Nov. 8, 1960 W. C. ARRASMITH 2,959,774

ANNUNCIATOR ASSEMBLY

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Fig. 1

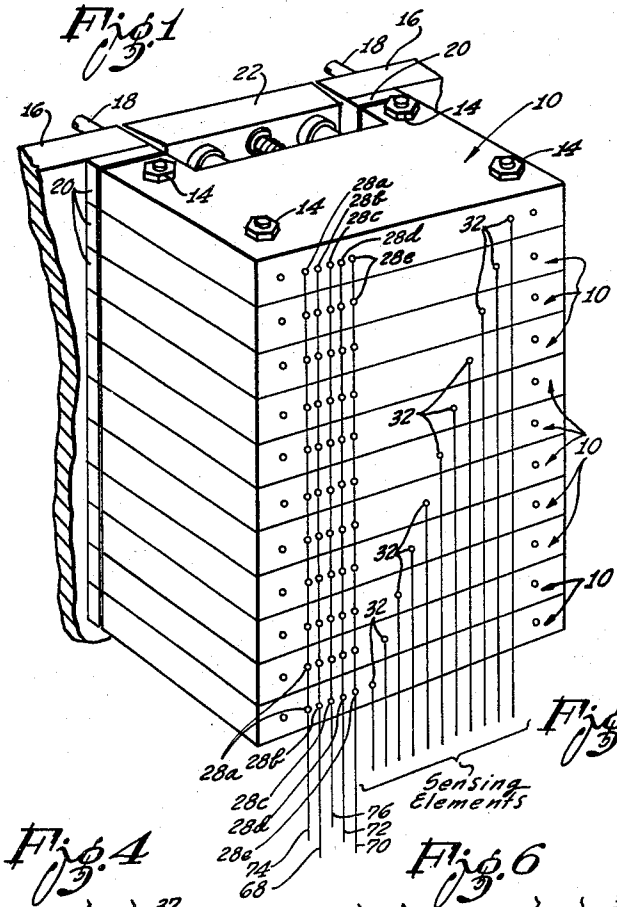


Fig. 2

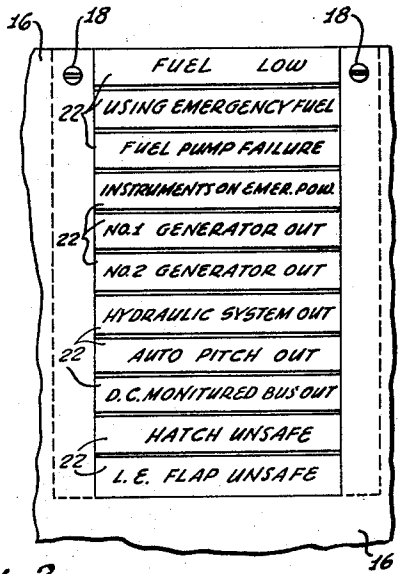


Fig. 3

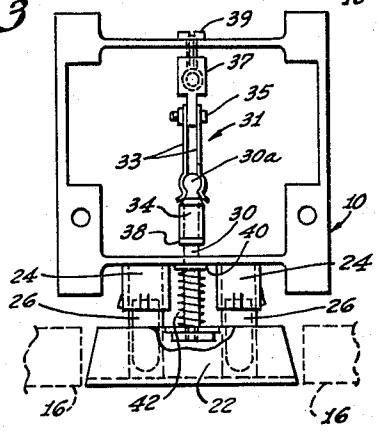


Fig. 4

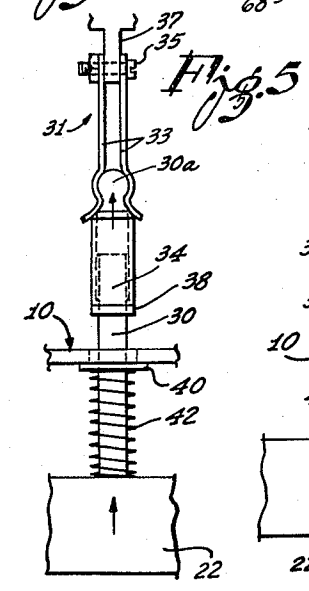


Fig. 5

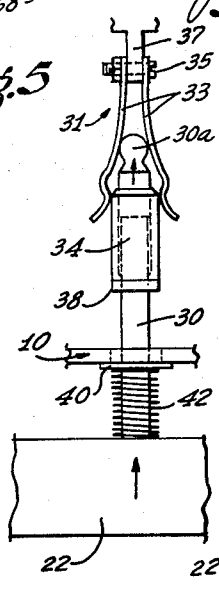
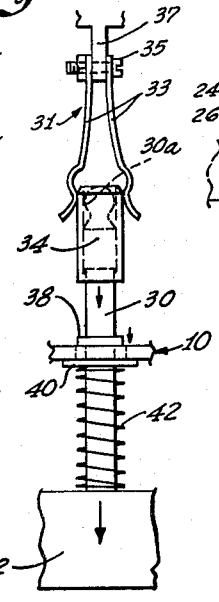


