Aug. 25, 1931. J. P. NAYLOR 1,820,086

SIGN

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FIG. 2.

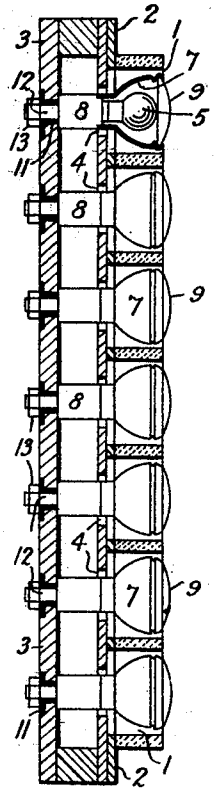


FIG. 1.

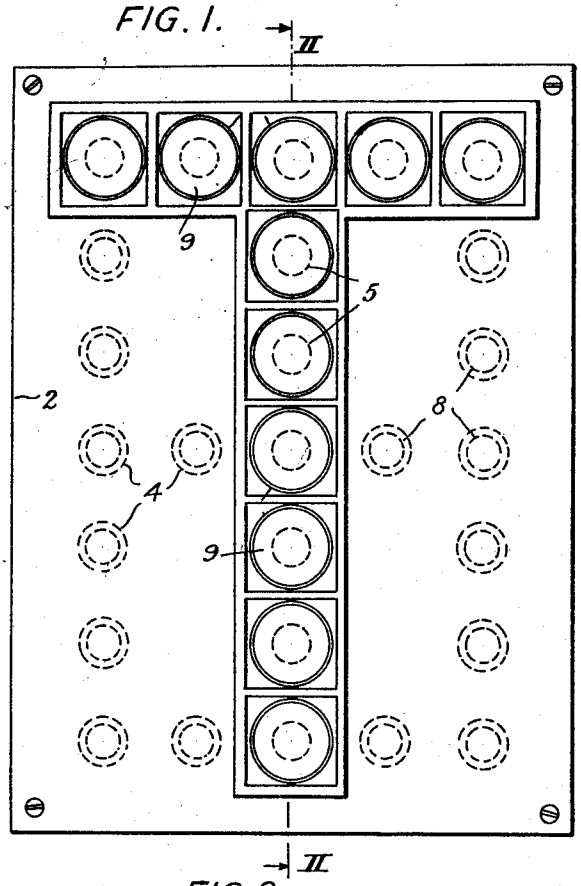
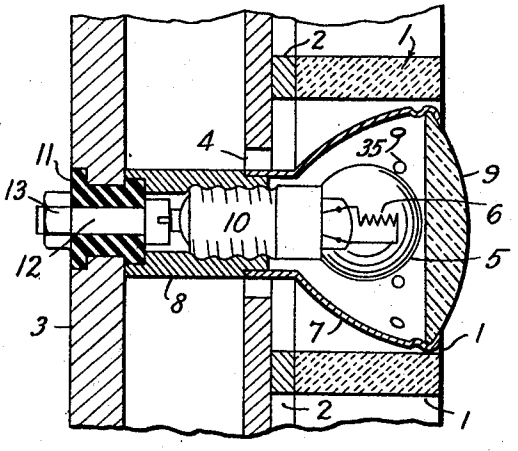


FIG. 3.



INVENTOR

J. Priestnall Naylor.

By R. R. Bowden

Attorney.

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FIG. 4.

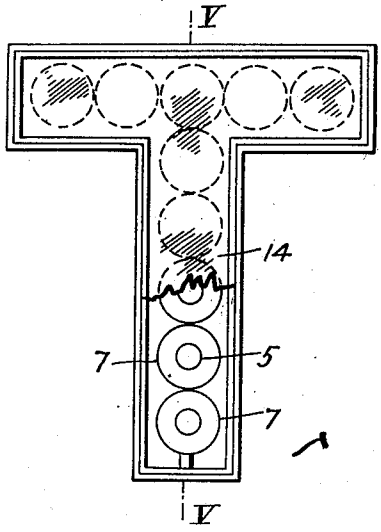


FIG. 5.

