April 22, 1969 C. S. SLOAN 3,440,647

TWO-TERMINAL INDICATOR LIGHT HAVING SPRING-BIASED TERMINALS

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Fig. 1.

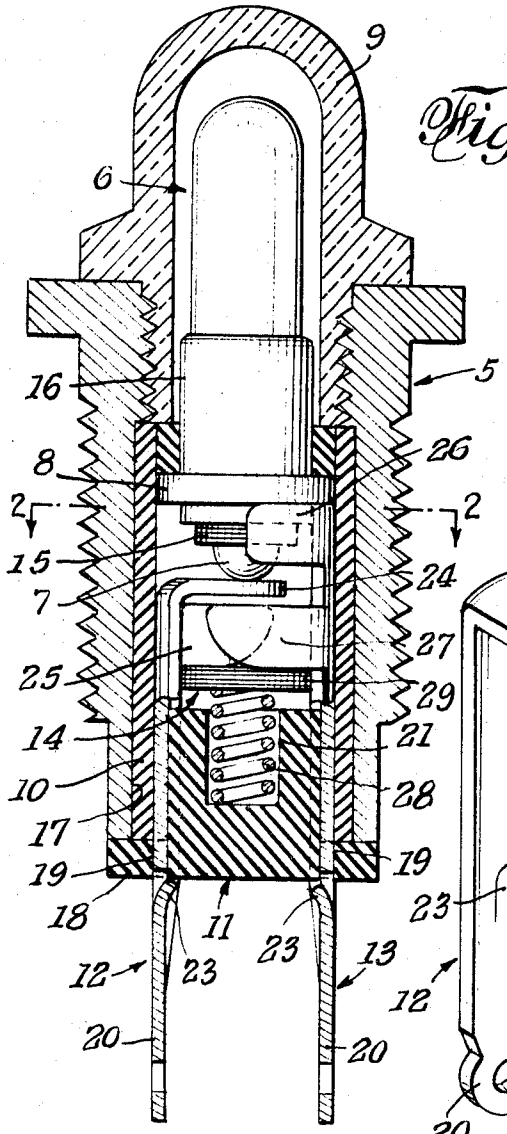


Fig. 2.

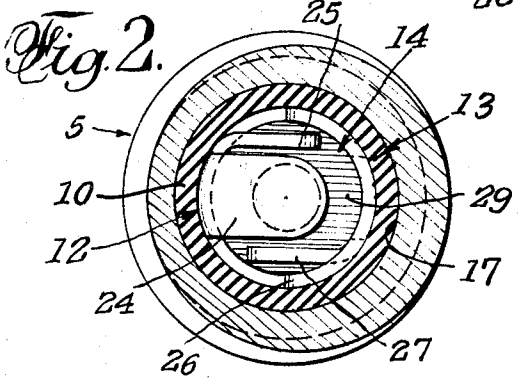
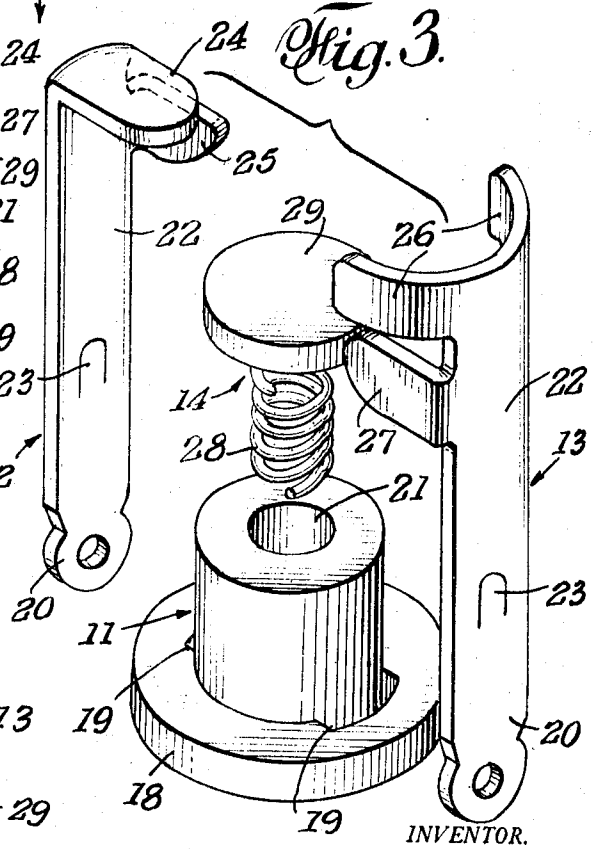


Fig. 3.



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TWO-TERMINAL INDICATOR LIGHT HAVING SPRING-BIASED TERMINALS

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This invention relates to lamp construction and deals more particularly with such a device that is amall and compact, thereby lending itself to installation in small or crowded areas.

An object of the present invention is to provide a lamp structure that provides a lamp holder for a small lamp which has two terminals for supplying power to the lamp in a small space. Such a small lamp is ordinarily provided with a center contact and a flange contact around the base of the lamp.