Fig. 6



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ANNUNCIATOR ASSEMBLY

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Fig. 7

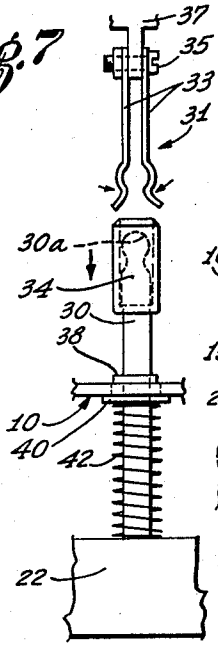


Fig. 10

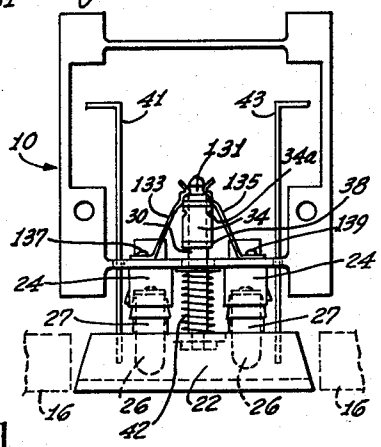


Fig. 8

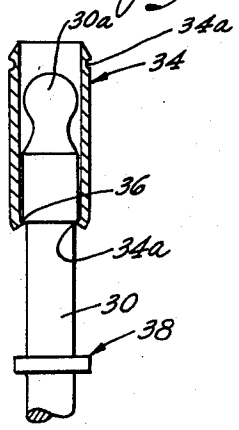
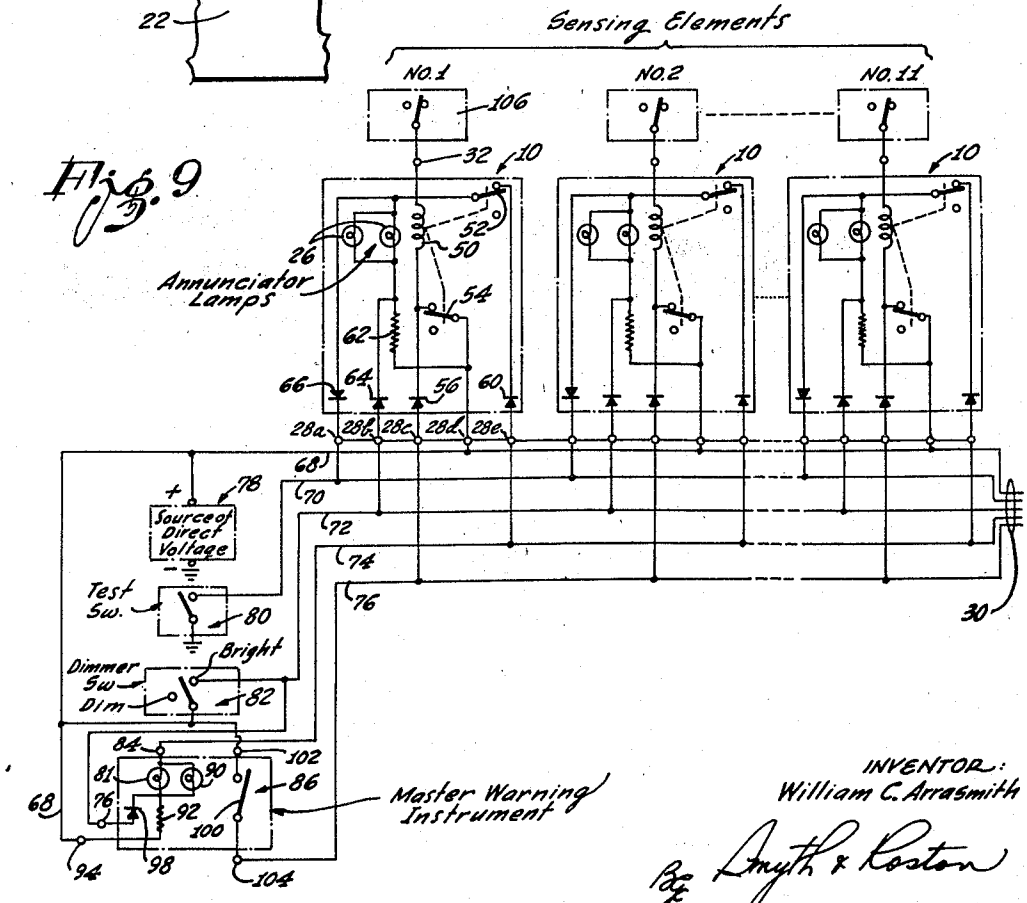


Fig. 9



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United States Patent Office 2,959,774 Patented Nov. 8, 1960

2,959,774

ANNUNCIATOR ASSEMBLY

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Filed July 7, 1959, Ser. No. 825,461

13 Claims. (Cl. 340—324)

The present invention relates to an improved assembly for use in electrically operated alarm systems of the annunciator type. The invention is more particularly concerned with an improved unit for use with a plurality of similar units on a central panel to provide visual indications of the occurrence of remote, identified hazardous conditions.

Annunciator warning systems are in general well known. An efficient system of this type is disclosed and claimed, for example, in copending application Serial No. 505,305 which was filed March 2, 1955 in the name of the present inventor, and which has been assigned to the present assignee. This application issued on May 19, 1959 as Patent No. 2,887,677.

