

CATHODE GLOWLAMP

Filed June 21, 1930

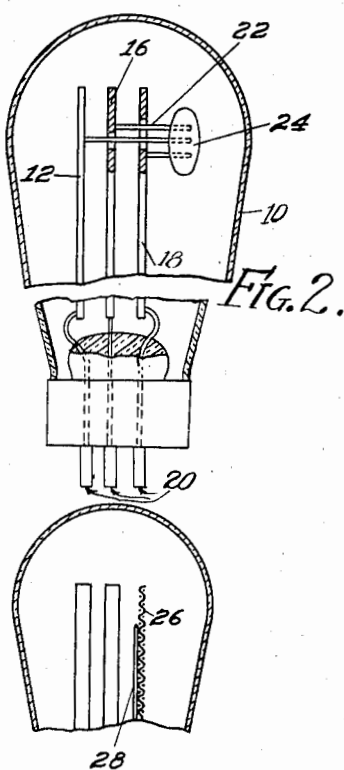


FIG. 2.

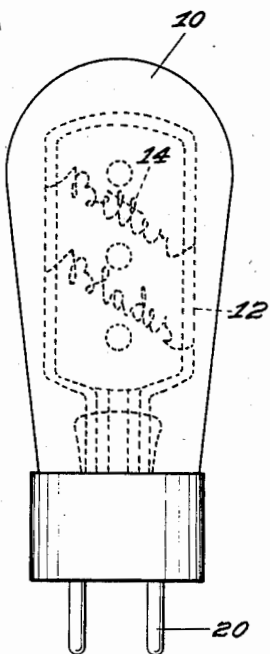


FIG. 1

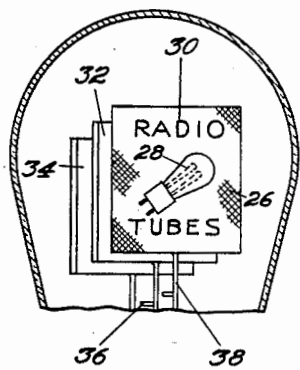


FIG. 3

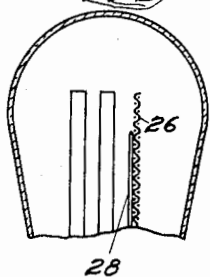


FIG. 4

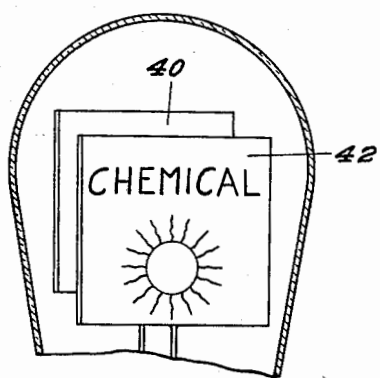


FIG. 5

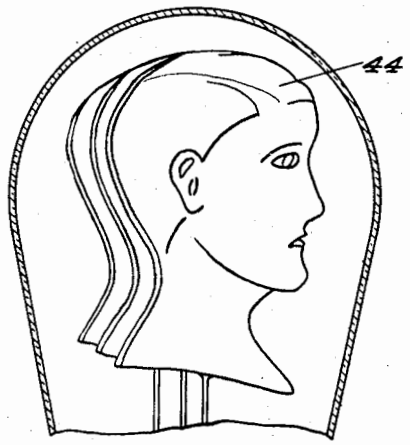


FIG. 6

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2,002,775

CATHODE GLOWLAMP

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Application June 21, 1930, Serial No. 462,744

10 Claims. (Cl. 176-14)

This invention relates to an improved cathode lamp, and has for one of its principal objects the provision of a lamp which utilizes the well-known principle of cathode glow for illuminating or making visible insignia of some sort, such as a letter or picture whereby the lamp is especially adaptable for advertising purposes.

Another important object of this invention is to provide in a glow lamp means for presenting various representations of practically any object in a manner calculated to attract the eye, as by alternately illuminating and darkening the object, or by rendering the object visible against a dark background or dark against a light background, or rendering the object visible against a dark background with illuminated edges or outline, the background being in the shape of some object.

Another object is to arrange electrodes so that with two back electrodes glowing words and pictures attached to a metal screen will be visible in silhouette, then by switching current to front screen and center plate a totally different picture and words are visible. This is arranged by coating the wires of the mesh in desired portions with insulating current, or luminescent chemicals or both, so that when the first picture is viewed in silhouette, the cement has no effect, but when the current is switched to the front mesh, the cement darkens the portion desired.

Another and further important object of the invention is the provision in a cathode glow lamp of a special construction for supporting the various elements such as the electrodes so as to retain the same properly spaced and insulated from each other while at the same time providing a compact and workable construction.

An important feature is low voltage and current necessary for operation. The cathode glow lamps of this invention use about 160 volts.

Other and further important objects of the invention will be apparent from the disclosures in the accompanying drawing and following specification.

The invention, in a preferred form, is illustrated in the drawing and hereinafter more fully described.