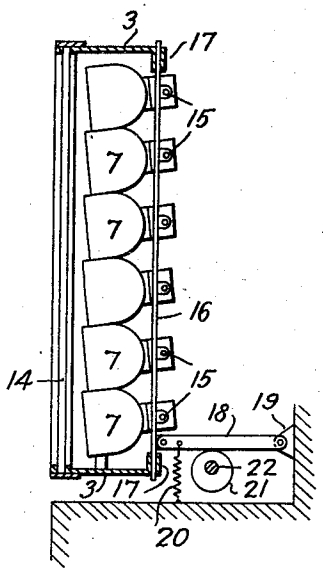
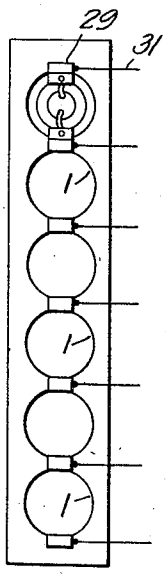


FIG. 7

FIG. 6.



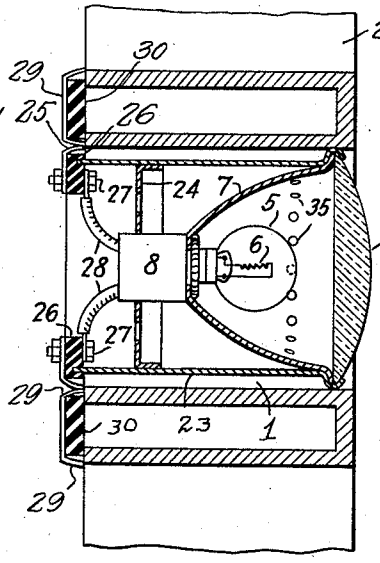
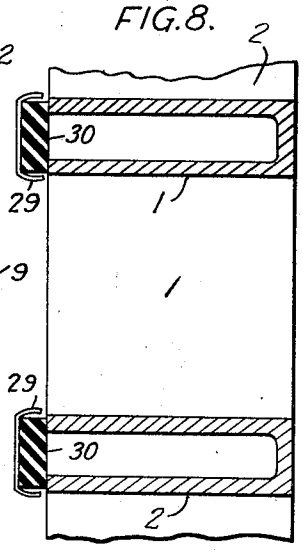


FIG. 8.



INVENTOR

J. Priestnall Naylor

By R. V. Bowden

Attorney.

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FIG. 9.

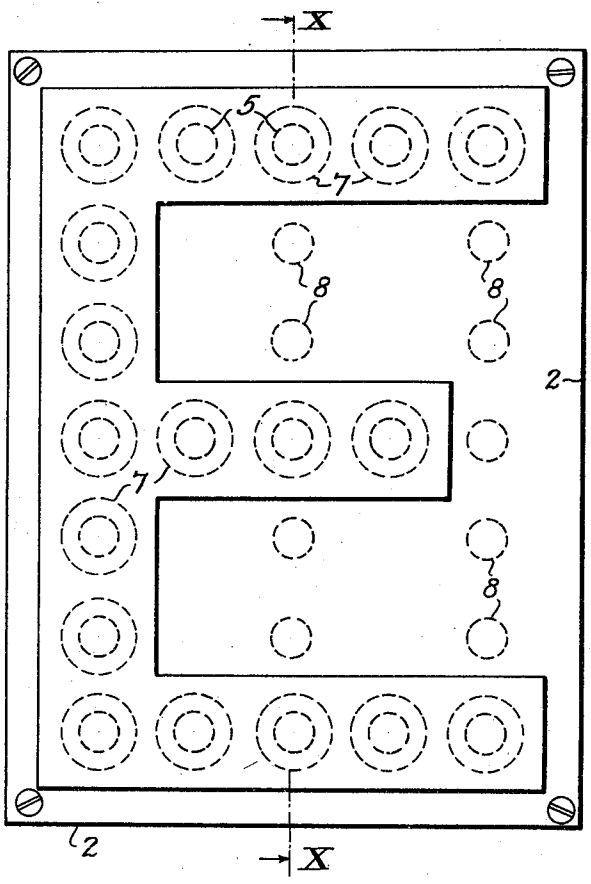


FIG. 10.

