June 5, 1956 R. N. FALGE 2,749,434

VEHICLE LAMP

Filed Oct. 30, 1952

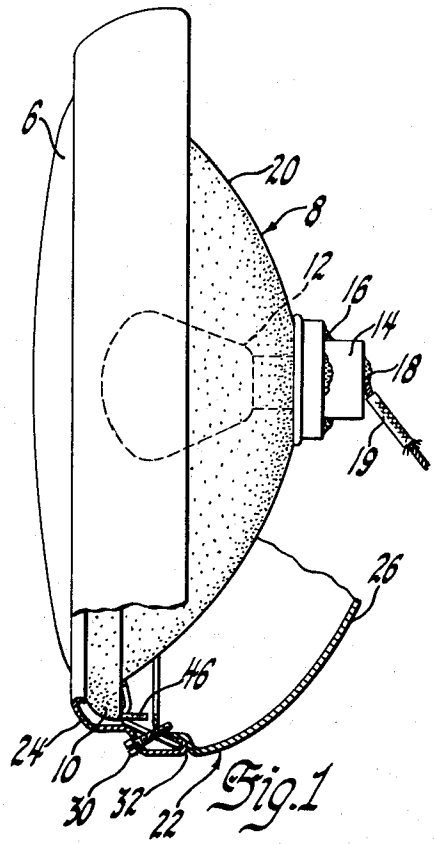


Fig. 1

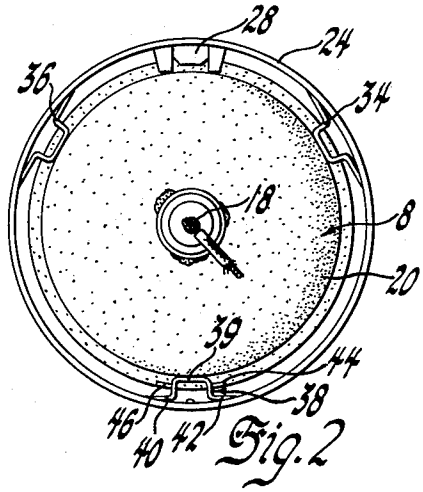


Fig. 2

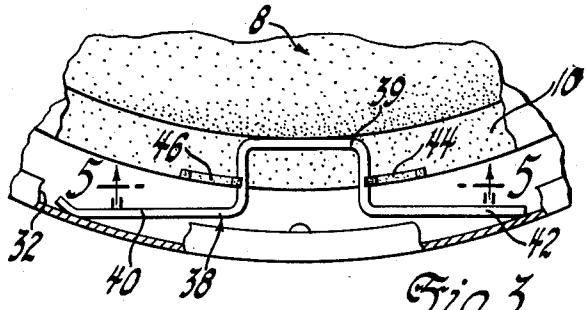


Fig. 3

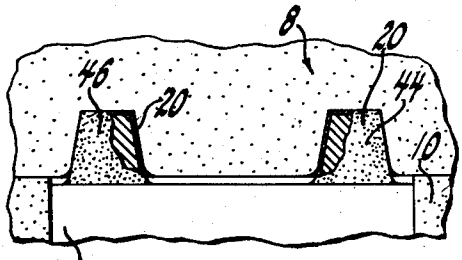


Fig. 4

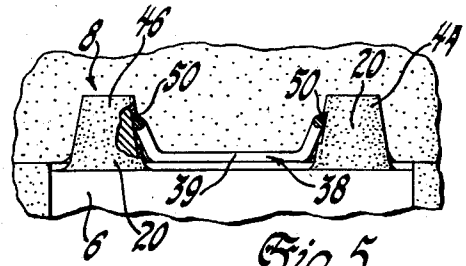


Fig. 5

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United States Patent Office

2,749,434

Patented June 5, 1956

2,749,434

VEHICLE LAMP

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Application October 30, 1952, Serial No. 317,711

6 Claims. (Cl. 240—41)

This invention relates to lamps suitable for use on motor vehicles and more particularly, to a means for grounding such lamps so as to complete the electrical circuit for the lighting element.

