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G. I. WILLIAMS

2,985,874

SELF-CONTAINED PANEL SIGNAL AND CONTROL

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FIG. 1

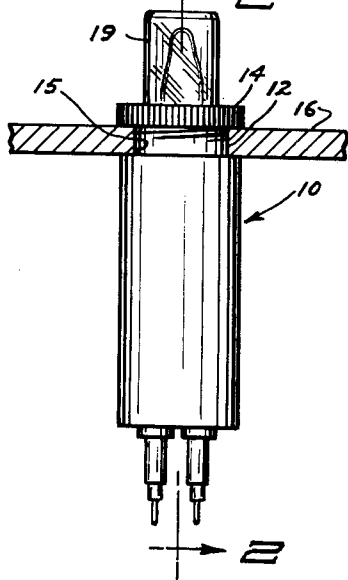


FIG. 2

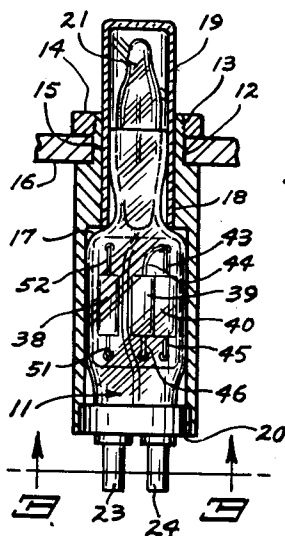


FIG. 3

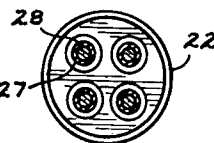


FIG. 4

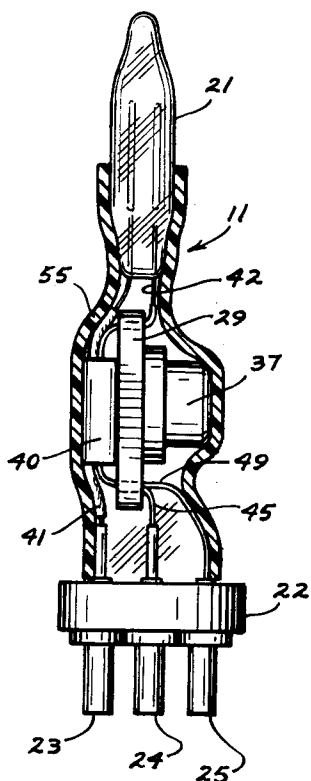


FIG. 5

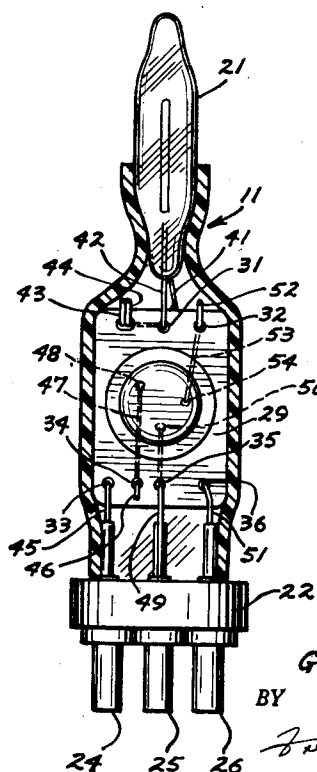
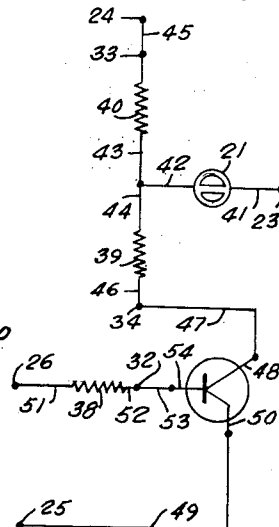


FIG. 6



INVENTOR.
GERALD I. WILLIAMS

BY

Fredrick C. Hughes
ATTORNEY

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SELF-CONTAINED PANEL SIGNAL AND CONTROL

Gerald I. Williams, St. Paul, Minn., assignor to Transistor Electronics Corporation, Minneapolis, Minn., a corporation of Minnesota

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5 Claims. (Cl. 340—381)

This invention relates to panel signals, and more particularly to a panel-mounted unit which has a lamp and control members contained within itself.

It has been customary in the past to provide signals such as lights in a panel board which are responsive to energization from the chassis of an associated electrical apparatus having resistors, electron tubes, and other electrical elements. Such apparatus, by way of example, includes computers, data processors, signal systems, keyboard equipment and automatic control devices. Aside from the problem of complexity arising from remotely interconnected parts, the electrical current and voltages required to operate the signals themselves may be of higher values relative to those in the main chassis. Thus, in those devices where the control system for the lamps are in the chassis, there is likelihood of disruption and damage to the lower voltage circuit systems should they become short circuited.

