March 14, 1967 W. F. ROLL, JR 3,309,577

ELECTRICAL COMPONENT HOUSING AND SYSTEM

Filed March 7, 1966 2 Sheets-Sheet 1

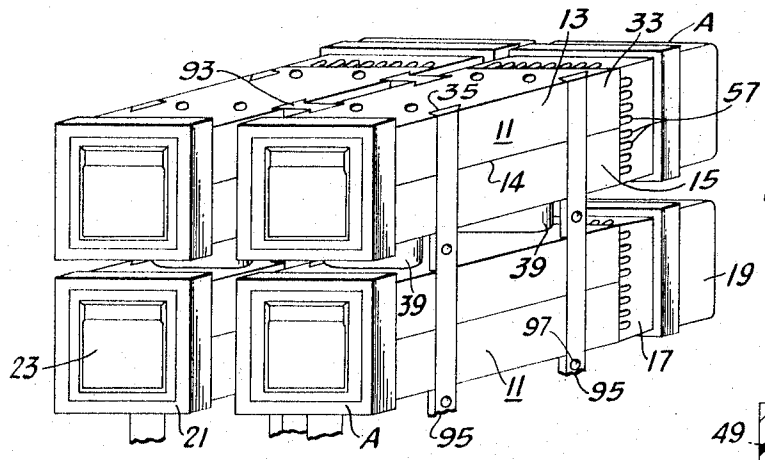


FIG. 1

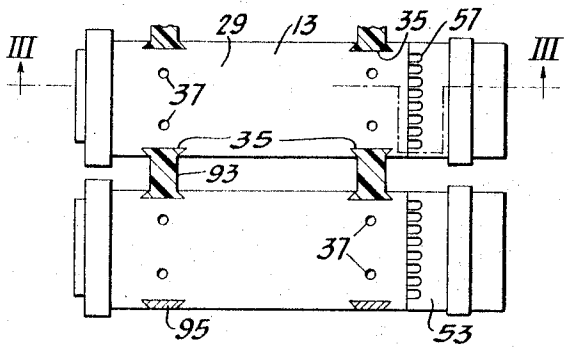


FIG. 2

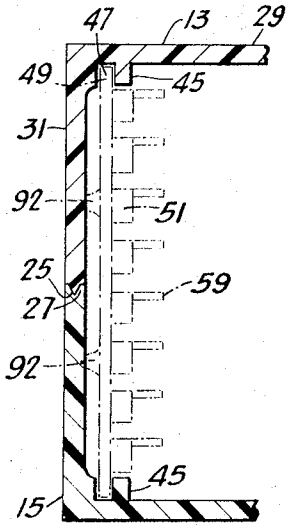


FIG. 4

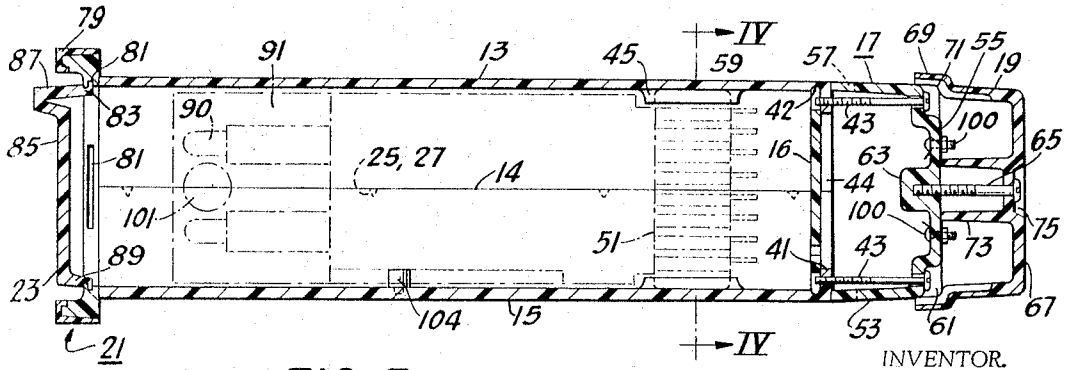


FIG. 3

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ELECTRICAL COMPONENT HOUSING AND SYSTEM

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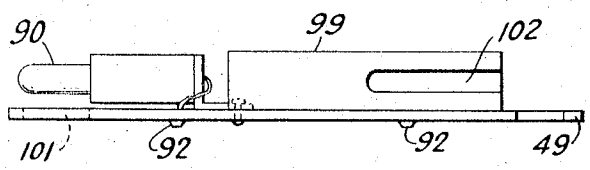