Annunciator warning systems of the type disclosed in the copending application, for example, usually include a plurality of electrically energized lamps. These lamps are mounted in suitable housings on a central control panel, and appropriate circuitry is provided for respectively connecting the lamps to corresponding sensing elements. The sensing elements are located at different points of the monitored area, and each sensing element may include a pair of normally open electrical contacts. These contacts are constructed to close by the sensing unit whenever the condition monitored by that particular sensing element actually occurs.

It is usual to group the electrically energized lamps in shunt-connected pairs, so that if one lamp burns out, the second will still glow if the contacts of the corresponding sensing element should close. It is also known to mount each pair of lamps in a separate elongated translucent annunciator member by means of appropriate sockets. Each of these annunciator members may have a flat panel-like front face which carries inscriptions identifying the corresponding monitored condition. These inscriptions may read, for example, "fuel low," "generator off," "hatch open," etc.

When the electrical contacts controlled by one of the above mentioned sensing elements closes, an energizing circuit is completed to its pair of lamps, and the translucent annunciator member associated with these lamps is illuminated. This illumination of the front panel of the translucent annunciator member causes its inscriptions to become visible.

Copending application Serial No. 617,618 filed October 22, 1956 in the name of the present inventor and assigned to the present assignee discloses and claims improved apparatus of the type described briefly in the preceding paragraphs. This latter application issued on April 26, 1960 as Patent No. 2,934,752.

In the apparatus described in the copending application Serial No. 618,617, the control circuits and control elements associated with each pair of electrically energized lamps are positioned in a small rectangular shaped capsule, and the elongated translucent annunciator member which is to be illuminated by the lamps is constructed to be plugged into the front edge of the capsule.

The capsules described in the copending application

Ser. No. 617,618 are designed and constructed so that they may conveniently be mounted on top of one another and held in an assembled stacked relationship. The stacked capsules are then mounted on the rear of a control panel, and their respective translucent annunciator members are plugged into the different capsules through openings in the panel and from the front of the panel. The construction of the annunciator members and associated capsules of the copending application Ser. No. 617,618 is such that the individual capsules may be easily removed from the stack and replaced should the occasion arise. Also, the individual translucent annunciator members of the copending application Ser. No. 617,618, and the lamps contained in these members, are removable from the front of the panel merely by an unplugging operation. This permits the electrically energized lamps in the different annunciator members to be replaced as they are burned out.

The present invention is concerned in one of its aspects with an annunciator assembly of the type discussed in the preceding paragraphs, and described and claimed in the copending application Ser. No. 617,618. An important feature of the present invention, however, is that the individual translucent annunciator members can be mounted flush with the front surface of the supporting panel. This is a distinct advantage over the prior art arrangements in which the individual annunciator members usually were mounted to project outwardly from the front face of the control panel. This was necessary with the prior art units to permit the individual annunciator members to be removed for the replacement of burned out lamps.

In accordance with the concepts and structural features of the present invention, any particular individual translucent annunciator member can be removed from its associated capsule, or housing, merely by depressing the particular annunciator member inwardly with respect to the plane of the front face of the supporting panel, and they by releasing the annunciator member. This causes an improved latching mechanism which is incorporated into the assembly of the invention to operate and displace the particular annunciator member outwardly from the plane of the supporting panel and to a position in which it can be easily removed.

The assembly of the present invention, as described above, is not only advantageous in the convenience with which the individual translucent annunciator members can be removed to replace burned out lamps, but it also permits the individual annunciator members to be mounted flush with the front surface of the control panel. This is most advantageous, for example, in the cockpit of an aircraft where it is most desirable to have a minimum of elements projecting from the plane of their supporting panels.

The annunciator warning assembly of the invention is also advantageous in that it permits a large number of translucent annunciator members to be supported in a minimum of space on a control panel. Even though the different annunciator members are positioned closely adjacent to one another, each may be conveniently removed without interference from the adjacent members, this being achieved merely by depressing the member which is to be removed and then releasing that member. The subsequent release causes the associated latching mechanism, in accordance with the concepts of the invention, to displace the particular annunciator member to a position at which it protrudes out from the plane of the control panel and of the other annunciator members. This places the particular annunciator member in a position in which it can be quickly and easily removed from the assembly.

The assembly of the invention can be used in conjunc-

tion with the capsule type of units described above. However, the invention, as will become evident, finds general utility whenever a plurality of individual strip or bar members, for example, are to be mounted on a supporting panel; and when it is desired that such members be conveniently and individually removable, and that they be normally disposed flush with the front face of the supporting panel.

