Feb. 12, 1935. J. KENNELLY 1,991,101

OSCILLATORY LAMP STRUCTURE

Filed Jan. 31, 1934 2 Sheets-Sheet 1

Fig. 2.

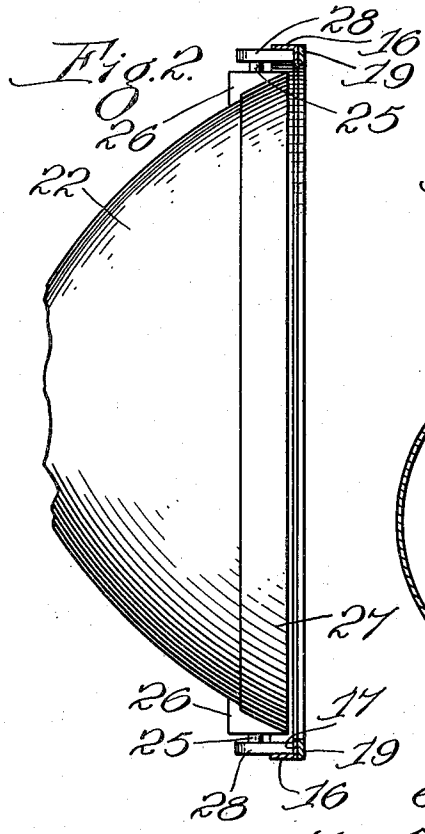


Fig. 1.

Inventor:
Jeremiah Kennelly.
By Dyrenforth, Lee, Chrittor & Wiles
Attys.

Feb. 12, 1935. J. KENNELLY 1,991,101

OSCILLATORY LAMP STRUCTURE

Filed Jan. 31, 1934 2 Sheets-Sheet 2

Fig. 3.

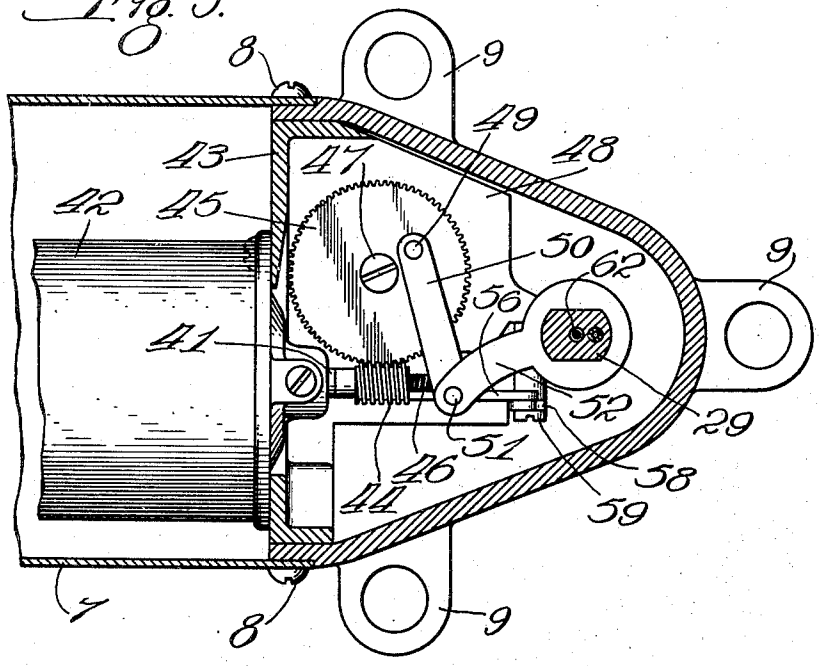
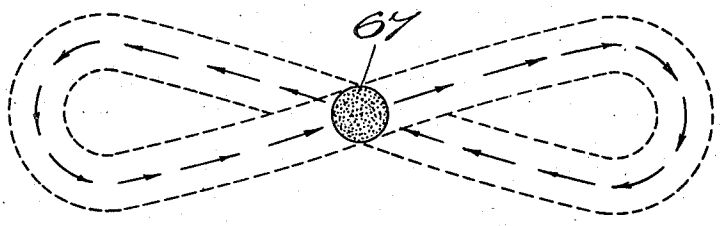


Fig. 4.



Inventor:
Jeremiah Kennelly.
By Dyer, Holt, Lee, Christy & Wiles.
Attys.

Patented Feb. 12, 1935

1,991,101

UNITED STATES PATENT OFFICE

1,991,101

OSCILLATORY LAMP STRUCTURE

Jeremiah Kennelly, Oak Park, Ill.