FIG. 8

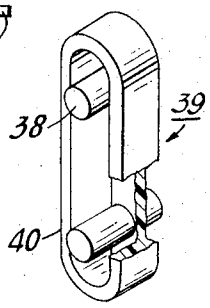


FIG. 6

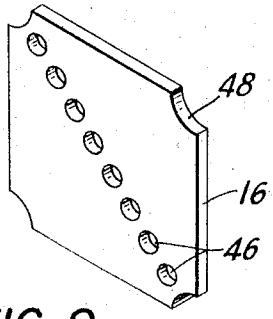


FIG. 9

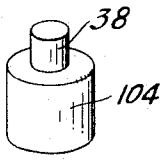


FIG. 5

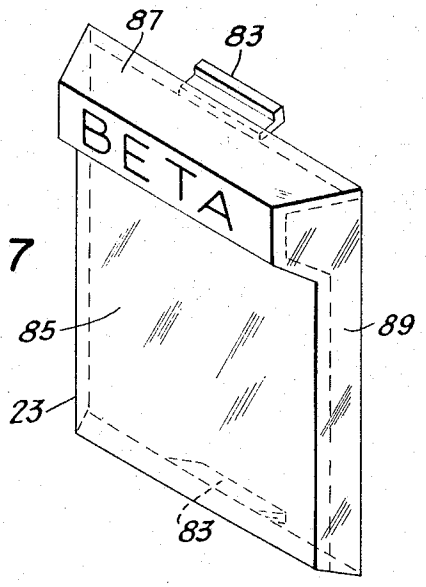


FIG. 7

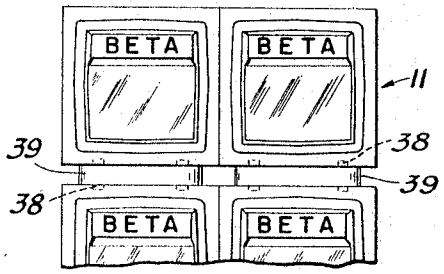


FIG. 10

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3,309,577

ELECTRICAL COMPONENT HOUSING AND SYSTEM

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Filed Mar. 7, 1966, Ser. No. 532,161
18 Claims. (Cl. 317—99)

This invention relates to electrical component systems and more particularly to an improved housing for electrical components.

While the present invention relates generally to a housing for various kinds of electrical components, it is particularly related to a housing for annunciators and the hereinafter description is directed to an annunciator housing and an annunciator system.

Annunciator systems generally include in their circuitry module components which provide a visual alarm unit, such as a light, for each variable that is to be monitored. The visual alarm unit becomes active and provides an indication that the variable has become abnormal, and a manually operable acknowledgement control may be provided which, when operated, deactivates the visual alarm unit signifying that an operator has acknowledged the visual signal. Usually, an audible alarm is also provided to attract the operator's attention to a central control panel containing the visual alarm units associated with practically all of the variables being monitored. Thus, the operator can determine at a glance the condition of all of the variables.

As would be expected, annunciator systems are quite complex in their components and circuitry, and anything as complex as annunciator systems is susceptible to occasional malfunctioning or improper operation. When such malfunctioning occurs, it is necessary that the variables be monitored visually or mechanically until such time as the system can be restored by replacing the malfunctioning annunciator or the defective electrical component of the annunciator. This has been difficult heretofore for the reason that the annunciator modules have been contained in a metal receptacle. Consequently, it has been necessary to obtain access to the back of the annunciator metal receptacle upon indication of a malfunctioning of a module of the annunciator, and the work of removing this annunciator module has been time consuming and expensive.

It is an object of this invention, therefore, to provide a novel system, such as a system comprising annunciator modules, that is readily and simply serviced by removing an improperly operating module with a properly functioning spare module, so that the entire system can be quickly restored to full operation with a minimum of interruption of service.

