

Sept. 24, 1935.

A. SPRUNG

2,015,442

BEACON LIGHT

Filed Nov. 20, 1934

2 Sheets-Sheet 1

Fig. 1.

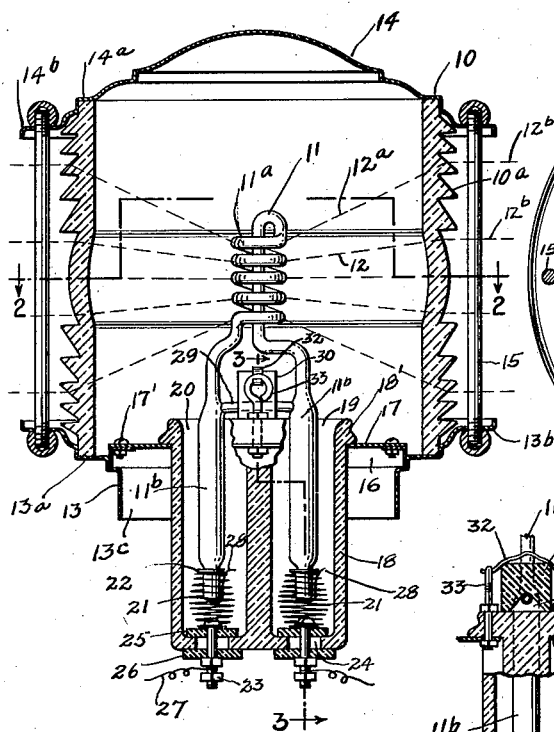


Fig. 2.

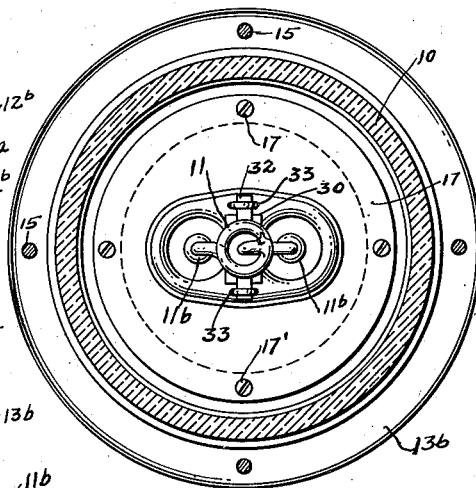


Fig. 3.

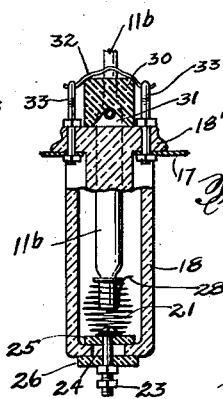


Fig. 4.

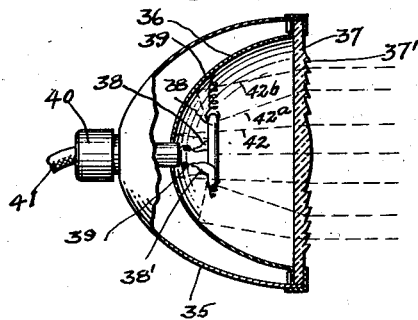
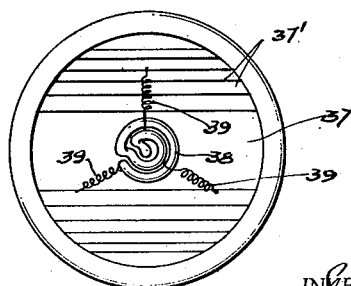


Fig. 5.



