United States Patent [19]

Bodge

[11] **3,794,800**

[45] **Feb. 26, 1974**

[54] **ROCKER ACTUATED CIRCUIT BREAKER HAVING IMPROVED MEANS FOR FUNCTION INDICATION**

[75] Inventor: **Clifford A. Bodge,** Attleboro, Mass.

[73] Assignee: **Texas Instruments Incorporated,** Dallas, Tex.

[22] Filed: **Jan. 2, 1970**

[21] Appl. No.: **123**

[52] **U.S. Cl.**.....**200/308,** 116/124 L, 200/317

[51] **Int. Cl.** **H01h 9/16**

[58] **Field of Search**..... 200/167 A, 167 R; 116/124

[56] **References Cited**

UNITED STATES PATENTS

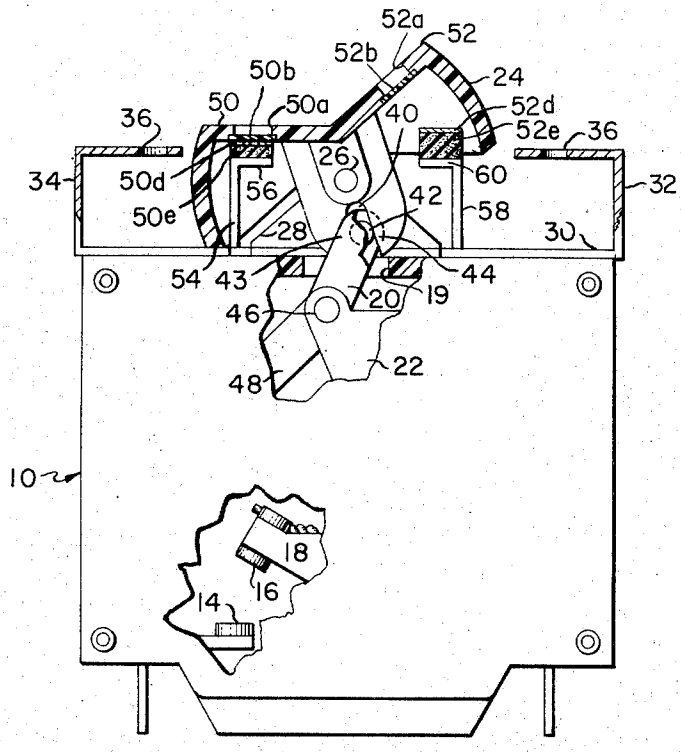
3,250,887	5/1966	Sorenson	200/167 R
3,294,926	12/1966	Dellert et al.	200/167 R
3,538,285	11/1970	Orts	200/167 R
3,237,591	3/1966	Pichel	116/124
3,305,677	2/1967	Bov	200/167 A X

Primary Examiner—Robert K. Schaefer
Assistant Examiner—William J. Smith
Attorney, Agent, or Firm—John A. Haug; Edward J. Connors, Jr.; James P. McAndrews

[57] **ABSTRACT**

Indication of the state of energization of a rocker actuated electrical switch is provided by locating transparent indicia on two opaque panels mounted on opposite face portions of the rocker, and highly light reflective material underneath the rocker in alignment with the indicia on each panel so that pivotal movement of the rocker brings a panel and reflective surface together at the same time that the second panel and reflective surface are separated. When a panel and reflective surface are together, light is reflected from the reflective surface through the indicia thereby giving the effect of a light being turned on in the switch and when the reflective surface is separated from the panel, reflected light from the surface is effectively precluded from passing through the indicia thereby giving the effect of the light being turned off in the switch. Each reflective surface is resiliently mounted to ensure optimum alignment and a close contiguous relationship of the reflective surface with the panel when they are in the engaged position.

