

May 14, 1940.

H. D. BLAKE

2,200,978

LAMP HOLDER

Original Filed Jan. 24, 1935

2 Sheets-Sheet 1

Fig. 1.

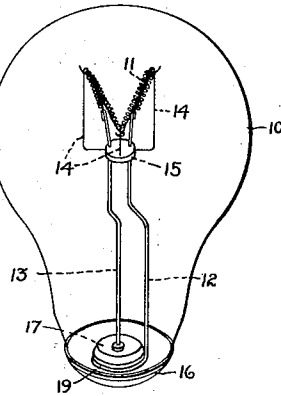


Fig. 2.

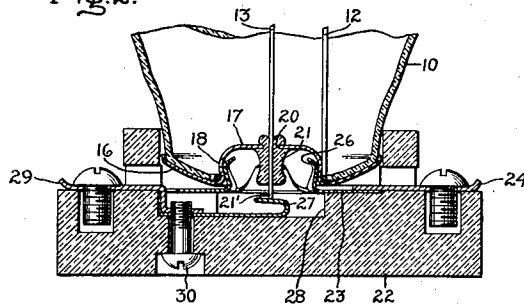


Fig. 3.

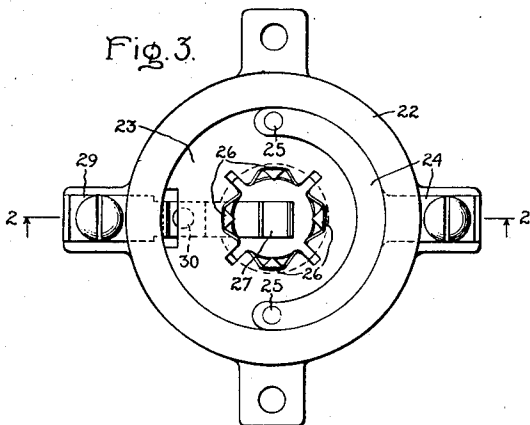


Fig. 5.

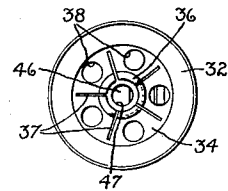
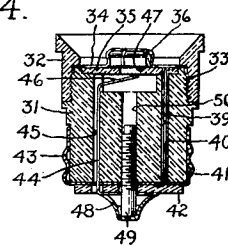


Fig. 4.