Application January 31, 1934, Serial No. 709,213

5 Claims. (Cl. 240—48)

My invention relates to lamp structures of the type involving means whereby the beam of light projected by the lamp is caused to oscillate, as for example, and more particularly, for signal or warning purposes, one of the more particular purposes for which my improved lamp structure was devised being for use on emergency cars, for example fire trucks, police cars, ambulances and the like, to warn pedestrians and vehicles of the approach of such cars.

My primary objects are to provide a novel, simple and positively operating construction of oscillatory lamp structure of the character above referred to; to provide for the oscillation of the beam of light in an endless curved path and preferably along a substantially figure 8 shaped path; and other objects as will be manifest from the following description.

Referring to the accompanying drawings:

Figure 1 is a view in longitudinal sectional elevation of a lamp structure embodying my invention.

Figure 2 is a broken view in elevation, with certain parts sectioned, of the reflector portion of the lamp structure and a portion of the supporting means therefor.

Figure 3 is a broken plan sectional view taken at the line 3 on Fig. 1 and viewed in the direction of the arrow; and

Figure 4, a diagrammatic view illustrating the path traversed by the beam of light projected from the lamp structure.

The structure shown comprises a casing 5 shown as of general rectangular form except at its forward end which is of tapering shape. The casing 5 is formed of a front casing section 6 open at its bottom and at its rear end, and a casing section 7 which extends over the open bottom and end of section 6 and is secured thereto as for example by screws represented at 8. The casing section 6 is shown as provided with apertured lugs 9 for receiving means, such as bolts (not shown) for securing the casing in position of use, as for example in horizontal position on the vehicle to which it is to be applied.

The lamp proper of the device is represented at 10 and is shown as comprising a casing section 11, as for example of sheet metal, open at its forward end adjacent to which latter it is peripherally grooved as represented at 12. The bottom portion of the casing 11 and represented at 13, and which is reinforced by a plate 14, is provided of flat form as shown and contains an elongated opening 15 for assembly with means hereinafter described for pivotally supporting the lamp proper on the casing 5.

Telescoping with the outer open end of the casing 11 is a ring 16 having an inturned annular flange 17 against which the lens 18, with a gasket 19 interposed, is held by a transversely split clamp ring 20. The ring 20 laps the peripheral edge of the lens 18 and also extends into the groove 12 in which position it is rigidly held as by means of a bolt 21 engaging the ends of the ring 20 at its split portion.

The lamp proper also comprises a reflector 22, an electric light bulb 23 and the usual electric socket structure 24 into which the bulb 23 extends.

The reflector 22, together with the bulb 23, is oscillatorily mounted on the casing 11 and to this end the reflector is provided with diametrically opposed trunnions 25 carried by bosses 26 provided on a reflector band 27 at the forward end of the reflector, the trunnions 25 being journalled in rearwardly extending ears 28 carried by the ring 16, the trunnions 25 being disposed, as shown, in a plane normal to the plane of the axis about which the casing 11 is oscillatable.

The pivotal mounting of the lamp proper 10 on the casing 5 comprises a shaft 29 extending upwardly through an opening 30 in the thickened forward end 31 of the top portion of the casing section 6, a flange 32 at the lower end of the shaft 29, a cup-shaped bearing member 33 fitted over the upper end of the shaft and having an upwardly extending flange 34 over which the casing section 11 is fitted at its opening 15, and a washer 35 and a nut 36 on the upper end of the shaft above the bearing member 33. The bearing member 33 is shown as provided with a depending annular flange 37 surrounding a hollow boss 38 on the top of the casing section 6 and is held on the shaft 29 against relative rotation of these parts by a pin 39 extending laterally from the shaft 29 and into a groove 40 in the member 33. The nut 36 thus not only holds the lamp proper 10 to the shaft 29 but also holds the flange 32 and the bearing member 33 in proper position relative to the casing 5 to permit of the oscillation of the lamp proper 10 by force applied to the shaft 29 for oscillating the latter.

The structure shown also comprises means for simultaneously oscillating the shaft 29 to oscillate the lamp proper 10 in one plane, as for example in a horizontal plane, and for rocking the reflector 22 at its trunnions 25 in a

plane normal to the plane in which the lamp proper 10 oscillates, to thereby cause the beam of light projected from the lamp structure to travel an endless reversely curved path generally of the shape of the figure 8.

The means shown for this purpose comprise a drive shaft 41 shown as, and preferably, the rotating shaft of a motor such as an electric motor represented at 42 located within the casing section 7 and shown as secured in place therein by attaching it to a frame member 43 rigidly secured in the rear open end of the casing section 6.

The shaft 41 carries a worm 44 which meshes with two worm wheels 45 and 46. The worm wheel 45 which is journalled at 47 on an extension 48 of the frame 43 is provided with a crank pin 49 to which one end of a link 50 is pivoted, the other end of this link being pivotally connected by a pin 51 with the outer end of an arm 52 rigidly secured to the shaft 29 between the flange 32 and a nut 53 secured on the lower end of the shaft.

