

Nov. 17, 1953

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ELECTRIC LAMP SHADE  
Filed June 29, 1950

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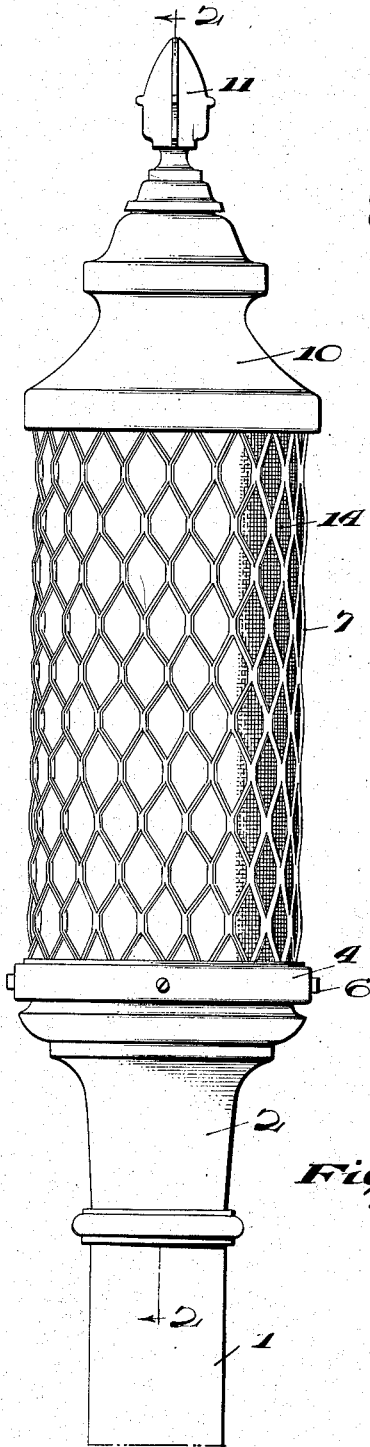


FIG. 1.

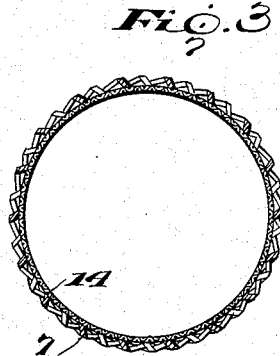


FIG. 3.

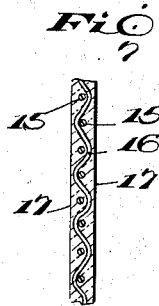


FIG. 4.

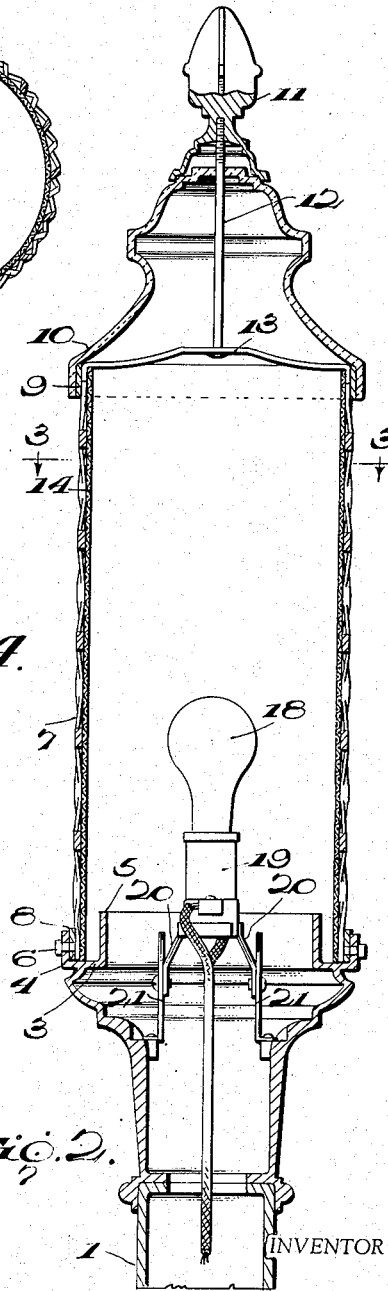


FIG. 2.

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2,659,809

## ELECTRIC LAMP SHADE

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Application June 29, 1950, Serial No. 171,053

4 Claims. (Cl. 240-25)

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This invention relates to a combined protector and light diffuser particularly intended for use with outdoor electric lights such as street lamps, but also advantageous for use with any electric lamp under circumstances such that protection against breakage is required.

