Feb. 28, 1950 H. R. YATES 2,499,049

INTERCHANGEABLE ILLUMINATED LETTER SIGN

Filed April 25, 1946 2 Sheets-Sheet 1

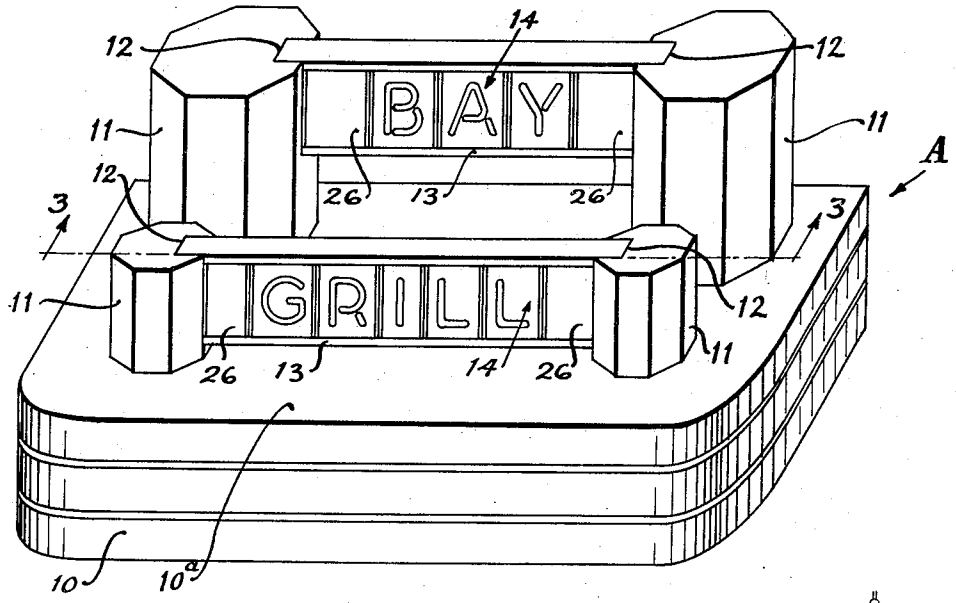


Fig. 1

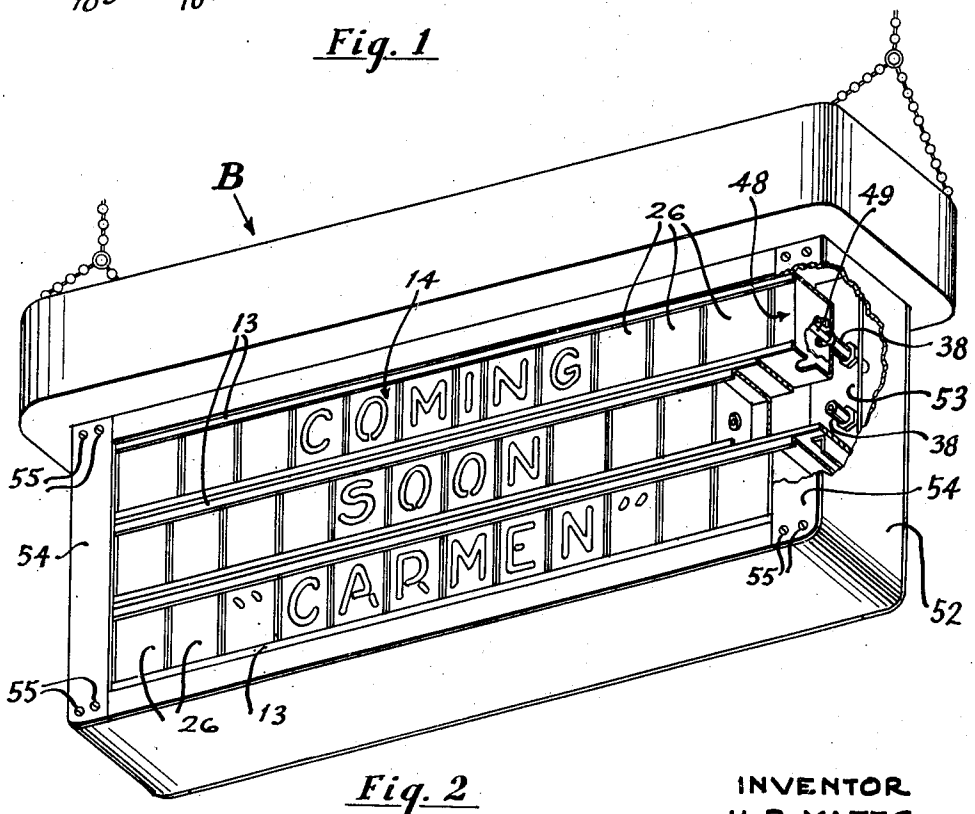


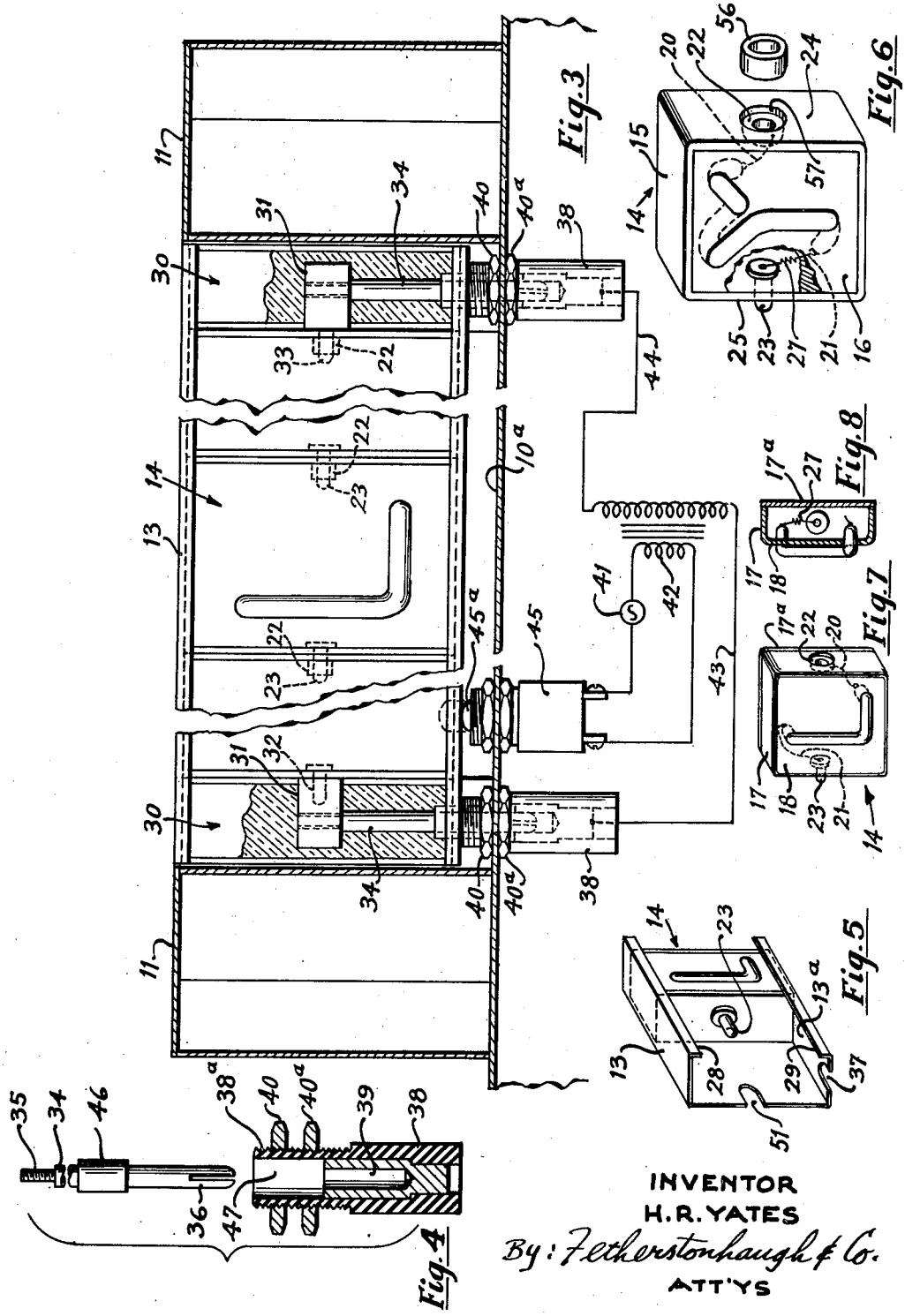
Fig. 2

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INTERCHANGEABLE ILLUMINATED LETTER SIGN

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3 Claims. (Cl. 40—130)

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This invention relates to an interchangeable electric sign such as a window display sign, a hanging sign, etc.