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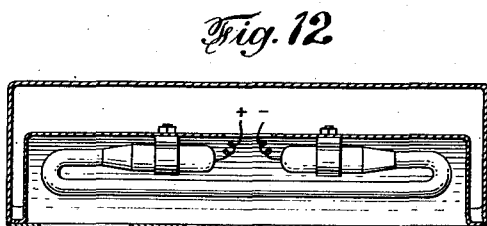
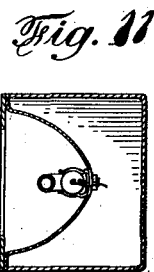
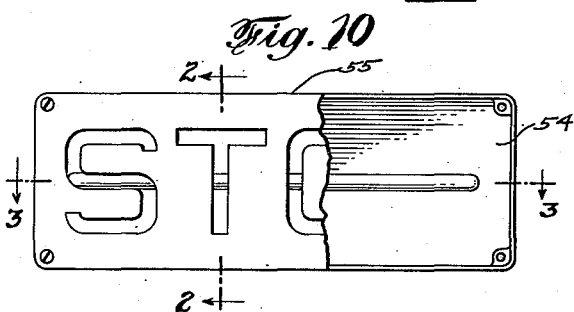
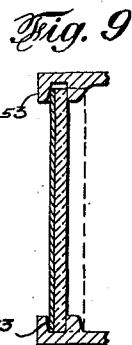
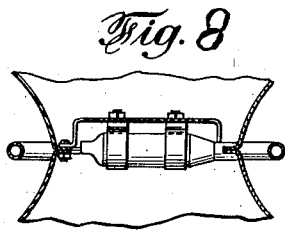
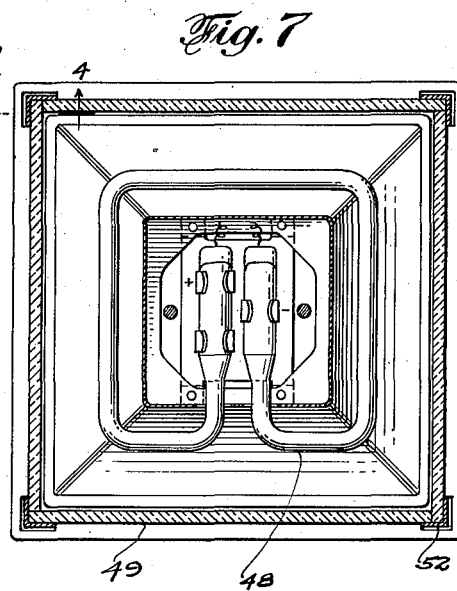
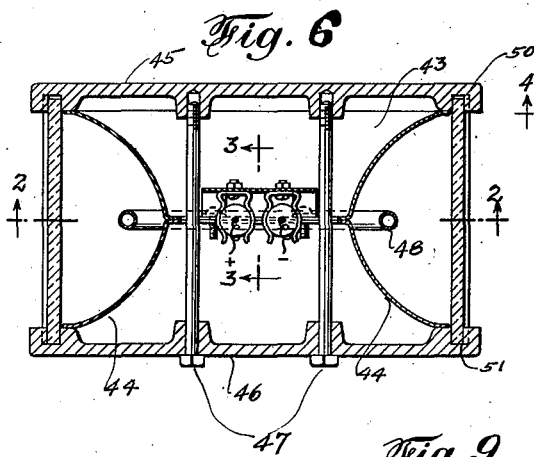
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2 Sheets-Sheet 2



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2,015,442

BEACON LIGHT

Abraham Sprung, New York, N. Y.

Application November 20, 1934, Serial No. 753,830

5 Claims. (Cl. 240—11.4)

This invention relates to new and useful improvements in beacon lights, warning lights and the like.

The invention has for an object the construction of a device as mentioned which is characterized by the provision of a luminous tube, massed or concentrated at the focal point of a lens of a beacon light, warning light or the like, for providing the illumination signal of the device. The feature of this construction is that the effectiveness of the light of the luminous tube will be greatly enhanced.

It is old to use luminous tubes, such as neon tubes for beacon lights, and signal devices. But, in all such prior constructions it was customary to arrange the luminous tubes in an unconcentrated mass consisting of a plurality of tubes arranged adjacent each other. The defects of such constructions were, first, that because no provision was made for concentrating the rays of the luminous tubes, the efficiency of the devices were extremely low and necessitated the use of a large number of luminous tubes; and second, because of the use of a large number of luminous tubes there was great possibility of breakage and damage. Prior devices also contained other and numerous defects, among them prominently, being the mounting of the luminous tubes in rigid association with the housings of the devices, so that vibrations from external sources could travel through the housings and readily reach the tubes, to the detriment of the tubes.

It is an object of this invention to construct a beacon light, warning light or the like so that a very small quantity of luminous tube is concentrated at an advantage point and is capable of producing sufficient light for the requirements of the device.

A still further object of the invention is to support a luminous tube in such a manner that external vibrations cannot possibly reach the tube. It is generally known that one of the main causes for damage to luminous tubes is continuous vibrations from external sources.

