

Oct. 10, 1950

J. E. DUPUY
CIRCULAR LIGHTING FIXTURE

2,525,022

Filed Oct. 23, 1946

2 Sheets-Sheet 1

Fig. 1

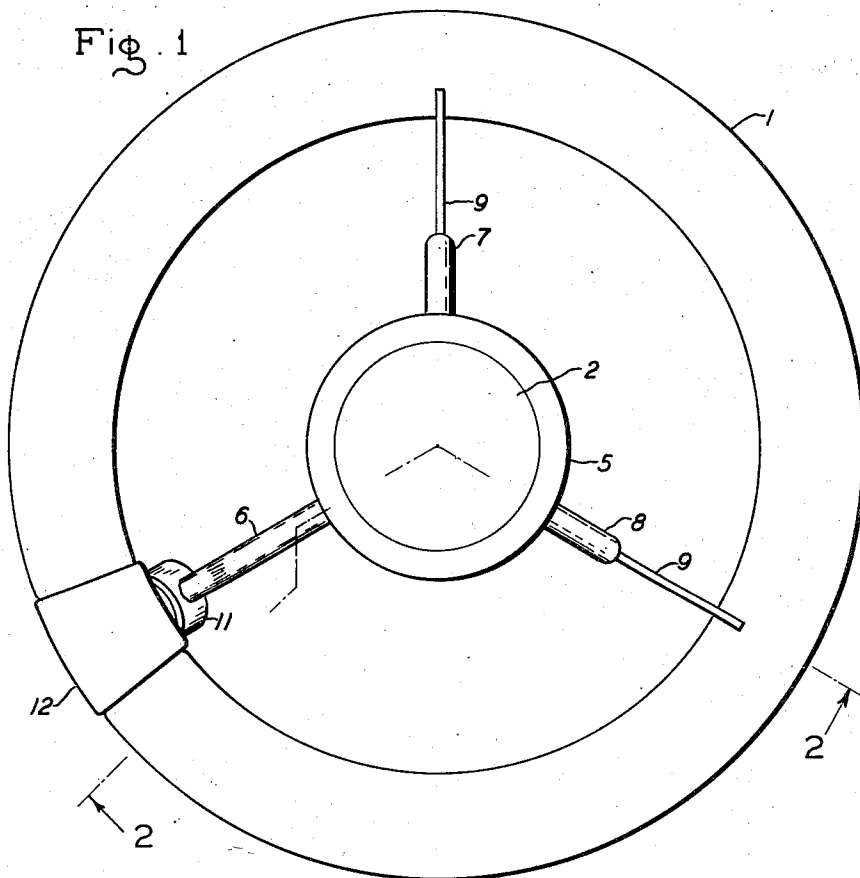
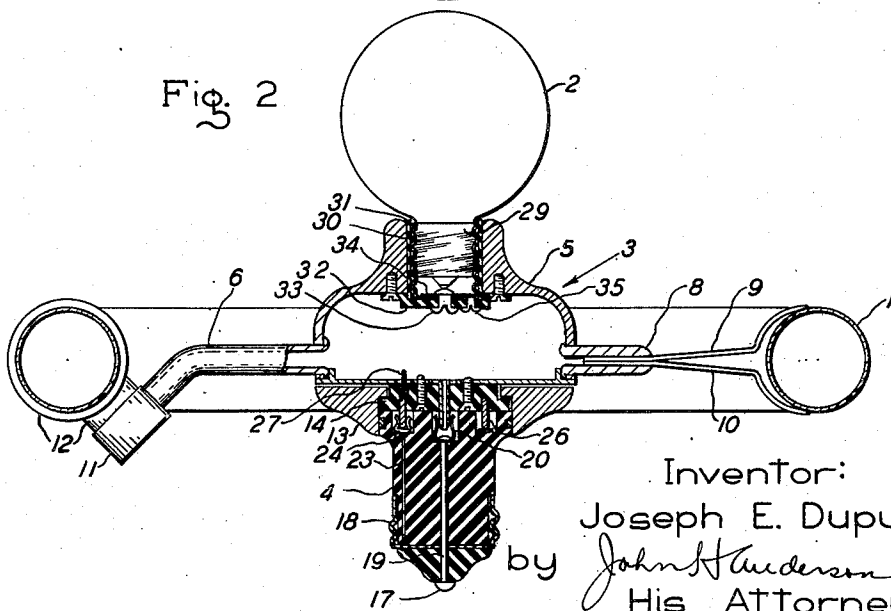