For numerous types of vehicles lamps such as spot lights, driving lights, etc., it is advantageous from a cost standpoint to establish the ground circuit for the lighting element by routing it through the lamp reflector, to the lamp housing and attaching bracket and thence through the frame of the vehicle. The lighting element, which is the conventional type light bulb is constructed so that one filament lead is electrically connected to a contact button on the end of the bulb base, and the other filament lead is electrically connected to the outer metal casing of the bulb base which, of course, is insulated from the aforementioned contact button. The metal bulb base is secured to the lamp reflector in electrical contact therewith, as for example, by soldering, and thus, the grounding circuit is routed through the reflector. In order to complete the grounding circuit, there must, of necessity, be provided adequate means to assure electrical contact between the metal reflector and the lamp housing. It is common practice to coat the metal reflector wtih some suitable organic and therefore non-conductive, material such as paint or lacquer to provide a base surface on the inside for the reflecting coating and a corrosive preventative surface on the outside or rear surfaces. Merely removing portions of the organic coating near the edge of the reflector where it contacts the lamp casing is not sufficient to establish a reliable contact for the grounding circuit since vehicle vibration and shock will cause the circuit to break, at least at times, and often premanently. Thus, it has been the practice to solder or otherwise secure a metal wire to the bulb base or some portion of the back of the reflector from which the paint has been removed and then secure the other end of this wire in electrical contact with the housing so as to complete the grounding circuit. Such structure is, however, relatively costly and thus detracts, to some degree, from one of the chief advantages of the overall lamp structure, namely, its low cost.

It is an object of this invention to provide a lamp having a grounding means which is reliable and which is relatively inexpensive. Another object of this invention is the provision of means for establishing positive electrical contact between a lamp reflector and casing which utilizes parts designed to serve other and additional functions in the lamp structure. Still another object is to provide a method of assembling lamps of the aforementioned type which method assures a reliable electrical contact between the reflector and the lamp housing.

These and other objects and advantages are carried out in accordance with the invention by the provision of a spring member positioned between the reflector and the lamp casing, which spring member is adapted to exert

pressure against an edged portion suitably provided on the reflector and against the casing thereby establishing a reliable electrical contact. As will more clearly be seen from the following description, the pressure of the spring element is sufficient to bite through the organic coating on the reflector and thereby contact the bare metal of the reflector. Also, as will be fully described hereinafter, the spring element utilized to make the electrical contact may be one or more spring clips designed to serve the additional function of holding the reflector and housing in assembled relationship.

In the drawing:

Figure 1 is a side view with parts broken away of a lamp embodying the invention;

Figure 2 is a rear view of the reflector and housing bezel assembly as shown in Figure 1, but in smaller scale;

Figure 3 is an enlarged rear view with parts broken away of the bottom portion of the reflector and housing bezel assembly and shows one embodiment of the invention;

Figure 4 is a partial enlarged bottom view of the reflector shown in Figure 3; and

Figure 5 is a view taken on the line 5—5 of Figure 3.

Referring now to the drawing, in Figure 1, 6 is a lens mounted in a metal reflector 8 by means of a circumferential flange 10 provided on the reflector and turned forwardly over the edge portions of the lens to hold the two parts firmly together. A light bulb 12 having a metal base 14 is positioned within a hole in the rear of the reflector and is secured to the reflector by a ring of solder 16 which also serves to establish electrical contact between the metal base 14 of the bulb and the metal reflector 8. Thus, the metal base 14 serves as the grounding contact for the lighting filament of the light bulb while a metal button 18 which is electrically insulated from the base 14, serves as the other contact. In the embodiment shown, electrical connection is made with the contact button 18 by soldering thereto the end of a cable 19 leading from the vehicle's source of electrical energy.