A still further object of this invention is a novel construction of the luminous tube wherein it is provided with electrodes extending in a novel manner into electrode receptacles, and associated with resilient means for the resilient supporting of the tube.

Still further, the invention also proposes an arrangement wherein the luminous tube is supported between opposed resilient means so as to be retained in a stationary position and be insulated from vibrations in any and all directions.

Still further, the invention contemplates the arrangement of the parts in such a manner that the beacon light, warning light or the like can have a reflector and lens, of various commercial designs co-operating with the luminous tube. For example, parabolic reflectors, and lenses of the fresnel and circular types can be used.

It is a further object of this invention to produce a device of the class mentioned which is simple and durable, and which can be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are most particularly set forth.

In the accompanying drawings forming a material part of this disclosure:—

Fig. 1 is a vertical section view of a beacon light constructed according to this invention using a fresnel lens.

Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary vertical sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is a side elevational view of a warning light constructed according to a modification of this invention; a portion of this figure being shown broken away to illustrate interior parts.

Fig. 5 is a front elevation view of the device shown in Fig. 4 looking from the right hand side.

Fig. 6 is a vertical sectional view of modification of this invention.

Fig. 7 is a horizontal sectional view taken of line 2—2 of Fig. 6.

Fig. 8 is a horizontal sectional view of line 3—3 showing the support for the electrode terminal.

Fig. 9 is a vertical sectional view of line 4—4 of Fig. 7.

Fig. 10 is a front elevation view showing an application of the modification of this invention; a portion of this figure shown broken away to illustrate the reflecting light in the rear of a cut-out legend.

Fig. 11 is a vertical sectional view taken of the line 2—2 of Fig. 10.

Fig. 12 is a horizontal sectional view taken on the line 3—3 of Fig. 10.

The beacon light, warning light and other de-

vice, according to this invention, includes a lens 10, and a luminous tube 11 massed or concentrated at the focal point of the lens. The lens 10, as shown is of the fresnel type; that is, it is of cylindrical glass construction with a plurality of peripheral refraction surfaces 10a arranged to direct the rays of light in a desired direction. The dash lines 12 show direct rays from the luminous tube; the dash lines 12a show spread rays, and the dash lines 12b show the refracted rays directed in the desired direction.

The lens 10 is associated with a housing whereby the device may be mounted upon a pedestal or other support. The housing comprises a lower housing section 13 engaging the bottom of the lens 10, and an upper housing section 14 engaging the top of the lens. These housing sections are connected by several bolts 15. The top housing section 14 is formed with several circular elements including an area 14a comprising a shoulder for receiving the top of the lens 10 and a portion 14b comprising a flange for the bolts 15. The bottom housing section 13 is also formed with several circular shaped elements including a circular portion 13a forming a shoulder into which the bottom end of the lens 10 engages, and a flange portion 13b for the bolts 15. The bolts 15 are arranged outside of the compass of the lens 10 and are extended between the flanges 13b and 14b. The bottom housing section is also formed with a cylindrical portion 13c adapted to engage the top of a pedestal or other support for the device.

A flange 16 is fitted into a circular recessed portion of the housing section 13 and connects with a horizontal disc 17 which is detachably mounted by means of several bolts and nuts 17'. The disc 17 supports a terminal receiving receptacle 18. This receptacle has two compartments 19 and 20. The receptacle 18 is formed with a top flange 18' which engages the material of the disc 17 around an opening of the same shape as the outside of the receptacle 18 so that the receptacle is supported in position.

The luminous tube 11 comprises a concentrated coil portion 11a terminating in a pair of parallel electrodes 11b. These electrodes extend into the compartments 19 and 20, one electrode into each compartment. The receptacle 18 is of insulation material such as porcelain. A means is provided for resiliently mounting the luminous tube 11 for the purpose previously described.

The mounting of the luminous tube 11 comprises a coil spring 21 in each of the compartments of the terminal receptacle 18 and arranged to engage an electrode contact 22 mounted upon the lower end of each of the terminals of the tube. The springs 21 are fixed in stationary positions by bolts 23 which pass through the bottom of the receptacle. More particularly, the receptacle is formed with openings 24 at the bottom thereof through which the bolts extend. Insulation washers 25 and 26 are arranged upon the top and bottom sides of the bottom of the receptacle and support the bolts. The bolts 23 are provided with pairs of nuts on their extended ends to comprise terminals for the wires, 27. The terminals 11b of the luminous tube are provided with terminal wires 28 which engage the springs 21 to make the electrical circuit.

