United States Patent

McNeil

[15] **3,678,261**

[45] **July 18, 1972**

[54] LENS ASSEMBLY FOR INDICATOR LIGHTS

[72] Inventor: **Daniel E. McNeil**, Broomall, Pa.

[73] Assignee: **Controls Switch, Inc.**, Folcroft, Pa.

[22] Filed: **March 22, 1971**

[21] Appl. No.: **126,505**

[52] **U.S. Cl.**.....**240/151**, 248/27, 339/176 L

[51] **Int. Cl.**.....**F21v 17/00**

[58] **Field of Search**.....240/2.1, 8.16, 41 BM, 41.3, 240/151, 152, 153; 339/176 L; 248/27

[56] **References Cited**

UNITED STATES PATENTS

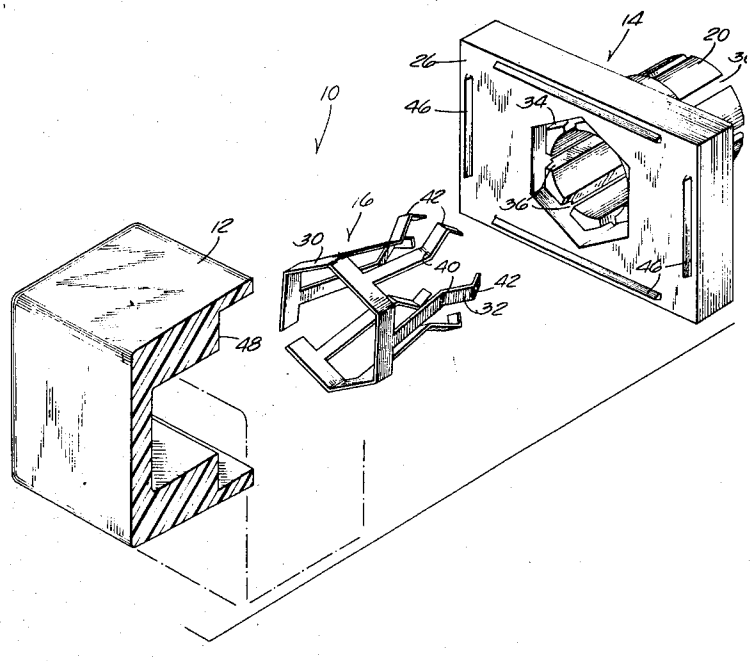
2,139,374	12/1938	Michel et al.	240/41 BM
2,210,312	8/1940	Wood	240/152 X
2,167,270	7/1939	Woodward	240/8.16 X

Primary Examiner—Samuel S. Matthews
Assistant Examiner—Fred L. Braun
Attorney—John W. Michael, Gerrit D. Foster, Bayard H. Michael, Paul R. Puerner, Joseph A. Gemignani, Robert E. Clemency, Andrew O. Riteris, Glenn A. Buse and Spencer B. Michael

[57] **ABSTRACT**

The lamp holder includes a collar which is captured in a groove provided in the reflector section of a lamp housing by a cup-shaped lens overlying and bonded, preferably ultrasonically, to the reflector section. Spring fingers extending from the collar of the lamp holder fit into slots provided in a barrel section of the lamp housing. The spring fingers have multiple bends forming two knee-like portions, one adapted to hold an indicator lamp and the other extending through slots provided in the barrel section, when an indicator lamp is installed. The latter knee-like portion engages the inside surface of the casing into which the lens assembly is installed and establishes electrical contact between the lamp and the casing.