Various interchangeable signs have been provided in the past in which it is necessary separately to mount on or demount interchangeable units, capable of illumination, in respect to a sign body having a voltage supply therein. In changing the sign an attendant must select each letter from a collection of letters which he carries with him before mounting it in the sign body. Such a method is especially inconvenient where the sign body is mounted at a high level making it necessary for the person changing the sign to reach the necessary level with a supply of letters and to make the several changes. The operations necessary invoke several hazards including the danger of dropping one or more of the number of interchangeable units. Moreover, the separately insertable units of the prior art necessitate as many electrical connections from the power supply to the base as there are interchangeable units in the sign, which design complicates the insulating and servicing of the sign. Also the interchangeable letters or figures of the prior art must of necessity be of equal width because they each have to fit into similar base sockets. It is thus impossible to include an interchangeable unit of an odd width in such interchangeable signs.

The present invention overcomes these defects of the prior art as well as providing other advantageous features.

It is, therefore, an object of this invention to provide an electric sign having interchangeable units capable of illumination which can be prearranged to form a complete sign element which complete elements can be bodily inserted in a sign carrier in one simple operation to produce said electric sign.

A further object of this invention is to provide an interchangeable electric sign in which the number of electrical connections between the sign carrier and the interchangeable units is an absolute minimum.

A further object of this invention is to provide an interchangeable electric sign which can be easily and effectively insulated against short circuits and which is absolutely safe to operate.

A further object of this invention is to provide an interchangeable electric sign which can be readily adapted to outdoor use.

A still further object of this invention is to provide a simple interchangeable electric sign in which the spacing between all letters will be correct and can be varied where necessary to produce this result.

It is a further object of this invention to provide an interchangeable electric sign which can be changed in a very simple manner by prearranging the selected interchangeable units in any

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desired formation to form a substantially rigid sign element which can be bodily mounted in a sign carrier to replace a similar element previously demounted from said carrier.

A still further object of this invention is to provide an interchangeable electric sign embodying the above features which can be manufactured from a minimum of parts.

With these and other objects in view the invention generally comprises interchangeable units detachably connected in a series circuit designed to form a substantially rigid sign element having desired sign characteristics and capable of being preliminarily assembled and then bodily mounted on a sign carrier. Preferably the interconnected units are arranged in a display tray mountable on a suitable carrier and the units being connected across a voltage supply on said carrier.

The invention will be clearly understood by reference to the following detailed specification taken in conjunction with the accompanying drawings.

In the drawings,

Fig. 1 shows a perspective view of sign suitable for window display, etc., constructed according to this invention.

Fig. 2 shows a perspective view of a hanging sign according to the invention, part of the sign frame being broken away more clearly to show parts of the construction.

Fig. 3 is a section through the sign shown in Fig. 1 taken substantially along the line 3—3, showing the wiring and connections of the sign.

Fig. 4 is an enlarged sectional view of a socket and jack used to connect a completed sign unit to the voltage supply.

Fig. 5 is a perspective detail of one end of a display tray.

Fig. 6 is a perspective view of one type of interchangeable unit of this invention.

Fig. 7 is a perspective view of another type of interchangeable unit of the present invention, and

Fig. 8 is a longitudinal section taken through the unit of Fig. 7.

Referring to the drawings, A indicates a sign designed to rest upon a mounting and which includes a base 10 made of any suitable material. Pillars 11 are positioned on the base and formed with the vertically extending channels or guideways 12 designed to receive the removable display trays 13. The display trays are trough-like in cross-section (see Fig. 5) and are designed detachably to retain the interchangeable units 14 as will be explained later.

