Dec. 13, 1938. J. FODOR 2,139,815

SIGN

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Fig. 1.

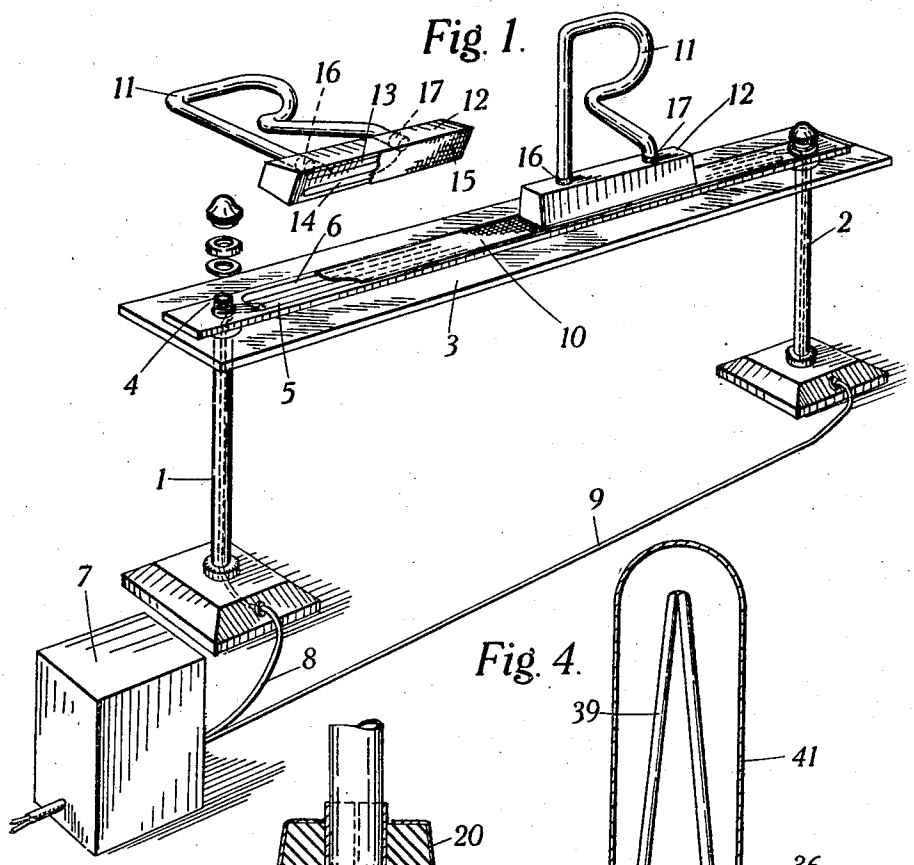
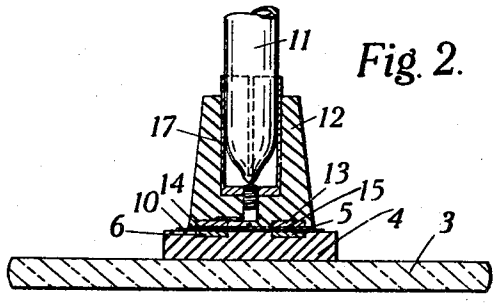


Fig. 3.

Fig. 4.

Fig. 2.



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SIGN

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5 Claims. (Cl. 40—130)

This invention relates to apparatus comprising luminous electric discharge tubes which have either internal or external electrodes, the tubes being fed with high frequency current. The apparatus according to the invention is applicable to advertising and like signs, to boundary lights for aerodromes, race tracks and the like, and to other purposes.

According to the invention, two relatively movable structures are provided each comprising one or more conductors, the conductors of one structure being connected to a source of high frequency supply and the conductors of the other structure being arranged to feed current to a luminous electric discharge tube forming part thereof, and these structures are arranged to be brought together so that the conductors of one are electrostatically or galvanically coupled to the conductors of the other, whereby the tube is fed from the high frequency current.

According to one form of the invention several structures are provided, the conductors of which are arranged to feed current to different luminous tubes, and these structures are arranged to be brought together alternatively or simultaneously with a single structure having conductors connected to a high frequency source and in such a manner that the conductors thereof become electrostatically or galvanically coupled with the conductors connected to the high frequency source.

A feature of the invention is that each luminous tube forms a part of the structure which comprises the conductors from which it is fed. A base, which is preferably of insulating material, supports the tube and carries those conductors which are coupled or connected with the conductors connected to the high frequency source.

This invention is particularly applicable to advertising or like signs since the text of the sign may be easily changed when desired. It is also applicable to boundary lights for aerodromes, race tracks and the like since the structure including the discharge tube is not secured in any way, and, therefore, is easily displaced if hit by any aeroplane or other moving object.