4 Claims, 2 Drawing Figures



PATENTED JUL 18 1972

3,678,261

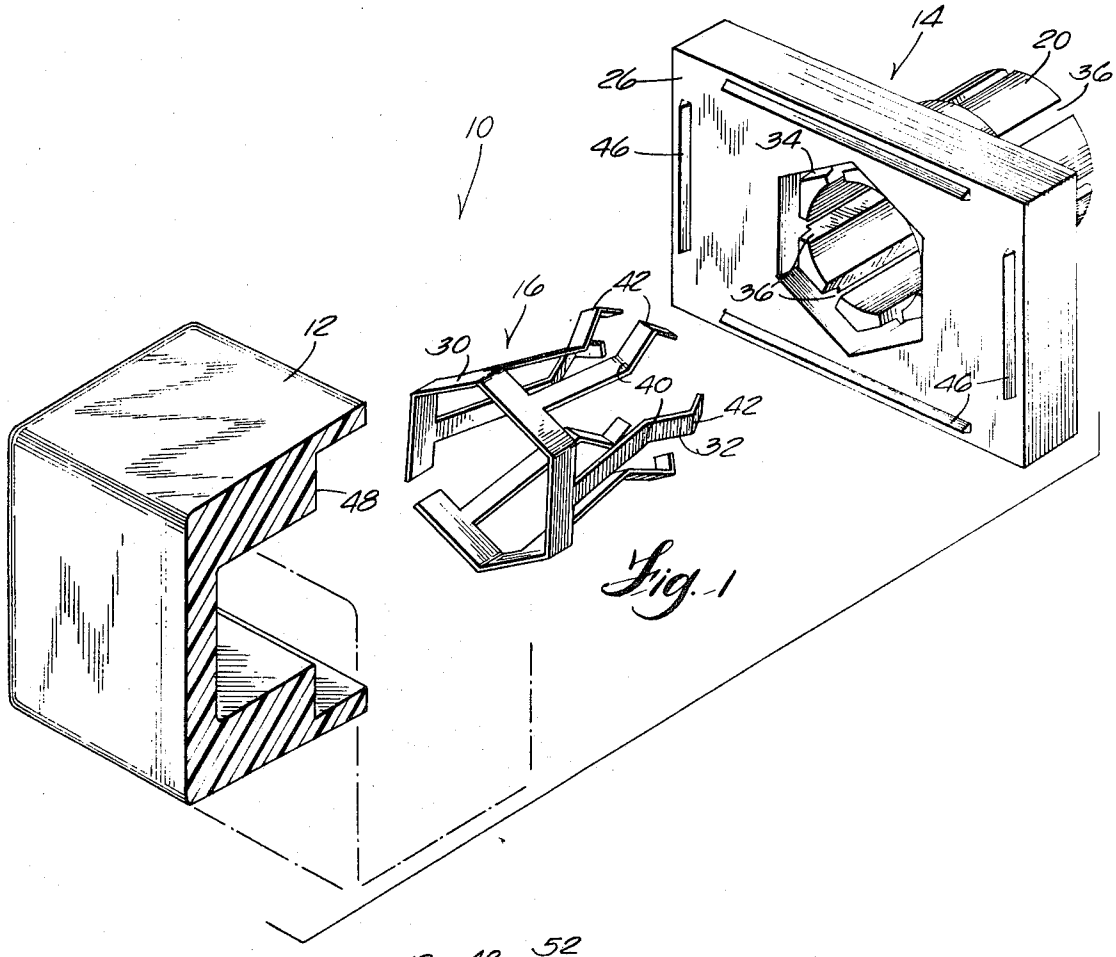


Fig. 1

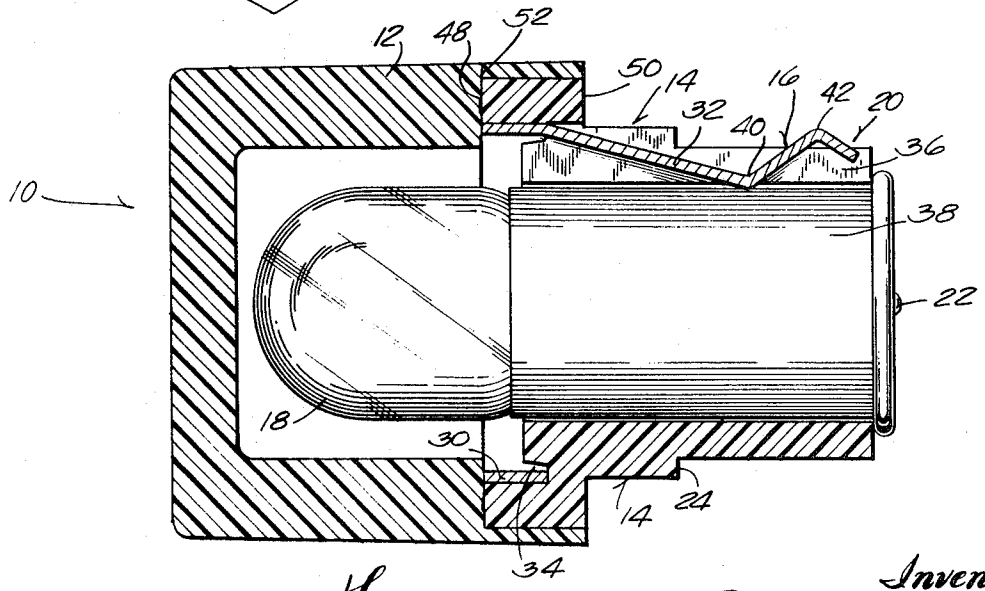


Fig. 2

Inventor
Daniel E. McNeil
By Henry A Bisé
Attorney

LENS ASSEMBLY FOR INDICATOR LIGHTS

BACKGROUND OF THE INVENTION

Indicator light assemblies are used extensively for a variety of purposes in electrical equipment. For instance, they are commonly used on push button switches to indicate off or on positions and in electrical circuits to indicate which ones are closed. One type of lens assembly used in conjunction with the indicator light includes a housing carrying a lamp holder with a transparent or translucent lens covering the outer end of the housing. The housing fits into a casing which is mounted to the back side of a panel or similar mounting means. The casing includes terminals for connection to an electrical circuit, one terminal being electrically connected to the casing wall and another electrically connected to a contact engaged by the indicator lamp. The lamp holder serves the dual function of retaining the indicator lamp and establishing electrical contact between the lamp socket and the inside wall of the casing. For relamping, the lens assembly is removed from the front of the panel by pulling it out of the casing and the burned out lamp is removed from the rear of the lens assembly.

Generally, the lamp holders employed by prior art lens assemblies are in the form of a slotted metallic tube arranged with two or more spring fingers holding the lamp and two or more spring fingers engaging the inside wall of the casing. Because of the cost of the material used and the fabrication and assembling procedures required, the overall cost of lens assemblies employing this type of lamp holder is quite high.