In Figs. 6, 7 and 8 forms of interchangeable units 14 according to the invention are clearly shown, which are generally rectangular in form. In Fig. 6 the unit comprises a casing or box 15 made from any suitable insulating material filled with a hardening plastic mass 16. In Figs. 7 and

8 a hollow casing shell 17 is shown which is open at its back and formed with a closed front face 18. A back piece 17a is preferably fastened over the open back of the shell 17. These units are designed to display illuminable letters or symbols comprised by a glass tube, bent to form a letter or symbol, in the case of Fig. 6, partially imbedded in the plastic mass 16, and in the case of Figs. 7 and 8 disposed to lie against the front face 18 of shell 17 which face forms a background for the illumined letter or symbol. The tubes for each letter or symbol are designed to be filled with a luminescent gas such as neon and hermetically sealed. The sealed ends of each tube are connected by wires 20, 21 to metal contacts 22, 23 on opposed sides 24, 25 of either form of unit 14. Metal contact 22 is a socket extending inwardly of side 24 preferably at its centre. Metal contact 23 is a plug or jack member projecting preferably from the centre of side 25 of the box and designed to slidably fit into socket contact 22 of any other interchangeable unit when they are placed side by side so that the side 24 of one abuts side 25 of the other. Dummy interchangeable units 26 having no lamps can be provided to fill up spaces as shown in Figs. 1 and 2. In these units a resistor imbedded in the plastic mass is connected between the contacts 22, 23 to give the unit the same resistance as a unit having a lamp. Resistors 27 (Fig. 6) may be placed in series with the lamps to give all interchangeable units the same resistance.

According to the present invention interchangeable units such as described above may be connected in abutting relation by means of their terminal connectors, to form a complete substantially rigid sign element capable of conducting electricity and which can be preformed and connected to or disconnected from electrical terminals of a sign carrier.

Preferably such substantially rigid element is introduced to a display tray 13 and the tray carrying said element is mounted in a sign carrier.

The tray 13 is channel-like in character, the channel of which is of a general cross section slidably to receive the units 14 which it is designed to carry, said units being here shown as rectangular. The channel is closed on three sides being open along the front and formed with the opposed flanges 28 and 29 along the front margins to prevent the interchangeable units 14 or the complete sign element formed by a plurality thereof from falling out of the tray which through its open front is designed to display the letter or symbols carried on the units 14 which it carries. Thus, during assembly of the letters or the mounting or demounting of the complete sign element composed of a plurality of units 14 the units are securely retained in the tray.

To mount the units 14 in the tray 13 they may be slid thereinto from either end individually and connected with one another by means of the plug and socket contacts provided or may be slid in as a substantially rigid sign element previously assembled. During the assembly in a tray of the number of units 14 desired dummy units such as 26 may be added to make the sign element of the desired length terminating adjacent to the opposite ends of the tray. These dummy elements, of course, may be of any desired width. Suitable terminal connectors are then added to form the electrical connection with the circuit associated with the sign carrier.

The terminal connectors are generally indicated by the numeral 30 and are comprised by a unit of insulating material designed to mount a suitable conducting block or fitting 31 therewithin which is formed with a socket 32 opening on the side face of the unit or a contact plug 33 projecting from the side of the unit (see opposite ends Fig. 3). The conducting block 31 is connected with a conducting shank 34 which may be formed with an upper screw-threaded connector 35 (Fig. 4) designed to be screwed into the block or fitting 31 and the lower end of the shank 34 terminates in the jack 36 which projects from the lower end of the unit. This unit may be slid into the end of the channel 13, the lower wall of which 13a is notched as at 37 at each end so that the jack 36 may be caused to project downwardly beyond lower wall 13a when the end units 30 are mounted as shown in Fig. 3. Consequently the socket 32 of one unit 30 may be caused to fit over the plug 23 of the end unit 14 of a sign element disposed in the tray while the plug 33 may be caused to enter into the socket 22 of the opposite end unit 14 in the other end of the tray. Thus, the tray embodying the complete sign element electrically connected and the projecting jacks 36 at each end may be bodily mounted in a sign carrier by connecting the jacks 36 in suitable sockets which are disposed in the sign carrier.

The sockets may comprise the insulating sleeve 38 screw-threaded externally at its upper end as at 38a and carrying within its hollow bore the metallic socket element 39. The upper end of this sleeve is designed to be mounted in the sign carrier so as to dispose its open end in a position to receive the jacks 36 projecting at the ends of the trays 13. Thus having reference to Fig. 1 and the lower sign element thereof.