The above and other aspects and advantages of the invention will become apparent from the following description, when taken in conjunction with the accompanying drawings, in which:

Figure 1 is a rear perspective view of a plurality of capsules assembled in a stacked condition and mounted on the rear face of a control panel, each of the illustrated capsules containing circuitry and control elements for electrically energized lamps which are controllable to illuminate annunciator members mounted on the different capsules in accordance with the concepts of the present invention;

Figure 2 is a front view of a panel of Figure 1 and illustrates the front faces of the different annunciator members and typical inscriptions that may be carried on those faces;

Figure 3 is a top view of one of the capsules of Figure 1, with the various control elements and circuitry included in that capsule being removed for purposes of clarity, and this view illustrating the manner in which a translucent annunciator member is releasably supported on the front edge of the capsule in a manner to permit it to be flush with the front surface of the supporting panel;

Figures 4, 5, 6 and 7 are fragmentary schematic illustrations of a latching mechanism constructed in accordance with the invention and which serves to releasably support an annunciator member on its associated capsule housing, these views illustrating how the annunciator member may be disengaged by depressing it inwardly toward the housing and by subsequently releasing it;

Figure 8 is a fragmentary view, partly in section, of a plug member which is mounted on each translucent annunciator member, and which has a cylindrical member slidably mounted on it, for reasons to be described;

Figure 9 is a circuit diagram of a suitable control system for the annunciator units of the present invention; and

Figure 10 is a top view of one of the capsules of Figure 1, similar to the view of Figure 3, but incorporating certain modifications in accordance with a second embodiment of the invention.

As stated previously, and as described in the copending application Ser. No. 617,618, the control circuit and elements for each pair of electrically energized lamps in the system may be individually housed in a separate capsule, and the translucent annunciator member to be illuminated by the energizing of the particular pair of lamps is supported on one edge of the capsule in a manner to be described. Such capsules are designated **10** in Figure 1, which illustrates a stack of similar annunciator capsules.

The annunciator capsules **10** are held together in a stacked condition by a plurality of bolts **14** which extend through the entire stack and which have appropriate nuts threaded to their extremities to hold the stack of capsules in an assembled condition. The stacks of capsules are supported on the rear face of a control panel **16** by means of a plurality of screws, such as the screws **18**. The individual capsules may be spaced rearwardly from the rear face of the control panel **16** by a plurality of spacer members **20** which may be inserted between the leading edge of each of the capsules **10** and the rear face of the panel **16**.

Each of the capsules **10** includes a translucent annunciator member **22** associated with it. As shown in Figures 1 and 2, the annunciator members **22** may have a generally elongated rectangular configuration, and they are received by corresponding openings in the panel **16** and are supported on the front edge of their respective capsules **10** in a manner to be described.

As shown in Figure 2, for example, each of the translucent annunciator members **22** has suitable inscriptions formed on its front face. These inscriptions identify the particular hazardous condition monitored by that particular annunciator member. Whenever the particular hazardous condition actually occurs, and in a manner to be described, the resulting closure of a pair of sensing element contacts causes a corresponding pair of electrical energized lamps to illuminate the particular one of the annunciator members **22**.

As shown, for example, in Figures 1 and 3, the annunciator members **22** are supported by their corresponding capsules **10** in positions such that their front faces are flush with the front face of the supporting panel **16**. This, as mentioned above, is convenient in that it not only removes the undesirable condition of having projecting elements in a cockpit, for example; but in addition the improved latching mechanism of the invention permits the different annunciator members **22** to be mounted closely adjacent to one another and yet be removed in a simple manner without interference from adjacent members, as will be explained.

As noted above, each of the capsules **10** contains the circuitry and control elements necessary to control the pair of electrically energized lamps associated with that particular capsule. To this end, each of the capsules has a plurality of terminals designated **28***a*, **28***b*, **28***c*, **28***d* and **28***e* mounted on its rear edge, and an additional terminal **32**. The terminals **28***a* of all the capsules in the stack are connected together, as shown in Figure 1, and this applies to the terminals **28***b*, **28***c*, **28***d* and **28***e*. The respective terminals **32** on the other hand, are connected to the different sensing elements in the area to be monitored.

As illustrated in Figure 3, each capsule **10** includes a pair of electric lamp sockets **24** mounted on its forward edge. The sockets **24** may be of any known physical construction and configuration, and they serve to support a corresponding pair of electrically energized lamps **26**. The lamps **26** are received in corresponding openings in the rear face of the associated annunciator member **22**, when the same is positioned in the corresponding opening in the control panel **16**. It will be observed that the annunciator **22** is normally positioned, as illustrated in Figures 1 and 3, in the opening in the panel **16** so that its front surface is flush with the front surface of the panel **16**.

A plug member **30** (Figure 3) is mounted on the annunciator **22**, and the plug member extends from the rear surface of the annunciator member. The annunciator member **22** is removable from the capsule **10**, and when it is moved into place in the opening of the panel **16**, the plug member **30** extends through an aperture in the front wall of the capsule **10**.

A resilient jack **31** is mounted in the capsule **10** in axial alignment with the aperture in the front wall of the capsule. The plug **30** has a ball-shaped extremity **30***a* and that extremity is engaged by the resilient jack **31** when the plug **30** is inserted into the capsule **10**. The jack **31** includes a pair of spaced arms **33** which are supported at one end by a screw **35**. The arms are resilient and their free ends are shaped to releasably engage the ball-shaped extremity **30***a* of the plug. The screw **35** supports the arms **33** on a bracket **37**, and the bracket is mounted to the rear wall of the capsule **10** by a screw **39**.

The jack **31** serves to hold the annunciator member **22** in position in the opening of the control panel **16**. When the annunciator member is in that position, the lamps **26** are received by the openings in the rear face of the annunciator member, and these lamps illuminate the in-

scriptions on the front face of the annunciator member **22**, when the lamps are energized.