6 Claims, 2 Drawing Figures



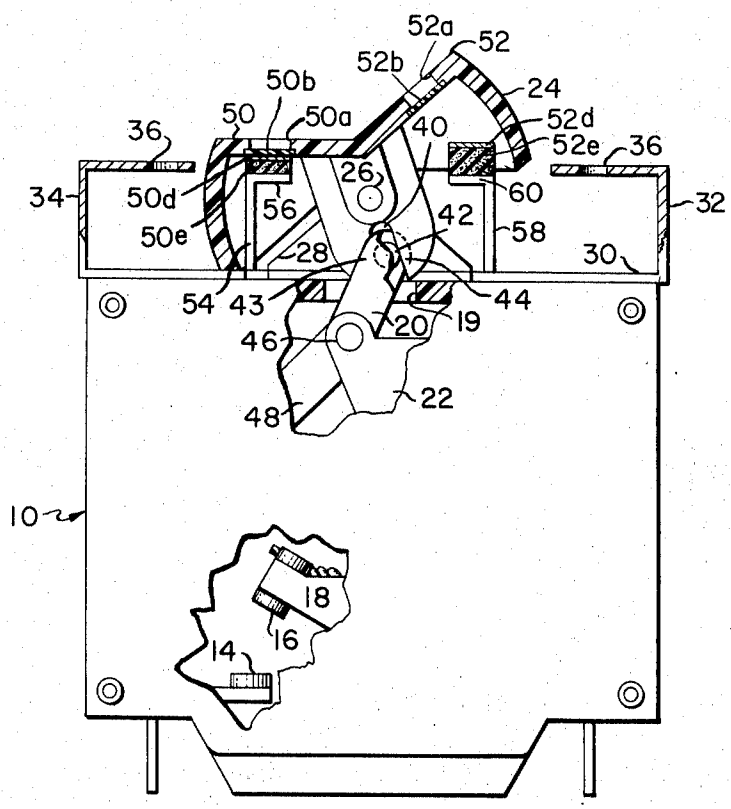


FIG. 1

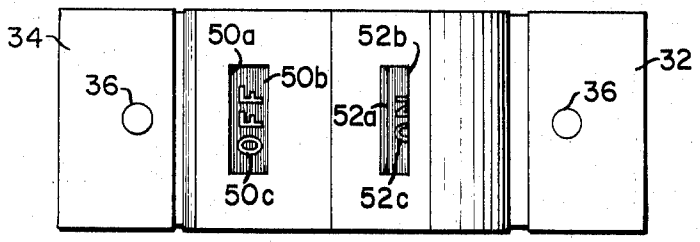


FIG. 2

INVENTOR
CLIFFORD A. BODGE
BY
John C. Haug
ATTORNEY

ROCKER ACTUATED CIRCUIT BREAKER HAVING IMPROVED MEANS FOR FUNCTION INDICATION

Switches and circuit breakers employing rocker actuating mechanisms are well known in the art. This invention relates to means for providing improved indication of the state of energization or function of such switches and circuit breakers. It is common in such prior art devices to provide some type of indicia on the face of the rocker such as "on" and "off" to indicate the state of energization. These indicia have been, for instance, engraved, raised or painted. While this is helpful, it nevertheless requires close inspection to determine the state of energization of the switch. This problem is further aggravated when the switches are mounted in panels containing a large number of such devices. In order to facilitate control by an operator over such devices, any means which make it easier, quicker and more reliable to communicate to the operator the information provided by the position of the actuating mechanism of the switches by means of the indicia on the switches indicating their state of energization is therefore highly desirable. One such means employed in certain prior art devices is the use of a light placed in the switch which light is actuated when the rocker is in a predetermined position. This, however, adds considerably to the cost of the device and also does not represent a perfectly reliable solution since the light means can burn out or fail to operate as intended due to some malfunction.

It is therefore an object of the invention to provide improved indicating means for a rocker actuated switch which can easily be observed by the eye of the operator even with a casual glance. Another object is the provision of such means which is simple, inexpensive, yet highly reliable. Yet another object of the invention is the provision of a mechanism which will not add materially to the cost of the device yet which will provide indication of the state of energization or function of a switch by communicating a signal which is clear, unambiguous and readily discernible.

Other objects and advantages of the instant invention will be apparent in the following description, claim and drawings, wherein:

FIG. 1 is a front elevation of a switch made in accordance with the invention partly in cross section and partly broken away; and

FIG. 2 is a top plan view of the FIG. 1 embodiment.

The switch shown in FIG. 1 may be of the type shown in U.S. Pat. No. 3,426,301, also assigned to Texas Instruments Incorporated. In this device, as seen in FIG. 1, device **10** includes linkage assembly comprising link **20** and extension **48** of link **20.** Movement of link **20** causes movable contact **16** mounted on arm **18** to engage and disengage stationary contact **14,** that is, the contact moves from an "on" position to an "off" position and back. Frame portion **22** supports a conventional overload or current sensing assembly which causes disengagement of the contacts upon an overload in a conventional manner, as described in the patent. Further details of the internal mechanism of switch **10** can be gleaned from the description and drawings of the patent and will not be further described herein since it is not necessary for a complete understanding of the instant invention.