The worm wheel 46, which is journalled on the extension 48 as indicated at 54, is provided with a crank pin 55 with which one end of a link 56 is pivotally connected the other end of this link being pivotally connected at 57 with the upwardly extending arm 58 of a bell crank lever fulcrumed at 59 on the extension 48 and extending at its other arm 60 into a groove 61 in the lower end of a rod 62 which extends upwardly through the center of, and is reciprocable in, the shaft 29, the upper end of the rod 62 being pivotally connected at 63 with the lower end of a link 64, the upper end of which is pivotally connected at 65 with an ear 66 secured to, and projecting rearwardly from, the reflector 22.

As will be readily understood the shape of the general figure 8 path caused to be traversed by the beam of light projected from the lamp proper 10 and illustrated in Fig. 4 at 67 (the arrows therein indicating the path travelled by the beam) the particular form of such path will depend upon the relative sizes of the worm wheels 45 and 46. Where, as in the construction shown, the form of such path is relatively long and narrow as represented in Fig. 4, the path of the crank-pin on the worm-wheel 45 ordinarily would be considerably larger than that of the crank-pin on the worm-wheel 46. The relative throws of the crank-pins and the lever-connections actuated thereby determine the amplitudes of the lateral swing of the lamp and the vertical tilt of the lamp. However, since the rates of oscillations depend upon the rates of rotations of the worm-wheels, the point where the path of the beam crosses itself (point 67, Fig. 4) will vary, where, as in the illustration given, the worm-wheels rotate at different speeds. It may be added that in the illustration given the tilting of the reflector 22 on the pivots 25 is comparatively slight. In the tilting movement, the rim 27 of the reflector is free to swing through the ring 16. Sufficient clearance is allowed between the front edge of the reflector and the lens 18. Should the amplitude of the tilting movement of the reflector be increased, it will be necessary, of course, to make sufficient allowance for clearance.

While I have illustrated and described a particular construction embodying my invention, I do not wish to be understood as intending to limit it thereto as the same may be variously modified and altered without departing from the spirit of the invention.

What I claim as new, and desire to secure by Letters Patent, is:

1. A structure of the character set forth comprising: a supporting-frame; an oscillatable vertical tubular shaft mounted therein; a lamp-casing fixedly carried by said tubular shaft; a tiltable reflector in said lamp-casing having lateral pivotal connections with the lamp casing; a vertically reciprocable plunger working through said tubular shaft and operatively connected to effect tilting of the reflector; an electric motor mounted in said supporting frame; and drive-connections actuated by the armature of said motor having means for oscillating said tubular shaft and means for reciprocating said plunger.

2. A device as specified in claim 1, in which said drive-connections comprise a pair of worm wheels disposed at an angle to each other and a worm on the armature-shaft serving to actuate said gears, said gears being equipped with crank pins through the medium of which said tubular shaft and said plunger, respectively, are actuated.

3. In a structure of the character set forth: a horizontally disposed supporting-housing equipped with means for mounting the same on an automobile; an electric motor mounted in the rear portion of said housing having a forwardly extending armature shaft equipped with a worm; a horizontally disposed worm-wheel and a vertically disposed worm-wheel mounted in the forward part of said housing and actuated by said worm, said worm wheels being equipped with crank pins; a tubular shaft oscillatably mounted in the upper front portion of said housing having its lower end equipped with an actuating arm operatively connected with the crank pin of said horizontal worm wheel; a plunger working through said tubular shaft and having connections with the crank pin of said vertical worm wheel; a lamp-casing fixedly mounted on the upper end of said tubular shaft to oscillate in a horizontal plane; a lamp-equipped reflector having lateral pivotal connections with the front portion of said lamp-casing; and a connection between the upper end of said plunger and said reflector whereby tilting of the reflector in a vertical plane is effected by said plunger.

4. A structure as specified in claim 3, in which said tubular shaft has its upper portion equipped with a bearing-cap fixedly related to the shaft and the lower portion of the lamp-casing, and the front upper portion of said housing is equipped with a bearing engaged by said cap.

5. In a structure of the character set forth: a lamp-casing having fixedly secured to its lower side a depending tubular shaft; a lamp-equipped reflector tiltably mounted in the front portion of said lamp-casing to swing in a vertical plane; reflector-tilting means depending through said tubular shaft; a supporting-housing in the upper front portion of which said tubular shaft is mounted for oscillation; and a continuously operating motor in said housing equipped with means for continuously oscillating said tubular shaft and continuously actuating said reflector-tilting means.

JEREMIAH KENNELLY.