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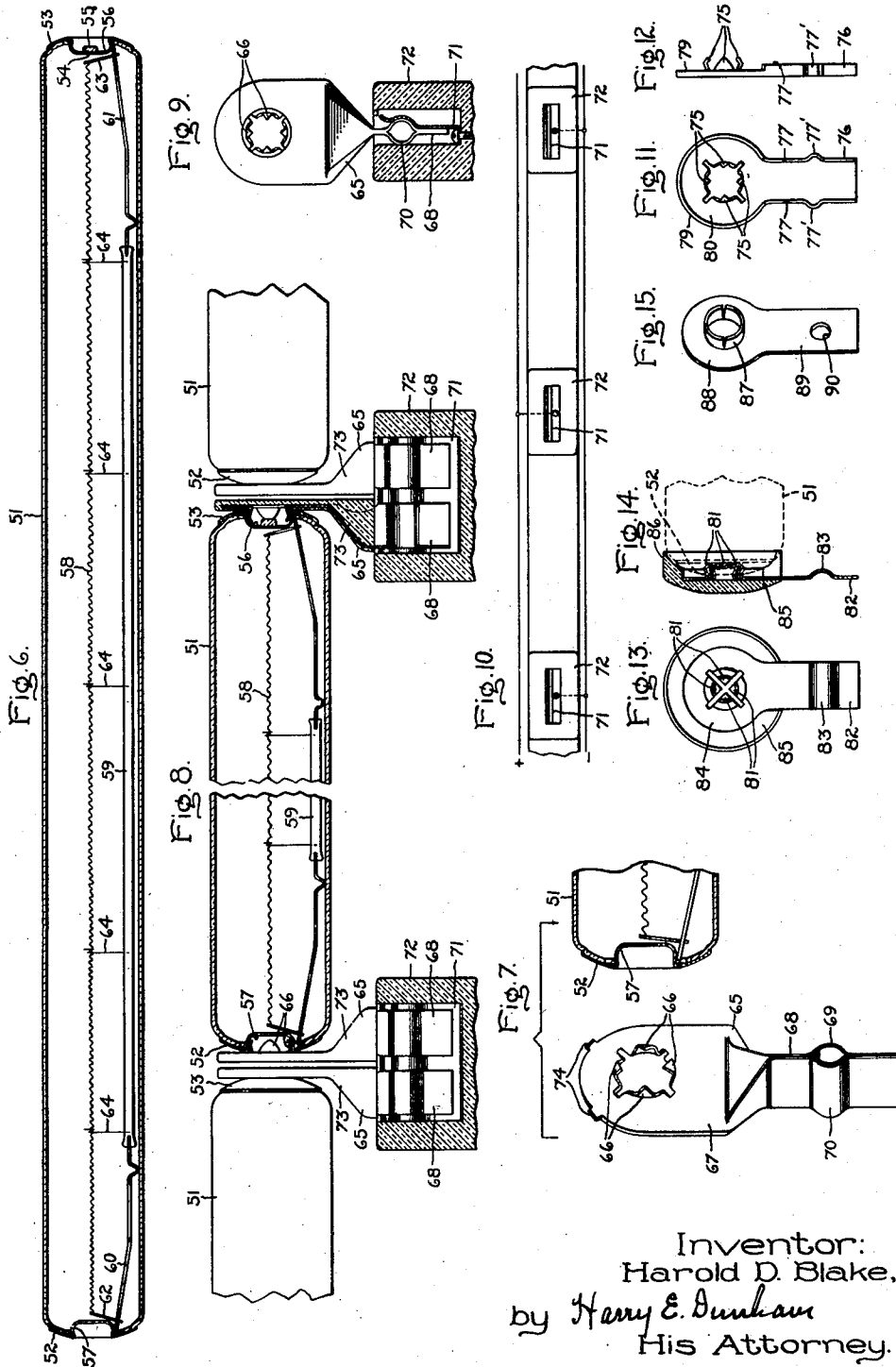
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LAMP HOLDER

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,200,978

LAMP HOLDER

Harold D. Blake, Cleveland Heights, Ohio, assignor to General Electric Company, a corporation of New York

Original application January 24, 1935, Serial No. 3,334. Divided and this application November 2, 1938, Serial No. 238,449

5 Claims. (Cl. 173—328)

This application relates to holders for mounting electric lamps, or similar devices, for conducting current to the electric energy transduction element or filament thereof and constitutes a division of my copending application Serial No. 3,334, filed January 24, 1935, issued as Patent No. 2,158,849 on May 16, 1939.

One of the objects of my invention is to provide a quickly detachable holder for engaging the base of an electric lamp and conducting current thereto.

My invention may be applied to electric lamps comprising an envelope or bulb having a base at one end or to lamps of the double-ended tubular type comprising a tubular bulb having a base at each end thereof such, for example, as the type disclosed in U. S. Patent 2,032,791, issued March 3, 1936, to Paul O. Cartun.

In the type of lamp disclosed in the Cartun patent application referred to, the filament extends practically the whole length of the lamp and the tubular bulb extends unshaded substantially to the extreme ends of the lamp so that, with suitable holders or mounting devices, a series of lamps may be mounted end to end practically without intervening structures that would interrupt the line of light. However, considerable difficulty has been experienced in the design of a satisfactory holder for this type of lamp. This difficulty is obviated when the holders are constructed in accordance with my invention. The said holders occupy a minimum amount of space between the ends of adjacent lamps and afford a good, safe and simple means of support and electrical connection.