The present invention provides an annunciator housing comprising a tubular main body portion, a collar fixed to one end of the main body portion, a closure removably secured to the collar and a closure removably secured to the other end of the main body portion. The tubular main body portion includes first and second matching units each of which includes a first wall and spaced apart second and third side walls that are fixed to the longitudinal edges of the first wall. Internally of each unit, there are fourth and fifth spaced apart walls affixed to the first wall in spaced apart relation from respective second and third walls to form opposed grooves within the main body portion. Thus, an electrical module of a rectangle shape that conforms to the internal configuration of the main body portion is inserted and maintained

in the main body portion by an edge mounting connector and module keying insert. The tubular main body portion also has external grooves in the side surfaces which are adapted to cooperate with splines that are used to fix and maintain adjacent housings in a spaced apart relation.

For a further understanding of the present invention and for advantages and features thereof, reference may be made to the following description taken in conjunction with the accompanying drawing showing for the purpose of exemplification a preferred embodiment of the invention.

In the drawing:

FIG. 1 is a schematic perspective view of a plurality of embodiments of the housing of the invention disposed in a stacked arrangement;

FIG. 2 is a plan view of the arrangement of housings shown in FIG. 1;

FIG. 3 is a sectional view of a housing along line III—III of FIG. 2;

FIG. 4 is a sectional view along line IV—IV of FIG. 3;

FIG. 5 is a schematic perspective view of a keying insert;

FIG. 6 is a schematic perspective view of a spacer piece;

FIG. 7 is a schematic perspective view of one end closure;

FIG. 8 is a schematic view of a typical electrical component or module adapted for use in the housing;

FIG. 9 is a perspective view of a terminal board; and

FIG. 10 is a schematic view of a stacked arrangement of the housings in accordance with another aspect of the invention.

FIG. 1 illustrates a stacked arrangement of a plurality of annunciator housings **11** arranged in block form. Of course, additional housing units may be arranged in similar fashion and connected to those shown in the drawing in the manner described hereinafter. Each module housing **11** comprises a tubular main body portion that is made up of a top **13** and bottom **15** half-housing, the half-housings **13**, **15** abutting along the longitudinal edges **14**; a terminal board **16**; a bus bar cover **17**; a rear cover **19**; a front shoulder frame or collar **21**; and a front cover **23**.

The top half-housing unit **13** is identical to the bottom half-housing unit **15**. Each unit **13**, **15** is provided with a plurality of index cone points on one longitudinal edge and index cone sockets **27** on the other longitudinal edge (FIG. 4). The cone points **25** on one edge of the top unit **13** mate with the cone sockets **27** on the edge of the bottom unit **15**. Because both units **13**, **15** are identical, therefore, the description hereinafter of only the top half-housing unit **13** suffices for a description of both half-housing units **13**, **15**.

The top half-housing **13** is a channel shaped and is formed by a first wall **29** and spaced apart second and third substantially parallel side walls **31**, **33** that are connected to the longitudinal edges of the first wall **29**. The spaced apart second and third walls **31**, **33** are each provided with spaced apart dovetail like grooves **35** having axes which are substantially perpendicular to the plane of the first wall **29**. The dovetail grooves **35** are disposed in the external or outer surface of the second and third walls **31**, **33**.

The first wall **29** has in the external surface thereof a plurality of spaced apart cylindrical recesses **37** which are conveniently disposed, as shown in FIG. 2, in alignment with the axes of the dovetail grooves **35** in the side walls **31**, **33**. Each recess **37** accommodates a matching

projecting cylindrical end portion 38 of a module spacer element 39 (see FIG. 6), and a plurality of such spacer elements are used to mount a plurality of modules 11 in spaced apart vertical relation, as suggested in FIGS. 1 and 10.

The spacer element 39 (FIG. 6) has an oval shaped, hollow main body portion 40, and two sets of cylindrical end portions 38 projecting from the main body portion, that are spaced apart the same distance as the recesses 37. Thus, double spacer unit 40 is used to maintain the housing in spaced apart relation in a first direction.

The right-hand end of the top half-housing unit 13 (FIG. 3), is provided with inwardly projecting shoulders 41 (only one pair of shoulders being shown) located preferably at the corners of the half-housing units 13, 15 for receiving anchoring screws 43 to mount the bus bar cover 17 to the right-hand end of the module housing 11. The screws 43 may be of the self-tapping variety, or the shoulders 41 may be drilled and the screws 43 may be machine type screws that engage tapped holes in the shoulders 41 as preferred. Except for the shoulders 41, the right-hand end of the housing is open, as at 44, to provide access therewithin.