It will be noted in the case of Fig. 3 that the threaded end of the sleeve is passed upwardly through an orifice in the base 10a of the sign carrier at a point to register with the lower end of the vertically disposed channels 12 and the sleeve 38 may be secured by the securing nuts 40 and 40a disposed on opposite sides of the base plate 10a as shown. Consequently when a tray carrying the complete sign element including terminal units 30 is caused to slide into the vertically extending grooves or channels 12 of the pillars 11 of the sign A the jacks 36 will enter into the socket 39 electrically to connect the complete sign element. Alternatively, however, it will be clear that the substantially rigid sign element formed by the individual units 14 and terminal units 30 when each of these units is plugged into the next adjacent unit by the said socket and plug connections such unit might be mounted in similar manner without the use of a tray 13. It is, however, as indicated preferred to employ a tray to assure the rigidity of the unit particularly in the case where any of the sockets and/or plugs might wear and thus provide for a less rigid sign element than where a tight fit was always the case while rendering the complete element so assembled easier to handle.

Power is supplied to the sign from a suitable power source generally indicated by the numeral 41 to the low voltage side of the transformer 42. The low voltage side of the transformer is connected so that the secondary circuit is energized when the assembled sign element carried by a tray 13 is positioned in the vertically extending guideways 12 of the pillars 11 and the jacks 36 are thereby introduced to the sockets 39. In this connection the secondary circuit connects with

the sockets 39 at each end of the sign such as by the leads 43 and 44 respectively which completes the secondary circuit through the lamp units and/or dummy units 26 by reason of the plug and socket connections therebetween 22 and 23.

The power supply 41 for the transformer 42 is preferably controlled by an "on-off" switch 45 in series with the primary winding of the transformer and located on the base 10a so that it is operated by a tray or sign element as it is moved in or out of the guideways 12. The switch plunger 45a is spring-urged to an "off" position (shown in dotted lines, Fig. 3), when the tray 13 is removed from the sign base, and is operated to an "on" position (shown in solid lines) by pressure of the tray 13 as it is placed in the guideways 12 of pillars 11. The jacks 36 are designed to project from the connectors 30 to sufficient degree such that in placing a sign unit in the guideways 12 the jacks 36 will enter the sockets 39 to establish a circuit through the series of interchangeable units 14, the secondary of transformer 42, leads 43, 44 and terminal connectors 30 before the switch plunger 45a has been depressed to an "on" position by the tray 15. As the sign unit is removed, the switch plunger 45a is spring-urged to an "off" position before continuity in the high voltage secondary circuit of the transformer 42 is broken. This design will prevent the possibility of any dangerous arcing due to the breaking of the high voltage secondary circuit at the jacks as the sign unit is removed, since the power supply is cut off before the secondary circuit is broken.

An insulating sleeve 46 is provided on the jacks 36 of such length that it covers and insulates the portion of the jack not in the socket 39 and enters the insulating pocket 47 of sleeves 38 just before the switch 45 is operated to an "on" position by the tray as the sign unit is placed in the guideways 12. Thus, there is no possibility of grounding or shorting the sign at the jacks because every part of the circuit is insulated from the instant the power is turned on.

In Fig. 2 a hanging type of sign is shown, designated generally by the letter B, which is designed to use the same interchangeable units and the same display trays as the window display model previously described. A slight change in the terminal connectors is, however, effected. In this case terminal connector 48 is provided of the same general construction as the terminal connectors 30 with the exception that the jacks 49 thereof are designed to project from the rear wall of connector 48 rather than from the lower end thereof, and slots 51 are formed in the ends of the back wall of the trays 13, shown in Fig. 5 to permit the jacks to project rearwardly of the trays.

The hanging sign B employs a casing 52 opened at its front to receive the trays 13 and preferably includes the end plates 53 designed to carry the sleeve housing sockets 38 as previously described and mounted in the end plates 53 in a manner similar to their mounting in respect to the base plate 10a of the sign of Fig. 1. These sleeves are thus disposed horizontally and when a complete sign element has been made up by disposing a series of the units 14 and end terminal connectors 48 such as shown in Fig. 2 the tray carrying the sign element may be quickly plugged into position by projecting the jacks 49 into the sockets carried by the sleeves 38. The circuit arrangement of course is similar to that previously described and a safety switch construction such as 45 described in connection with Fig. 3 may be readily employed in the sign of Fig. 2 and contacted by the back wall of each tray.

Suitable dummy units 26 obviously are used in connection with this sign also and it might be noted in respect to both types of signs that since the dummy units can be of various widths the centering and/or arrangement of the letters and/or symbols can be easily achieved in accordance with particular requirements.