Further features and advantages of my invention will appear from the following description of species thereof and from the drawings.

In the drawings Fig. 1 is a perspective view of an incandescent lamp employed with my invention; Fig. 2 is a vertical section on an enlarged scale of a portion of the lamp and a socket shown in plan view in Fig. 3, the section being taken on the line 2—2 of Fig. 3; Fig. 4 is a vertical section through an adapter which permits mounting the lamp in a standard screw-threaded socket, and Fig. 5 is a plan view thereof; Fig. 6 is a longitudinal section of a double-ended tubular lamp; Fig. 7 is an enlarged perspective and partial section of a holder and lamp respectively; Fig. 8 is an elevation, partly in section, of a series of lamps and holders of the type shown in Figs. 6 and 7 mounted in sockets; Fig. 9 is a front elevation of one of the holders of Fig. 8 mounted in a socket which is shown in section; Fig. 10 is a partially diagrammatic view of a series of sockets showing the electrical connections thereto; Figs. 11 and 12 are front and side elevations respectively of a modified holder; Figs. 13 and 14 are a front and side view in section

respectively of another modified holder; and Fig. 15 is a perspective view of still another modified holder.

Referring to Fig. 1, the lamp described and claimed in my aforementioned application comprises a glass bulb or envelope 10 containing a filament 11 which has its ends secured to the inner ends of lead wires 12, 13 and is supported at intermediate points by the ends of support wires 14. The opposite ends of said support wires 14 and portions of the lead wires 12, 13 are sealed in a glass bead 15. A metal disc 16 (Fig. 2) is sealed to the edges of the opening at the end of the bulb 10 to constitute an end wall and contact. The said disc is preferably of the general type disclosed in the Cartun patent hereinbefore referred to, and consists of a metal or alloy which has a coefficient of expansion approximating that of the glass of which the bulb is made and seals readily thereto by fusion. For a soft glass bulb the disc is preferably made of an iron alloy containing about twenty-nine per cent of chromium, such as an alloy marketed by the Allegheny Steel Company as "Allegheny 55." The disc 16 is preferably concave or dish-shaped so that it may be made of thin material and still be adequately strong.

The disc 16 has an annular recess or depression 17 at the center, preferably of an inverted conoidal form, that is, it preferably increases in diameter inward from the edge or surface of the disc, the maximum diameter of the particular design shown in Fig. 2 being at the point 18. The end of the lead wire 12 is formed into a loop 19 in a plane at right angles to the axis of the lamp, the said loop portion 19 encircling the shoulder formed by the depression 17. The lead wire 13 extends through an exhaust opening 20 at the center of the depression 17, the said opening being sealed by a mass of glass 21 which also insulates the said lead wire 13 from the disc 16. The mass of glass 21 is formed by fusing down a portion of a glass exhaust tube which was previously fused to the disc 16 around the opening 20 and through which the bulb 10 was exhausted. The lead wire 13 may be exposed at the surface of the glass mass 21 to serve in itself as the center contact 21' for the lamp, the disc 16 serving as the other contact.

Figs. 2 and 3 show one form of holder or socket that may be used for mounting the lamp. The said socket comprises a body portion 22 of insulating material. One of the contacts consists of a metal disc 23 located within the socket and secured to a terminal 24 by screws 25. The center portion of said disc 23 is formed into a plurality (four) of upwardly extending resilient fingers or prongs 26 which are radially compressible. The said prongs 26 are annularly disposed and extend outwardly and then inwardly so that

when the lamp is inserted in the socket, the said prongs 26 are first compressed by the outer edge of the walls of the depression 17 in the disc 16 and then snap outward into the enlarged portion 5 of the said walls of said depression. The socket also comprises a center contact consisting of a resilient metal strip 27 disposed in a hole 28 at the center of the socket and connected to a terminal 29 by a screw 30. The terminal 24 is electrically connected to the disc 16 and lead wire 12 through the disc 23 and prongs 26; while the terminal 29 is electrically connected to the lead wire 13 which itself in this case constitutes the center contact of the lamp, through the center contact strip 27 of the socket.