These contacts of a small lamp, when produced with the usual manufacturing tolerance, vary in their longitudinal spacing between .050" and .068". In order that proper electrical contact be made between these contacts and current-conveying terminals, suitable pressure must be applied between the contacts and terminals. The mentioned broad tolerances frequently cause either the center or the flange contact to have poor engagement with one of the current-conveying terminals because variations in the contact spacing prevent suitable pressure on both contacts by the terminals. Another object of the invention is to provide a lamp structure, as characterized above, in which the terminals are maintained under resilient pressure which applies mutually balanced pressure engagement of said terminals with the lamp contacts regardless of tolerance variation in the longitudinal spacing of said contacts.

A further object of the invention is to provide a lamp structure in which the terminals move longitudinally relative to each other causing a balancing of the pressure of said terminals with the lamp contacts to accommodate for manufacturing tolerance variations in the spacing of said contacts.

This invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The above objects are realized in a two-terminal indicator light that has an incandescent lamp with a center contact and a flange contact insulated therefrom, is provided with two current-conducting terminals insulated from each other, one for electrical engagement with the center contact and the other for electrical engagement with the flange contact, and a resiliently biased dielectric member engaged with and biasing both said terminals in contact-engaging direction. The terminal that achieves engagement with its contact under this bias will stop its movement. The bias on the dielectric member will cause it to continue the movement of the other terminal until it achieves engagement with the other contact. The two pressures thus applied are balanced and, therefore, equal, resulting in efficient connecting of the lamp in the circuit in which the terminals are incorporated.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description and which is based on the accompanying drawing. However, said drawing merely shows, and the following description merely describes, one embodiment of the present invention, which is given by way of illustration or example only.

In the drawing, like reference characters designate similar parts in the several views.

FIG. 1 is a longitudinal sectional view of a two-terminal indicator light according to the present invention.

FIG. 2 is a cross-sectional view as taken on the line 2—2 of FIG. 1.

FIG. 3 is an exploded perspective view of the terminals of said light together with the means for imposing contact-engaging bias on said terminals.

The indicator light that is illustrated comprises a conductor body **5** that is adapted to be mounted on a panel, or the like, an incandescent lamp **6** mounted in said body and having a center contact **7** and a flange contact **8** insulated therefrom, an enclosing lens **9** for said lamp, an insulating sleeve **10** in the body **5**, an insulator body **11** fitted in said sleeve and closing the inner end of the body, current-conducting terminals **12** and **13** extending through and spaced apart by the insulator body **11**, and pressure-balancing means **14** to apply resilient pressure on said terminals in a direction toward the lamp **6** to resiliently bias the terminals, respectively, into pressure engagement with the contacts **7** and **8**.

The contacts **7** and **8** are insulated from each other by a dielectric spacer **15**. The flange contact **8** is commonly carried by the base **16**.

A bore **17** in the body is lined by the sleeve **10**. The body **5** may be dielectric, obviating the need for the sleeve **10**. Said body **5**, lamp **6**, and the lens **9**, threadedly connected to the body, comprise an environment in which the present improvements are embodied. These improvements are provided for obtaining proper pressure engagement of the terminals **12** and **13**, respectively, with the contacts **7** and **8** under all manufacturing tolerance variations in the longitudinal spacing of said contacts **7** and **8**.

The insulator body **11** is preferably pressed into the bore of sleeve **10**, has a flange **18** that engages the end of the body **5** to limit the position thereof in said sleeve bore, and is provided with slots **19** through which the connection ends **20** of the terminals **12** and **13** are adapted to be passed in a manner that permits the terminals to move longitudinally in said slots. A seat **21**, open at the top, is provided in the insulator body **11**.

The two terminals **12** and **13** are alike in the portions **22** thereof that engage the body **11** and the previously mentioned conductor-connecting ends **20** which extend beyond said body. Sheared and inbent tabs **23** in the terminal ends **20** engage the outer face of body **11** to limit the inward position of said terminals. However, the terminals are capable of longitudinal movement outwardly under the limiting control of the pressure-balancing means **14**.

The terminal **12**, at its inner end, is provided with a bent end **24**, the same being adapted for pressure engagement with the center contact **7** of the lamp **6**. A finger **25** extends from one edge of the terminal **12** laterally toward the terminal **13**, said finger being closely adjacent to the bent end **24**.

The terminal **13**, at its inner end, is formed with arcuately extended portions **26**, the same being adapted for edgewise pressure engagement with a flange contact **8** of the lamp **6**. A finger **27**, similar to the finger **25**, extends laterally from the edge of terminal **13** that is opposite to the edge from which said finger **25** extends. As can be seen in FIG. 1, said fingers **25** and **27** are aligned, they being similarly spaced from the respective tabs **23**. As shown best in FIG. 2, said fingers **25** and **27** are on opposite sides of the axis or center of the body **5**.