In the case of a street light, for example, the glass bulb of the electric lamp is fragile and if exposed is easily broken when struck by any flying object, and also must be protected against rain, snow and ice, and wind, if frequent replacement is to be avoided. Hence it is desirable to enclose such bulbs in protective shades, but at the same time the material of which the shade is made must be either transparent or translucent and often should be colored to provide special lighting effects. As a result of these requirements, shades for street lights are usually made of frosted or other translucent glass, either white or colored as may be desired, and such shades are little if any less subject to breakage than the light bulbs themselves. Even when the shade is covered by an external guard of heavy wire or the like, it is still vulnerable to attack by missiles capable of penetrating the guard, such as air rifle shot or small stones or pebbles thrown by mischievous children. Replacement of such broken glass shades is a source of constant trouble and expense. Moreover, the cost of the glass shades themselves is an important item because each shade must be individually molded at the factory to the proper size and shape, and even though the fragile shades are packed for shipment and handled carefully, some breakage is unavoidable and the loss due to breakage is apt to become excessive.

It is an object of the invention to provide a combined protector and light diffuser which is practically nonbreakable.

Another object is to provide a protector and diffuser which is flexible and capable of yielding when struck by a small missile such as mentioned above so that breakage is practically eliminated.

Another object is to provide an improved device of the type characterized in the preceding objects which can be made either transparent or translucent, which is capable of providing diffused illumination, and which can have any color it may be desired to impart to the illumination.

A further object is to provide such a device in a form capable of being packed, stored and transported in flat condition either for original installation or for replacement.

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A still further object is to provide a device of the above type which can be manufactured by quantity production methods at relatively low cost, and which if desired can be manufactured and shipped in large sizes and cut and shaped on the job for purposes of installation.

With the above objects in view, the present invention comprises an external rigid guard structure of any suitable material and construction, and an internal flexible liner which provides added protection for the electric lamp and at the same time serves to control the character of the illumination. The guard should be strong enough to withstand the impact of heavy missiles or other forces that might destroy or carry away the installation, but should also comprise an openwork structure that does not hinder seriously the transmission of light. The guard structure is preferably of metal and may suitably comprise metal rods or heavy wires or strips fabricated or assembled in any suitable way to form a cage or meshwork around the lamp. The metalwork can be finished in any desired manner as by nickel plating, galvanizing or painting, or can be made of chrome or stainless steel or other weatherproof metals. Preferably the guard structure serves also as the frame of the combined protector and diffuser, but if desired the guard structure can be formed separately and attached to any suitable frame.

Inside the guard structure is a liner comprising a substantially continuous sheet of flexible light-transmitting material having the plural functions of protecting the lamp against weather, furnishing added protection against small missiles penetrating the guard structure, and of controlling the character of the illumination from the lamp. For example, the liner may be transparent if desired, but usually will be more or less translucent so as to diffuse the illumination and provide a substantially uniform soft glow. The material of the liner may also be colored to provide appropriately colored illumination. For example, a red light is desirable to indicate the location of warning signals, and a yellow light is often preferred for street lighting and has the additional advantage that it does not attract various types of insects. The continuity of the liner protects the lamp against wind, rain, snow and like weather forces. The flexibility of the liner permits it to yield and to absorb the impact of small missiles without breakage, this action being facilitated by locating the liner inside the rigid guard and loose with respect thereto so that it can bend in-

wardly away from the guard to any extent required to distribute the impact over a relatively large area and thus to absorb it without breakage.

Any of various well known plastics can be used in making the liner, the particular type of plastic to be employed being a matter of choice depending on the conditions to be satisfied in each case. It is advantageous to coat the plastic onto a support of wire screen or the like, thus obtaining strength and resiliency as well as flexibility with a thin coating of plastic. For example, good results have been obtained with a plastic coated screen known as "Cel-O-Glass" which comprises 14-mesh galvanized wire screen coated on both sides with plastic of the cellulose acetate type. Such a liner, when loose from the surrounding guard, can bend or flex inwardly to absorb repeated impacts and will continue to spring back to its original shape. The continuous plastic coating keeps out the weather, and by virtue of its light-diffusing effect, which appears to be assisted by reflection from the screen wires, the emitted illumination is a uniform soft diffused glow free from glare.

Flexibility of the liner is also important from the standpoint of installation. Liner sheets of the above type can be made of any desired size and can be stored, transported and handled in flat condition. For either original installation or replacement, the sheets can be manufactured originally in the proper size or cut to size and shape whenever desired, as for example at the point of installation. The sheets are then bent into proper shape corresponding to that of the guard, and inserted into the guard where they tend to expand or straighten out and thus hold themselves in position by frictional engagement with the guard, being free to flex inwardly upon impact of a missile as described above. In the case of a cylindrical guard, for example, a liner sheet of the proper dimensions is simply rolled into tubular form and inserted into the guard. However, the edges of the tube can be secured together in any suitable way, if desired, as by overlapping them and stapling or otherwise securing them together.

One embodiment of the invention has been illustrated in the accompanying drawings which show a protector and diffuser mounted on top of a lamp post for street lighting or the like. However, it is to be expressly understood that devices embodying the invention can be used for hanging lamps or lamps of any other desired type, and that the drawings are for purposes of illustration only and are not to be taken as a definition of the limits of the invention, reference being had to the appended claims for this purpose.