Figs. 4 and 5 illustrate a screw-threaded adapter or holder which may be mounted in the conventional type of screw-threaded sockets to permit mounting the lamp therein without replacing the sockets in existing installations. The said adapter comprises a cylindrical body portion 31 of insulating material having an annular cap 32 secured to its upper end by screw threads 33. A metal contact disc 34 and an insulating disc 35 are locked between a shoulder in the said cap 32 and the body portion 31. The said metal disc 34 has an upstanding annular and concave lamp engagement portion 36 at the center, the said engagement portion and the major part of the disc being divided into a plurality (five) of segments by radial slots 37. Holes 38 are punched in the disc 34 between the said slots 37 to add to the resiliency of the segmental engagement portion. A metal contact strip 39 extends through a longitudinal slot or channel 40 in the body portion 31. The upper end of said strip 39 extends laterally between the discs 34 and 35, being in electrical contact with said disc 34. The lower end of said strip 39 extends through a slot in a cup-shaped shell 41 mounted on the lower end of the body portion 31 and laterally between the bottom of said shell 41 and an insulating disc 42. The shell 41 is thereby electrically connected to the disc 34 by the strip 39. The said shell 41 is provided with screw threads 43 for engagement with the screw-threaded shell of a conventional socket. Another contact strip 44 extends through a longitudinal slot 45 in the body portion 31. The upper end portion 46 of said strip 44 is bent toward the center of the said body portion 31 and it bears against the bottom of the insulating disc 35 below a central aperture 47 therein. The lower end of said strip 44 extends through slots in the bottom of shell 41 and the disc 42 and laterally between the bottom of said disc 42 and a metal end contact cap 48. The said cap 48 is secured to the end of a threaded pin 49 which extends through central apertures in the lower end of contact strip 44, disc 42, and bottom of shell 41 and into a central round hole 50 in the body portion 31 in which it is securely held.

When the lamp of Fig. 1 is inserted in the adapter, the segments of the engagement portion 36 snap into the depression 17 in the disc 16 and the end contact 21' on the lamp extends through the aperture 47 and engages the upper portion 46 of the strip 44 which constitutes the center contact of the adapter. The said lamp base disc 16 is thus electrically connected to the screw-threaded shell 41 and the center contact 21' to the end contact 48 of the adapter.

Fig. 6 illustrates a double-ended tubular incandescent lamp of the type disclosed in the hereinafore-mentioned Cartun patent. It comprises a tubular glass bulb or envelope 51 having

metallic discs 52, 52, one sealed to each end thereof as an end wall and contact. The discs 52, 53 are of the same type as the disc 16 in Figs. 1 and 2 except that the disc 52 is not provided with an exhaust aperture. The bulb is exhausted through an aperture 54 at the center of the disc 53, the said aperture being sealed by a mass of glass 55 which constitutes the residue of an exhaust tube and is sheltered in the recess or depression 56 at the center of the disc. The said depression 56 and the depression 57 in disc 52 are of the same design as the depression 17 in disc 16 (Figs. 1 and 2). The filament 58 extends substantially the entire length of the bulb 51 and is electrically connected at each end to one of the discs 52, 53. The filament supporting structure may consist of a (glass) stay rod 59, having terminal wires 60 and 61 fused to respective ends thereof, short support wires 62, 63 welded to the wires 60, 61 respectively and secured one to each end of the filament, and support wires 64 spaced along the stay rod 59 and fused thereto and supporting the said filament at intermediate points. The end portions of the wires 60, 61 are formed into loops which engage the shoulders formed by the depressions 57, 56.