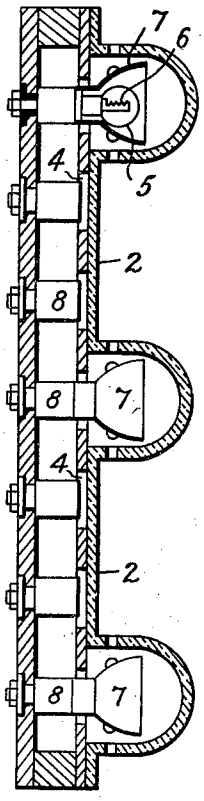
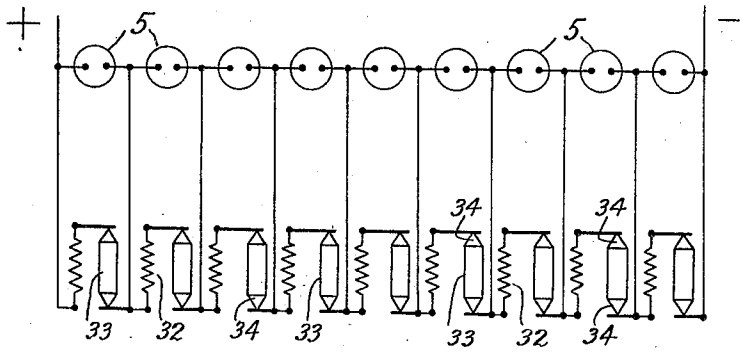


FIG. 11.



INVENTOR
J. Priestnall Naylor.
By R. N. Bowden
Attorney.

Patented Aug. 25, 1931 1,820,086

UNITED STATES PATENT OFFICE

JAMES PRIESTNALL NAYLOR, OF LONDON, ENGLAND

SIGN

Application filed June 28, 1929, Serial No. 374,574, and in Great Britain June 30, 1928.

This invention relates to illuminated signs such as letters, characters and other symbols of the kind provided with a plurality of electric lamps, and has for its object to improve the construction and arrangement of such signs so as to increase the attractiveness and legibility thereof and obtain, without glare, a greater intensity of illumination with relatively smaller current consumption than is possible with such signs as heretofore constructed, the illumination obtainable being of sufficient intensity to enable the sign to be effectively displayed in bright sunlight.

According to this invention the luminous elements of electric signs of the kind referred to comprise a group of lamps each provided with a short compact filament and a highly concentrative reflector, which luminous elements are either housed in the body of a cellular or of a glazed or translucent letter, symbol or the like, or in a protective box or background, the front of which carries a fixed or detachable glazed or translucent display letter or symbol.

The luminous elements may each be arranged in a casing so as to form removable self-contained units that can be fitted into counterpart openings of a cellular letter or other symbol on which electrical contact members are arranged so as to engage counterpart contacts on the unit casing, or the lamps and reflectors together with their electrical connections may be carried by a background, while the letter or symbol to be displayed is carried by a removable counterpart screen, the lamps and reflectors being arranged on the background so as to register with openings in the screen and with the letter carried thereby so that when the screen is mounted upon the background the lamps and reflectors on the background are housed in the body of the letter.

The background may also be in the form of a trough or box in which the lamps and reflectors together with their electrical connections are arranged, the front of the box being covered by a screen which forms or carries the glazed or translucent letter to be displayed.

In a modified construction the background may consist of a perforated support which serves to carry upon one side the letter or other symbol to be displayed, and on the opposite side the box or background in which the lamps and reflectors are arranged, so that light from the lamps is directed through the perforated support and the letter or symbol mounted upon the face thereof. For this purpose the perforated support may be stencilled so that the stencilled apertures register with the letter or symbol.

The lamps and reflectors may be adjustably mounted in the box or background so that the same may be set at any required angle according to the direction of display required. For instance when the sign is arranged on a tall building in a relatively narrow thoroughfare the lamps and reflectors may be set so as to direct the light downwards.

To increase the attractiveness and widen the angle of display, the lamps and reflectors may be mounted so that motion can be imparted thereto by cams and levers or other mechanism operated by a suitable motor.

Instead of providing separate reflectors for each lamp, parabolic or other concentrative reflecting surfaces may be formed in the face of the letters or symbols, such reflecting surfaces terminating in sockets to receive the lamps with compact filaments so that the filaments lie in the axis of the reflecting surface, while the front of the reflecting letter may be glazed in any convenient manner either with a single glazing or with a separate glazing for each socket so as to prevent the lodgement of dust etc. on the lamps and reflecting surfaces.

When the lamps having compact filaments are of low resistance the same are preferably connected in electrical series together with known means for automatically providing an alternative path for the current so that the circuit of the series is maintained in the event of failure of any lamp or lamps of the group, thus enabling the defective lamp or lamps to be readily located.