SUMMARY OF THE INVENTION

The simple arrangement of the lens lamp holder and lamp housing of the lens assembly of this invention described in the abstract permits the use of inexpensive materials and assembly by rapid, simplified techniques.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded, perspective view, partially sectioned, showing the components of the lens assembly.

FIG. 2 is a cross-section, elevation view showing the lens assembly of FIG. 1 assembled with a lamp installed.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Lens assembly **10** includes a transparent or translucent lens **12**, lamp housing **14** and lamp holder **16** which holds a conventional flanged, flat base indicator lamp **18**.

Lamp housing **14** has a tubular barrel section **20** which fits inside a conventional casing (not shown) mounted to back of a panel (not shown) or similar mounting means. The casing is of conventional design having one terminal electrically connected to its wall and another terminal connected to a contact adapted to be engaged by lamp base contact **22**. Shoulder **24** on barrel section **20** slides inside the casing when lens assembly **10** is used with a push button switch. In other applications where the lens assembly is not depressed for operation, shoulder **24** is dimensioned to provide a pressure fit with the casing.

Cup-shaped lens **12** fits over and is bonded to reflector section **26** of the lamp housing **14**. Lens **12** can have any convenient cross-section, such as rectangular (as shown in FIG. 1), square, circular, hexagonal, etc. with reflector section **26** of the lamp housing having a complementary shape.