The plug **30** has a cylindrical member **34** slidably mounted on it, as best shown in Figure 8. The cylindrical member **34** has an inner diameter which is slightly greater than the outer diameter of the ball-shaped extremity **30***a* of the plug **30**. This permits the cylindrical member **34** to slide to the end of the block **30** and to a position covering the ball-shaped extremity of the plug, as shown in Figure 8. The rear end of the cylindrical member **34** is turned inwardly, as shown at **34***a*, and inwardly turned end of the cylindrical member **34** engages a shoulder **36** on the plug **30** to prevent the cylindrical member from moving off the end of the plug. A collar **38** is secured to the plug **30** to the rear of the cylindrical member **34**, and this collar serves to push the cylindrical member into the jack **31** so as to disengage the ball-shaped end **30***a* of the plug **30**, when the annunciator member **22** is displaced inwardly toward the capsule **10**.

A second collar **40** (Figure 3) is slidably mounted on the plug **30** in front of the collar **38**. The collar **40** has a diameter greater than the diameter of the plug-receiving aperture in the front wall of the capsule **10**. A coil spring **42** is mounted on the plug **30** between the rear face of the annunciator member **22** and the collar **40**, and this spring engages the collar and the annunciator member **22** to bias the annunciator member outwardly from the front wall of the capsule **10**.

The manner in which the latching mechanism of the invention operates when it is desired to release the annunciator member **22** is shown by the fragmentary schematic diagrams of Figures 4–7.

The illustration of Figure 4 shows an annunciator member **22** in its position as normally engaged by the jack **31** and held in place on its corresponding capsule **10**. When it is desired to release the annunciator member, it is depressed inwardly towards the capsule **10** as shown in Figure 5. This causes the collar **38** to move the cylindrical member **34** into the jack **31** and spread the arms **33** of the jack so as to disengage the ball-shaped extremity **30***a* of the plug from the jack. Then, when the annunciator member **22** is subsequently released, and as shown in Figure 6, the resilient spring **42** biases the member outwardly from the capsule **10** to withdraw the ball-shaped end **30***a* of the plug **30** down into the cylindrical member **34**. The annunciator member **22** is now displaced outwardly from the plane of the front surface of the panel **16** in position to be removed.

The cylindrical member **34** may be provided with a peripheral groove **34***a* (Figure 8) near its forward extremity, and the arms **33** of the resilient jack **31** engage this groove with a slight retaining pressure when the cylindrical member is moved into the jack.

Now, to remove the plug assembly from the jack **31**, and as shown in Figure 7, it is merely necessary to move the displaced annunciator member **22** outwardly and away from its associated capsule. This removal reveals the lamps **26** on the edge of the corresponding capsule **10**; so that they may be easily removed and replaced. Then, the annunciator member **22** may again be plugged into its capsule **10** into the plug-jack relationship illustrated in Figure 4.

The terminals **28***a*, **28***b*, **28***c*, **28***d* and **28***e* of Figure 1 are shown in the circuit diagram of Figure 9, and the terminal **32** of Figure 1 is also shown in Figure 9. Each of the capsules **10** contains a single relay having an energizing winding **50** and having a pair of armatures **52** and **54**. When the winding **50** is energized, the armature **52** opens from its upper contact and closes on its inactive lower contact. At the same time, when the winding **50** is energized, the armature **54** opens from its inactive lower contact and closes on its upper contact.

One terminal of the winding **50** is connected to the terminal **32**, and the other terminal of this winding is connected to the cathode of a diode **56**. The anode of this diode is connected to the terminal **28***c*.

The upper contact associated with the relay armature **54** is connected to the common junction of the diode **56** and the winding **50**. The armature **54**, itself, is connected to the terminal **28***b*. The armature **52** is connected to the common junction of the winding **50** and the terminal **32**. The upper contact associated with this armature is connected to the cathode of a diode **60**. The anode of this diode is connected to the terminal **28***a*.

The two electrically energized lamps **26**, referred to in conjunction with Figure 3, are mounted in the described manner, and are connected in parallel, as shown in Figure 9. These shunt connected electrically energized lamps are connected through their sockets **24** (Figure 3) to the common junction of the winding **50** and the terminal **32** in Figure 9, and to one terminal of a resistor **62**. The other terminal of the resistor **62** is connected to the terminal **28***b*.

A diode **64** has its cathode connected to the common junction of the lamps **38**, **40** and the resistor **62**, and the anode of this diode is connected to the terminal **28***d*. A diode **66** has its cathode connected to the terminal **28***c* and the anode of this diode is connected to the terminal **32**. The elements and circuitry described above are similar to those described in the copending application Ser. No. 617,618 referred to above, and they constitute suitable internal connections and components for each of the capsules **10**.

The five leads from the respective terminals **28***a*, **28***b*, **28***c*, **28***d* and **28***e* of Figure 1 are designated **74**, **68**, **76**, **72** and **70**. The lead **68** is connected, as shown in Figure 9, to the positive terminal of a source **78** of direct voltage, the negative terminal of this source being grounded. The lead **70** is connected to the fixed contact of a test switch **80**. This switch may be in the form of a single-pole single-throw manually operated push button switch. The armature of the switch is normally biased out of engagement with the fixed contact, and the armature is grounded.

