

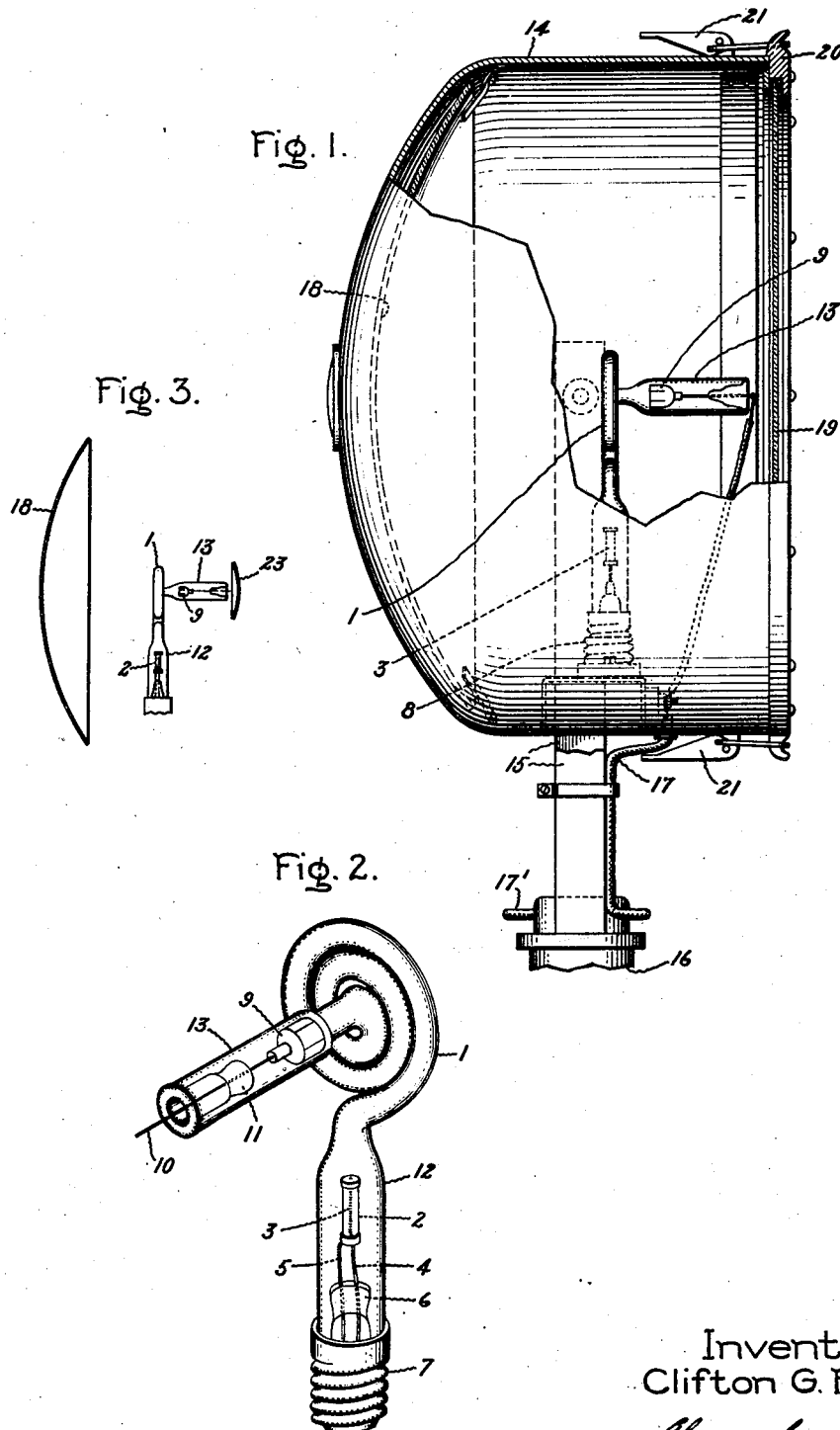
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GASEOUS BEACON LAMP

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GASEOUS BEACON LAMP

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The present invention relates to the construction of a gaseous glow lamp which is suited particularly for use in projectors.

Neon glow lamps, because of their predominant reddish orange radiation, are well suited for signal purposes. For aviation signals neon lamps are peculiarly well adapted as they can be seen through fog greater distances than ordinary lamps.

Attempts have been made to adapt neon lamps for use with reflectors but for various reasons difficulties have been experienced. The low intrinsic brilliancy of neon lamps as heretofore constructed has been disadvantageous to the development of a projector outfit.

I have discovered that a neon, or other gaseous ionization lamp when provided with a thermionic cathode can be constructed with a tubular container wound upon itself in compact form and that although the current flows in opposite directions in adjacent turns, the lamp can be started at low voltage and can be operated at extraordinarily high intrinsic brilliancy at commercial distribution voltages. Also in accordance with my invention such a high intensity lamp is arranged with a reflector to produce a beam of reddish light.