Fig. 2



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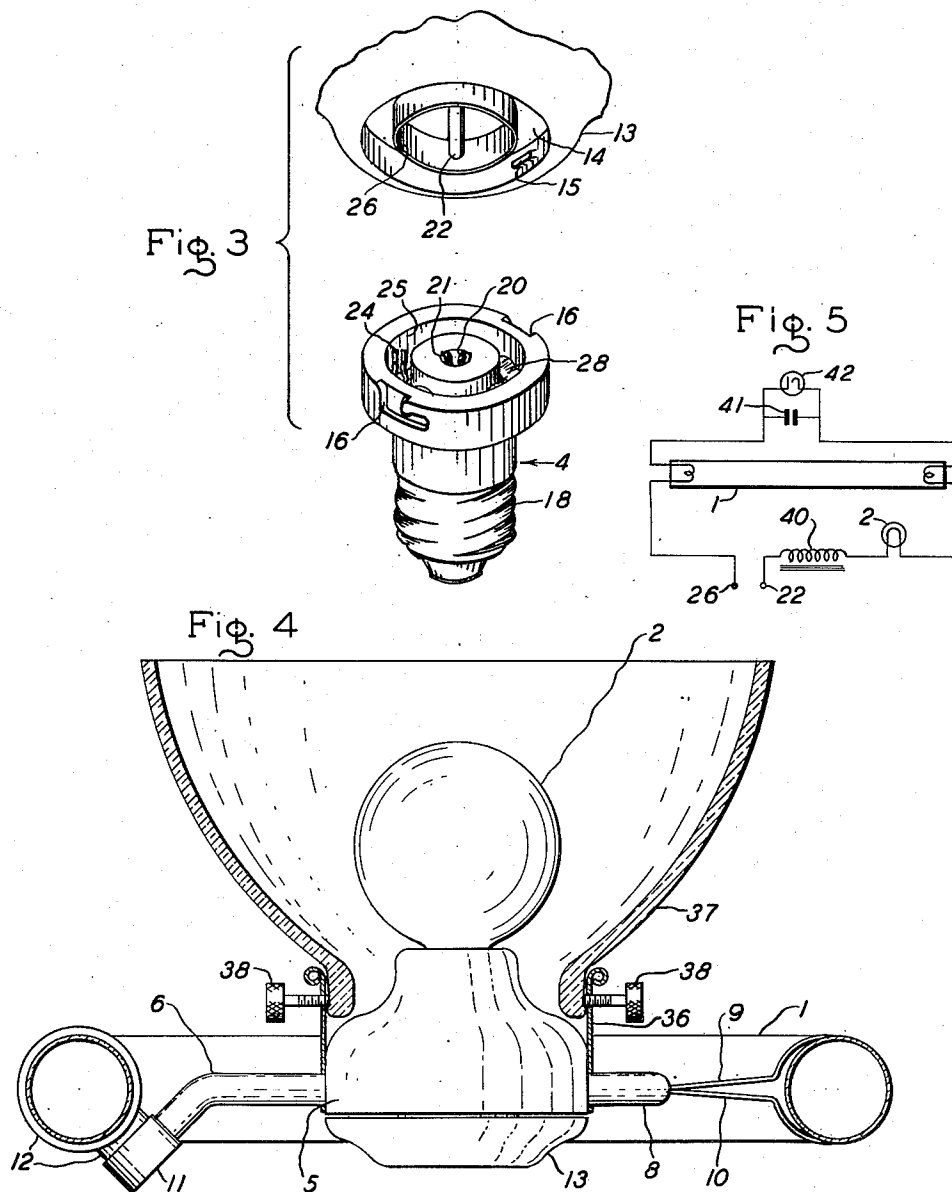
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UNITED STATES PATENT OFFICE

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CIRCULAR LIGHTING FIXTURE

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5 Claims. (Cl. 240—51.12)

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My invention relates to lighting equipment and its principal object is to provide a compact lighting unit or fixture including a tubular fluorescent lamp of circular shape which is readily mountable in many types of fixtures designed for incandescent lamps. Another object of my invention is to provide a lighting unit which comprises a holder for a circular fluorescent lamp, an incandescent lamp and the starting and operating equipment for the fluorescent lamp. Further objects and advantages of the invention will appear from the following detailed description of species thereof shown in the accompanying drawings and from the appended claims.