The lead **72** is connected to the fixed contact of a dimmer switch **82**. This latter switch may also be in the form of a single-pole single-throw manually operated push button switch. The armature of the switch **82** is connected to the positive terminal of the source **78**. The armature of the switch **82** is normally biased into engagement with its fixed contact, and when the movable arm is depressed, the connection from the positive terminal of the source **78** to the lead **72** is broken.

The lead **74** is connected to a terminal **84** of a master warning instrument **86**. The terminal **84** is connected to one side of a pair of shunt connected master warning electrically energized lamps **88** and **90**. A resistor **92** connects the other side of these shunt connected lamps to a terminal **94** of the unit. A further terminal **96** is connected to the anode of a diode **98**, and the anode of this diode is connected to a common junction of the lamps **88**, **90** and the resistor **92**. The terminal **96** is connected externally to the lead **72**. The unit **86** also includes an "acknowledge" or reset switch **100**. The switch is normally spring biased to an open condition and it is a single-pole single-throw type. The fixed contact of the switch **100** is connected to a terminal **102** of the unit **86** which, in turn, is connected to the positive terminal of the source **78**. The armature of the switch **100** is connected to a terminal **104** of the instrument **86**, and this terminal is connected externally to the lead **76**. The terminal **94** of the instrument is connected externally to the positive terminal of the source **78**.

The terminal **32** is connected to the armature of a switch **106** incorporated in a sensing element in the area to be monitored. This switch is actuated in known manner to close in response to the occurrence of a certain condition. The switch includes a fixed contact which is grounded, and the armature of the switch closes

with the fixed contact upon the occurrence of a certain condition as, for example, the rise of pressure or temperature above a selected threshold, a drop in oil pressure, the mechanical shifting of an element, etc. Sensing elements, in themselves, are well known in the art. It is believed, therefore, that a detailed description of such an element is not necessary to the understanding of the present description.

Assume now that the hazardous condition monitored by the sensing element No. 1 has occurred, thereby causing the armature of the switch **106** in that element to close on its grounded fixed contact. The closure of the switch **106** places a ground on the terminal **32** of the capsule **10**. This completes a circuit from the negative terminal of the source **78** through the annunciator lamps **26**, through the diode **64**, and through the switch **82** to the positive terminal of the source **78**. The annunciator lamps **26**, therefore, glow brightly and illuminate the inscriptions on their associated annunciator member **22**.

The closure of the switch **106** of the sensing element No. 1 also completes a circuit from the negative terminal of the source **78** through the terminal **32**, through the armature **52** of the relay and its upper contact, down through the diode **60**, through the master warning lamps **88** and **90** through the diode **98**, and through the dimmer switch **82** to the positive terminal of the source **78**. The master warning lamps **88** and **90**, therefore, also glow brightly.

It should be pointed out that the master warning instrument is usually located in such a position that it may readily catch the eye of the operator to inform him of the fact that something is wrong. The operator then turns to the annunciator members **22** to determine the locality of the fault or hazardous condition. When the operator's attention has been attracted by the glowing lamps in the master warning instrument, the instrument has served its purpose. Now, the master warning lamps can be de-energized and placed in readiness to indicate another monitored hazardous condition that might arise. This de-energizing of the master warning lamps is accomplished by closing the reset switch **100**.

When the reset switch **100** is closed, the lead **76** connects the terminal **28***c* of the capsule to the positive terminal of the source **78**. This causes the relay winding **50** to be energized to move the arm **54** to its upper contact. The arm **54** now establishes a circuit which holds the winding **50** energized so long as the fault at the No. 1 sensing element causes the switch **106** to remain closed. At the same time, the energizing of the relay winding **50** causes the arm **52** to move from its upper contact to break the connection of the lamps **88** and **90** in the master warning instrument. The master warning lamps, therefore, are de-energized. However, the annunciator lamps **26** remain energized and their corresponding annunciator member **22** remains illuminated as long as the fault continues.

The dimmer switch **82** serves as a means for dimming the annunciator lamps **26** and the master warning lamps **88** and **90** when so desired. When the dimmer switch **82** is depressed, the circuit through the diode **64** from the annunciator lamps **26** is broken, and an auxiliary circuit through the resistor **62** and through the terminal **28***b* to the positive terminal of the source **78** is established. The annunciator lamps, therefore, continue to glow but with reduced luminance because the resistor **62** has effectively been placed in their energizing circuit. Likewise, the actuation of the dimmer switch **82** breaks the circuit from the master warning lamps **88** and **90** through the diode **98**, and causes these lamps to be energized through the terminal **94** and through the resistor **92**. The master warning lamps, therefore, also continue to glow but also with reduced brilliance.

The test switch **80** is effectively connected through the diode **66** in shunt across the sensing elements. When this test switch is actuated, it stimulates the closure of all the sensing elements so that appropriate tests can be made to assure that the system is in proper working order.

In the embodiment of Figure 10, the elongated translucent annunciator member **22** is also supported on its capsule **10** in a position such that its front face is normally flush with the front of the panel **16**. In the latter embodiment the electrically energized lamps **26** are supported in the annunciator member itself in respective plugs **27**. The plugs in turn are supported removably in the sockets **24** on the front edge of the capsule **10**.