My invention will be more fully explained in the following specification and will be pointed out with particularity in the accompanying claims. The drawing shows in Fig. 1 in side elevation a projector containing a lamp embodying my invention, the casing of the projector being in part broken away; Fig. 2 shows such a lamp in perspective; and Fig. 3 is a diagram illustrating a modification.

Referring to the drawing, a lamp embodying my invention as best shown in Fig. 2 comprises a tubular container, preferably consisting of vitreous silica, a portion 1 of the container being coiled to form a compact disc-like-body, its walls being in immediate juxtaposition and its axis being substantially in the same plane, for example, as a spiral with closely adjacent sides. At one end of said container is provided a thermionic cathode 2, comprising a nickel tube coated externally with a thermionically active material and being provided with an interior heater 3. The heater is connected at one end to leading-in wire 4, the open end being connected by welding or otherwise to the cylinder 2 which in turn is connected to a leading-in wire 5. The cylinder 2 may consist of nickel and may be coated during manufacture with barium carbonate. Preferably suitable carbonizable binder such as a solu-

tion of a cellulose compound and an organic solvent may be mixed with the barium carbonate to form a paste which is applied upon the surface of the nickel cylinder. Such a coated cathode is activated by heating close to the melting point of nickel in a maintained vacuum. The heater 3 may consist of tungsten, molybdenum, or other suitable refractory material. The leading-in wires 4, 5 are sealed into a glass stem 6 and connected into an external screw base 7 to which electrical contact may be made in the usual way by means of a socket 8 (Fig. 1). At the opposite end of the coiled container is an anode 9 connected to a leading-in wire 10 which is sealed into the stem 11. The glass stems 6 and 11 are sealed into the quartz container by graded or step seals in the usual well understood manner. The anode 9 may consist of iron, aluminum, nickel, or molybdenum.

Although the proportions and other structural features may be varied considerably within the confines of my invention, I may say that for illustrative purposes I have found suitable for use in a beacon a lamp comprising a quartz tube having a length of about 25 centimeters and having an inside diameter at the narrower light-giving zone between the electrodes of about 5 millimeters. The diameter of the electrode chambers 12, 13 may be about 30 millimeters. Such a quartz lamp will operate satisfactorily when filled with neon at a pressure of about 2 to 5 millimeters of mercury. It may be operated with a current of 5 to 10 amperes and at an impressed potential of about 125 volts. Although preferably some resistance should be included in the main energy supply circuit of the lamp this is not required. The cathode heater 3 which is connected in series with the lamp functions as a resistance.

As shown in Fig. 1 a gaseous ionization lamp embodying my invention may be mounted within a projector having a casing 14 and supported upon arms 15 which may be rotated during operation by a mechanism (not shown but indicated broken away at 16). Electric current is supplied through a contact-making device (not shown) permitting rotation, the current being supplied to the electrodes by conductors 17, 17'.

The small diameter illuminating portion 1 of the lamp is so mounted in the socket 8 that its center is located substantially at the focus of a parabolic mirror 18. The front of the projector is provided with a cover glass 19 held within a frame 20 which is secured upon the periphery of the housing 14 by the clamps 21.

If desired a spherical mirror 23 may be provided, as shown in Fig. 3, adjacent the outer end of the right angled tubular portion 13 containing the anode thereby reflecting back toward the parabolic mirror 18 light radiated toward this spherical mirror from the lamp. Preferably this mirror is so arranged that the reflected image is superimposed upon the lamp spiral 1 in such position that the reflected light compensates for the deficiency in light from the walls of the coiled tube thus avoiding the formation of dark bands in the beam. By arranging the coils of the spiral that the contiguous walls of adjacent coils are slightly overlapped by another coil the same effect may be obtained. An outfit of this sort, using for example a reflector of 24 inches diameter and a lamp consuming about 10 watts per square centimeter and giving about 100-125 lumens per square centimeter of external area, can be seen from a distance of several miles even through a foggy atmosphere and has the appearance of a red glowing ball. It is particularly suited for beacon purposes for aviation fields because of its distinctive character.

What I claim as new and desire to secure by Letters Patent of the United States is:—

1. A gaseous glow lamp comprising a tubular container provided with a luminosity-producing gas and electrodes therein including a thermionic cathode, said container being coiled with its

walls in immediate juxtaposition and its axis substantially in the same plane.

2. A lamp comprising a spiral silica container having contiguous walls closely adjacent and located substantially in the same plane, electrodes therefor including a thermionic cathode, and a charge of neon gas at a pressure of several millimeters of mercury.

3. A luminous unit for electric signs or the like, comprising a panel of transparent material having a convolute passage therein arranged with the several turns of said passage in immediate juxtaposition whereby to form a substantially continuous, uniformly luminous field when filled with a luminous gas, a conductive luminous gas in said convolute passage and electrodes for said gas on the panel at the ends of said convolute passage.

4. A luminous unit for electric signs or the like, comprising a panel of transparent material having a convolute passage therein, the adjacent turns of which are separated by spaces of such inconsiderable width that a substantially continuous, uniformly luminous field is formed when said passage is filled with a luminous gas, a conductive luminous gas in said convolute passage and electrodes for said gas at the ends of said convolute passage.

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