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SEALING MEANS FOR LAMP HOUSING CLOSURE

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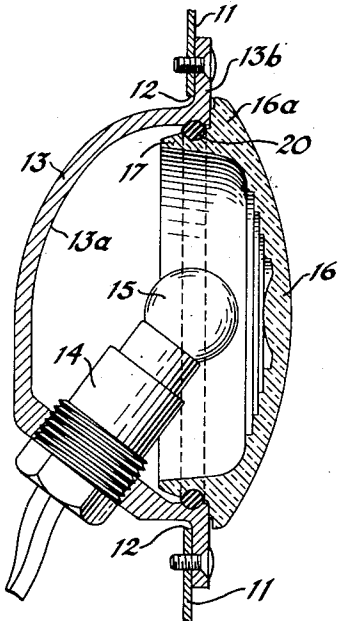


Fig. 1

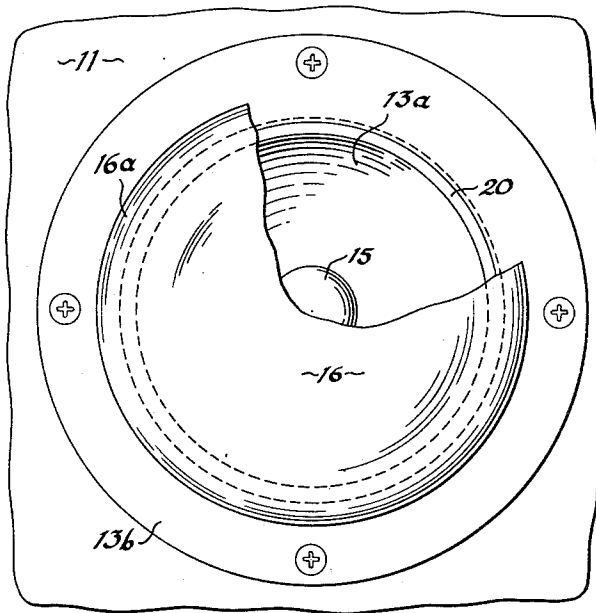


Fig. 2

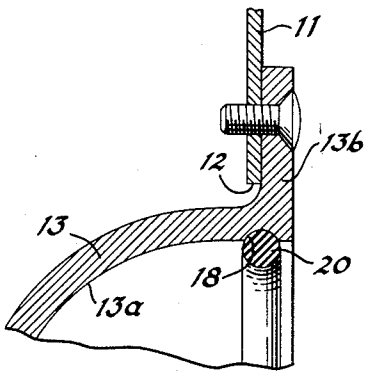


Fig. 3

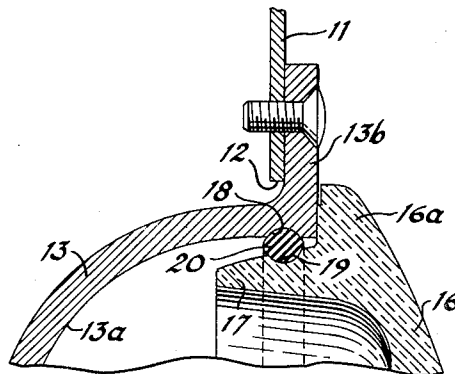


Fig. 4

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## SEALING MEANS FOR LAMP HOUSING CLOSURE

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1 Claim. (Cl. 240—7.1)

The present invention relates to a novel and improved vapor-proof and leak-proof enclosure, and to a static seal especially adapted for use as a low pressure sealing element in combination with a chambered container or hollow body, and a closure therefor.

An object of the invention is to provide a seal which permits ready attachment and removal of the closure, using only a simple tool such as a screw driver or stout knife blade. The sealing element is quite inexpensive, and immediately replaceable if it becomes unserviceable after extended use. A number of adaptations where such seal can be advantageously used will immediately occur to those skilled in the art.

It can be used, for example, in a blow-out cap for low pressure, safety-valve type operation in conjunction with containers where it is desirable that the pressure in the space be maintained below a predetermined figure. In the meantime the chamber is effectively sealed against dust, dirt, or moisture contamination, as will appear hereinbelow.

A further object of the invention is to provide a vapor-proof enclosure adapted to receive a static seal as herein defined.

As illustrative of the structure and one advantageous use of my static seal, reference may be had to the following description of one of the many possible useful embodiments of the invention, in conjunction with the accompanying drawings, in which:

Fig. 1 is a vertical sectional view of a vehicle marker light or clearance light attached to a vehicle, a minor fragmentary portion of the vehicle wall being shown.

Fig. 2 is a front elevational view, as seen from the right of Fig. 1, a portion of the lens being broken away to reveal internal structure.

Fig. 3 is a fragmentary sectional view, somewhat enlarged showing the lamp housing carrying my static seal.

Fig. 4 is a view, similar to Fig. 3, but showing an assembly comprising a housing, a seal, and a closure which in the present instance is a lens element.

In the drawings there is shown a portion of a panel 11 forming the side, front, or rear wall of a vehicle, the wall being usually of sheet metal. The wall is provided with an opening 12 of suitable shape and size to receive a cupped lamp housing 13. If desirable, and as is usual, the inner wall of the lamp housing may have a polished reflecting surface 13a.