Adjacent the inwardly projecting shoulders 41 are grooves 42 that are adapted to receive the terminal board 16 of FIG. 9. Such terminal board 16 is provided with a plurality of holes or apertures 46 that receive and retain tubes (not shown) through which electric leads pass. The corners 48 of the terminal board 16 are formed so as to cooperate with the inwardly projecting shoulders 41.

Intermediate the ends of the top half-housing unit 13, and about where shown in FIG. 3, there are short longitudinally extending fourth and fifth spaced apart wall members 45 (only one being shown), that are integrallly formed with the top wall 29 and which are disposed in spaced apart relation to the adjacent side walls 31, 33 respectively. The slots or spaces 47 between the short longitudinally extending walls 45 and the side walls 31, 33 are adapted to accommodate and hold the outwardly extending portion 49 of an electrical component, such as an electrical connector 51 indicated phantomly in FIGS. 3 and 4. The connector 51 is adapted, thus, to remain in a fixed position in the housing 11 as it has only the single function of connecting the panel board 91 to the sensor, and control sections of the system. Thus, the connector 51 has almost no tendency to break down or malfunction.

The bus-bar cover 17 comprises a hollow receptacle having preferably tapering walls 53 and an end wall 55. The tapering walls 53 are provided, at the free edges thereof, with a plurality of slots 57 arranged in side-by-side spaced apart relation, as may be noticed by referring to FIG. 2. The slots 57 provide access for electrical lead wires or other connectors that may be connected to the usual terminal tails 59 on the connector 51, or to other electrical elements, disposed within the housing 11. The end closure wall 55 is provided with a plurality of recesses 61, four being indicated in the embodiment of the invention shown in FIG. 3, wherein each there is a hole that accommodates the cover holding screw 43 mentioned previously. Centrally disposed on the inside surface of the end closure wall 55 is a protrusion or bossing 63 that is adapted to receive another screw 65, preferably of the self-tapping type, which connects the rear cover element 19 to the bus bar cover 17, as suggested in FIG. 3.

While in a preferred embodiment of the invention, the main body portion of the housing 11 comprises two cemented half-housing units 13, 15, it is to be understood that, in some applications, the main body portion may be formed as a single unit from a suitable plastic material such as an acrylonitrile butadiene styrene polymer.

Those skilled in the art will also recognize that, even though they are not shown in the drawings, suitable bossings are provided on the inner surfaces of the walls 29, 31, 33 in way of the recesses 37 and the grooves 35 to strengthen the walls in way of the recesses and grooves.

The rear cover 19 comprises a hollow receptacle having an end closure wall 67 that is integrally formed with tapering side walls 69; the tapering side walls 69 being flared outwardly to provide a shoulder 71 that mates with the rounded corners of the bus bar cover 17. Internally, the rear cover 19 is provided with a tubular member 73 that is formed integrally with the end closure walls 67 and which abuts the end wall 55 of the bus bar cover 17 when the module housing unit 11 is assembled, as shown in FIGS. 1 and 3. The head of the screw 65 preferably lodges in a recess 75 in the outer surface of the end walls 67 thereby providing a flush outer surface on the end wall 67.

In some applications, it is desirable and preferable to arrange the module housings 11 as suggested in FIG. 10. That is, the module housings are disposed in abutting relation in a horizontal direction but, in a vertical direction, the module housings are disposed in a spaced apart relation. In order to provide a strictly rectangular front end configuration, the unitary front shoulder frame 21 is applied to the assembled housings, as shown in FIG. 3. The front shoulder frame or collar 21 comprises a plurality of bars 79 that are arranged so as to interlock with the housing ends (FIG. 3). Preferably the front shoulder frame 21 is bonded to the assembled top 13 and bottom 15 housings in a conventional manner, using any suitable adhesive.

From FIG. 3 it will be noticed that the inner surface of the respective top 13 and bottom 15 half-housings are substantially smooth, particularly adjacent the left hand end, and in each inner surface there is a centrally disposed rectangular slot 81 for receiving a projecting tab portion 83 of the front cover 23.

In a preferred embodiment of the invention, the half-housing units 13, 15, the bus bar cover 17, the terminal board 16, the rear cover 19, and the front shoulder frame 21 and the spacers 39, may be made of any suitable material preferably of a plastic nature. A suitable type of plastic material for the foregoing units is an acrylonitrile butadiene styrene polymer.