Link **20** is caused to move by rocker member **24** mounted on pivot **26** which pivot is supported in the apex portion of triangular frame **28** which is preferably formed by bending from a bracket **30** mounted on the switch housing. Bracket **30** is provided with upstanding legs **32** and **34** used for attachment of switch **10** to a mounting panel and is provided with apertures **36** for securement to the panel (now shown). Link **20** extends through aperture **19** in the top surface of the housing of switch **10** as shown in FIG. **1.** Rocker **24** is provided with slot **40** into which pin **42** extends between bifurcations **43,44** in one end of link **20.** As rocker **24** is pivoted about **26,** link **20** is caused to pivot about pivot **46** which pivot is fixed in two opposite side walls of the switch **10** housing. As mentioned supra, extension **48** of link **20** causes movable contact **16** on arm **18** to engage and disengage stationary contact **14** upon movement of link **20.**

Cutout portions or windows **50***a* and **52***a* are provided on opposing surfaces or faces **50** and **52** of rocker **24** respectively, and panels **50***b* and **52***b* are fixed therein by conventional means such as by an adhesion. As best seen in FIG. **2,** indicia **50***c* and **52***c* are formed respectively in panels **50***b*, **52***b* which are otherwise opaque. Any indicia can be employed, such as for example, "off" and "on" respectively. Reflective surface **50***d* is mounted on sponge material **50***e*, in turn mounted on L-shaped member **54** formed with a platform **56.** Member **54** may conveniently be struck from bracket **30.** In like manner, upstanding bracket **58** may be struck from **30** with platform **60** attached thereto and supports thereon sponge material **52***e* and reflective surface **52***d.* Reflective surfaces **50***d* and **52***d* are preferably formed of a highly light reflective material having a bright color such as a fluorescent type of material.

As seen in FIG. **1,** depression of surface **50** causes panel **50***b* to move reflective surface **50***d* downwardly against the bias of sponge material **50***e* into a second position in which sponge material **50***e* is somewhat compressed. This insures that reflective surface **50***d* is aligned and contiguous with panel **50***b* to optimize the quantity of light reflected through indicia **50***e* yet without having to be concerned with exacting alignment of the various elements during construction. This also mitigates possible problems in maintaining alignment of the various elements throughout the life of the switch. The sponge material provides flexibility so that the reflective surface is always in close physical contact with panel **50***b* when surface **50** is in the depressed position. In like manner, when surface **52** is depressed, panel **52***b* is brought into close physical contact with reflective surface **52***d.*

When the reflective surface is contiguous to the panel having transparent indicia therein, the reflection of the light therethrough gives the impression to a viewer of a light being turned on yet when the reflective surface is moved away from the panel, the impression is given of the light being turned off. That is, when the panel is separated from the reflective surface, the indicia cannot be seen. This effect is enhanced by making the opaque portion of the panel the same color as the transparent portion. Thus it will be seen that the invention provides very simple, highly reliable means for giving positive, clear indication for the state of energization or function of a rocker actuated switch yet without adding significantly to the cost of the device.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

It is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

As many changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings, shall be interpreted as illustrative and not in a limiting sense, and it is also intended that the appended claims shall cover all such equivalent variations as come within the true and spirit and scope of the invention.

I claim:

1. An electrical switch comprising a housing, a stationary electrical contact mounted in the housing, a movable electrical contact and means to cause the movable contact to move into and out of engagement with the stationary contact including a rocker pivotably mounted on the housing and pivotable from a first to a second position and back, the rocker having first and second window portions in first and second respective surfaces thereof on opposite sides of the rocker pivot, a panel mounted in each window portion, the panels having portions which are transparent, light reflecting surfaces mounted on the housing intermediate the housing and each panel so that pivotal movement of the rocker brings one of the first and second panels toward one of the light reflecting surfaces at the same time it brings the other of the first and second panels away from the other light reflecting surface.

2. A switch according to claim 1 in which the light reflecting surfaces are movably mounted and the rocker displaces one surface in one of its first and second positions and the other surface in the other of its first and second positions.

3. A switch according to claim 2 in which the light reflecting surfaces are mounted on a sponge-like block of material.

4. A switch according to claim 1 in which both panels are formed of opaque material except for the transparent portions which are formed in a desired indicia pattern.

5. A switch according to claim 4 in which the indicia on the two panels are "off" and "on" respectively.

6. A switch according to claim 1 in which the pivot of the rocker is located intermediate a plane on which the light reflecting surfaces lie and the housing.

* * * * *