Various embodiments of the present invention are illustrated by way of example in the accompanying drawings wherein similar references indicate like parts.

Figure 1 is a front view and Figure 2 a vertical section on the line II—II (Figure 1) of a removable cellular letter T provided with luminous elements in accordance with the present invention, while Figure 3 is a detail sectional view further illustrating the construction of the luminous elements indicated at Figure 2.

Figure 4 is a front view and Figure 5 a vertical section of a glazed trough letter T provided with mechanically operable luminous elements in accordance with the present invention.

Figure 6 is a front view and Figures 7 and 8 detail sectional views drawn to a larger scale illustrating one application to a cellular letter of self-contained removable luminous units in accordance with the present invention.

Figure 9 is a front view, and Figure 10 a vertical section of a removable translucent letter E provided with luminous elements constructed in accordance with the present invention.

Figure 11 is a diagram illustrating the manner of connecting a group of lamps in series together with automatic devices for providing an alternative path for the current on failure of any lamp or lamps in the group.

Figures 1 and 2 illustrate one construction of removable cellular letter T adapted for illumination by a group of luminous elements mounted in a relatively fixed background.

The letter T shown is formed in metal, wood or other suitable material with a plurality of cells or perforations 1 through the body thereof, such letter being mounted upon a screen or panel 2 in which slots or perforations are formed so as to register with the cells or perforations 1 through the letter.

The screen or panel 2 is adapted to be screwed or otherwise detachably secured to the face of a perforated box or background 3 which carries a group of luminous elements presently referred to.

The box or background is furnished with a plurality of perforations 4 so that the group of luminous elements can be arranged therein according to the configuration of the letter to be displayed. Thus as illustrated the group of luminous elements are arranged in the perforated background to form the outline of a letter T.

Each luminous element consists of an incandescent electric lamp 5 provided with a short compact filament 6 and a parabolic reflector 7 which is mounted upon the lamp socket 8 and carries a lenz 9 which serves to protect the reflecting surface and lamp from dust etc., and also serves to diffuse the light from the lamps.

As illustrated at Figure 3 the lamp sockets 8 are internally screw-threaded to receive a threaded lamp cap 10, and are secured in the background 3 by an insulating block 11 which carries the usual lamp contact 12 and terminal 13.

The lamps 5 and their reflectors 7 project from the face of the background 3 and register with the cells or perforations 1 in the letter and the apertures in the detachable screen 2 so that when the screen is assembled to the background 3 the lamps and reflectors pass into the cells or perforations of the letter so that their glazing 9 is substantially flush with the display face of the letter, while the perforations 4 in the background are masked by the detachable screen which carries the letter.

Figures 4 and 5 illustrate another construction of letter T in which the background 3 is in the form of a T-shaped trough or box wherein the lamps 5 and the reflectors 7 are mounted while the display face of the letter is formed by a removable counterpart glazed cover 14 which is flanged so as to fit over the front of the trough-like background 3 as indicated at Figure 5.

The parabolic reflectors 7 together with their lamps 5 are pivotally mounted in bearings 15 and are connected by a sliding rod 16 that works in guides 17 to one end of a lever 18, the opposite end of which is pivoted to a bracket 19. The lever 18 is controlled by a spring 20 and bears on a cam 21 mounted upon a shaft 22 that is rotated in any convenient manner by a motor so as to impart an oscillating movement to the lamps and reflectors, thus increasing the field and attractiveness of the luminous display.

Figures 6, 7 and 8 illustrate a cellular letter I in which the luminous elements are detachably mounted in the body of the letter instead of being carried on a separate background.

As illustrated in Figure 7, each of the lamps 5 together with its parabolic reflector 7 and glazing 9 is mounted in a cylindrical casing 23 that is adapted to fit into one of the cells or perforations 1 in the body of the letter.

As shown the cylindrical casing 23 is furnished with a perforated diaphragm 24 which carries the lamp socket 8, while the adjacent end of the casing 23 carries a pair of spring contacts 25 mounted upon insulating blocks 26 and furnished with terminals 27 to which the leads 28 are respectively connected.

The rear surface of the cellular letter I is furnished with spring contacts 29 mounted upon insulating blocks 30 arranged at the rear ends of the cells or perforations 1 so that when the cylindrical casing 23 is inserted into one or other of the cells or perforations 1 and then rotated the spring contacts 25 thereon engage the contacts 29 on the rear face of the letter, thus holding the cylindrical casing in position and also connecting the lamp therein to a source of cur-

rent through the conductors 31 (Figure 6) connected to the contacts 29.