In order to furnish a more durable structure by preventing corrosion, the entire non-reflective or rear surface of the reflector 8 is provided with an organic or other non-conductive coating 20 such as paint, lacquer, varnish or the like.

The above described lens-reflector-bulb assembly forms a lighting unit which is mounted in a lamp housing 22 which comprises a bezel 24 and a cup-shaped casing member 26 which are secured together by means of the tang 28 on the top of the bezel 24 which is positioned to engage a mating slot (not shown) on the top of the casing 26 adjacent its edges, and a threaded member 30 which passes through a hole in the bottom of the bezel and threadedly engages the casing. The housing bezel 24 is formed with an inwardly turned edge portion which forms a circumferential groove 32. The lighting unit is properly positioned in the bezel as shown and is retained therein by a series of circumferentially spaced wire spring clips 34, 36 and 38 each of which is formed with a generally U-shaped portion 39 which engages the back of the reflector flange 10 and legs 40 and 42, the ends of which engage the bezel groove 32. When so positioned, each of these clips 34, 36 and 38 exerts a spring pressure between the bezel and the reflector thereby retaining the lighting unit securely positioned in the bezel.

In order to form an electrical contact between the painted reflector and the bezel thereby grounding the lamp circuit, two spaced backwardly extending tapered lugs 44 and 46 are formed on the base of the reflector. As can

best be seen in Figures 4 and 5, these lugs 44 and 46 comprise out-struck and backwardly turned portions of the reflector flange 10 and therefore their edge portions are of substantially the same thickness as the reflector. Thus, the edge portions of the lugs, being relatively thin, present a surface from which the paint is easily worn or removed.

When the lamp is assembled, the pressure of the legs 40 and 42 of spring clip 38, bearing against bezel groove 38, jams the U-shaped portion 39 tightly between lugs 44 and 46 causing the clip 38 to dig through the paint on the edges of the lugs, thereby contacting the bare metal of the reflector to establish electrical contact therewith. The small point of contact between the lug and clip will insure a great amount of pounds pressure per square inch so that electrical contact is maintained and cannot be broken by corrosion. It will be noted that in the embodiment shown, the wire from which the clip 38 is made is at substantially a right angle to the edge of the lug at the point of contact. Thus, all of the spring pressure of the U-shaped portion of the clip 38 bears against a very small area on the lug thereby giving maximum assurance that it will dig through the coating to make electrical contact. In Figure 4, the lugs are shown prior to positioning the clip 38, the organic coating 20 still being intact. Figure 5 shows the clip 38 positioned between the lugs, the coating 20 having been removed by the spring pressure, as shown at 50. The taper of the lugs 44 and 46 allows, of course, for easy insertion of the clip 38 into position. Once assembled, the spring pressure of the metal clip 38 provides a constant and reliable electrical contact between the reflector and the bezel, thus grounding the circuit. At the same time, the clip 38 serves the additional and aforementioned function of retaining the lighting unit in the housing bezel.

The clip 38 may be made of any suitable spring metal material such as steel or iron; however, we prefer to use a beryllium-copper alloy because of its additional qualities of high electrical conductivity and corrosion resistance.

While in the preferred embodiment which is shown, two lugs 44 and 46 are used, one to each side of the U-shaped portion of the spring clip 38, other arrangements whereby a relatively thin edged portion of the reflector is positioned so that the spring clip 38 will dig through the paint under spring pressure may also be used. For example, a single lug positioned so that the U-shaped portion of the clip 38 will straddle it and contact its edge portions under spring pressure may be used in place of the two lugs 44 and 46.