In the drawings,

Fig. 1 is a side view of a street lamp equipped with a device embodying the invention;

Fig. 2 is a vertical sectional view on the line 2-2 of Fig. 1;

Fig. 3 is a section on the line 3-3 of Fig. 2; and

Fig. 4 is a sectional view showing the construction of the liner.

Referring to the drawings, 1 is a lamp post of any suitable type on top of which is mounted a suitable base 2 for supporting the lamp itself and the protector and diffuser. It will be understood that these elements as shown in the drawings are conventional and that their particular construction is not a part of the present invention.

As shown, the base 2 is flared outwardly and is provided at the top with a horizontal annular flange 3 having marginal external and internal rings 4 and 5 respectively between which the bottom edge of the protector device is inserted and supported. Set screws 6 or equivalent means serve to secure the protector in position.

The guard structure serves not only to prevent heavy missiles from striking the liner but also serves as the framework of the protector device itself. In the form shown, the guard comprises an open mesh metal framework 7 having diamond-shaped meshes made according to a known procedure by slitting a metal sheet longitudinally and spreading the slit portions to form the diamond-shaped mesh openings. At its lower end, this meshwork is secured in any suitable way as by welding to a base ring 8 seated on the flange 3 between the rings 4 and 5 of the base 2 and secured in place by means of the set screws 6. At its upper end, the meshwork is secured to a similar ring 9 which fits within the flanged lower edge of a suitable canopy-type cap or crown 10 preferably of molded plastic. The cap 10 may have any desired configuration for ornamental effect, and may be secured in place in any suitable manner as by means of an ornamental nut 11 screwed onto the upper end of a rod 12 which extends through a hole in the top of the cap 10 and is secured at its lower end to a strap 13 extending diametrically across the ring 9. The cap 10 and nut 11 thus cover the top of the protector device and prevent the entry therein of rain or snow. It will be understood, however, that any other desired type of cover may be employed, and that in the case of a hanging lamp, the lower end of the protector device may be left open if desired.

Within the guard 7 is a flexible resilient liner 14 preferably made of the type shown in detail in Fig. 4. The intersecting wires of an ordinary wire screen are indicated at 15 and 16, and this screen is coated on both sides with plastic material 17, the two coatings of plastic merging so that the screen wire is in effect imbedded in the plastic. The result is a sheet of substantial strength, flexibility and resiliency which is rolled into tubular form and inserted within the cylindrical guard 7 as described above. The liner is not attached to the guard, being supported at its lower end by the lamp post base 2 so that it is secured against movement relative to the guard in an axial direction, but is free to bend or flex inwardly away from the guard to absorb impacts as described above and then to return to its cylindrical formation.

An electric lamp 18 of any desired type can be mounted within the protector and diffuser device in any desired manner. As shown, the lamp socket 19 is supported by arms 20 on brackets 21 secured to the lamp post base 2.

While only one embodiment of the invention has been illustrated and described, it is to be expressly understood that this embodiment is for purposes of illustration only and that the invention is not restricted thereto, as various changes can be made in the form, details of construction, arrangement and material of the guard and liner, and they may be used in connection with various other types of lamps and in various other shapes and sizes, all without departing from the spirit of the invention. Reference is therefore to be had to the appended claims for a definition of the limits of the invention.

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What is claimed is:

1. In a combined protector and light diffuser for an electric lamp, the combination of an outer protective guard formed of rigid metal elements arranged in the form of a network around the lamp to withstand the impact of relatively large missiles and having relatively large meshes for the emission of light from the lamp, and a flexible, resilient liner of metal wire screen having relatively small meshes and a continuous coating of flexible, light-transmitting material, said liner having the same shape as said guard and fitting closely within said guard but detached therefrom and capable of flexing inwardly away from said guard to absorb the impact of relatively small missiles penetrating said network.

2. In a combined protector and light diffuser for an electric lamp, a guard around said lamp formed of rigid metal rods interconnected in an approximately diamond-shaped network, said guard withstanding the impact of large missiles and having relatively large meshes for the emission of light from the lamp, in combination with a flexible liner sheet fitting closely against said guard and closing the network openings to prevent penetration of the network by small missiles, said sheet being yieldable inwardly away from said guard to absorb the impact of such small missiles and comprising metal wire screen having relatively small meshes and a continuous coating of flexible light-transmitting material which controls the character of the illumination.

3. A device as defined in claim 2, said network

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being substantially cylindrical and said liner comprising a sheet rolled into cylindrical form and inserted within said cylindrical network.

4. A protective housing for an electric lamp comprising top and bottom members one of which has provision for mounting an electric lamp thereon, a frame interconnecting said members and supporting one member on the other, said frame comprising a rigid metal network extending between said members and surrounding said lamp to protect it against the impact of relatively large missiles and having relatively large meshes for the emission of light from said lamp, and a flexible liner of metal wire screen having relatively small meshes and a continuous coating of light-transmitting material, said liner fitting closely within said network frame to close the openings therein and prevent penetration of small missiles and being yieldable inwardly to absorb the impact of such small missiles.

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