

June 24, 1958

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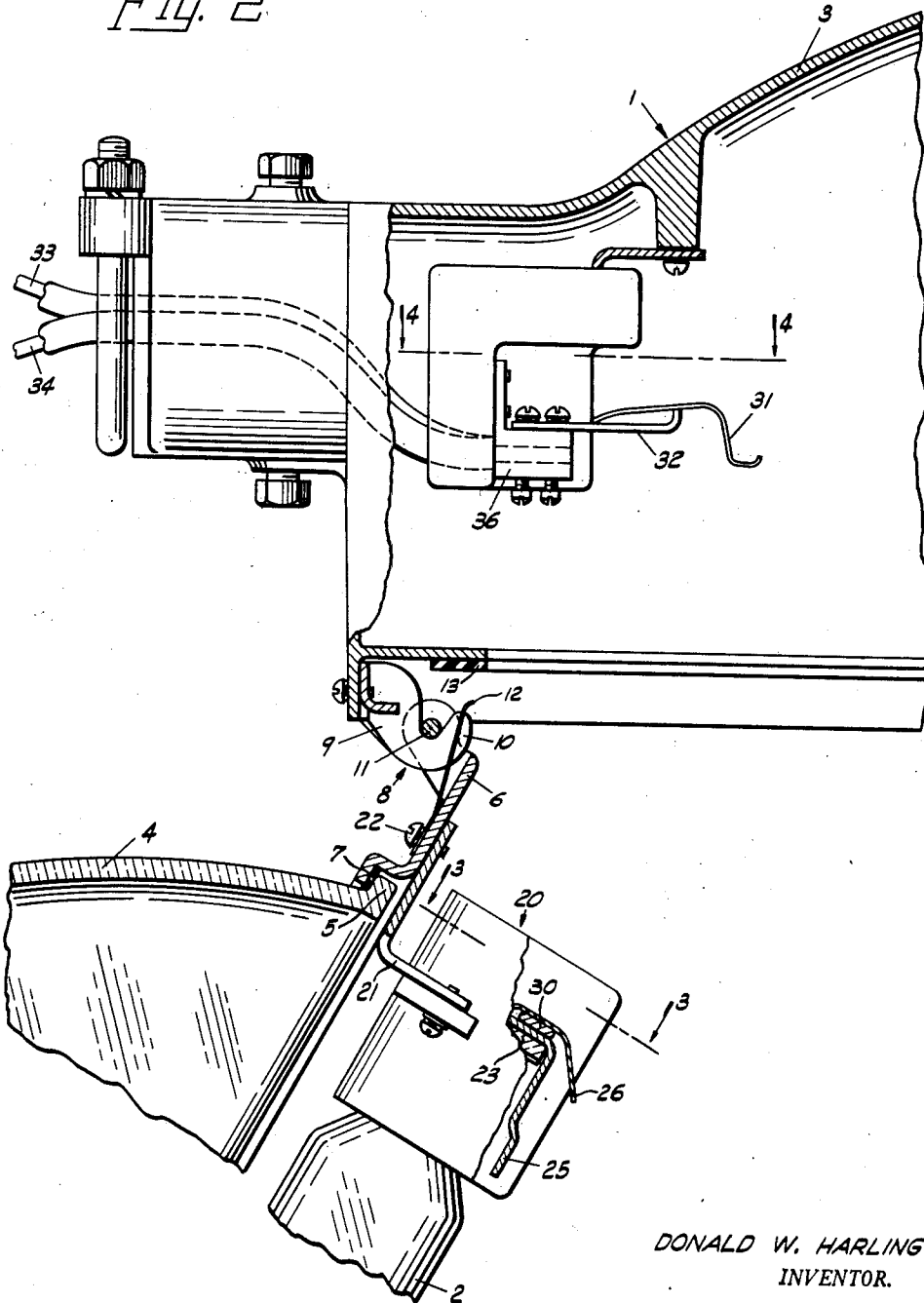
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LAMP HOLDER ASSEMBLY FOR LUMINAIRE

Filed Sept. 28, 1953

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Fig. 2



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2,840,690

LAMP HOLDER ASSEMBLY FOR LUMINAIRE

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Application September 28, 1953, Serial No. 382,718

5 Claims. (Cl. 240—25)

The present invention relates to luminaires, and particularly relates to a lamp holder assembly for luminaires, such as those used for street lighting purposes.