The pressure-balancing means **14** is shown as comprising a compression spring **28** seated in the seat **21** of the insulator body **11**, and a dielectric washer **29** disposed upon the end of said spring and biased by the spring against the fingers **25** and **27** which are thus engaged with dia-

metrally opposite points of said washer. In practice, the terminals **12** and **13** are assembled with the body **11** so that the spring **28** is under some compression. After the lamp **6** has been placed, through the bore of sleeve **10**, in its operative position, the above assembly is fitted into the bore of the sleeve **10** with the end **24** of terminal **12** engaged with the center contact **7** of the lamp **6**, and the edge of the arcuate portion **26** engaged with the flange contact **8** of said lamp.

Since it is the lamp **6** that may require to be removed or replaced several times during the life of the lamp holder, rather than the holder itself, it will be understood that the parts and means **10** to **14** inclusive, comprise an assemblage that preferably retains its position in the bore **17** of the body **5** and that the lamp **6** and lens **9** are the elements that are moved with relation to the end **24** and extension **26** of the respective terminals **12** and **13** of said assemblage.

If the pressure by the lamp contacts on the terminals is equal, the pressure by the fingers **25** and **27** on the mentioned opposite points of the washer **29** will be balanced. The washer will retain a level position while the spring **28** is compressed thereby.

Should one terminal or the other be engaged first by one of the contacts **7** or **8**, the finger of that terminal will be pressed down on the washer **29**, causing the same to tilt, thereby pushing upwardly on the finger of the other terminal and biasing said other terminal upwardly in a direction to engage the other of said contacts. Although the washer **29** remains in a tilted position, the pressures on the diametrally opposite points thereof are balanced, causing the contacts **7** and **8** to be engaged by their respective terminals with equal pressure. Therefore, it is certain that the lamp contacts are properly in electric circuit with the terminals **12** and **13**.

Having thus described this invention, what is claimed and desired to be secured by Letters Patent is:

1. In an indicator light having a body adapted to be fitted with a lamp that has two longitudinally spaced contacts:

(a) an insulator mounted in said body in spaced relation to said contacts,

(b) two spaced electrically-conducting terminals carried by and longitudinally movable in said insulator,

(c) each terminal being provided with an end to be engaged by one of the lamp contacts,

(d) a finger on each terminal, said fingers being transversely spaced and extending from one terminal toward and spaced from the other terminal, and

(e) spring-biased means carried by said insulator and biased into engagement with said fingers of the terminals to longitudinally move one of said terminals to engage one of the lamp contacts in response to pressure applied on the finger of a terminal engaged by the other lamp contact.

2. In an indicator light having a body adapted to be fitted with a lamp that has two longitudinally spaced contacts:

(a) an insulator mounted in said body in spaced relation to said contacts,

(b) two spaced electrically-conducting terminals carried by and longitudinally movable in said insulator,

(c) each terminal being provided with an end to be engaged by one of the lamp contacts,

(d) a finger on each terminal, said fingers being transversely spaced and extending from one terminal toward and spaced from the other terminal,

(e) a spring-biased dielectric member carried by the insulator engaged with said fingers at diametrally opposite points thereof,

(f) said dielectric member being tilted by the finger of a terminal that is engaged by one contact of the lamp, and

(g) said dielectric member, upon being tilted, bearing against the finger of the other terminal and longitudinally moving the latter terminal into engagement with the other lamp contact.

3. In an indicator light having a body adapted to be fitted with a lamp that has two longitudinally spaced contacts:

(a) an insulator mounted in said body in spaced relation to said contacts,

(b) two spaced electrically-conducting terminals carried by and longitudinally movable in said insulator,

(c) each terminal being provided with an end to be engaged by one of the lamp contacts,

(d) a finger on each terminal, said fingers being transversely spaced and extending from one terminal toward and spaced from the other terminal,

(e) a spring-biased dielectric member carried by the insulator engaged by said fingers at diametrally opposite points thereof,

(f) the pressure of the finger of a terminal engaged by one contact of the lamp causing the dielectric member to tilt and thereby, bias the other terminal in a direction to engage the other contact of the lamp.

4. In an indicator light provided with two transversely spaced insulated terminals for electrical engagement with two longitudinally spaced terminals of a lamp disposed in said light:

(a) means mounting said terminals for longitudinal movement relative to the lamp contacts, and

(b) means provided with a resilient bias engaged with the two terminals and pressing them in a direction to be respectively engaged by the lamp contacts,

(c) the terminal that is first engaged by one of the lamp contacts coming to rest, and

(d) the resilient bias on the other terminal continuing in effect until the latter terminal achieves engagement with the other lamp contact,

(e) the bias on both terminals being balanced when both terminals are thus engaged.

5. In an indicator light according to claim **4**, the means provided with a resilient bias comprising:

(a) an insulator that mounts and serves to space the terminals,

(b) a compression spring extending from the insulator in a direction toward the lamp contacts, and

(c) a dielectric member pressed by the spring toward the lamp, diametrically opposite points of said member being engaged by a finger portion provided on each terminal.

6. In an indicator light according to claim **5**, said fingers being transversely spaced and extending from one terminal and spaced from the other terminal.

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U.S. Cl. X.R.

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