From FIG. 7, it will be noticed that the front cover or closure 23 is a hollow receptacle having a rectangular flat first portion 85 that merges with a V-shaped portion 87, shown at the top in FIG. 7, and sloping side walls 89. The walls 89, at the top and bottom of the closure 23, support outwardly projecting tab portions 83 that are adapted to engage and mate with the slots 81. Actually, the front cover or closure is adapted to be inserted into the front end of the housing 11 in four different positions, depending on the arrangement of the housing.

The front cover or closure 23 is made preferably of a flexible translucent material such as translucent polypropylene. The cover is translucent for the reason that when a malfunction occurs in the electrical component within the housing, the lamps 90 (FIGS. 3 and 8) burn and a visual signal is thus given to the system operator. Thereafter, the operator can readily and easily remove the front cover 23, reach inside the housing and remove the malfunctioning electrical component. Subsequently, a replacement component may be easily and quickly inserted in the housing and the front cover replaced. By making the front cover translucent, it is apparent that the malfunctioning component can be detected even though there is no audible alarm.

The assembly of the module housing 11 from the several components is readily accomplished in the following manner. The top and bottom half-housing units 13, 15 are matched with the index cones 25 mating with respective cone sockets 27. Before cementing or bonding the top and bottom half-housing units along the abutting surfaces 14, it is preferred that the connectors 51 and terminal board 16 be installed in the housing main body portion. The slots 47 are purposely somewhat narrower than the thickness of the outwardly projecting tab portions 49 on the connector 51 so that when the tabs are

urged into the slots **47**, the connectors are maintained in a fixed position within the housing. Thereafter, using any suitable bonding medium, the top **13** and bottom **15** half-housings may be adhesively secured to each other along abutting surfaces **14**.

As mentioned previously, the unitary front shoulder frame **21** may be bonded in any suitable manner to the left-hand end of the tubular main body portion, as indicated in FIGS. 1 and 3. The front or left-hand end of the tubular housing is, at this time, open (as is the rear or right end) and an electrical component, such as the panel board module **91**, is mounted in each of the connectors **51**, about as indicated in FIG. 3.

In accordance with this invention, the connector **51** is mounted at a preselected intermediate position in the tubular housing which permits access to both ends of the connector. A bus-bar cover **17** is adapted to close one end of the housing, and the front or other end of the housing is closed by a readily removable closure. The connector **51** is adapted to be engaged with the panel board module **91** of an annunciator system which is inserted through the front end of the housing.

Thus, in the event of malfunctioning of the annunciator system it is necessary only to remove the front end closure, extract the improperly functioning annunciator module and insert a properly functioning spare annunciator module. This change of modules can be done with a minimum of time and effort on the part of an operator.

FIG. 8 shows somewhat schematically a typical annunciator panel board **91**. In this instance, the electrical circuitry is encapsulated in the unit denoted **99** that is mounted on the base portion **49**, preferably of an electrically conductive metal. As mentioned previously, there are a plurality of supports **92** that project from the base member **49** for engagement with the side wall of the housing **31**.

In a side wall of the unit **99**, there is an elongate slot **102** that cooperates with the main body portion of a keying insert **104** (FIG. 5) when the insert is mounted within one of the half-housing units **13**, **15**. FIG. 3 shows the keying insert **104** mounted in one location in the half-housing unit **15**. It should be understood that a plurality of mounting holes to receive the outwardly projecting portion **38**, though not shown, are provided in each half-housing unit **13**, **15**. Thus, a number of different modules, each having a slot **102**, may be arranged in the housing **11**.

Extending from the unit **99** are the warning lamps **90** that burn when the annunciator module is malfunctioning. The base portion **49** also has an aperture **101** in the left-hand end for receiving a finger or a tool, as mentioned previously, to extract the module or electrical component from the housing.

After a plurality of the module housing **11** have been assembled in the manner suggested, a system comprising several module housings **11**, or as many as desired, may be stacked vertically and/or horizontally, about as indicated in FIG. 1.

In one aspect of the invention the module housings **11** are arranged in spaced apart relation in a first direction (vertical) using a plurality of the spacer pieces **39**. The cylindrical extending portions **38** of the spacer pieces, as mentioned previously, may be readily inserted in the recesses **37** provided in both the top and bottom half-housing units **13**, **15**. In the arrangement housing units **11** shown in FIG. 1, the several component housings **11** are maintained in a spaced apart relation in a second direction (horizontal) by inserting a length of double-tenon spline **93** (see FIG. 2), which is preferably made also of an acrylonitrile butadiene styrene polymer plastic material in the grooves **35**. The double-tenon spline **93** is adapted to fit snugly in the opposed dovetail grooves **35** of adjacent housings, and the housings are frictionally held in position; no additional fasteners are required to secure the adjacent housings to the spline **93**. As shown in FIG. 1, the first direction is vertical and the second direction is horizontal, but, of course, the first and second directions need not be limited to strictly vertical or horizontal directions.