In the drawing:

Figure 1 is an elevation of the improved cathode glow lamp used for advertising purposes as embodied in this invention.

Figure 2 is a side elevation of the device showing the improved means for supporting and spacing the electrodes.

Figure 3 illustrates another means of present-

ing an object for visualization in connection with the device.

Figure 4 is a side elevation of the apparatus shown in Figure 3.

Figure 5 illustrates another modification of the invention.

Figure 6 shows still a further modification.

As shown in the drawing:

The reference numeral 10 indicates generally a glow lamp comprising a tube which is filled in the usual manner with a gas such as a rare gas under a low pressure and which has a plurality of electrodes mounted therein which electrodes will emit the customary cathode glow upon the passage of a suitable current of electricity through the tube.

One of the important adaptations of this invention is to make one of the electrodes in the form of a frame of wire or the like as shown at 12 and having some insignia such as letters or the like either attached to or integral with the frame as illustrated at 14. Directly behind the frame 12 but spaced and insulated therefrom is another plate 16 preferably of metal mesh which may be formed to represent some object identified by the wording in the frame 12, and there is also preferably provided a third plate 18 also properly spaced from the other plates, these plates being connected to current-carrying prongs or the like 20 in such a manner that the electric connections can alternately be switched from one plate to the other, whereby either the framework may be caused to glow against the dark background of the object representation 16 or vice versa, and whereby other effects can also be obtained. The particular color of the glow will depend upon the nature of the gas in the tube, such as neon, argon, krypton, mercury, etc. etc.

As best shown in Figure 2, the plates or electrodes are suitably separated at the top and spaced from each other by means of a plurality of horizontally extending bracing rods 22, one of the rods being connected to the back portion of the frame member 12 by means of spot welding or the like, and passing through a suitable opening formed in the electrode 16. Another rod is fastened to the back of the electrode 16, and both of these rods pass through another suitable opening in the plate 18, this plate in turn having a rod fastened thereto and all of the rods are then embedded in a suitable supporting and insulating element such as a bead of glass or the like 24, forming an insulating support of mechanical rigidity invisible from the front.

In Figures 3 and 4 is illustrated another adaptation of the invention wherein the first plate or electrode 26 is composed of a mesh of metallic wire or the like, this mesh having in turn attached thereto and preferably on the back thereof the representation of the object desired to be advertised as illustrated at 28. Words or letters as shown at 30 may also be attached to the mesh. Layers of coarser or finer mesh may be welded together for various half-tone effects. The mesh screens may be turned at angles to each other either in parallel planes or otherwise for different effects. Solid metal fastened to mesh produces black, openings cut in the mesh produce full brilliancy. Different layers, angles or sized, of mesh produce any desired intermediate half-tone. Openings for light may be placed in the representation of the object whereby interior arrangement of the same can be illustrated, when the light from a glowing cathode 32 behind the plate 30 will pass therethrough.

In Figure 5 is shown a plurality of electrodes 40 and 42, one or more of which can be coated or covered in the plates with a chemical adapted to produce an additionally colored light when exposed to high frequency current. This chemical is of some luminescent material such as zinc sulphide which will produce a yellowish green color, or calcium tungstate which will produce a blue color when bombarded by electrons. Obviously, this color may be varied depending upon the particular gas used in the tube and also depending upon the particular chemical used.

In Figure 6 is illustrated a plurality of electrodes, the first of which is formed to represent some certain object as shown at 44, and certain portions of which are covered with insulating paint or cement which will not glow under the electron bombardment, as this film of paint or cement appears dark when the plate becomes covered with luminescent cathode glow as the electrons traveling from the negative to the positive plate, and the ions to the negative plate will avoid the coated portion. In this way, any desired effect of object representation in colors and in very attractive combinations can be accomplished. Further, if a lighter coating of insulating paint or cement is used on some portions of the electrode, different shades of light effects can be created simulating a half-tone picture. This can also be obtained by using tiny dots of cement.

The half-tone effect can also be created by the use of the wire mesh electrode either by varying the spacing between the wires or by forming definite openings therein as distinguished from the remaining portion thereof or by the use of luminescent paint or insulating cement thereon.

In the use of three electrodes, with the front electrode of mesh, and with a source of alternating current connected to the back plates, the front mesh plate not being connected, a half-tone effect picture or words is presented on account of the fact that the glowing middle plate is viewed through the mesh. A further different effect may be produced by coating the individual wires of the mesh so as to insulate the same in desired portions, but without effecting its transparency, a second and different picture or words will be presented to the observer when the circuit is switched to the mesh, and the middle plate. Luminescent chemicals may be used on the screen mesh as heretofore pointed out in connection with a solid plate, and a combination of a solid metal plate, such as nickel, to represent an object, and

other objects formed out of mesh, these being welded or otherwise attached to the front and rear of the mesh electrode, will produce a still further attractive half-tone effect when subjected to a source of potential. A variation of the nickel plate used on the front of the mesh electrode may be used additionally to form part of a second picture produced when the current is switched. This switching can be automatically and intermittently accomplished in various ways such as by a thermostat or some other suitably controlled and operated device.