A bridge piece 29 connects the terminals 11b of the luminous tube, and is arranged at a position slightly above the central wall of the receptacle between the compartments 19 and 20. A resilient or rubber block 30 is mounted over the

bridge 29 and has a bottom recessed portion 31 for receiving the bridge. This block 30 is held in position by a strip 32 positioned over the block and having its ends engaging anchorage bolts 33 mounted upon the flange 18' of the terminal receptacle. The anchorage bolts 33 also serve to connect the terminal receptacle 18 with the disc 17 as clearly illustrated in Fig. 3. Particular attention is called to the fact that the springs 21 resiliently force the luminous tube upwards so that the bridge 29 is in intimate contact with the resilient block 30, and therefore the luminous tube is resiliently supported, and insulated from vibrations in the housing of the device.

The operation of the device is as follows:— Electrical energy may be supplied to the neon tube 11 through the terminals 23 for causing the tube 11 to be luminous. The luminous tube 11 is concentrated at the focus of the lens 10. The rays from the luminous tube will be deflected by the lens 10 in the desired directions. It is a feature of this invention that the luminous tube is massed or concentrated at the focus of the lens. It is a further feature of this invention that the luminous tube 11 is insulated against vibrations from the housing of the device. The luminous tube can be removed and replaced from the device when desired by disconnecting the bolts 15 to separate the housing sections and then removing the lens 10. Furthermore, the disc 17 can be removed when desired, which is an advantage, in that the housing section 13 can therefore be permanently attached to a supporting pedestal. The terminal receptacle 18 can be removed from the disc 17, as desired. The luminous tube can be removed from the device by forcing it slightly downward against the action of the springs 21, and then removing the block 30, which is possible because the strip 32 is now no longer under tension, and may be slipped free from the anchorage bolt 33. The luminous tube can then be lifted out from the terminal receptacle 18.

In Figs. 4 and 5, another embodiment of the invention has been disclosed wherein the luminous tube is also associated with a reflector. More particularly, the device comprises a housing 35 supporting a parabolic reflector 36 and a lens 37. The lens 37 is of the disc type, and is formed with a plurality of refracting surfaces 37'. A luminous tube 38 is resiliently mounted, and massed or concentrated at the focal point of the reflector and lens.

This luminous tube is in the form of a spiral. The resilient mounting comprises several radial springs 39 attached to their inner ends to the tube, and at their outer ends to the reflector 36. The luminous tube 38 is provided with terminals 38' connected by leads 39 to a socket 40, having a cable 41, to which a source of current can be connected. The dash lines 42 indicate direct rays from the luminous tube 38. The dash lines 42a indicate spread rays, and the dash lines 42b the reflected rays. All of these latter rays are also directed as desired by refraction surfaces 37'.

In Fig. 6 is shown a reflecting device comprising a plurality of contiguous elongated concave reflectors, the number of sides not being limited in this invention.

In Figs. 10, 11, 12 is shown one continuous elongated concave which can be used if required with any type of cut-out legend—design—figure or display.

Referring to Figs. 6, 7 in detail, this embodiment of the invention comprises a housing 43

supporting elongated concave reflecting surfaces 44 on four sides. A top member 45 and bottom member 46 encloses these housings through the medium of bolts 47. A luminous tube 48 is mounted within the interior of these housings and runs parallel to the longitudinal axis of the reflectors 44. This tube 48 is preferably located on a line coincident with a line passing through the foci of the elongated reflectors 44.

Protecting glasses 49 are positioned on the outside extremity of the reflector and placed in grooves 50 and 51 of the upper and lower members respectively. Metal angle pieces 52 are inserted at the corners of the intersection of these grooves and hold the glass plates 49 from the outside in place. At the intersection of the grooves and at the place where metal angle pieces are inserted a taper 53 is so arranged in the corners of the grooves of the upper and lower members respectively that when drawing the housing together by means of bolts 47 the angle pieces 52 will be forced in a horizontal inward direction causing the glass panels 49 to be drawn rigidly together.

The grooves 50 and 51 of the upper and lower members as well as the interior of the metal corner pieces are lined with a suitable waterproof and weather-proof materials to prevent any leakage whatsoever into the interior section of the housing.

