

INDICATING DEVICE WITH BUILT-IN PHOTOVOLTAIC GENERATOR

The invention relates to indicating devices such as road signs, street signs, professional signs etc. which are provided with night lighting of informative signs.

Some indicating devices used in road signs, urban billboards, commercial sign-boards etc. are provided with an electrical night lighting equipment connected with the mains for its electricity supply. Due to this connection these devices can only be used in zones provided with the mains and in all cases their use is generally limited because of high cost of installation and maintenance.

So as to remedy the above mentioned inconvenient one can equip such indicating devices with a self-feeding electricity source such as a photovoltaic generator. Using this latter technique one usually manufactures for example large dimension road signs or small street-address plates. In such existing devices the photovoltaic panel - part of the generator - constitutes a particular component which is distinct from the indicating plate. Due to this particularity the whole device is especially exposed to vandalism and also to rubbery of the photovoltaic panel which can easily be used for other purposes.

Another solution can now be conceived for the electrical night lighting of indicating devices thanks to last improvements in manufacturing photovoltaic panels while spreading out thin layers of Amorphous Silicon or Gallium Arsenide onto glass or a plastic film or any other suitable support. Thus we propose to integrate the photovoltaic generator into the indicating device, not by

means of assembling parts of different origins in a single device, but especially by integrated manufacturing of both indicating information and collecting photoelectricity functions.

5 For this purpose the indicating device subject of the invention comprises one or more indicating plates, each made on a single support of suitable material. On this single support the indicating plate is divided in one or more parts used as a background - generally dark-
10 coloured - and one or more parts used as informative signs generally light-coloured and representing letters, numbers, symbols, figures, etc. What characterizes the invention is that the background of the indicating plates, in whole or part, constitutes by itself a built-
15 in photovoltaic collector directly manufactured on the supporting material and used as part of a photovoltaic generator for night lighting of contiguous informative signs.

 In the invented device the electricity generated by
20 photocells will be accumulated during the day in a battery via an electronic regulating device and will supply at night a device able to light the informative signs of the indicating plates, upon command of an adequate light detector. Regarding the particular
25 techniques used for the informative signs of the indicating plates, corresponding particular techniques will be used for the night lighting of the signs.

 As a first example the informative signs can be
30 simply painted on the support using a light semi-transparent colour, while an appropriate light source is provided into the interior of the indicating device box

and supplied with electricity by the previous described photovoltaic generator. In the daytime the rather light informative signs stand up against the rather dark background, and at night they get illuminated by the
5 above mentioned electrical light. Obviously, all components of the device will be designed so as to obtain a sufficient night brightness of the informative signs regarding the rather limited light power allowed by the built-in photovoltaic generator in relation to the
10 dimensions of the indicating device and its hazardous solar exposure. One can also conceive the particular parts of the indicating plate used as informative signs in a much more elaborated manner, while manufacturing them by spreading out a thin layer of semi-conductor
15 material, such as Gallium Arsenide so as to provide a photoemittent device, or such as Zinc Sulfur so as to provide an electroluminescent device eventually completed by a photoconducting layer according to the PC-EL technique. In the latter elaborated embodiments of the
20 invention the photovoltaic generator will at night directly supply electricity to the self-lighted informative signs through their electrodes. Consequently in this latter embodiment the whole indicating plate appears like a particular integrated circuit solely
25 usable for its indicating function.

Using the latter embodiment of the invention one can particularly conceive street signs comprising an indication plate of appropriate shape whose background constitutes an amorphous silicon photovoltaic collector
30 and whose indicative signs are photoemittent or electroluminescent as described above. The indicating

plate is fitted into a resin-filled box which is provided in its rear part with a special location for a battery and an electronic card both easily plugged and removed.

5 While I have described various embodiments of my invention it is to be understood that the disclosure is merely illustrative and that modifications and changes can be made without departing of the spirit of the invention and within its scope as claimed.

Having described my invention, what I claim is :

1. In an indicating device provided with night lighting of informative signs the combination of a single support with informative signs occupying a part of the support and a background constituting in whole or part a built-in photovoltaic collector.
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2. The combination of claim 1 with a battery connected to the photo-voltaic collector via an electronic regulating device so as to constitute a photovoltaic generator.
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3. The combination of claim 1 or claim 2 with a transparent material used as support and a semi-transparent colour becoming transparent with a certain intensity of light used for painting informative signs.
- 15 4. The combination of claim 3 and claim 2 with one or more light sources fitted behind the support and nightly supplied with electricity by the photovoltaic generator.
5. The combination of claim 1 or claim 2 with informative signs provided by means of photoemittent semiconductors thin layers.
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6. The combination of claim 1 or claim 2 with informative signs provided by means of electroluminescent semiconductors thin layers.
7. The combination of claim 6 with an additional photoconductor thin layer.
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8. The combination of claim 5 or claim 6 or claim 7 and claim 2 with a circuit connecting at night the semiconductors informative signs with the photovoltaic generator.

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SUMMARY

This invention relates to indicating devices provided with night lighting of informative signs.

5 The device subject of the invention comprises one or more indicating plates of appropriate shape. Each plate is made on a single support of suitable material. On this single support the indicating plate is divided in one or more parts used as a background and one or more parts
10 used as informative signs. What characterizes the invention is that the background of the indicating plates, in whole or in part, constitutes itself a built-in photovoltaic collector directly manufactured on the supporting material and used as part of a photovoltaic
15 generator for night lighting of contiguous informative signs.