When the complete sign elements including the trays have been mounted such as shown in Fig. 2 a facing frame 54 rectangular in form is put in place and secured in any suitable manner such as by the screws 55. This serves positively to retain the trays in their mounted position against any possible dislodgment. The end members of the frame 54 serve to overlap the ends of the trays thus positively to retain them in position.

In the case of an outdoor sign it is proposed to include an insulating sleeve 56 (Fig. 6) to protect the interconnection between units against weather elements. In this respect a counter-sunk portion 57 may be provided in the side wall of the unit around the socket opening into which one end of the insulating sleeve 56 is designed to fit. Thus, by forming a similar countersunk portion in the opposite side wall of the unit around the projecting plug, the opposite end of the insulating sleeve 56 will enter into the countersunk portion of an adjacent unit when it is plugged into the socket of another thereby fully to encase the socket and plug connection against moisture.

The preferred form of individual unit is that shown in Figs. 7 and 8 comprised by a hollow body closed on the ends, sides and front and orificed in the side walls and in the front to receive socket and plug and the lamp element respectively. The necessary electrical connections between lamp and socket and plug contacts are made within the hollow body and a firm rigid light weight unit, thus formed which will readily display the lamp unit exposed on the front face thereof while providing a unit which when connected with others will form a substantially rigid sign element. This avoids difficulties in setting a plastic filling that might arise in connection with a unit as illustrated in Fig. 6 and lends to the positive uniform character of each unit.

From the foregoing it will be clear that I have produced an interchangeable sign generally simple in character which is readily changed and serviced in a manner that avoids difficulties apparent in the prior art.

What I claim as my invention is:

1. An interchangeable electric sign comprising a carrier with guideways and a rigid interchangeable sign element capable of conducting electricity therethrough and being detachably mountable in said guideways on said carrier, said interchangeable sign element including a plurality of detachably interconnected and interchangeable sign units, each capable of conducting electricity therethrough and at least some being capable of illumination, said sign element comprising a channel element designed to contain a series of said interconnected units, said channel element being open at its ends to slidably admit said sign units and open over a major portion of its front to display said sign units, said interchangeable sign units each having connecting means on opposed sides thereof in the form of a plug on one side and a socket on the other, said socket being diametrically positioned to said plug so that the plug of one unit engages the socket of

an abutting unit when positioned in said channel element to electrically interconnect said units in said sign element, terminal connectors designed to slide into the open ends of said channel element and detachably connect to the end members of said sign element, said terminal connectors each having a jack projecting therefrom, said channel member being slotted to allow said jack to project beyond said channel member substantially at right angles thereto, said carrier having sockets with a voltage supply thereacross, said sockets being designed to slidably receive said jacks of said terminal connectors when said sign element is mounted on said carrier to connect said sign element across said voltage supply to illuminate those sign units capable of illumination.

2. An interchangeable electric sign comprising a carrier with guideways and a rigid interchangeable sign element capable of conducting electricity therethrough and being detachably mountable in said guideways on said carrier, said interchangeable sign element including a plurality of detachably interconnected and interchangeable sign units, each capable of conducting electricity therethrough and at least some being capable of illumination, said sign element comprising a channel element designed to contain a series of said interconnected units, said channel element being open at its ends to slidably admit said sign units and open over a major portion of its front to display said sign units, said interchangeable sign units each having connecting means on opposed sides thereof in the form of a plug on one side and a socket on the other, said socket being diametrically positioned to said plug so that the plug of one unit engages the socket of an abutting unit when positioned in said channel element to electrically interconnect said units in said sign element, terminal connectors designed to slide into the open ends of said channel element and detachably connect to the end members of said sign element, said terminal connectors each having a jack projecting therefrom and said channel member being slotted to allow said jack to project beyond said channel member substantially at right angles thereto, said carrier having sockets designed to slidably receive said jacks as said sign element is mounted on said carrier, a transformer having its secondary connected across said sockets, an on-off switch connected in the primary of said transformer, said switch being normally spring urged to an off position and mounted on said carrier so that said sign element operates it to an on position when it is mounted on said carrier to energize said transformer and illuminate those units capable of illumination.

3. An interchangeable electric sign as claimed in claim 2 and having insulating sleeves on said jacks designed to cover the portion of said jack protruding from said terminal connectors from an instant just before said "on off" switch is operated to an "on" position as said sign unit is mounted on said carrier.

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