It has long been the practice in the operation of series connected lamps, such as those that may be used in street lighting installations, to provide a means, such as a film cutout, for maintaining continuity of service in the series circuit when one or more lamps have burned out. Series circuits have been provided in a major share of the installations of both incandescent and gaseous discharge luminaires for the numerous advantages provided by such circuits. One of the disadvantages of operating lamps in series connection has been that it is practically a necessity that the circuit be opened before replacing burnt out lamps, film cutouts, and to perform other maintenance operations because of the relatively high voltage and amperage ordinarily supplied to such circuits, making it unsafe for an operator to work with "live" parts. Generally, such maintenance work has been performed during the daylight hours, and the maintenance crews must depend upon reports from neighbors or spotter crews to know which lamps have burned out without energizing the entire circuit for the particular purpose of spotting such lamps.

It is among the objects of the present invention to provide a luminaire lamp holder, preferably, but not necessarily in series electrical connection, for receiving either an incandescent lamp, or a gaseous discharge lamp, and having contacts arranged for normal electrical engagement with fixed contacts, which contacts may be disengaged during periodic maintenance operations without disrupting continuity of service in the remaining lamps of the circuit, and with the various parts of the luminaire to be serviced being disconnected from line current.

Another object of the present invention is to provide a lamp holder for a series-connected luminaire, which includes separable contacts adapted for normal electrical engagement to establish a circuit through a film cutout to the conducting lamp receptacle, and which contacts may be moved towards disengagement without disrupting continuity of service in the series circuit to permit replacement of the cutout and the lamp and other maintenance operations out of danger of physical contact with electrically "alive" parts.

It is a specific object of the present invention to provide a lamp holder for a series-connected luminaire including a pair of normally disengaged stationary contact members, each separately normally engaged with a pair of cooperating contact members fastened to a lamp socket and having a film cutout interposed therebetween, wherein said movable contacts may be moved towards electrical disengagement with said stationary contacts with said stationary contacts concurrently electrically engaging one another for maintaining electrical continuity in the series circuit.

For a better understanding of the present invention, reference may be had to the accompanying drawings in which;

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Fig. 1 is a fragmentary side elevational view, partly in section, of a luminaire, illustrating the various components of the lamp holder in normal operating relationship.

Fig. 2 is a fragmentary view, partly in section, of a portion of a luminaire with the various operating parts rotated to out-of-circuit position.

Fig. 3 is a fragmentary sectional view taken along lines 3—3 of Fig. 2.

Fig. 4 is a fragmentary sectional view taken along lines 4—4 of Fig. 2.

Referring now to Fig. 1 of the drawings, there is illustrated a street lighting luminaire of the enclosed type generally indicated by the reference numeral 1. The particular luminaire illustrated utilizes an electrical lamp 2, which may be of the incandescent type or the gaseous discharge type, and which has its longitudinal axis disposed in a horizontal plane. It is to be noted, however, that the novel device, described hereinbelow, is equally applicable to lamps disposed in a vertical operating position, and that the luminaire, itself, is illustrated for descriptive purposes only.

The luminaire, in general, comprises a housing or reflector 3, which preferably has a specular surface interiorly thereof for reflecting light rays in a predetermined direction. In an enclosed luminaire of the present type, it is conventional to provide light-transmitting glassware comprising a globe 4, which is of a refracting nature. Additional light deflectors (not shown) may be provided as desired. The globe 4 may be provided with a marginal flange 5 engaging a mounting ring 6 with a cushioning resilient gasket 7 interposed therebetween. The gasket 7 is preferably of a material that will provide a moisture-proof seal between the members. It is also conventional to provide a compensating hinge and latch arrangement, the hinge portion of which is shown generally by the reference character 8. Inasmuch as the latch member does not constitute a part of the present invention, it has not been disclosed herein, but may take any of the usual forms, such as the arrangement described and claimed in U. S. Patent No. 2,309,279, granted to R. L. Smythe on January 26, 1943, and assigned to the same assignee as is the present invention.

In general, the latch member comprises a pair of trunnions 9 secured to the housing 3 and provided with hook portions 10 for receiving a pivot pin 11 integral with the globe mounting ring 6. A resilient spring member 12 is mounted on the ring 6, and has its free end cooperating with the trunnions 9 to provide pressure in an upward direction to maintain the moisture-proof seal between the ring and the housing 3. A resilient sealing gasket member 13 is interposed between the housing and the mounting ring peripherally of the globe 4 to complete the seal.

The preferred mounting arrangement for the lamp holder is to position the lamp receptacle, denoted generally at 20, on a bracket 21 secured to the mounting ring 6 of the globe 4 by means of a machine screw 22 engaging tapped holes in the bracket. It will be apparent from the following description that the receptacle may be mounted in any of various mounting positions without departing from the scope of the present invention, and without interfering with its operating characteristics.