The above described arrangement is such that when the member **22** is depressed and released to cause it to spring out from the panel **16**, the plugs **27** are drawn out of the sockets **24** a sufficient distance to de-energize the lamp **26**. This is advantageous in that it permits the pilot to de-energize any particular annunciator member after he has been made aware of the fault. This obviates the annoyance of the presence of a glowing annunciator panel after the fault has been appreciated, especially if the fault is one that need not be corrected immediately.

In the embodiment of Figure 10, the end of the plug **30** has a notch **131** formed in it; and this notch is positively engaged by a pair of resilient members **133**, **135**. The resilient members form the jack in the latter embodiment, and they are fastened to the front edge of the capsule by suitable means, such as by a pair of pins **137**, **139**. The plug **30** is released from the jack by the cylindrical member **34** in exactly the same manner as described above for the previous embodiment.

It will be remembered that, as stated above, each annunciator member **22** has a particular inscription on its face corresponding to the fault it is monitoring. It is important, therefore, that an annunciator member should never be plugged into the wrong capsule, for then a false designation would be given should the fault monitored by that particular capsule arise.

To prevent an annunciator member **22** from being plugged into the wrong capsule, the embodiment of Figure 10 provides means for caging the annunciators in their associated capsules. This means permits the annunciator member to be withdrawn out from the front edge of the capsule a sufficient distance to replace the lamp **26**, but does not permit the annunciator member to be completely removed from its capsule.

The caging means referred to in the preceding paragraph takes the form in the embodiment of Figure 10 of a pair of strip-like slide members **41** and **43**. These slide members are molded into the annunciator member **22** and they extend through the front edge of the capsule **10** and into its interior. The rear extremities of the slide members **41** and **43** are bent over to engage corresponding shoulders in the side walls of the capsule **10** when the annunciator member is drawn out from the panel **16** to its permissible limit.

The invention provides, therefore, an improved annunciator assembly in which the different annunciator members may be held flush with the control panel. The improved assembly of the invention also provides, by means of an improved latching mechanism, for the convenient release of individual ones of the annunciator members. This release is carried out, as described above, by merely depressing the selected annunciator member and then releasing it. This causes the selected member to be displaced outwardly from the plane of the control panel for its convenient removal.

I claim:

1. An assembly for use in an electrical system including: a housing having an aperture therein, a movable member, an elongated plug member mounted on the movable member and projecting from the movable member to be inserted in the aperture in the housing, a resilient jack mounted in the housing in alignment with the aperture therein to engage the plug and thereby hold

the movable member on the housing, and means for releasing the elongated plug member from the resilient jack when the movable member is moved in the direction of the housing.

2. An indicating assembly for use in an electrical system including: a housing having an aperture therein, an annunciator member, an elongated plug member mounted on the annunciator member and projecting from the annunciator member to be inserted in the aperture in the housing, a resilient jack mounted in the housing in alignment with the aperture therein to engage the extremity of the plug and thereby hold the annunciator member in the housing, a cylindrical member slidably supported on the plug adjacent the extremity thereof, and means coupled to the plug for forcing the cylindrical member into the jack to disengage the extremity of the plug from the jack when the annunciator member is moved in the direction of the housing.

3. An indicating assembly for use in an electrical system including: a housing having an aperture therein, an annunciator member, an elongated plug member having a peripheral groove adjacent the extremity thereof and mounted on the annunciator member and projecting from the annunciator member to be inserted in the aperture in the housing, a resilient jack mounted in the housing in alignment with the aperture therein to engage the groove in the extremity of the plug and thereby hold the annunciator member on the housing, a cylindrical member slidably supported on the plug adjacent the extremity thereof, a collar secured to the plug to the rear of the cylindrical member for forcing the cylindrical member into the jack to disengage the groove at the extremity of the plug from the jack when the annunciator member is moved in the direction of the housing, and resilient means for retracting the plug from the jack when the groove at the extremity thereof is so disengaged from the jack by the cylindrical member.

4. An indicating assembly for use in an electrical warning system including: a housing having an aperture therein, an annunciator member, an elongated plug member having a ball-shaped extremity and mounted on the annunciator member and projecting from the annunciator member to be inserted in the aperture in the housing, a resilient jack mounted in the housing in alignment with the aperture therein to engage the ball-shaped extremity of the plug and thereby hold the annunciator member on the housing, a cylindrical member slidably supported on the plug adjacent the ball-shaped extremity thereof and movable to a position covering the ball-shaped extremity, a collar secured to the plug to the rear of the cylindrical member for forcing the cylindrical member into the jack to disengage the ball-shaped extremity of the plug from the jack when the annunciator member is moved in the direction of the housing, a second collar slidably mounted on the plug and having a diameter greater than the diameter of the aperture in the housing, and a resilient member mounted on the plug between the annunciator member and the second collar to bias the second collar against the housing so as to retract the plug from the jack when the ball-shaped extremity thereof is so disengaged from the jack by the cylindrical member.

5. An indicating assembly for use in an electrical warning system including: a housing including a front wall having an aperture therein, an annunciator member, socket means for supporting at least one electric lamp in position to illuminate the annunciator member when the annunciator member is mounted on the housing, and means for mounting the annunicator member on the housing and including latching means for releasing the annunciator member when the same is moved in the direction of the housing.