The lamp is mounted on holders or mounting devices 65 (Figs. 7 to 9), the lamp-engaging portions of which consist of resilient fingers or prongs 66 (similar to the prongs 26 in Figs. 2 and 3) which snap into the depressions 56, 57 in the discs 53 and 52. The said holders 65 are formed from sheet metal strips 67 and preferably have some form of socket-engaging portion 68. The said socket-engaging portion 68 is formed by folding back the end portion of the strip 67 at right angles to the main portion thereof. The forward edge of this folded portion is then split at 69 and formed at that point into a cylindrical protuberance 70 which engages with a contact strip 71 in a socket 72. The entire holder 65, with the exception of the socket-engaging portion or prong 68 and the lamp-engaging prongs 66, is preferably covered or coated with an insulating material 73 which may be sprayed or molded thereon or may be in the form of a cap secured thereto. The holder 65 is shown in Fig. 7 before the application of the insulating material, lugs 74 being preferably provided to more securely hold the insulation thereon.

As shown in Figs. 8 and 10, when a number of lamps 51 are arranged end to end, the sockets 72 and their terminal strips 71 may be made sufficiently wide to accommodate two holders 65, thereby permitting the holders to be placed immediately adjacent each other so that the line of light from the lamps is substantially unbroken. Fig. 10 shows a method of wiring the sockets, the terminals of successive sockets being connected to opposite sides of the line so that the adjacent ends of two lamps are connected to the same side of the line.

By forming the terminal prong portion 68 of the holder 65 so that it is in a plane at right angles to the plane of the body portion 67 and lamp engagement prongs 66, it lies substantially in the plane through the longitudinal axis of the lamp or parallel thereto so that the terminal strips 71 of the sockets may be made a little wider than the distance between the opposite edges of the adjacent terminal prongs 68, thereby leaving some room for small variations in the lengths of the lamps 51. The said lamps 51 may be mounted by first attaching the holders 65 to the ends thereof and then grasping the bulb 51

and moving the lamp laterally toward the sockets 72 to insert the prongs 68 therein.

Figs. 11 and 12 illustrate a holder having lamp-engagement fingers or prongs 75 similar to the prongs 66 of the holder 65, but the socket-engagement portion or prong 76 has turned-up edges 77. The said edges 77 may constitute the socket terminal engagement portions so that this holder is also adjustable in the socket longitudinally of the lamp axis in the same manner as the holder 65 of Figs. 8 to 10. The said edges 77 may be provided with protuberances 77' or indentations for engagement with coacting indentations or protuberances in the socket terminals. The rim 79 of the body portion 80 of the holder may also be turned up to form a securing or anchoring means for an insulating cap or coating (not shown).

Figs. 13 and 14 illustrate another modified holder in which the lamp base engagement prongs or segments 81 are similar to the prongs 66 of the holder 65 in Figs. 8 to 10 except that there is but little space between the adjacent edges thereof. A holder with prongs of this type could not be used with the disc 53 in Fig. 6 because of the presence of the glass mass 55 unless the depression 56 were made sufficiently deep. However, it could also be used on either end of the lamp if the said glass mass were eliminated from the outside of the disc and the lamp exhausted in some other manner, for example through the side wall of the bulb 51. The socket-engaging prong portion 82 of the holder may be provided with a protuberance 83 for engagement with the terminal of a socket. The circular body portion 84 of the holder is encased in an insulating cap 85 which may be made of a molded composition and has a projecting rim or edge portion 86 which surrounds the end of the lamp 51 and completely encloses the disc 52, thereby preventing accidental contact therewith. As will be manifest from Fig. 14, the rim portion 86 covers and protects the edge of the circular body portion 84 and is formed with an opening for passage of the prong portion 82.

