Jan. 5, 1937. G. TILLES 2,066,549

LIGHT SIGN DEVICE

Filed Sept. 12, 1932

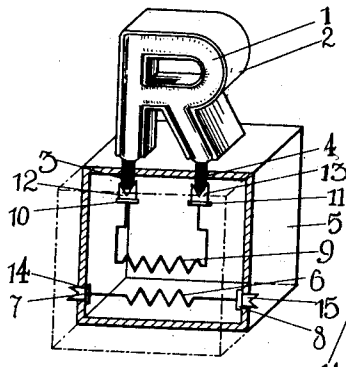


Fig. 1

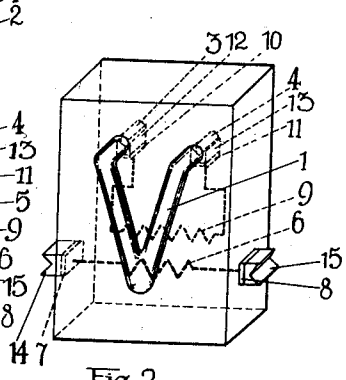


Fig. 2

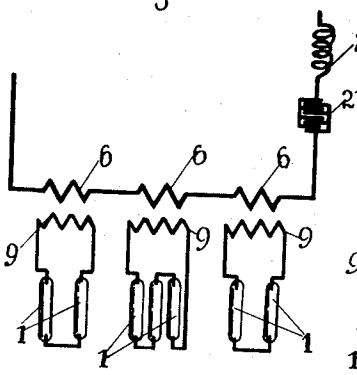


Fig. 3

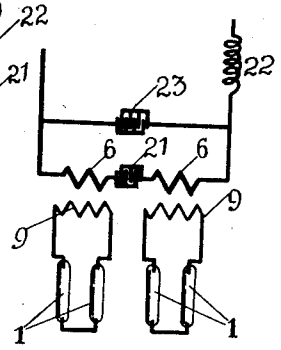


Fig. 4

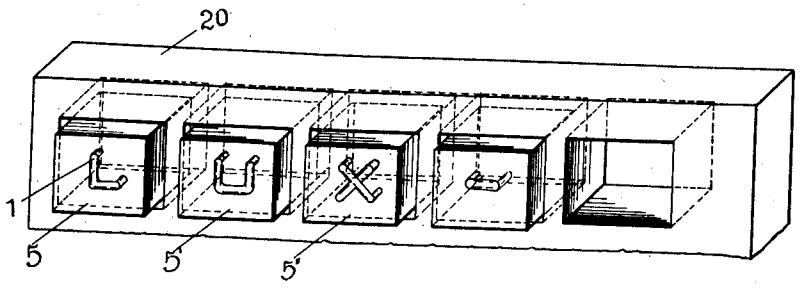


Fig. 5

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Patented Jan. 5, 1937 2,066,549

UNITED STATES PATENT OFFICE

2,066,549

LIGHT SIGN DEVICE

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Application September 12, 1932, Serial No. 632,868
In Austria September 19, 1931

3 Claims. (Cl. 176—124)

This invention relates to a new and improved light sign device for illuminated advertisements and the like, more particularly for indoor use. With the hitherto known luminous tube advertising devices the luminous tubes are connected to high tension transformers. Light signs of this type are subject to high tension regulations, and may therefore be erected only in the open where they can be mounted at a distance of at least 4 metres or thereabouts from the ground. Neon sets of the hitherto known types are moreover very expensive, since they must be provided with expensive safety devices, such as a main circuit breaker, over-voltage protection device, ground wires, and the like.

It has been found that it is by no means necessary to employ a transformer for several thousand volts in order to obtain the light effect peculiar to neon tubes. Exhaustive tests have proved that, given certain preconditions, the voltage of the transformers can be very considerably reduced both on the primary and on the secondary side, without impairing the luminosity of the tubes, and that light signs can therefore be made for lower voltages than those hitherto employed. This result is achieved in accordance with the invention by arranging that each luminous element be connected to a transformer which in its turn is separately and directly connected to a common source of low frequency current, each of these transformers being designed for less than 250 volts on the primary side and for less than 1500 volts on the secondary side. Transformers can thus be employed the dimensions of which amount to but a few centimetres, and which can be mounted together with the luminous tubes without danger indoors. The primary windings of the transformers are preferably connected in series, the terminals of the secondary winding of each of these transformers being connected to a pair of the luminous tube electrodes. In this manner the primary voltage of the transformers can be still further reduced, so that the transformers can be of quite small dimensions. If, for example, the primary winding of each transformer be designed for 8 volts, some 28 transformers can be fed in one current circuit from a supply system of 220 volts. It thus becomes possible to manufacture written signs or the like of considerable length in the form of panels or one-piece signs.

Some examples of the embodiment of the invention are illustrated diagrammatically in the accompanying drawing, in which:

Fig. 1 shows one example of the connection of a letter to a box containing the transformer, in approximately natural size.

Fig. 2 shows a modified form of this connection.

Fig. 3 shows the arrangement of a condenser in series with the series resistance.

Fig. 4 illustrates the employment of a bridging condenser.

Fig. 5 shows a special frame or carrier for the transformer boxes and luminous tubes.