The lamp receptacle 20 comprises a heat and electrical insulating member 23, which is preferably of porcelain, or the like. A conducting socket 24 is mounted interiorly of the insulating member, and may be of the conventional threaded type for receiving either incandescent or gaseous discharge lamps. If it is desired, a conducting member of the bayonet type (not shown) may be provided.

The contact structure comprises a set of stationary contacts and a set of movable contacts, the cooperating members of each set being in normal electrical engagement.

It is not necessary that the contacts in themselves be movable; but the term is used to denote contact members that may be moved towards separation and electrical disengagement. That is, the terminal connections of the conducting socket 24 are each completed through the movable contacts 25 and 26, respectively. As shown in Fig. 3, the contact 25 is electrically connected to the center contact (not shown) of the lamp base, whereas the generally U-shaped contact 26 is electrically connected to the threaded lamp receiving portion of the socket 24. A film cutout 30 is interposed between each of the contacts 25 and 26 when the lamp is series-connected, and is arranged to continue the electrical circuit in the conventional manner should the lamp burn out. The cutout 30 is normally non-conducting and becomes conducting after rupture caused by a high surge in the circuit when the lamp 2 burns out.

As shown in Figs. 1 and 4, the lamp holder is positioned in normal operating position with the movable contacts 25 and 26 in electrical engagement with the stationary contacts 31 and 32, respectively. The stationary contacts are biased towards electrical engagement with one another, as shown in Fig. 2. It is preferable to provide the movable contact 25 of a relatively heavier conducting material than the resilient stationary contact 31. This relative material thickness will permit the movable contact 25 to press the resilient stationary contact 31 towards disengagement with the stationary contact 32, as is shown in Fig. 1. Each of the stationary terminals 31 and 32 are connected to line by means of leads 33 and 34 electrically connected to terminal blocks 35 and 36, respectively.

With the parts in normal operating position, as shown in Fig. 1, the circuit may be traced from the leads 33 and 34 to each of the stationary contacts 31 and 32, respectively. Inasmuch as the globe 4 is in latching relationship with the housing 3, an upward pressure exerted by the latch member (not shown) and the spring 12 will cause the movable contact 25 to become electrically engaged with the stationary contact 31, and further to press that contact upwardly and out of electrical engagement with the stationary contact 32. The circuit may then be completed from the contact 31 to the contact 25 connected to the lamp, and then through the conducting portions of the lamp. Current may then travel from the lamp to the socket 24 and to the movable terminal 26 fastened thereto. The completed circuit will now be established through the stationary contact 32 the terminal block 36, to the lead 34, thereby connecting the luminaire in series relationship with the remainder of the lamps on the circuit.

Should it be necessary to replace a burnt out lamp or to perform other maintenance operations such as cleaning of the globe, etc., the various movable parts may be rotated to the position shown in Fig. 2. It will be apparent that as the parts are moved to the position shown in Fig. 2, the upward force on the stationary contact 31 will be removed, and that contact will become electrically engaged with the stationary contact 32 to provide a shunting means for maintaining the electrical circuit throughout the series-connected system. It is to be noted, that if a lamp had previously burned out, the circuit would have been short-circuited through the film cutout 30 in the conventional manner.

It is preferable, though not essential, to provide an arrangement of contacts and pressure between contact members that will permit the short-circuit to be established between the stationary contacts 31 and 32 before contact 25 becomes disengaged therewith. This will insure continuity of service in the series-connected circuit without the presence of momentary flickering, arcing, or the possibility of a line surge occurring, which might accidentally rupture other film cutouts. Another important reason for permitting engagement and disengagement of contacts in the above order, is that when used

with systems incorporating gaseous discharge lamps, such as mercury vapor lamps, there is considerable danger of destructive flashover when attempting to restart these lamps if current is even momentarily interrupted. On interruption of current, high pressures in the lamp will be sustained with consequent high internal electrical resistance which would require a relatively higher starting voltage resulting in the destructive flashover.

It will be seen that when the movable parts are rotated to the position shown in Fig. 2, that both the film cutout 30 and the conducting socket 24 will be entirely out of electrical contact with any electrically alive parts, and maintenance operations may be conducted on them without danger of contact by an operator with those parts. The cutout may be replaced by simply springing the contact 26 away from the contact 25, removing the ruptured cutout, and replacing it with a new one. If it is so desired, the pin 11 may be removed from the hook portions 10 of the trunnions 9, whereby the entire globe unit with the receptacle 20 will be free from the housing 3 for removal to street level for any repairs, cleaning, or replacements.

As has been previously stated, it is within the province of this invention to provide a receptacle (not shown) on a separate pivot structure from the hinge 3 of the luminaire 1 without interfering with the operating characteristics of the invention.