The housing wall is provided with a socket 14 which can be fixed in the wall, and is here shown as having a screw-thread engagement therein. The socket carries a lamp 15 which is fixed at the focal point of the housing. A lens 16 is retained in the housing as will presently be more fully described.

As is well known, plated surfaces of the reflector type, when exposed to air and moisture, progressively deteriorate, or become covered by a coating of dirt and dust, so that the housing must occasionally be removed for replating, repolishing, or even replacement. In addition,

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moisture and dirt have a detrimental effect on electrical connections, so that current flow may be interrupted or short circuited. Previous attempts at effecting a leak-proof seal have involved clamping the lens tightly in the housing, in conjunction with a sealing gasket. Even then the removal of the lens to replace the bulb is difficult because the clamping means corrodes, and the lens is sometimes broken in attempts to remove it.

I have provided a simple and effective sealing means which is vapor-proof and leak-proof, and which permits practically instantaneous removal of the lens whenever desirable, such as for bulb replacement. The lens 16 has an axially inwardly extending annular shoulder 17. The circumferential edge of the lens extends radially outwardly beyond the shoulder, at 16a, to provide a flange which overlaps the edge flange 13b of the housing. When in assembled relationship the shoulder portion 17 nests within the annular, peripheral edge part of the housing in telescoped relationship, but with adequate working clearance. The outer periphery of the shoulder tapers radially inwardly, converging away from the inner wall 13a of the housing. When in such assembled relationship, the inner wall of the housing is provided with a peripheral groove 18 which is in planar registry with a complementary groove 19 on the outer wall of shoulder 17. The grooves are preferably of arcuate character in cross section.

Seatable in both grooves is a static seal member 20 of the type known to those skilled in the mechanical arts as an O ring. It is preferably circular in cross section, when unstressed, but may be elliptical, or otherwise of rounded peripheral contour, and is of relatively resilient, rubber-like material so that it can be deformed sufficiently to permit the cooperating parts to be subjected to a mildly forced fit to the assembled position shown in Fig. 4 wherein the ring 20 nests simultaneously in both grooves 18 and 19. As shown in Fig. 3 the ring 20 may be first seated in groove 18, whereupon the lens 16 may be snapped inwardly to the position of Fig. 4. In such position the lens is tightly retained, and the seal is so effective that there is no evidence of leakage of moisture, or other corrosive or stain-inducing medium, to the interior of the lamp housing. A screw driver or a heavy knife blade can be inserted beneath it, whereupon the lens can be removed without undue effort. The length of service of the ring 20 is limited only by the inherent life characteristic of the material from which it is formed, and in all probability the ring will last for years. A replacement ring can be readily procured, if eventually desirable, and there are no clamping rings, screws, etc., to deteriorate and cause assembly and disassembly troubles.

As evidence of the efficiency of the seal when assembled in this way I have made actual pressure tests of containers in which a sealing cap was retained on a closure in the manner above described, namely by means of aligned, complementary grooves in a respective closure and container wall and a rubber O ring having a snap-in seat in both grooves. Air under pressure was admitted to the container, and the pressure was gradually increased until the cap blew out. In a decisive number of successive tests the cap blew out at a surprisingly uniform maximum pressure figure, which, under the volumetric and surface area factors of the test was 14 pounds per inch in excess of atmospheric pressure. A pressure of this order is one which I regard as moderate, but highly satisfactory for sealing characteristics in normal use.

The art has previously disclosed the use of an O ring in what I may term "dynamic" sealing adaptations wherein such a ring is seated in a groove in one element of a relatively movable pair, the other element having a smooth wall surface. In such use the advantage of the

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O ring lay in its relatively low frictional characteristics, and its ability to "roll" through a limited longitudinal space. In the present application the seal is strictly a "static" one, wherein there is no relative movement of the parts during service, and the two cooperating elements which are used in combination with the ring are each provided with a groove of segmental circular contour in cross section.

What I claim is:

A vapor-proof vehicle lamp comprising, in combination, a housing of cup-like shape having at its open periphery an annular flange extending transversely to the axis of the housing, a discoidal, slightly-cupped lens having a generally tubular flange of a diameter smaller than the housing periphery so as to be telescopingly movable thereinto and having an annular shoulder extending transversely outwardly whereby to be abutable against said annular flange when said tubular flange is telescopingly inserted within said housing as aforesaid, the inner surface of said housing within said annular flange and the outer surface of said tubular flange being provided with peripheral grooves of arcuate cross section which are in mated alignment when said annular

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shoulder abuts said annular flange as aforesaid, the portion of said tubular flange inwardly beyond said arcuate groove being inwardly convergent conically whereby to provide a clearance between said conical portion and the inner wall of said housing, and a ring of resilient material of rounded cross section seatable partially in each said groove, the spacing between the complementary walls of said arcuate grooves, and the thickness of said ring being such that the ring is subjected to leak-proof compression when the lens is telescopingly assembled into the housing when said annular shoulder is moved into abutment with said annular flange.

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