Fig. 15 illustrates still another modified holder in which the lamp base engagement portion consists of a resilient split ring 87 extending outward from the body portion 88 and preferably increasing in diameter toward its outer edge so that it will snap into the depression 56, or 57 of the discs 53, 52. The socket-engaging portion consists of a prong 89 extending from the body portion 88 and may have a hole 90 therein for engagement with a protuberance on a socket terminal member.

Obviously, the insulating cap 85 in Figs. 13 and 14 may be used with the holders in Figs. 11, 12 and 15 and a somewhat similar cap may be used with the holder 65 in Fig. 7. Also, the socket engaging portions or prongs 68, 76, 82 and 89 of the various holders may be interchanged, as well as the lamp base engagement portions 26, 36, 81 and 87. In particular, the lamp base engagement portion 34-36 of the adapter shown in Figs. 4 and 5 may be incorporated in any of the various holders shown in Figs. 3, 8 and 11 to 15.

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

1. A holder for an electric lamp comprising a substantially flat sheet metal portion with annularly disposed integral spring fingers extending outwardly from one face thereof for engagement with a cavity in a lamp base, a cap of insulat-

ing material covering covering said sheet metal portion on the face opposite said spring fingers and having a rim covering the edge of said portion to form insulating means encasing said portion, said cap being provided with an opening in the rim thereof, and a projecting prong portion extending from said flat sheet metal portion through the opening in said rim and beyond the confines of said insulating cap for engagement with a socket.

2. In combination, a holder for an electric lamp comprising a substantially flat sheet metal portion with annularly disposed spring fingers extending outwardly from one face thereof for engagement with a cavity in a lamp base, a cap of insulating material covering said sheet metal portion on the face opposite said spring fingers and having a rim covering the edge of said portion to form insulating means encasing said portion, a projecting prong portion extending from said flat sheet metal portion through the opening in said rim beyond the confines of said insulating cap, and a socket having a housing of insulating material carrying a contact engaged by said projecting prong.

3. In a holder for an electric lamp, a substantially flat sheet metal plate having annularly disposed spring fingers extending outwardly from one face thereof for engagement with a cavity in a lamp base, a cap of insulating material covering said sheet metal plate on the face opposite said spring fingers and having a rim covering the edge of said plate, said cap being provided with an opening in the rim thereof, a projecting portion extending from said sheet metal plate through the opening in said rim to a point beyond the confines of said insulating cap for engagement with a socket, said prong portion having turned up edges provided with an enlarged portion for engaging a socket.

4. A holder for an electric lamp comprising a substantially flat sheet metal plate having annularly disposed spring fingers extending outwardly from one face thereof for engagement with a cavity in a lamp base, a cap of insulating material covering said sheet metal plate on the face opposite said spring fingers and having a rim covering the edge of said plate to form insulating means encasing said plate, said cap being provided with an opening in the rim thereof, and a prong portion projecting from said plate through the opening in said rim and extending to a point beyond the confines of said insulating gap, said projecting prong portion being twisted along its longitudinal axis at right angles to the face of said sheet metal plate for engagement with a socket, said prong portion also having protruding means for engaging a socket.

5. In a device of the class described, a socket having a contact strip therein, a substantially flat metal holder provided with annularly disposed integral spring fingers extending outwardly from one face thereof for engagement with a cavity in a lamp base, a cap of insulating material covering said metal holder on the face opposite said spring fingers and having a rim covering the edge of said holder, said cap being provided with an opening in the rim thereof, and a projecting prong portion extending from said metal holder through the opening in said rim to a point beyond the confines of said insulating cap and engaging said contact strip.

HAROLD D. BLAKE.

4

CERTIFICATE OF CORRECTION.

Patent No. 2,200,978.

May 14, 1940.

HAROLD D. BLAKE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 1, for the reference numerals "52, 52" read --52, 53--; page 3, second column, line 1, claim 1, strike out "covering" second occurrence; line 34, claim 3, after "projecting" insert the word --prong--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of June, A. D. 1940.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.