The construction illustrated in Figures 9 and 10 is generally similar to that described with reference to Figures 1 and 2 except that the letter E shown is hollow and is formed of transparent material such as glass, the letter being moulded integrally with the detachable screen 2.

The lamps 5 together with their reflectors 7 are mounted and arranged in the box or background 3 so as to follow the contour of the letter E.

The lamps and reflectors project from the front of the perforated background so that when the removable screen and letter are assembled to the background the lamps and reflectors project into the body of the hollow transparent letter, as indicated.

The letter E may be made of frosted or opal glass, and may be provided with clear sections which register with the lamp reflectors, or with a clear front so as to increase the brilliance of the luminous display, while the remaining portions of the letter are less brilliantly illuminated by the diffused light from the lamps.

When the letters comprise a translucent or transparent front as described for example with reference to Figures 4 and 5 or Figures 9 and 10, the lamps and reflectors may be arranged so as to focus the light upon the translucent letter as a series of separate rings or discs of light, or the lamps and reflectors may be arranged so as to form a continuous band of light upon the translucent letter.

When low resistance lamps having compact filaments are employed the lamps of each letter or symbol are arranged in electrical series together with means for automatically providing an alternative path for the current, as illustrated diagrammatically at Figure 11 in which 5 indicates the lamps arranged in series with a source of electrical supply, indicated by the references plus and minus, together with substitutional resistances 32 and coherers 33 which may each consist of a glass tube containing flaked aluminium coated with oxide and provided with a conductive cap 34 at each end.

In the event of failure of any of the lamps 5 in the series group, the corresponding coherers 33 are exposed to the full main pressure which breaks down the insulating oxide so that the coherers become a conductor and allows the current to flow through the corresponding resistance 32, thus short-circuiting the defective lamp and maintaining the series circuit.

The construction illustrated may be modified by omitting the substitutional resistances 32 so that a defective lamp is short-circuited by the corresponding coherer 33, the consequent slight rise in the electrical pressure being distributed through the remaining lamps in the series.

The coherers and substitutional resistances may be arranged in known manner in the lamp caps when the sign is operated with small currents, but in the case of signs operated with relatively heavier currents the coherers and substitutional resistances may be arranged in any convenient manner and position in the lamp circuits so as to dissipate the heat generated by the passage of current therethrough.

To prevent the letters or symbols becoming over-heated provision is made for the adequate circulation of air about the lamps and reflectors and the enclosures in which they are mounted. Thus, as indicated at Figures 3 and 7, the reflectors 7 may be perforated as indicated at 35 to allow air to circulate about the lamp and reflector behind the glazing 9, the heated air escaping freely through the clearance about the enclosure.

I claim:—

1. In an illuminated sign of the kind referred to a group of luminous elements each comprising an incandescent lamp having a compact filament and arranged in combination with a concentrative reflector the front of which is glazed with a light diffusing screen, each of said lamps and reflectors being mounted in a casing so as to form removable self-contained units that can be fitted into counterpart openings in the body of the sign, said casing being furnished with contact members connected to the lamp mounted therein, which contact members are adapted to engage counterpart contact members on the body of the sign.

2. In an illuminated sign the combination of a perforated background carrying a group of incandescent lamps each having a compact filament and a concentrative reflector provided with a glazing, with a removable front comprising a perforated panel that carries a cellular display face which is adapted to register with and form a housing for the luminous elements carried by the background when the removable front is assembled to the latter.

3. In an illuminated sign having a translucent display face, the combination of a perforated background carrying a group of incandescent lamps each having a compact filament and a concentrative reflector, with a removable front comprising a panel formed integrally with the hollow translucent display face of the sign, said hollow display face being in registry with and forming a ventilated housing for the luminous elements when assembled to the background carrying the latter.

4. In an illuminated sign of the kind referred to the combination with a cellular sign body, of a plurality of self-contained luminous elements each consisting of an incan-

descent lamp having a compact filament and a concentrative reflector mounted in a cylindrical glazed casing furnished with insulated spring contact members for the lamp, which contact members are adapted to engage counterpart insulated spring contacts on the cellular sign body when assembled to the cellular sign body.

In testimony whereof I affix my signature.

JAMES PRIESTNALL NAYLOR.