In manufacturing and assembling the lamp, the reflector with integral lugs 44 and 46 is first formed by some suitable stamping operation after which it is provided with the organic coating and the front reflective surface. The coating operation may be accomplished by dipping, spraying, brushing or other means. It is preferable to take precautions against the accumulation of excessive paint on the edge portions of the lugs 44 and 46 and for this reason, it is desirable to hang the reflectors during baking with the lugs up so that the paint will not drain toward them and collect on their edges. After drying, the light bulb 12 and lens 6 may be secured into position in the reflector and the reflector positioned in the housing bezel 24. Then the spaced spring clips 34, 36 and 38 are snapped into position between the bezel groove 32 and the reflector, the U-shaped portion 39 of clip 38 being wedged between the lugs 44 and 46 to dig through the paint and establish electrical contact. After the necessary electrical connection is made with the contact button 18 of the light bulb, the bezel is assembled to the casing 26 thereby completing the assembly.

While the embodiment of the present invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What I claim as new and desire to obtain by Letters Patent of the United States is:

1. In a lamp of the type having a metal reflector member serving as a part of the lamp electrical grounding circuit, said member being coated with a non-conductive material, the combination of a metal housing in contact with said member, a lug having an edge portion formed integral with said member and extending outwardly therefrom, and a metal wire spring pressed between said member and said housing, said spring being urged by its own resilience into contact with said edge portion to thereby extend through the non-conductive coating thereon and make electrical contact wtih said member.

2. A vehicle lamp comprising a metal housing provided with a groove on its interior surface, a metal reflector member positioned within said housing and having a coating of non-conductive material, a lighting element mounted in said reflector and grounded through said member, a metal lug having an edge portion formed integral with said member and extending outwardly therefrom and a metal wire spring acting between said member and said groove to hold said member within said housing, said spring being urged by its own resilience into contact with said edge portion to thereby extend through the non-conductive coating thereon and complete electrical contact between said member and said housing.

3. A vehicle lamp comprising a generally cup-shaped casing, a bezel provided with an internal circumferential groove secured to said casing, a metal reflector member positioned in said bezel and having a coating of non-conductive material, a lighting element mounted in said reflector and grounded through said member, a pair of lugs having edge portions formed on said member, and a metal spring-like member having a generally U-shaped portion and a pair of legs extending therefrom pressed between said member and said groove, said U-shaped portion being wedged between the edge portions to extend through the non-conductive coating thereon and make electrical contact with said member.

4. A vehicle lamp comprising a generally cup-shaped casing, an annular shaped bezel provided with an internal circumferential groove secured to said casing, a metal reflector member positioned in said bezel and having a coating of non-conductive material, a lighting element mounted in said reflector and grounded through said member, a pair of lugs having edge portions formed integral with said member and extending outwardly therefrom, and a metal wire spring having a generally U-shaped portion and a pair of legs extending therefrom acting between said member and said groove, said U-shaped portion being wedged between said edge portions to extend through the non-conductive coating thereon and make electrical contact with said member.

5. A vehicle lamp comprising a generally cup-shaped casing, an annular shaped bezel provided with an internal circumferential groove secured to said casing, a metal reflector member positioned in said bezel and having a coating of non-conductive material, a lighting element mounted in said reflector and grounded through said member, a pair of tapered lugs having edge portions formed integral with said member and extending outwardly therefrom, and a beryllium-copper alloy wire spring having a generally U-shaped portion engaging said member and a pair of legs extending therefrom engaging said groove, said spring acting between said member and said groove to retain said member in position within said bezel, said U-shaped portion being wedged between said edge portions to extend through the non-conductive coating thereon and make electrical contact with said member.

6. A method for assembling a lamp of the type having a reflector forming a part of the grounding circuit for said lamp, said method comprising the steps of forming a pair of spaced lugs on an edge portion of the reflector, coating the reflector with a non-conductive material, positioning said reflector in the bezel, and wedging a metal wire spring between said spaced lugs to act between said reflector and said bezel, said spring being urged by its own resilience to penetrate the nonconductive coating on edge

portions of said lugs and thereby establish electrical contact between said reflector and said bezel.

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