It is within the contemplation of this invention and a general object thereof to provide a self-contained signal and control assemblage for panel mounting which is compact and reduces the complexity of circuits contained within the chassis.

It is a further object of the invention to provide a panel light assemblage which has its high voltage operating circuits within the panel-mounted assemblage with only the small voltage control circuit extending to the delicate portions of the apparatus.

Another object of the invention is to provide a small panel-mounted light assemblage wherein a lamp and transistor element will be contained within a simple casing, a mounting card within the casing serving to insulate certain wires from each other and render them collectively a part of the mounted structure.

A still further object of the invention is to provide a light assemblage of the class described wherein a small board or card is provided with openings so that circuit wires interconnecting terminals with elements such as resistors, transistors and lights may pass through the openings and contribute to a small and compact association of electrical parts held structurally together without screws, rivets, clips or other independent fasteners.

Another object of the invention is to provide an assemblage of the class described wherein a lamp is mounted at one end, the terminals at the other, and the remainder of the parts being mounted on a dielectric card without the aid of fasteners, the entire assemblage being supported additionally by a shrunken sleeve element having dielectric properties.

These and other objects and advantages of the invention will more fully appear from the following description, made in connection with the accompanying drawings, wherein like reference characters refer to the same parts throughout the several views and in which:

Figure 1 is a side elevation of my self-contained panel signal and control, the panel being shown segmentally in cross section;

Figure 2 is a longitudinal section of the assemblage

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taken on the line 2—2 of Figure 1, the internal portions being shown in full line representation;

Figure 3 is a section taken at the terminal end of the assemblage on the line 3—3 of Figure 2 and looking in the direction of the arrows;

Figure 4 is an enlarged side elevation of the insert assembly alone, the sleeve casing being shown in cross section;

Figure 5 is another view of the insert assembly taken from the right in Figure 4, the sleeve casing being cut away in vertical section; and

Figure 6 is a schematic diagram of the electrical circuit connecting the lamp and control elements.

With continued reference to the drawing, my self-contained panel signal and control comprises generally a casing 10 and an insert assembly 11 contained compactly within the housing 10, as shown in Fig. 2. The housing itself is cylindrical in character, having an externally reduced forward portion 12 which is threaded at 13 to receive a knurled nut 14 for securing the housing within an opening 15 formed in panel 16.

Internally of the housing 10 is a main cylindrical bore 17 which extends longitudinally of the cylinder and connects with bore 18 having reduced diameter and extending through the forward end to retain a transparent cap 19. The rearward end of the casing 10 is open and the internal diameter at the rearmost end is increased to form an annular internal groove 20, as shown in Fig. 2.

The insert assembly 11 is shown in enlarged view in Figs. 4 and 5, and comprises a forward electrical signal such as lamp 21 and a rearward terminal cap 22 which in turn retains the terminal contacts 23, 24, 25 and 26 as shown in Figs. 4 and 5. The terminals 23—26 may be provided with sockets 27, each of which can receive a terminal prong 28, as shown in Fig. 3. Between the lamp 21 and terminal cap 22 is positioned an apertured dielectric mounting card 29, as shown more particularly in Figs. 4 and 5. The mounting card 29 is preferably dielectric in nature so as to assist in maintaining the various electrical elements in insulated condition. The mounting card 29 has a plurality of openings or apertures formed therethrough, the instant disclosure utilizing seven, three of which are designated 30, 31 and 32, at the upper portion of the mounting card 29, and 33, 34, 35 and 36 at the lower portion thereof.

It is contemplated that at least one electrical circuit element be associated with the mounting card 29 and, for purposes of illustrating the present invention, one transistor element 37 and three resistor elements 38, 39 and 40 are shown, the arrangement being such that the transistor is mounted at one side of the mounting card 29 and the resistors are mounted at the other, as shown in Fig. 4.

Various wire leads connecting the terminals 23—26 with the lamp 21 and other electrical circuit elements 37—40 are laced in and out of the mounting card apertures 30—36 in such a manner as to effect the desired circuits and, at the same time, firmly mount the entire assemblage together without the use of independent fasteners. A specific typical circuit application is as follows: Terminal 23 connects with lead 41 which extends upwardly into lamp element 21, return lead 42 extending downwardly from lamp 21 and passing through the opening 31 and is secured to the ends of the two wires 43 and 44, as shown in Fig. 5. The ends of wires 43 and 44 extend through opening 30 and are bent upwardly to maintain their position in the opening 30. The wire 43 connects with the resistor 40 which, in turn, has another wire lead 45 connecting with the terminal 24, as shown in Figs. 4 and 5, the lead 45 being woven back through opening 33 of the mounting card 29 before it is secured to its terminal. The wire 44 which was

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mutually secured to wires 43 and 42 connects with the resistor 39 which, in turn, has a wire 46 extending reversely through the hole 34 in the mounting card 29 and being bent at its end portion to form a holding structure. Wire 47 is connected to the wire 46 and extends rearwardly of the mounting card 29, as viewed in Fig. 5. It then connects with transistor terminal 48 which passes through the mounting card 29.