6. An indicating assembly for use in an electrical warning system including: a housing including a front wall having an aperture therein, an elongated annunciator member of generally rectangular configuration and composed of translucent material, socket means mounted on the front wall of the housing for supporting at least one electric lamp in position to illuminate the annunciator member when the annunciator member is mounted on the housing, an elongated plug member mounted on the annunciator member and projecting from the rear face of the annunciator member to be inserted in the aperture in the front wall of the housing, a resilient jack mounted in the housing in alignment with the aperture therein to engage the plug and thereby releasably mount the annunciator member on the housing, and means for releasing the elongated plug member from the resilient jack when the annunciator member is moved in the direction of the housing.

7. An assembly to be mounted on a supporting panel including: a housing to be mounted on the rear face of the panel adjacent an opening in the panel, a movable member having a configuration to be received by the opening in the panel, means for mounting the movable member on the housing in position in the opening in the panel, and latching means included in the mounting means for releasing the annunciator member when the same is moved into the opening in the panel in the direction of the housing.

8. An indicating assembly for use in an electrical warning system and to be mounted on a supporting panel, said assembly including: a housing to be mounted on the rear face of the panel with a front edge thereof facing an opening in the panel, a translucent annunciator member having a configuration to be received by the opening in the panel and having a front face with inscriptions formed thereon, socket means for supporting at least one electric lamp in position to illuminate the annunciator member when the annunciator member is positioned in the opening in the panel, means for mounting the annunciator member on the housing in position in the opening in the panel with the front face of the annunciator member flush with the front face of the panel, and latching means included in the mounting means for releasing the annunciator member when the same is moved into the opening in the panel in the direction of the housing.

9. An indicating assembly for use in an electrical warning system and to be mounted on a supporting panel, said assembly including: a housing to be mounted on the rear face of the panel with a front edge thereof facing the rear face of the panel, electric socket means for at least one electrically energized lamp supported on the front edge of the housing adjacent an opening in the panel, a translucent annunciator member having a configuration to be received in the opening in the panel and having inscriptions formed on a front face thereof and further having an opening therein to receive the electrically energized lamp, an elongated plug member mounted on the translucent annunciator member having a ball-shaped extremity and projecting from the rear face of the translucent member to be inserted in an aperture in the front edge of the housing, a resilient jack mounted in the housing in alignment with the opening in the front edge thereof to engage the ball-shaped extremity of the plug and thereby hold the translucent member in place in the opening of the panel with the front edge of the translucent member flush with the front face of the panel, a cylindrical member slidably mounted on the plug adjacent the ball-shaped extremity thereof, a collar mounted on the plug to the rear of the cylindrical member to force the cylindrical member into the jack so as to disengage the extremity of the plug from the jack when the translucent member is depressed inwardly into the plane of the panel, and resilient means mounted on the plug for retracting the translucent annunciator member out of the plane of the front face of the panel when the ball-shaped extremity of the plug is disengaged from the jack by the cylindrical member.

10. An indicating assembly for use in an electrical warning system including: a housing having an aperture

therein, an annunciator member, an elongated plug member mounted on the annunciator member and projecting from the annunciator member to be inserted in the aperture in the housing, a resilient jack mounted in the housing in alignment with the aperture therein to engage the plug and thereby hold the annunciator member on the housing, means for releasing the elongated plug member from the resilient jack when the annunciator member is moved in the direction of the housing, and caging means extending from the annunciator member into the housing to prevent the removal of the annunciator member from the housing.

11. The combination defined in claim 10 in which the caging means includes at least one strip-like slide member affixed to the annunciator member and extending from the rear face thereof into the housing in sliding relationship with the housing, and said slide member including means for preventing the complete withdrawal thereof from the housing.

12. An indicating assembly for use in an electrical warning system including: a housing having an aperture in the front edge thereof, an annunciator member, an elongated plug member having a peripheral groove at the extremity thereof mounted on the annunciator member and projecting from the annunciator member to be inserted in the aperture in the housing, a resilient jack mounted in the housing at the front edge of the housing adjacent the aperture and having at least one resilient member positioned to engage the peripheral groove in the plug member when the plug member is inserted into the aperture and thereby hold the annunciator member on the housing, a cylindrical member slidably supported on the plug adjacent the extremity thereof, a collar secured to the plug to the rear of the cylindrical member for forcing the cylindrical member into the jack to disengage the resilient member from the groove in the plug when the annunciator member is moved in the direction of the housing, and resilient means for retracting the plug from the jack when the resilient member is so disengaged from the groove at the extremity of the plug.

13. An indicating assembly for use in an electrical warning system including: a housing including a front wall having an aperture therein, an elongated annunciator member of generally rectangular configuration and composed of translucent material, socket means mounted on the front wall of the housing, plug means mounted on the annunciator member to be inserted in the socket means in electrical contact therewith when the annunciator member is supported on the housing and for supporting at least one electric lamp in the annunciator member in position to illuminate the annunciator member when the plug means is inserted in the socket means, an elongated plug member mounted on the annunciator member and projecting from the rear face of the annunciator member to be inserted in the aperture in the front wall of the housing, a resilient jack mounted in the housing in alignment with the aperture therein to engage the plug and thereby releasably mount the annunciator member on the housing, and resilient means for releasing the elongated plug member from the resilient jack and de-energizing the electric lamp when the annunciator is moved in the direction of the housing and released.

No references cited.