In the arrangement of housings shown in FIG. 10, the double-tenon spline **93** is also used, but it is shorter than the spline shown in FIG. 2, so that the shoulder frames **21** of adjacent housings **11** abut in the horizontal direction.

The module housings at the ends of a stacked arrangement, such housings being indicated by the letter A in FIG. 1, are supported by continuous lengths of a single-tenon metal spline **95**, having therein one or more holes **97** adapted to receive suitable mounting fasteners; thus, the entire stack of modules may be fixed to a convenient supporting structure in a selected location. Preferably, the single-tenon spline is made of metal, such as aluminum, although a suitable plastic material may be used if preferred.

After the module housings have been stacked in a preferred manner, and after the connectors **51** are wired, the electrical leads passing through the holes **46** in the terminal board **16**, the bus-bar cover **17** may be mounted to the rear end of the module housing, making sure that the wire leads are placed in respective slots **57**; the cover **17** being secured, of course, by the screws **43**. Later, after the field terminals **100** (FIG. 3) are wired in (the terminals **100** having been connected previously to the connector **51**), the rear cover **19** may be placed over the terminals **100** in the end of the bus bar cover and secured in place by the screw fasteners **65**. Thereupon, the flexible translucent end closure, or front cover **23**, may be inserted in the end of the module housing **11**; the projections **83** engaging respective slots **81**.

Those skilled in the art will recognize several features and advantages in the novel electrical component housing **11** of the invention. Each of the housings may be assembled rapidly and easily, and an electrical system, such as an annunciator system, can be readily and quickly assembled by the "building block" method. No special tools or skills are required to assemble the stacked arrangement of module housings and the assembled groups of housings may be supported from existing structure, using nothing more than ordinary tools and equipment. The individual electrical component units, such as module panel board **91**, may be readily removed, and new module units may be plugged into the connector **51** simply by removing the front end closure **23** of the housing and then reaching inside the housing and grasping the component with the fingers or with an appropriate tool. Also, the wiring associated with the electrical connectors mounted in the housing is quickly and easily accomplished. Once the connector **51** is wired, it is no longer necessary to disconnect and connect the electrical components, such as the panel board **91**, each time a malfunction develops.

Other features and advantages of the invention are reflected in that the individual electrical components may be removed and replaced by persons who need not be skilled in the electronic art. It is only necessary to remove the cover **23**, pull out the defective component, plug in a replacement component, and then replace the front cover **23**.

Moreover, the housing **11** of the invention may be used for other electrical components such as a relay package and the like. If desired, switches also can be appropriately mounted in a module housing.

It should be apparent to those skilled in the art that the module housing of the invention offers many advantages because of the novel manner of assembly and mounting the units. A plurality of the housings may be grouped in many different configurations of rows and columns to suit almost any requirement. In fact, many different sequences and arrangements can be blocked if desired.

While the housing **11** has been shown as a rectangular tubular element, in the preferred embodiment of the invention, it should be understood that the housing may have a cylindrical, ellipsoidal, or other geometrical form

and the housing of the invention is not limited to only a rectangular configuration.

Although the invention has been described herein with a certain degree of particularity, it is understood that the present disclosure has been made only as an example and that various modifications and changes may be made within the scope of the invention as defined by the appended claims.

What is claimed is:

1. A housing for electrical components comprising:
(a) a main body portion including first and second matching units, each such unit comprising:
(i) a first wall having longitudinal edges;
(ii) spaced apart second and third side walls joined to the longitudinal edges of said first walls, the walls of said unit having therein spaced apart external grooves,
(iii) fourth and fifth spaced apart walls joined to said first wall and spaced apart from respective second and third walls forming slots, adapted to receive and cooperatively maintain one of said electrical components within said main body portion;
(iv) cooperative means on said first and second units for maintaining said units in matched substantially parallel axial relation;
(b) a collar mounted to one end of said main body portion and securing together said matched first and second units;
(c) a first closure removably secured to said main body portion; and
(d) a second closure removably secured to the other end of said main body portion and having therein perforations for admitting electrical connections to the electrical components within said housing.