In applying the invention to boundary lights, one or more conductors fed from a high frequency electric source are embedded in insulating material, said insulating material and conductor or conductors forming a single structure which is embedded in the earth with its upper surface substantially level with the surface of the ground. Luminous electric discharge tubes are employed for the boundary lights and each is mounted on a base having one or more conductors situated in or near its bottom surface and arranged to be electrostatically coupled to one or more of the embedded conductors fed from the high frequency source. The base and tube form a movable structure which is preferably of such a shape as to stand stably on the insulating layer which covers the embedded conductors but it is not secured in any way and can, therefore, be easily displaced if hit by a moving object. The high frequency generator may be arranged in a cavity in the ground.

In order that the invention may be more clearly understood reference will now be made, by way of example, to the accompanying drawing in which:—

Fig. 1 shows a perspective view of one form of the invention employing electrostatic coupling and partly cut away to show the construction.

Fig. 2 shows a section through the supporting structure and the structure comprising the discharge tube.

Fig. 3 shows a modified detail.

Fig. 4 shows the invention applied to boundary lights for aerodromes.

Referring to Figs. 1 and 2 of the drawing which show one embodiment of the invention applied to an advertising sign or like device, the structure having conductors connected to the high frequency source, is constituted by a stand having two upright supports 1, 2, to the top of which is connected a sheet of glass 3 which carries a strip of insulating material 4 having two parallel conducting bars of metal 5 and 6 embedded therein and spaced apart. The conductors are fed from the high frequency source 7 by conductors 8, 9 which pass up the respective supporting legs 1, 2 and connect respectively with the conducting bars 5, 6. The upper surface of the strip of insulating material 4 is covered with another layer of insulating material 10, such as by a strip of insulating tape or by painting with insulating varnish.

The luminous tubes 11 in the form of letters, symbols or other desired shape are each carried by a base part 12 to form a movable structure. Embedded in the base part are two conducting bars 13, 14, which are spaced apart at approximately the same distance as the parallel bars 5 and 6. The lower surface of the base 12 and the bars 13, 14 are covered with a layer of insulating material 15, such as a strip of insulating tape or by painting with insulating varnish. The conducing bars 13, 14, are respectively connected to the metallic sockets 16, 17 into which the ends of the luminous discharge tube 11 are inserted and

supported in a vertical position. By positioning the movable structure upon the fixed structure as shown, the conductors in the base part 12 and in the strip of insulating material 4 are substantially in register and electrostatically coupled, whereby the high frequency current applied to the conductors 5, 6 is electrostatically induced into the conductors 13, 14 whereby the tube is fed and may be illuminated.

The conducting bars in the stand and the base parts are preferably covered with insulating material as indicated in order to protect them, but this is not always necessary.

It will be readily understood that by means of the invention any number of luminous discharge tubes, each supported in a movable base part, may be placed upon the stand and illuminated, whereby it is possible to interchange the wording of the sign in a simple and easy fashion. The discharge tubes illustrated in the drawing have no internal electrodes, the sockets 17 constituting the electrodes of the tube. Internal electrodes may, however, be provided if desired.

Instead of arranging two conductor bars in the stand a single bar may be used since it is possible, when using high frequency current, to illuminate the tubes by merely applying the current thereto at one point. In other alternative arrangements more than two bars may be used in the stand and/or in the base part.

The coupling capacity between the conductors in the stand and the conductors in the tube bases may be made different for different tubes so as to give them the high frequency supply appropriate to the different characteristics (for example, size of tube or nature of gas filling) of the different tubes. For example, the thickness of the di-electric between the bars may be different for different tubes, or the length or width of the bars in the structure comprising the discharge tubes may be adjusted to produce the desired coupling capacity.

It is preferable to surround the stand or the part thereof which contains the bars to which high frequency current is supplied, and also the bases of the tubes or the parts thereof which contain the conductors, by metal in order to screen the high frequency conductors and thus prevent them from interfering with local radio reception. One method of effecting this screening is shown in Fig. 3 in which the tube supporting base part 12 is surrounded by a metal screen 20 except at its underneath surface, and the stand 4 is also enclosed by a metallic screen 21 except for its upper surface. Preferably, the screen 21 makes electrical contact with the screen 20 when the base part is stood upon the stand. The screen or screens are preferably earthed.

It will be understood that various modifications may be made. For example, the high frequency generator may be arranged to form a support for the insulating strip or the strip may be arranged at the upper surface of a box or table which contains the high frequency generator, the whole box preferably being made of metal or otherwise screened. Further, clips or other means may be provided for holding the base-parts firmly on the supporting stand. Moreover, several stands may be built together in a single structure and various tubes, each mounted on its base, and having the same or different colours and shapes may be provided to be used in conjunction with the stand simultaneously, or, alternatively. The stand may also be arranged so as to support an ordinary article of commerce to which, for example, the luminous sign relates.

The invention is also applicable to boundary lights for aerodromes, race tracks and the like and one embodiment is illustrated in Fig. 4. The line 30 indicates the ground level and a cavity 31 is formed in the ground and in it a high frequency generator 32 is housed and connected to feed two conductors 33, 34 supported in insulating material near the top of the cavity and covered with a thin layer of insulating material 35, the top surface of which is approximately level with the ground surface.