In the drawings Fig. 1 is a top plan view of a lighting unit embodying my invention; Fig. 2 is a side elevational, partly sectional view thereof taken along the line 2—2 of Fig. 1; Fig. 3 is an exploded perspective view of the screw plug adapter and a fragment of the lower part of the housing shown in Fig. 2; Fig. 4 is a side elevational, partly sectional view of a similar lighting unit with a light diffusing bowl mounted thereon, and Fig. 5 is a wiring diagram of a circuit for the lighting unit.

The lighting unit shown in Figs. 1, 2 and 3 of the drawing comprises a tubular fluorescent lamp 1 circular in shape, an incandescent lamp 2 which may be connected in series with the fluorescent lamp and a holder 3 for the lamps 1 and 2. An adapter 4 is mounted on the holder 3 for insertion into the usual screw threaded sockets of incandescent lamp fixtures, such as table lamps, floor lamps, ceiling mounted fixtures and the like. The holder 3 is in the form of a spider having a hollow hub 5 in which starting and operating equipment for the fluorescent lamp 1 may be housed. The complete unit may be connected into the usual home and store lighting circuits having screw threaded sockets without changing the existing wiring.

The circular or annular fluorescent lamp 1 is supported on the holder 3 by three arms 6, 7 and 8 fastened to and extending radially from the hub 5 and spaced apart approximately 120 degrees. The two arms 7 and 8 each have a pair of resilient metal jaws 9 and 10 for engaging the glass envelope of the lamp 1. Each pair of jaws 9 and 10 are sprung apart when the lamp 1 is mounted on the holder 3 and engage the circular lamp envelope at points located on its side toward its center and spaced apart a distance less than the outside diameter of the tubular envelope. The gripping force exerted by the jaws thus tends to move the lamp 1 laterally on the holder 3.

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Such movement of the lamp is prevented by the rigid arm 6 to which is attached the socket 11 which engages the base 12 affixed to the adjoining ends of the lamp envelope. The usual openings in the socket 11 and the usual outwardly projecting prongs on the base 12 are arranged at an angle of approximately 45 degrees to the direction in which the force exerted by the jaws 9 and 10 tends to move the lamp 1 so that this force clamps the lamp 1 to the holder 3 and holds the contact prongs on the base 12 in firm engagement with the socket contacts. My invention is not limited, of course, to the particular form of arms 7 and 8 shown but obviously includes different types of arms capable of exerting a clamping force on the lamp 1 in cooperation with arm 6. The lamp 1 may be readily removed from the holder 3 by pulling the base 12 upward at an angle to free the prongs from the socket 11. This shifts the lamp 1 laterally toward the left of the holder 3 when the unit is in the position shown in Fig. 2. The end portions of the jaws 9 and 10 are so curved that the lamp 1 may be shifted in affecting its removal. When the base 12 has been freed from the socket 11 the lamp 1 may be moved toward the right sufficiently to release the envelope from the jaws 9 and 10 and to pass the lamp over the jaws 9 and 10 on the respective arms 7 and 8. The lamp 1 may be mounted on the holder by taking the same steps in the reverse order.

The inside diameter of the circular fluorescent lamp 1 is considerably larger than that of the bulb of the incandescent lamp which it will usually replace in fixtures designed for incandescent lamps. In certain types of fixtures having members, such as supports for a shade, for example, close to and around the incandescent lamp, the substitution of my lighting unit for the incandescent lamp would be impossible if the holder 3 had to be rotated to turn the adapter 4 into and out of the screw thread socket of the fixture because the arms 7 and 8 or the jaws 9 and 10 would strike the supports. Accordingly, I provide a separable swivel joint between the adapter 4 and the hub 5 of the holder 3 so that the adapter may be removed from the hub 5 and screwed into the fixture socket. After the adapter 4 is properly in place in the socket the holder 3 may be mounted thereon as described below without rotating the lighting unit.