In assembling these modifications of beacon lights a continuous length of tubing is mounted so that its electrodes or terminals are not exposed to view and at the same time having its luminous tubes positioned parallel to the longitudinal direction and within the confines of the concave reflector surface.

The glass panels 49 are set in the grooves 51 of the lower member then the angle pieces 52 are positioned at the intersections of the grooves on the outside where the glass panels meet. The upper member 45 is then placed over the glass panels thereby enclosing the housing. The upper edges of the glass panels fit in the grooves 50 of the upper member.

The angle pieces 52 will fit in the intersecting grooves in such a manner that the upper and lower ends of the angle pieces 52 contact with the taper 53 located in the groove at said intersection. Bolts 47 engage the upper and lower members by drawing them together; simultaneously closing the housing of the beacon light in a vertical and horizontal manner, the horizontal manner being effected by the angles 52 moving inwardly due to the taper 53 shown in Fig. 9.

The modifications shown in Fig. 10 where the combined reflector and luminous tube 54 is mounted directly behind the cut-out legend 55, producing an illuminated sign.

When elongated concave reflectors are used with the luminous tube running parallel to the longitudinal axis of the reflectors, a sheet of light is obtained instead of a flicker as heretofore has been the case in intermittently flashing beacon and warning lights. Preferably, the concave reflector has a parabolic contour, but obviously, other shapes may be employed without departing from the spirit of the invention. Also, an effective device can be obtained by positioning the luminous tube at other points or a line passing through the foci of the reflectors.

The creating of an intermittent sheet of light is decidedly more effective than the well known flicker or flash for giving warnings of dangerous curves, intersections or the like.

While I have illustrated and described my invention with some degree of particularity, I realize that in practice various alterations therein may be made. I therefore reserve the right and privilege of changing the form of the details of construction or otherwise altering the arrangement of the correlated parts without departing from the spirit or the scope of the appended claims.

Having thus described my invention which I claim as new, and desire to secure by United States Letters Patent is:—

1. In a beacon light, a polygonal continuous reflecting device having each of its sides in the shape of an elongated concave reflector, each reflector being parabolic in cross section and comprising two similar sections removably clamped together along the longitudinal center line of the reflector, both of said sections reflecting light in the same general direction, and a continuous luminous tube encircling the polygonal reflecting device, said tube being positioned at the foci of the reflectors.

2. In a beacon light, a rectangular continuous reflecting device having each of its sides in the shape of an elongated concave reflector, each reflector comprising two similar sections removably clamped together along the longitudinal center line of the reflector, both of said sections reflecting light in the same general direction, and a continuous luminous tube encircling the rectangular reflecting device, said tube being positioned at the foci of the reflectors.

3. In a beacon light, a casing comprising substantially rectangular top and bottom plates having tapered grooves near the edges thereof, angle members extending between the plates and positioned in the grooves at the corners of the plates, panels of transparent material positioned in said grooves and engaging the angles, and means for drawing the plates towards each other to rigidly clamp the panels and angle members in position.

4. In a beacon light, a casing, comprising a top plate and a bottom plate, said plates having tapered grooves near the edges thereof, panels of transparent material positioned in said grooves, means for drawing the plates towards each other to rigidly clamp said panels in position, a rectangular reflecting device supported by said plates, said reflecting device having each of its sides in the shape of an elongated concave reflector, each reflector comprising two similar sections joined together along the longitudinal center line of the reflector, and a continuous luminous tube encircling the rectangular reflecting device, said tube being positioned at the foci of the reflectors.

5. In a beacon light, a casing, comprising a top plate and a bottom plate, said plates having grooves near the edges thereof, and tapered at their intersections, angle members, extending between the plates and positioned in the tapered grooves at their intersections, panels of transparent material positioned in said grooves, and engaging the angles, and means for drawing the plates towards each other to rigidly clamp the panels and angle members in position, a reflecting device supported by said plates, said reflecting device comprising a continuous elongated concave reflector, and continuous luminous tubing positioned within and parallel to the said elongated concave reflector.

DISCLAIMER

2,015,442.—*Abraham Sprung*, New York, N. Y. BEACON LIGHT. Patent dated September 24, 1935. Disclaimer filed December 7, 1936, by the patentee; the assignee, *C. F. Burgess Laboratories, Inc.*, consenting and joining in. Hereby enters this disclaimer to claims 1, 2, and 4 of said Letters Patent. [Official Gazette December 29, 1936.]