an electric lamp adapted to receive an incandescent light bulb having a light source; a generally ellipsoidal member separate from the light bulb and supported by said lamp and having an inner reflecting surface; a lamp shade carried by said lamp and enclosing said member and light bulb, said shade having an opening in its upper end; means carried by said lamp and accessible through said shade opening for holding a cigarette with the end portion of the cigarette located at substantially one focus of said member; said light source being disposed at substantially the other focus of said member when received in said lamp, the ellipsoidal portion of said member terminating in a plane adjacent said one focus of said member.

11. In ignition apparatus for cigarettes and the like: an electric lamp adapted to receive an incandescent light bulb having a light source; a reflecting and focusing device comprising a plurality of ellipsoidal members longitudinally spaced from each other and having inner reflecting surfaces; the longitudinal spacing of said members from each other providing spaces therebetween through which light can pass; a lamp shade carried by said lamp and enclosing said device and light bulb, said shade having an opening in its upper end; means carried by said lamp and accessible through said shade opening for holding a cigarette with the end portion of the cigarette located at substantially one common focus of said members; said light source being disposed at substantially the other common focus of said members when received in said lamp.

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