2. The invention set forth in claim 1 wherein:
(a) said collar is bonded to the one end of said main body portion; and
(b) said first and second units are bonded together in matching relation.

3. The invention set forth in claim 1 wherein:
(a) said cooperative means on said first and second units includes a plurality of conical points and matching conical sockets.

4. The invention set forth in claim 1 wherein:
(a) said first closure is flexible translucent plastic material; and
(b) said main body portion, said collar and said second end closure are of plastic material.

5. The invention set forth in claim 1 including:
(a) a third closure removably mounted to said second closure.

6. A system of housings for electrical components comprising:
(a) a plurality of such component housings arranged in spaced apart relation each said housing including
(i) a main body portion including first and second matching units comprised of
(1) a first wall having longitudinal edges;
(2) spaced apart second and third walls joined to the longitudinal edges of said first wall, the walls of said unit having therein spaced apart external grooves;
(3) fourth and fifth spaced apart walls joined to said first wall and spaced apart from respective second and third walls forming slots adapted to receive and cooperatively maintain one of said electrical components within said main body portion;
(4) cooperative means on said first and second units maintaining said units in matched substantially parallel axial relation;
(5) a collar mounted to one end of said main body portion and securing together said matched first and second units;
(6) a first closure removably secured to said main body portion; and
(7) a second closure removably secured to the other end of said main body portion and having therein perforations for admitting electrical connections to the electrical components within said housing;
(b) first means cooperating with adjacent housing units whereby a group of said units is maintained in spaced relation in a first direction; and
(c) second means cooperating with opposed grooves in adajcent spaced units or groups of units whereby adjacent groups of units are maintained in spaced relation in a second direction.

7. The invention set forth in claim 6 wherein:
(a) said first means comprises spacer pieces;
(b) said second means comprises splines that frictionally maintain the cooperative units in preselected positions; and
(c) a third closure is removably mounted to the second closure of each housing unit;

8. An assembly of housings for electrical components of annunciator systems comprising:
(a) a plurality of annunciator module housings each housing including
(i) an elongated tubular member adapted to contain at least one of said electrical components;
(ii) a first closure removably secured to one end of said member;
(iii) a second closure removably secured to the other end of said member and having therein perforations for removably admitting electrical leads to be connected to the electrical components within said housing;
(b) said housings being arranged in groups, each group including at least one housing unit;
(c) first means cooperating with and maintaining adjacent housing units of a group in juxtaposed relation in a first direction; and
(d) second means cooperating with and maintaining adjacent groups of housing units in juxtaposed relation in a second direction.

9. The invention set forth in claim 8 wherein:
(a) said first means comprises spacer pieces of a preselected definite length; and
(b) said second means comprises splines of preselected definite length.

10. The invention set forth in claim 9 wherein:
(a) said spacer pieces cooperate with recesses in a first exterior wall of adjacent housing units; and
(b) said splines cooperate with grooves in a second exterior wall of adjacent housing units.

11. An electrical assembly comprising:
(a) a longitudinally extending tubular housing;
(b) an electrical connector mounted within said housing intermediate the end thereof, access to said connector being gained from either end of said housing;
(c) a first closure removably secured to one end of said housing;
(d) electrical terminals associated with said first closure that are adapted to be connected to said electrical connector;
(e) a second closure cooperating with said first closure and covering said electrical terminals;
(f) an electrical component disposed in said housing in cooperative engagement with said connector, said component being inserted into and extractable via the other open end of said housing;
(g) a second resilient closure cooperatively engaging and removable from said housing at said other end; and
(h) means to extract said component from said housing whereby upon the malfunctioning of said electrical

component it may be extracted therefrom and a properly functioning component inserted thereinto so as to engage with said connector.

12. The invention set forth in claim 11 wherein:

(a) said tubular housing has a rectangular cross sectional shape.