Terminal 25 has a wire 49 which passes through opening 35 in the mounting card 29 and extends upwardly to connect with the transistor terminal 50 which, in turn, extends rearwardly through the mounting card 29. The terminal 26 connects with wire 51 which passes through the opening 36 in card 29 and provides one terminal of the resistor 38, as shown in Fig. 2. Another conducting wire 52 extends from the resistor 38 and terminates with the short end extending through the opening 32 in mounting card 29. Connected to the wire 52 before it passes through opening 32 is a short wire 53 which connects with the remaining transistor terminal 54 which extends through the mounting card 29 as in the case of the other transistor terminals.

The circuit application illustrated utilizes a 3.0 volt signal swing at terminal 26 which, in turn, is connected in series to the resistor 38 providing a resistance of 22 K. A negative direct current voltage of 200 volts is applied to terminal 24 which, in turn, is connected in series to resistor 40 which is rated at 330 K. This series circuit includes the light 21 and terminal 23. A parallel circuit exists from the resistor 40 through resistor 39 to transistor terminal 48. Resistor 39 is rated at 100 K. It will of course be understood that terminal 25 is common to the input circuit and terminal 23 is common to the output circuit and for some applications may be connected together. With the foregoing circuit application, the lamp will glow at a positive swing of 1 to 10 volts. The lamp extinguishes at a negative swing of 2.5 volts. Numerous other circuits and element ratings will suggest themselves to the user while preserving the miniature character of the panel-mounted unit. If it becomes necessary to repair or replace any of the parts of the insert assembly, the terminal cap 22 may be simply removed from the shouldered end portion 20 of housing 10 and the entire assemblage and its component parts are immediately exposed to view.

I have found that additional structural strength and insulation safety can be effected by shrinking a plastic sleeve 55 about the entire insert assembly, leaving the cap terminal exposed at its rearmost portion and the lamp 21 at its forwardmost portion.

It will, of course, be understood that various changes may be made in the form, details, arrangements and proportions of the parts without departing from the scope of my invention as set forth in the appended claims.

What I claim is:

1. A panel indicator unit comprising: a housing adapted to be secured to a panel and encase said indicator; an electric lamp mounted in said housing and having an externally visible portion; a mounting card for mechanically supporting said lamp; a control element having an input adapted for connection to a control

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voltage, and an output adapted for connection to a supply voltage through said electric lamp, said control element being attached to said mounting card; and a plug having a plurality of terminals adapted for external connection which are connected to said control element, said plug supporting said mounting card and sealing said housing.

2. The invention as set forth in claim 1 including a shrink fit dielectric plastic sleeve formed tightly and rigidly about said control element and said mounting card to provide support and insulation thereto.

3. An indicator for use with bi-stable circuits comprising: a housing having a flange member to secure said housing to a panel and encase the internal elements therein; a transistor having first, second, and third elements for amplifying input signals and producing output signals representative thereof; input means connected to said first and second elements for receiving said input signals; a neon indicating lamp having a predetermined voltage level cut off; output means including means for connecting said lamp and a supply voltage between said third and second elements; and a plug closing said housing having a plurality of terminals adapted for external connection which are connected to said transistor and said input and output means.

4. An indicator for use with computer circuits comprising: a housing having a flange member to secure said housing to a panel and encase the internal elements therein; a transistor having base, emitter, and collector elements for amplifying input signals and producing output signals representative thereof; input means connected to said base and emitter elements for receiving said input signals; a neon indicating lamp having a predetermined voltage level cut off; voltage conducting means for connecting a voltage supply to drive said neon lamp; output means connecting said lamp between said voltage conducting means and said collector element and further connecting said voltage conducting means to said emitter element; and a plug having a plurality of terminals adapted for external connection which are connected to said input means and said output means, said plug supporting said transistor and said input and output means and sealing said housing.

5. The invention as set forth in claim 4 wherein said output means connects said lamp as well as said voltage conducting means between said collector and emitter elements of said transistor.

References Cited in the file of this patent

UNITED STATES PATENTS

2,072,635	Helgason et al.	May 2, 1937
2,334,579	Powell	Nov. 16, 1943
2,575,821	Linton	Nov. 20, 1951
2,585,794	Kurshan	Feb. 12, 1952
2,647,222	Nieset	July 28, 1953
2,740,111	Bogue et al.	Mar. 27, 1956
2,847,559	Harrington et al.	Aug. 12, 1958

FOREIGN PATENTS

889,620	Germany	Sept. 10, 1953
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