The boundary lights to be fed from the high frequency generator consist of one or more luminous tubes supported in a base 36, preferably of insulating material, and arranged to be fed from conductors 37, 38 situated at or near the bottom surface of the base and disposed so that they may be brought into register with the conductors 33, 34 in the cavity. The bottom surface of the base 36 may be covered with an insulating layer 42. The luminous discharge tube 39 is preferably arranged to form a vertical inverted V of standardized proportions and preferably has one arm of the V of one colour, for example red, and the other arm of another colour, for example blue. The V may be formed from two tubes of different colours. Means may be provided to make the cavity watertight.

A cover 41 may be secured to the tube supporting base and preferably consists of some transparent material with reinforcement, for example wire mesh. The covers may be coloured, for example in rings, to give a distinctive appearance in day light.

The base for the discharge tube is not secured in any way to the apparatus contained in the cavity and it is, therefore, easily displaced if hit by an aeroplane or other moving object. Means are preferably provided, however, to locate the tube base upon the insulating layer which covers the conductors in the cavity, for example by the spigots 43, which are preferably so arranged as to determine the direction in which the discharge tubes are arranged.

A plurality of cavities may be provided around the aerodrome each containing, as described above, a high frequency generator and embedded conductors. The high frequency generators may be supplied from a common source of power and may be controlled by a common controlling device which may be a simple switch, a flashing switch, or a control switch arranged to supply the generators alternatively or in any desired sequence. According to an alternative embodiment wherein a plurality of boundary lights are employed these may be fed and/or controlled from a common high frequency source.

The apparatus arranged in the cavity and the tube supporting bases may be metallically screened in a manner similar to that described with reference to Fig. 3. The screens are preferably earthed and also if the reinforcement in the cover for the luminous tube is of metal, this may also be earthed, preferably through conductors provided in the base and contacting with earthed conductors provided in the cavity.

Instead of electrostatically coupling the conductors in one structure to the conductors in the other structure as has been described, they may be galvanically connected, by arranging the conductors to make metallic contact when the two structures are brought together. The conductors

may be shaped so as to locate the movable structures on the fixed structure. The conductors in one structure may be of channel form and the conductors on the other structure be in the form of knife edges adapted to engage with the channels.

I claim:—

1. A sign comprising a member, two conductors arranged substantially parallel to one another adjacent the surface of said member, a high frequency generator the output of which is connected to said conductors, a base part movable relative to said member, a luminous electric discharge tube supported by said base part, two conductors extending in substantially parallel directions adjacent the under surface of said base part and connected to feed said luminous discharge tube, the whole being so arranged that when the base part and member are placed together the conductors in said base part are electrostatically coupled with the conductors in the member whereby the high frequency current is transferred to feed the luminous discharge tube.

2. A sign comprising a member, at least one conductor arranged along the length and adjacent the upper surface of said member, a layer of insulating material covering said conductor, a high frequency generator connected to supply high frequency current to said conductor, a plurality of base parts each supporting a luminous electric discharge tube, and at least one conductor arranged along the lower surface of each of said base parts and connected to feed the associated discharge tube, the whole being so arranged that the base parts may be interchangeably arranged one behind the other adjacent the member whereby the high frequency current is transferred from the conductor in the member to the conductors in the base parts and the several discharge tubes are illuminated simultaneously.

3. A sign comprising a member, at least one conductor arranged along the length and adjacent the upper surface of said member, a high frequency generator connected to supply high frequency current to said conductor, a plurality of base parts each supporting a luminous electric discharge tube, at least one conductor arranged along the lower surface of each of said base parts and connected to feed the associated discharge tube, and metallic screens shielding the conductive parts to which high frequency current is fed, the whole being so arranged that the base parts may be interchangeably arranged one behind the other adjacent the member whereby the high frequency current is transferred from the conductor in the member to the conductors in the base parts and the several discharge tubes are illuminated simultaneously.

4. A sign comprising a member, at least one conductor arranged along the length and adjacent the upper surface of said member, a layer of insulating material covering said conductor, a high frequency generator connected to supply high frequency current to said conductor, a plurality of base parts each supporting a luminous electric discharge tube, at least one conductor arranged along the lower surface of each of said base parts and connected to feed the associated discharge tube, metallic screens shielding the conductive parts to which high frequency current is fed, and an earthing connection to said metallic screens, the whole being so arranged that the base parts may be interchangeably arranged one behind the other adjacent the member whereby the high frequency current is transferred from the conductor in the member to the conductors in the base parts and the several discharge tubes are illuminated simultaneously.

5. A sign comprising a structure, at least one conductor arranged in said structure, a high frequency generator, means for feeding the high frequency current to said conductor in said structure, a second structure adapted to rest on said first structure when in the operative relation and to be displaceable therefrom upon impact by moving objects, a luminous electric discharge tube supported by said second structure, and at least one conductor arranged in said second structure and arranged to feed current to the luminous discharge tube, the whole being so arranged that when the structures are arranged in close proximity to one another the high frequency current is electrostatically transferred from the conductor in the first structure to the conductor in the second structure to illuminate the electric discharge tube.

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