13. An assembly of annunciator systems comprising:

(a) a plurality of longitudinally extending tubular housings arranged in groups, each group including at least one housing;

(b) an electrical connector mounted within each said housing intermediate the ends thereof, access to said connector being gained from either end of said housing;

(c) a first closure removably secured to one end of each housing;

(d) electrical terminals associated with each said first closure that are adapted to be connected to said electrical connector;

(e) means covering the terminals of each said first closure;

(f) an annunciator module disposed in each housing in cooperative engagement with said connector, said module being inserted into and extractable via the other open end of said housing;

(g) means to extract said annunciator module from said housing whereby upon the malfunctioning of said module, it may be extracted therefrom and a properly functioning module may be inserted into said housing and into engagement with said connector;

(h) first means cooperating with and maintaining adjacent housings of a group in spaced relation in a first direction; and

(i) second means cooperating with and maintaining adjacent groups of housings in spaced relation in a second direction.

14. An assembly of annunciator systems comprising:

(a) a plurality of longitudinally extending housing units arranged in groups, each group including at least one housing;

(b) an electrical connector mounted within each said housing intermediate the ends thereof, access to said connector being gained from either end of said housing;

(c) a first closure removably secured to one end of each housing;

(d) electrical terminals associated with each said first closure that are adapted to be electrically wired to said electrical connector;

(e) means covering the terminals of each said first closure;

(f) an annunciator module disposed in each housing in cooperative engagement with said connector, said module being inserted into and extractable via the other open end of said housing;

(g) a terminal board disposed within each housing intermediate said connector and said first closure, said terminal board cooperating with the electrical connector being gained from either end of said housnals;

(h) means to extract said annunciator module from said housing whereby upon the malfunctioning of said module, it may be extracted therefrom and a properly functioning module may be inserted into said housing and into engagement with said connector;

(i) a second closure removably secured to the other end of said housing;

(j) first means cooperating with and maintaining adjacent housings of a group in spaced relation in a first direction;

(k) second means cooperating with and maintaining respective housings of adjacent groups of housings in abutting relation in a second direction; and

(l) third means cooperative with at least one housing unit whereby said assembly of annunciator housings is supported as an entity.

15. The invention set forth in claim 14 wherein:

(a) said first means comprises first spacer pieces of preselected length that are cooperative with opposed adjacent housing units in a group; and

(b) said second means comprises second spacer pieces that cooperate with opposed adjacent housing units in adjacent groups.

16. The invention set forth in claim 14 wherein:

(a) said longitudinally extending housings are parallelepiped in shape.

17. The invention set forth in claim 14 wherein:

(a) said second closure is translucent whereby whenever said annunciator malfunctions, a visual signal generated in said module is evident through said translucent second closure.

18. A system of housings for electrical components comprising:

(a) a plurality of such component housings arranged in spaced apart relation each such housing including

(i) a main body portion including first and second matching units comprised of

(1) a first wall having longitudinal edges;

(2) spaced apart second and third walls joined to the longitudinal edges of said first wall, said second and third walls having therein spaced apart external grooves;

(3) fourth and fifth spaced apart walls joined to said first wall and spaced apart from respective second and third walls forming slots adapted to receive and cooperatively maintain one of said electrical components within said main body portion;

(4) cooperative means on said first and second units maintaining said units in matched substantially parallel axial relation;

(5) a collar mounted to one end of said main body portion and securing together said matched first and second units;

(6) a first closure removably secured to said main body portion and closing said one end;

(7) a second closure removably secured to the other end of said main body portion and having therein perforations for admitting electrical connectors running to an electrical component within said housing;

(8) a third closure removably mounted to said second closure; and

(9) a terminal board disposed within said housing intermediate the fourth and fifth walls and said second closure, said terminal board being perforated to accommodate the electrical connections running to said electric components;

(b) an electrical connector mounted in said slots within each said housing and intermediate the ends thereof, access to said connector being gained from either opened end of said housing;

(c) electrical terminals associated with each said second closure that are adapted to be connected to said electrical connectors;

(d) an annunciator module disposed in each housing in cooperative engagement with said connector, said module being insertable into and extractable via said one end of said housing;

(e) means mountable within said housing and engageable with said module whereby said module is oriented in a selective manner;

(f) means to extract said annunciator module from said housing whereby upon the malfunctioning of said module, it may be extracted therefrom and a properly functioning module may be inserted into said housing and into engagement with said connector;

(g) first means including first spacer pieces of preselected length that are cooperative with opposed

housing units in a group whereby a group of said housing units is maintained in spaced relation in a first direction;

(h) second means including second spacer pieces of preselected length that cooperate with opposed housing units in adjacent groups whereby said groups of housing units are maintained in spaced relation in a second direction; and

(i) third means cooperative with at least one housing unit whereby said assembly of annunciator systems is supported as an entity.

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