Lamp holder **16**, constructed from a resilient material, has a collar **30** with a plurality of legs **32**, which act as spring fingers, extending therefrom. Collar **30** of lamp holder **16** is captured in groove **34** provided in reflector section **26** by lens **12** to prevent shifting. The axial length of collar equals the depth of groove **34** and lens **12** overlies at least a portion of the collar so that the lamp holder is locked in place. Legs **32** fit into complementary slots **36** provided in barrel section **20**. Legs **32** are provided with multiple bends so that, when lamp **18** is installed as shown in FIG. 2, lamp base **38** engages and is held between first knee-like portions **40**. Legs **32** are spread apart by the lamp base and the outer ends extend through slots **36**, as shown in FIG. 2, so that second knee-like portions **42** can engage the inside wall of a casing when the lens assembly is installed therein. This establishes an electrical contact between the lamp base and the casing.

Lens **12** and lamp housing **14** are preferably molded from a thermoplastic material, such as various types of suitable butyrates, polyolefinic polymers and the like, so that they can be bonded together by conventional thermoplastic welding techniques, such as heat sealing or ultrasonic welding. Preferably, the top surface of reflector section **26** is provided with small projections **46** (as shown in FIG. 1) and lens **12** and lamp housing **14** are bonded together ultrasonically. Projections **46** act as energy directors during the welding operation and minimize the acoustical energy required to melt the material of the adjoining surfaces sufficiently to produce a good bond.

Lens assembly **10** is assembled by inserting lamp holder collar **30** into groove **34** and legs **32** into slots **36** and then placing lens **12** over reflector section **26** with shoulder **48** engaging projections **46**. As shown in FIG. 1, the collar and legs and the lamp holder are normally slightly sprung apart, i.e., must be compressed slightly for installation into groove **34** and slots **36**. This insures that the lamp holder is maintained in a snug fit with the lamp housing during assembly. With the assembled unit positioned in an appropriately shaped fixture, an acoustic horn (not shown), having a central aperture larger than the outside diameter of shoulder **24**, is brought into compressive engagement with flange **50** on lamp housing **14**. Acoustic energy is transmitted by the horn to lamp housing flange **50**, through projections **46** to lens shoulder **48** and the adjoining surfaces are softened. The lamp housing and lens are maintained in compression, and upon cooling, an effective bond is produced therebetween at **52**.

From the above description, it can be seen that the simple arrangement of the lens, lamp housing and lamp holder permit the use of inexpensive materials and rapid, inexpensive assembly techniques. Hence, the overall cost of the lens assembly of this invention is approximately one-tenth of that of prior art devices employing a slotted metallic sleeve as the lamp holder. Also, the arrangement provides a simple and reliable means for holding the lamp holder solidly in place thereby preventing shifting during lamp replacement and/or lens assembly installation into a casing.

I claim:

1. An indicator light lens assembly comprising, in combination

a lamp housing having a tubular barrel section and a centrally apertured reflector section integral with one end of said barrel section, said barrel section having a plurality or radially spaced elongated slots in the end opposite to the reflector section and said reflector section having a groove encircling said aperture;

an electrical indicator lamp having a base positioned inside said barrel section and a bulb portion extending through said aperture;

an electrically conductive lamp holder having a collar positioned in said groove and a plurality of radially spaced, spring fingers extending from said collar and disposed inside said barrel section, each of the fingers having multiple bends forming first and second knee-like portions with the first knee-like portion being engaged by and holding the base of said lamp and the second knee-like portion extending through the slots in said barrel section; and

a cup-shaped lens encompassing said bulb portion and mounted to said reflector section to capture said collar in said groove, said lamp being removable from said lamp housing through the end opposite said reflector section.

2. The lens assembly according to claim **1** wherein said lens and lamp housing are made from a thermoplastic material.

3. The lens assembly according to claim **2** wherein said lens and lamp housing are bonded together ultrasonically.

4. The lens assembly according to claim 3 wherein said reflector section is provided with projections on the top surface thereof which engage the underside of said lens during assembly.

* * * * *

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,678,261 Dated July 18, 1972

Inventor(s) Daniel E. McNeil

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Change the Assignee from "Controls Switch, Inc." to

--- Control Switch, Inc. ---;

Column 2, Claim 1, line 6 at the start of the line, change

"or" to --- of ---.

Signed and sealed this 3rd day of April 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents