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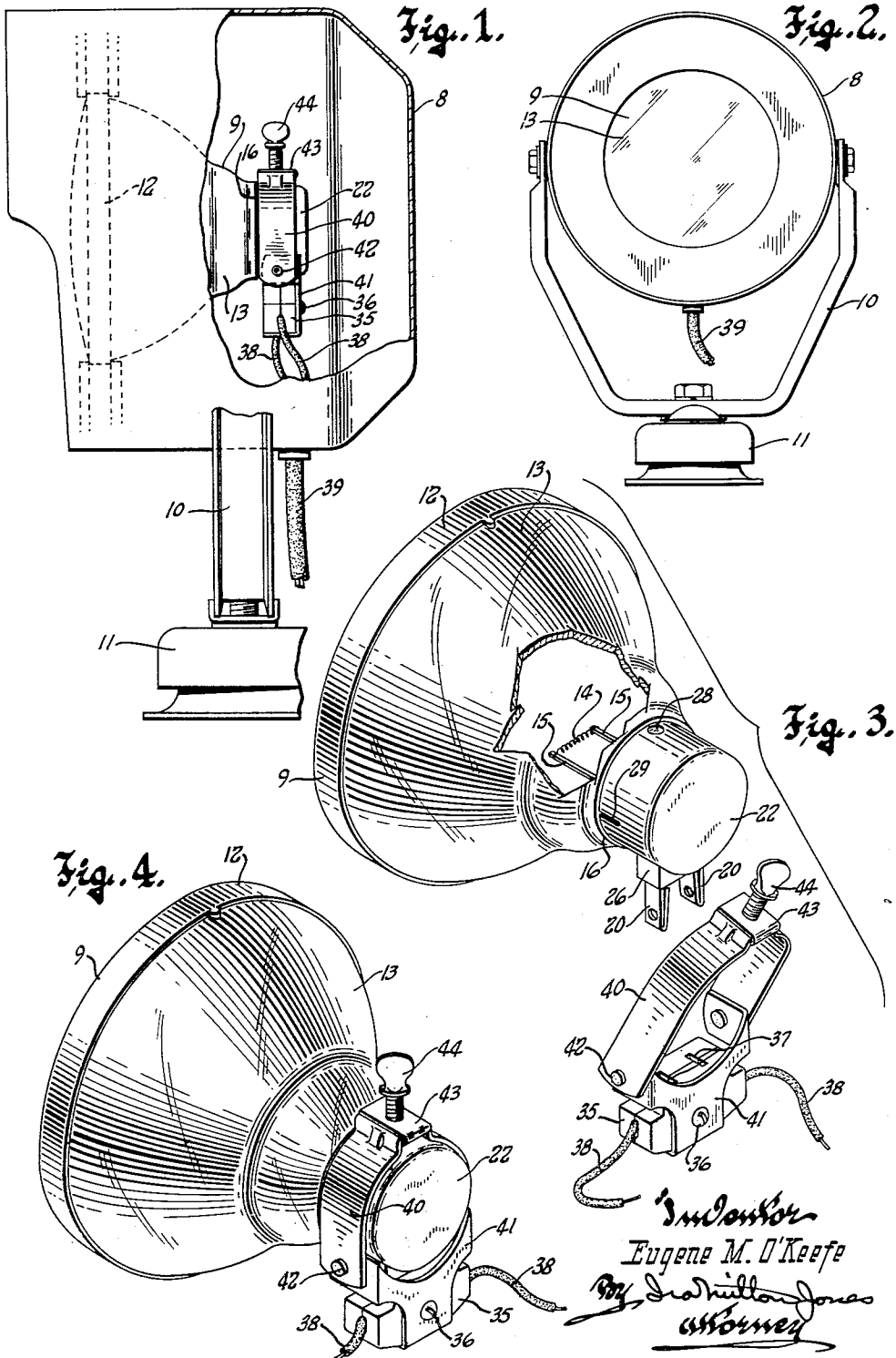
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MOUNTING FOR ELECTRIC LAMPS

Filed Dec. 24, 1959

2 Sheets-Sheet 1



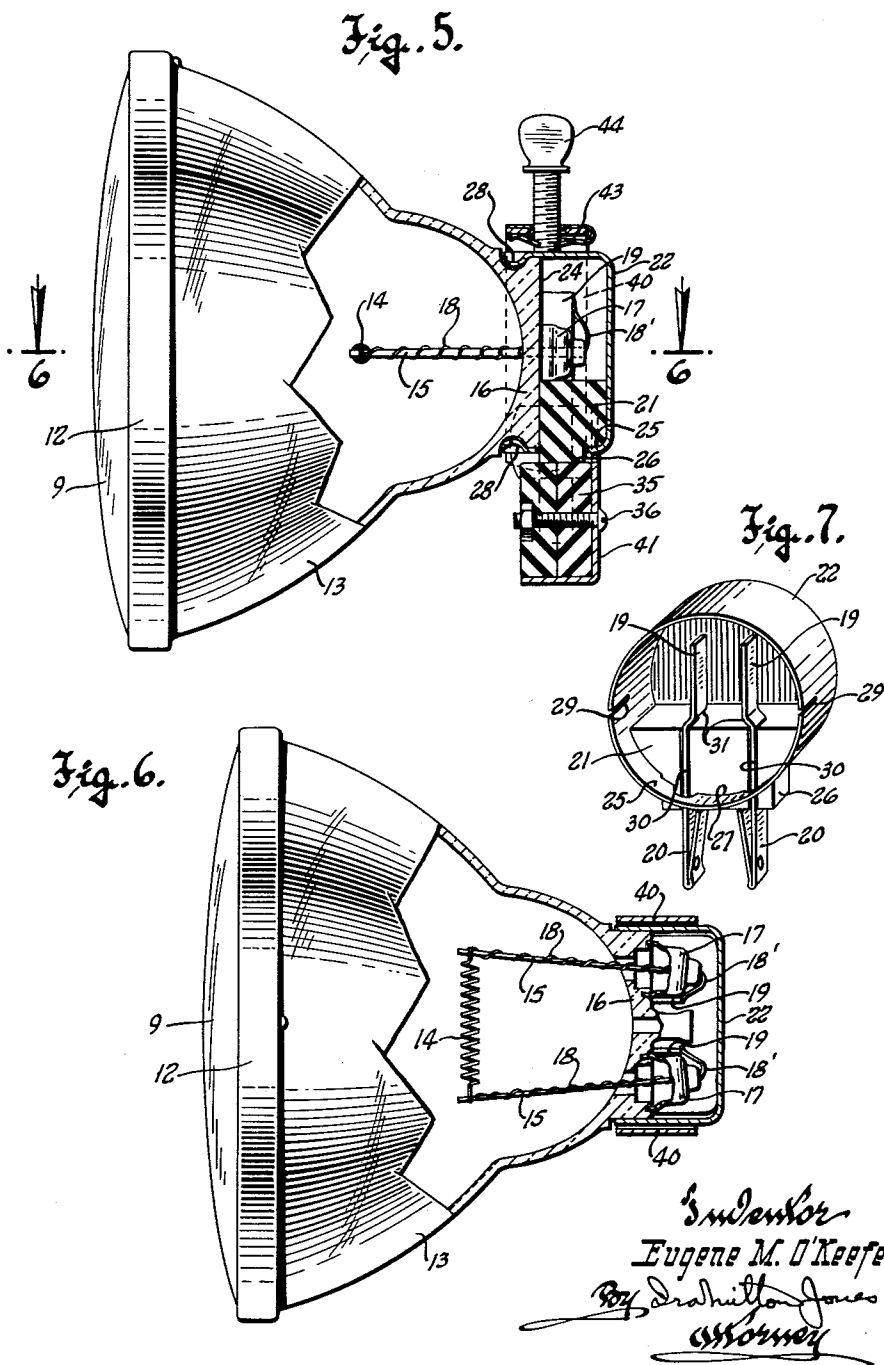
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MOUNTING FOR ELECTRIC LAMPS

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2 Claims. (Cl. 240—41)

This invention relates to the mounting of electric lamps, and refers more particularly to the mounting of lamps in situations where the lamp is subjected to severe vibration and shock, as, for instance, the rough service expected of heavy ground working equipment used by contractors.

Shock resistant mountings for electric lamps are, of course, not new, and it has been long recognized that a mounting which clasps the lamp by its peripheral portion, i.e. the rim of its lens, and thereby floatingly supports the lamp from its housing assures longer lamp life than one in which the lamp is mounted by its base, as for instance by having its base screwed into a receptacle or socket.

It has been found, however, that even those mountings which grasped the lamp by its peripheral portion, possessed a heretofore unsuspected source of lamp failure, especially where the lamp was of the type equipped with terminal prongs projecting laterally from a metal shell fitted to the base of the lamp. In these lamps, the lead-in wires for the ends of the filament are brought out through the base of the lamp and soldered to the prongs. Since the inner end portions of the prongs to which the filament lead-in wires are soldered, are inside the metal shell or cap which is fitted to the lamp base, and the prongs must be supported in a way which keeps them electrically insulated from the metal shell, despite the fact that the prongs pass through its side wall, it follows that the prongs must be capable of easy assembly and disassembly with their support. This requirement is met by seating the prongs rather loosely in pockets or slots formed in a block of ceramic insulation which, in turn, is loosely nested into the cup-shaped metal shell.

To connect the lamp with a source of current, its prongs are "plugged" into a suitable socket or receptacle which is flexibly connected, inside the housing of the lamp, to the end of the supply cord. For two important reasons, the socket or receptacle is not secured to the housing. If it were, it would interfere with the floating mounting of the lamp; and also, to enable "plugging in" the lamp, it must be possible to withdraw the socket or receptacle from the housing.

Because of the manner in which the prongs have to be mounted, it is inevitable that they are free to vibrate with respect to the lamp base and the metal shell fitted thereon, and since the prongs constitute the only support for the receptacle into which they are inserted, the weight or mass of the receptacle aggravates the ill effects of this freedom of the prongs to vibrate or move relative to the lamp base.

It is this vibration or movement of the prongs with respect to the lamp base which has been found to cause breakage of the filament lead-in wires or their soldered connections to the terminal prongs.

Having discovered this source of lamp failure, it would appear that the remedy would lie in a redesign of the lamp to eliminate the possible vibration of the terminal prongs relative to the lamp base. Though this might be done, it still would not solve the problem.

Bearing in mind that the receptacle or socket by which the prongs are, of necessity, tightly gripped, adds its weight and mass to that of the prongs, and that the socket or receptacle cannot be supported from the fixture housing without nullifying the cushioning effect gained by the shock resistant lamp mounting, it follows that

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while the prongs might be initially secure against vibratory motion relative to the lamp base, they would soon loosen.

Moreover, a redesign of the lamp might very well result in a loss of some of the advantages of the lamp as it now exists, and might entail an economically unwarranted increase in its cost of production. The problem to which this invention is directed, therefore, assumes that the lamp must be accepted in its existing form, with the terminal prongs free to vibrate with respect to the lamp base.

It is, therefore, the purpose and object of this invention to provide simple means by which relative vibratory motion between the prongs and the lamp base may be eliminated, without requiring any change in the structure of the lamp.

This invention achieves this purpose in an extremely expeditious way, by the simple expedient of securing the receptacle against vibratory motion with respect to the lamp base.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

FIGURE 1 is a side view of a light fixture of the type with which this invention is concerned, having part thereof broken away;

FIGURE 2 is a front view of the fixture;

FIGURE 3 is a perspective view of the lamp and its terminal receptacle, shown separated;

FIGURE 4 is a view of the lamp and its receptacle in assembled relation;

FIGURE 5 is a view partially in side elevation and partially in longitudinal section, through the lamp and its receptacle;

FIGURE 6 is a view partially in side elevation and partially in section, on the plane of the line 6—6 in FIGURE 5; and

FIGURE 7 is a perspective view of the terminal prong assembly of the lamp shown separated from the lamp.

Referring now more particularly to the accompanying drawings, the numeral 8 designates the housing of a light fixture of the type with which this invention is primarily concerned, and which serves as a mounting and enclosure for an electric lamp 9. The housing 8 is supported between the arms of a yoke 10 which, in turn, has a swivel connection to a base 11 securable to any supporting structure.

The lamp 9 is readily removably mounted in the housing 8 by a shock resistant mounting which grasps the lamp by its peripheral portion 12. While this shock resistant mounting for the lamp forms no part of this invention, it must be understood that whatever means are employed to so mount the lamp in the housing has to permit the lamp to be removed for replacement, and must support the lamp in a way which precludes, or at least greatly minimizes, the transmission of shock and vibration from the lamp housing to the lamp.

The lamp is a standard product made by one of the larger manufacturers of electric lamps, and comprises a glass envelope 13 composed of a rear reflector section and a front lens section. The lamp filament 14 is supported in the envelope by a pair of rods or filament supporting elements 15 which project forwardly from the base 16 of

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the lamp, as best seen in FIGURE 6. The filament supporting elements or rods 15 may be embedded directly in the glass base 16 but, preferably, are mounted in the manner illustrated in Patent No. 2, 194,373, issued to General Electric Company, March 19, 1940. Accordingly, the filament supporting elements or rods 15 are secured in small metal caps 17 which, in turn, are sealed to the glass base.

Preferably the filament lead-in wires 18 are wrapped about the supporting elements or rod 15 and have their outer ends exposed on the exterior of the caps 17 or electrically connected thereto. In any event, they are connected with terminal prongs 19 by short lengths of wire 18'.

The prongs 19 extend edgewise across the flat rear face of the lamp base, with their outer end portions 20, which are doubled back upon themselves—or hairpin-shaped—projecting laterally beyond the base. The prongs are held in this position by a block 21 of insulating material, preferably ceramic which, in turn, is secured in position by a cup-shaped metal shell or cap 22 tightly fitted to the base of the lamp.

The block 21 of insulating material is of a size and shape to fill the major part of one-half of the cup-shaped shell and is held in this position by being confined between the rear of the lamp base and the end wall 24 of the shell and between the side wall 25 of the shell and the metal caps 17. A boss 26 on the block of insulating material projects through a hole 27 in the side wall of the shell, and by having the terminal prongs nested therein, serves to insulate the same from the shell.

The securement of the shell 22 to the lamp base is effected by engaging the shell over the base and pressing diametrically opposite portions 28 of the side wall of the shell into correspondingly located pockets or notches in the lamp base. To facilitate snug engagement of the shell with the lamp base, its side wall 25 has diametrically opposite slits 29 therein, preferably equispaced between the indented portions 28.

Although the described assembly fairly well secures the block of insulation 21 against movement with respect to the lamp base and shell 22, it does not hold the prongs 19 against vibratory motion with respect to these parts. This follows from the fact that, to enable the described assembly and particularly to enable the terminal prongs to be soldered to the terminal portions of the filament lead-ins, the mounting of the prongs in the block of insulation 21 inevitably leaves the prongs rather loose. Thus, as clearly shown in FIGURE 7, the medial portions of the prongs are received in slots 30 formed in the block of insulation, the slots being wide enough to freely receive the prongs therein and the depth of the slots being such that the prongs will be loosely confined edgewise between the back of the lamp base and the bottom of the slots.

In the endwise direction, the prongs are loosely held against displacement by shoulders 31 formed therein as a result of offsetting their inner ends, and by the abutment of the ends of the inturned outer end portions with the adjacent face of the boss 26.

Though the described construction of the lamp and the mounting of its prongs forms no part of this invention, it has been detailed to illustrate the problem with which this invention is concerned.