The effects described above as produced with the use of alternating current in combination with three electrodes, one or two being of mesh, can also be produced by using two electrodes and direct current, one of such electrodes being of mesh and the other a solid plate. When the mesh electrode is positive, the plate will glow, the mesh remaining unilluminated, but any picture on the plate or the outline of the plate will be visible through the mesh. When the polarity is reversed, the mesh being then negative, will glow, thereby producing any picture outline thereon and in the same position so far as the eye of the observer is concerned. Quite startling effects can accordingly be produced.

In the use of alternating current and three solid electrodes, such as illustrated partly in Figure 6, the impression of a source of potential upon the two rear electrodes produces the face or other object formed by the front electrode in outline only upon a glowing background. When the front and middle electrodes are connected to the source of current, the face or other object will appear in half-tone simulation on account of the insulating cement being applied thereto in varying thicknesses.

With the use of luminescent chemicals either alone or in conjunction with insulating cement, various colors in different degrees of brilliancy may be obtained by varying the thickness of the layers or by changing the chemicals themselves.

It will be evident that herein is provided an advertising device in the form of a cathode glow lamp which combines all of the desirable features of an attractive representation of an object to the public in an illuminated background capable of being economically manufactured and susceptible of long and continuous use. Additionally, various combinations of such glow lamps can be used in sequence to form a series of representations of objects either simultaneously or successively presented to the eye. The various color combinations are possibly practically innumerable, thereby enhancing considerably the practical value of this invention.

I am aware that many changes may be made and numerous details of construction varied throughout a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than as necessitated by the prior art.

I claim as my invention:

1. A glow lamp, comprising a sealed envelope having a gaseous filling, a plurality of electrodes within the envelope, each electrode formed of a conducting material adapted to glow when connected to a source of potential, one of said electrodes comprising a sheet of wire mesh, said wire mesh having means thereon producing a half-tone lighting effect when the lamp is viewed from the wire mesh side.

2. A glow lamp, comprising a sealed envelope having a gaseous filling, a plurality of electrodes

within the envelope, each electrode formed of a conducting material adapted to glow when connected to a source of potential, one of said electrodes comprising a sheet of wire mesh, said wire mesh having means thereon producing a half-tone lighting effect when the lamp is viewed from the wire mesh side, said means comprising variations in the spacing between the strands of the mesh.

3. A glow lamp, comprising a sealed envelope having a gaseous filling, a plurality of electrodes within the envelope, each electrode formed of a conducting material adapted to glow when connected to a source of potential, one of said electrodes comprising a sheet of wire mesh, said wire mesh having means thereon producing a half-tone lighting effect when the lamp is viewed from the wire mesh side, said means comprising a coating of a luminescent paint.

4. A glow lamp, comprising a sealed envelope having a gaseous filling, a plurality of electrodes within the envelope, each electrode formed of a conducting material adapted to glow when connected to a source of potential, one of said electrodes comprising a sheet of wire mesh, said wire mesh having means thereon producing a half-tone lighting effect when the lamp is viewed from the wire mesh side, said means comprising a coating of an insulating cement.

5. A glow lamp having three plate-like electrodes arranged in spaced relation side by side, said electrodes having electrical connections whereby electric current may be changed from between one pair of said electrodes to between another pair thereof to cause one of said electrodes to either be covered with a negative against a dark background glow or appear as dark against a glowing background.

6. A negative glow lamp having three plate-like electrodes arranged in spaced substantially parallel relation side by side, said electrodes being so arranged that one serves as a background for another when viewed from the front, said electrodes having external terminals whereby any two of them can be connected to a source of current and covered with a negative glow.

7. A negative glow device arranged to produce both glowing designs against a dark background and dark designs against a glowing background when energized by alternating current which comprises an envelope, a plate-like background electrode therein having an external terminal, a plurality of other display electrodes spaced from said background electrode and obstructing from view only a portion of said background electrode when the device is viewed from the front, said other electrodes also having external terminals whereby connections from a source of alternating current may be shifted between any two of said electrodes.

8. A negative glow lamp having therein three spaced plate-like electrodes capable of acting either as anodes or cathodes and forming together a display pattern in which each forms a distinctive part both when it is energized and when it is deenergized and an electrical connection for each of said electrodes, one of said electrodes being at least partially coated with a material changing the apparent color of its cathode glow.

9. A negative glow lamp having therein three spaced plate-like electrodes capable of acting either as anodes or cathodes and forming together a display pattern in which each forms a distinctive part both when it is energized and when it is deenergized and an electrical connection for each of said electrodes, one of said electrodes having portions of its surface coated with a material changing the intensity of the cathode glow.

10. A negative glow lamp having therein three spaced plate-like electrodes mounted side by side, each of the electrodes being of substantial size and approximately the size of the other electrodes, said electrodes being so arranged and electrically connected that either may become an anode or a cathode and forming together a display pattern in which each forms a distinctive part of the display pattern both when it is energized and when it is deenergized, and electrical connections for said electrodes respectively.

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