Referring to Fig. 1, the leters or other signs 1 are provided with a frame or holder 2 shaped according to each of the signs. The tubes 1 are each mounted in a vertical position with their electrodes 3, 4 on the upper surface of a box of any desired shape, for instance in the shape of a cube 5, in which the transformer in accordance with the present invention is housed. The primary winding of the transformer is denoted by 6 and the secondary winding by 9, while 7 and 8 denote the terminals of the former, and 10, 11 the terminals of the latter.

The transformers are preferably interchangeably mounted in the boxes 5, so that they are instantly deprived of current on being removed from the boxes. By the insertion of transformers with other luminous elements the written or other sign can be varied at will.

The luminous element can be fixedly or detachably connected to the box 5 which can be made of any desired permissible material, for example sheet metal or insulating material. If the attachment be permanent the terminals of the secondary winding are fixedly connected to the electrodes of the tube. If the luminous tubes are to be made interchangeable, the terminals of the secondary winding, as in the constructional examples shown in the drawing, are taken to spring contacts 12, 13 of any well known type between which the luminous tubes can be plugged in, so that with a certain number of transformers any desired number of combinations of letters or the like can be used.

The individual boxes 5 can be arranged in rows adjacent or above each other, and can be combined in any desired manner to form a unit, with the primary windings of the transformers connected in series. For this purpose the terminals of the primary winding are provided with spring contacts 14, 15 of any well known type, so that the elements, each of which consists of a luminous tube 1, the transformer, and the box 5, together constitute a series of letters, signs, or pictorial representations. These spring contacts can also be brought out from the interior of the elements,

so that the series can be formed by simply sliding the boxes 5 into contact with each other.

In the form of construction shown in Fig. 2 the luminous tubes 1 are placed either directly or in frames against one face of the boxes 5, the arrangement being otherwise the same as that shown in Fig. 1.

With the hitherto described forms of construction, when the luminous tubes are interchangeably mounted, the transformer is not interrupted on the primary side when a tube is removed, since in this case the primary terminals are still connected to the supply system.

In order to enable the number of elements connected to a supply system of a certain voltage to be varied, an adjustable series resistance, for example a choke coil, is provided in one of the end boxes for the purpose of neutralizing excess voltage.

This adjustable series resistance such, for instance, as a choke coil may be of conventional type in order that it may be readily adapted to the number of transformers. The resistance is adjustable as by providing the windings of the coil thereof with a plurality of contacts engageable by a movable contact so that more or less of the coils of the winding may be connected in series as required in accordance with the number of transformers to be supplied. If, however, a condenser 21 of suitable size be connected in series with the choke coil 22 into the primary circuit (Fig. 3) the surprising result is obtained that the transformers, that is to say also the tubes, can be switched on and off as desired without the necessity for regulating the resistance and without appreciable alteration in the charging rate, that is to say in the amount of current taken.

An increase in the number of transformers connected in series is also effected by connecting a supplementary bridging condenser 23 in parallel to the primary transformer windings 6, 6 (Fig. 4).

For the reception of the transformers and of the luminous tubes there can also be provided special carriers, for example special boxes or frames 19 (Fig. 5) into which the transformers 5, 5', 5'' are built. The connection of the luminous tubes to the covering member 20 forming the lid of the box can be effected in any desired manner.

In consequence of the particular construction of the transformer and of the combination of the same with the luminous tubes the invention permits of the manufacturing of advertisement signs of small dimensions which, in view of the low secondary voltage obtainable in accordance with the invention, are suitable for use indoors. The individual elements of the installation (transformer with box and tube) can be sold singly as structural units, can be made capable of exportation, and, in contrast to the hitherto known neon sets, which can only be erected by specially trained electricians for high tension installation work, can be fitted together by any amateur to form any desired and variable text or representation, so that the hitherto necessary and comparatively high costs of assembly and erection are entirely avoided. The combining of the boxes containing the transformers with the signs proper is so effected, in contrast to the hitherto known sets, that no points of connection with the carrier of the luminous tubes are visible, so that the new type of sign, given appropriate framing of the luminous tubes, is also effective as a day-light advertisement.

The new advertising light sign, since it does not employ high frequency current, does not have a disturbing effect upon radio reception which, as is well known, is a serious drawback to the known types of neon installations and the like.

It will be clear that the invention can also be used for advertising and similar purposes in the open, and in this case also the invention opens up new spheres of application, such as the provision of signalling lamps on railways, advertisement signs on automobiles, and the like. The invention can also be used for ornamental purposes in connection with interior decoration work.

I claim:

1. An installation for operating gas discharge tubes supplied by an alternating current lighting network of the usual voltage and frequency comprising individual luminous elements, a separate transformer for each element including a primary and a secondary winding, the secondary windings being connected with the respective luminous elements, a choke coil and a condenser, and means connecting the several primary windings and said choke coil and said condenser in series in said network.

2. An installation as claimed in claim 1 characterized by the provision of a bridging condenser connected in parallel to cross the primary winding of at least one of the transformers.

3. An installation for operating gas discharge tubes supplied by an alternating current lighting network of the usual voltage and frequency comprising individual luminous elements, a separate transformer for each element and including a primary and a secondary winding, the secondary windings being connected with the respective luminous elements, an adjustable series resistance constituting a choke coil and a condenser, and means connecting the several primary windings and said adjustable resistance and said condenser in series in said network.

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