It is also to be noted that the device may be installed in conventional vertically mounted lamps to provide the same functions and with very little modification of the parts illustrated and described.

It will be apparent that there has been provided a novel lamp holder assembly for a luminaire of either the enclosed or the open type, which assembly is especially applicable to a series-connected luminaire for maintaining continuity of service in the remainder of the lamps of the circuit during the performance of maintenance operations thereon, and to provide a structure having its major operating components movable towards a safe position for replacement of lamps, cleaning or other maintenance functions.

I claim:

1. In a luminaire comprising a stationary housing and a globe assembly providing a removable closure therefor, said globe assembly being movable from a closed position to an open position relative to said housing; a first pair of contact members biased towards electrical engagement with one another and arranged to complete an electrical series circuit on said engagement, a second electrical circuit including a conducting lamp socket and a second pair of contact members insulated from one another by means of a film cutout interposed therebetween and arranged for separable individual engagement with a respective contact of said first pair of contact members, one of said pairs being secured to said globe assembly for concurrent movement therewith for alternatively connecting said second circuit in series relationship with said first mentioned series circuit and physically separating said first pair of contact members on movement of said globe assembly towards closed position, and to concurrently release said first pair of contact members towards engaged position and electrically isolate said second circuit from said first mentioned series circuit on movement of said globe assembly to open position.

2. In a luminaire comprising a stationary housing and a globe assembly pivotally mounted thereon and providing a removable closure therefor, said globe assembly being pivotally rotatable from a closed position to an open position relative to said housing; a first pair of contact members biased towards electrical engagement with one another and arranged to complete an electrical series circuit on said engagement, a second electrical circuit including a conducting lamp socket and a second pair of contact members insulated from one another by

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means of a film cutout interposed therebetween and arranged for separable individual engagement with a respective contact of said first pair of contact members, one of said pairs being secured to said globe assembly for concurrent rotative movement therewith for alternatively connecting said second circuit in series relationship with said first mentioned series circuit and physically separating said first pair of contact members on rotation of said globe assembly towards closed position, and to concurrently release said first pair of contact members towards engaged position and electrically isolate said second circuit from said first mentioned series circuit on rotation of said globe assembly to open position.

3. In a luminaire comprising a stationary housing and a globe assembly providing a removable closure therefor, said globe assembly being movable from a closed position to an open position relative to said housing; a pair of stationary contact members positioned in said housing arranged for series-circuit line connection and biased towards electrical engagement with one another to complete said connection, and a conducting lamp socket secured to said globe assembly for concurrent movement therewith and having a pair of spaced-apart contacts, each of said spaced-apart contacts in separable engagement with a respective one of said stationary contact members and concurrently urging said stationary contact members toward electrical disengagement with one another on movement of said globe assembly to closed position, whereby said series-circuit is completed through said lamp socket on movement of said globe assembly to closed position and whereby said spaced-apart contacts and said socket will be completely electrically isolated from said series-circuit connection on movement of said globe assembly to open position.

4. In a luminaire comprising a stationary housing and a globe assembly providing a removable closure therefor, said globe assembly being movable from a closed position to an open position relative to said housing; a pair of stationary contact members positioned in said housing arranged for series-circuit line connection and biased towards electrical engagement with one another to complete said connection, and a conducting lamp socket secured to said globe assembly for concurrent movement therewith and having a pair of spaced-apart contacts normally insulated from one another by means of a film cutout interposed therebetween, each of said spaced-apart contacts in separable engagement with a respective one

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of said stationary contact members and concurrently urging said stationary contact members toward electrical disengagement with one another on movement of said globe assembly to closed position, whereby said series-circuit is completed through said lamp socket on movement of said globe assembly to closed position and whereby said spaced-apart contacts and said socket will be completely electrically isolated from said series-circuit connection on movement of said globe assembly to open position.

5. In a luminaire comprising a stationary housing and a globe assembly pivotally mounted thereon and providing a removable closure therefor, said globe assembly being pivotally rotatable from a closed position to an open position relative to said housing; a pair of stationary contact members positioned in said housing arranged for series-circuit line connection and biased towards electrical engagement with one another to complete said connection, and a conducting lamp socket secured to said globe assembly for concurrent rotatable movement therewith and having a pair of spaced-apart contacts normally insulated from one another by means of a film cutout interposed therebetween, each of said spaced-apart contacts in separable engagement with a respective one of said stationary contact members and concurrently urging said stationary contact members toward electrical disengagement with one another on rotation of said globe assembly to closed position, whereby said series-circuit is completed through said lamp socket on pivotal movement of said globe assembly to closed position and whereby said spaced-apart contacts and said socket will be completely electrically isolated from said series-circuit connection on rotation of said globe assembly to open position.

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