As noted hereinbefore, lamps constructed in this manner have advantages over other available lamps—as, for instance, those which use a screw type connection with their sockets or receptacles. These advantages are well understood in the art, but, as pointed out hereinbefore, they also have a disadvantage which was not heretofore recognized—namely, that the inevitable looseness of the terminal prongs led to relative vibratory motion between them and the terminal portions of the filament lead-in wires and this, in turn, caused breakage of the lead-in wires, or their soldered connections to the prongs.

With the present invention, this objection is entirely

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eliminated by the simple expedient of securing the receptacle 35 into which the terminal prongs are engaged to connect the lamp with a current source, against relative motion with respect to the lamp base and the metal shell 22.

The receptacle 35 is of conventional construction and consists of a body of insulating material, preferably made up of two complementary halves, held together by a bolt 36. Opening to one of its faces, this block of insulating material has a pair of sockets 37 into which the terminal prongs are snugly and tightly received. Inside these sockets are the female connectors (not shown) of the receptacle, which, as is well understood, are connected with conductor leads 38. The conductor leads 38 are flexible and long enough to allow the entire receptacle to be withdrawn from the lamp fixture housing 8, despite the fact that the conductors are connected to the supply cord 39 which, in turn, is anchored to the housing at its point of entry thereinto.

As indicated, the prongs 19 tightly fit the sockets 37, so that when they are engaged therein, the prongs, for all intents and purposes, become anchored to the receptacle or, stated conversely, the receptacle is supported by the prongs. Hence, by securing the receptacle against relative motion with respect to the lamp base and the shell 22, the possibility of vibratory motion between the prongs and the terminal portions of the lamp filament is eliminated.

To hold the receptacle to the lamp base, a U-shaped strap or bail 40 is hingedly connected to the receptacle by means of a bracket 41 fixed to the receptacle by the bolt 36, and pivotally connected with the ends of the U-shaped strap or bail, as at 42. The bight or closed end of the bail has a nut 43 fixed thereto, in which a clamping screw 44 is threaded.

As clearly shown in FIGURE 4, the bail 40 is of a size to embrace the metal shell when the lamp prongs are plugged into the receptacle and, upon tightening of the screw 44 the receptacle will be drawn tightly against the boss 26 of the insulating block 21, to thereby hold the entire assembly firmly together and against relative vibratory motion of its several parts.

From the foregoing description, taken in connection with the accompanying drawings, it will be readily apparent to those skilled in this art, that this invention overcomes an objection inherent in an electric lamp and its manner of mounting or connecting the same to an electric supply which, though heretofore not recognized, has been nonetheless experienced to a large degree and unjustly charged to or considered a defect in a lamp which has many advantages and which is very well suited to use in situations where the fixture in which the lamp is located is subjected to extreme vibration and shock.

What is claimed as my invention is:

1. In combination: an electric lamp having a glass envelope with an integral glass base, filament leads entering the envelope through the glass base and having ends disposed externally of the base, a metal shell tightly fitted to the exterior of the glass base and enclosing the external ends of the filament leads, terminal prongs for the lamp, means mounting said prongs with their inner ends inside the metal shell and their outer end portions outside the shell, and in a manner which leaves them free to vibrate with respect to the shell and the glass base, and means physically and electrically securing the prongs to said external ends of the filament leads; a receptacle having sockets in which the prongs are tightly received, and by which the prongs are connectible with current supply lines; and clamping means carried by the receptacle and engaging the metal shell remote from the receptacle to draw the receptacle against the shell and thereby secure the receptacle as well as the prongs and their connections to said external ends of the filament leads against vibra-

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tory motion with respect to the shell and the glass base.

2. The combination of claim 1, wherein the shell is cup-shaped and the terminal prongs pass through one side wall portion of the shell; and further characterized by the fact that said clamping means comprises a bail hingedly connected to the receptacle and embracing the shell, and screw means carried by the bail and reacting against the opposite side wall portion of the shell.

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