As shown in Figs. 2 and 3 the separable swivel joint comprises a metal collar 13 journaled on a support 14 of electrically insulating material which is bolted to the bottom of the hub 5. The inner surface of the collar 13 (Fig. 3) has a pair

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of diametrically opposed pins 15 or lugs for engaging the slots 16 in the outside surface of the adapter 4. The collar 13 thus may be rotated on the hub to index the pins 15 with the slots 16 and to lock the hub 5 and the adapter 4 together. Thus, the hub 5 and its projecting arms 6, 7 and 8 need not be rotated when mounting the unit in a fixture. When the fixture comprises shade supports in the form of a loop, sometimes called a harp, with the fixture socket within the loop, first the adapter 4 may be screwed into the fixture socket and then the hub 5 with the incandescent lamp in place may be secured to the adapter 4 with its arms 6, 7 and 8 projecting outward between the shade supports. The circular lamp 1 may then be lowered over the loop and mounted on the holder 3 after which the blade may be mounted on its supports.

The lower part of the adapter 4 is in the form of a screw threaded plug having the usual insulated center contact 17 and an outer contact consisting of a threaded metal shell 18. The center contact 17 is provided with a wire conductor 19 terminating in a clip shaped resilient contact 20 mounted in a circular cavity 21 in the top of the adapter 4. The contact 20 engages a pin contact 22 embedded in the insulating support 14 and exposed to the interior of the hub 5 for connection with the electrical elements of the lamp circuit which may be housed in the hub. The outer shell 18 is electrically connected to another wire conductor 23 having at its end a clip shaped contact 24 mounted in an annular recess in the adapter 4. A ring contact 26 embedded in and protruding from the insulating support 14 is adapted to engage the contact 24 in the annular recess 25 and is provided with a conductor 27 extending into the interior of the hub 5 for connection with the lamp auxiliary elements housed in the hub. Thus, when the hub 5 is mounted on the adapter 4 their respective contacts will engage each other regardless of the relative angular position of the hub and the adapter. The pins 15 on the collar 13 of the hub are releasably held in locked position in the slots of the adapter by the annular, resilient metal strip 28 secured to the bottom of the annular recess 25 in the adapter 4 and pressing against the ring contact 26 on the hub.

The separable swivel joint between the hub 5 and the adapter 4 makes the lighting unit highly flexible in that it may be mounted in a variety of fixtures designed for incandescent lamps. However, many of such fixtures provide adequate unobstructed space around the socket for mounting the lighting unit. For such fixtures it will not be necessary to provide a swivel joint between the hub and the adapter. Thus, my invention is not limited to the use of a swivel connection between the hub and the adapter but obviously includes other separable connections, such as a bayonet base and socket, or a permanent joint between the adapter and the hub.

The hub 5 has a screw shell type socket recessed therein for accommodating the threaded base shell 29 of the incandescent lamp 2 (Fig. 2). The threaded shell 30 of the socket is electrically insulated from the metal hub 5 by an electrically insulating sleeve 31 clamped therebetween. The socket shell 30 is riveted to an electrically insulating disc 32 which is bolted to the hub. The rivet 33 is insulated from the shell 30 by an insulating disc 34 and serves as the center contact of the socket for engaging the corresponding contact of the lamp base. It passes through the discs 33

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and 34 into the interior of the hub 5 for connection with electrical elements which may be housed in the hub. The shell 30 is held against turning by a stud 35 embedded in and passing through the supporting disc 32 to serve as a connection between the shell 30 and electrical elements in the hub 5.

The lighting unit shown in Fig. 4 of the drawing is similar to that shown in Figs. 1 to 3 and is provided with a ring support 36 for the light diffusing glass or plastic bowl 37 which is used in many types of home lighting fixtures, particularly in reading lamps. The support 36 may be fastened to the hub 5 by welding, for example, or a threaded separable joint may be used between the hub and the support. The usual thumb screws 38 are provided on the support for releasably holding the bowl 37 on the hub. The lighting unit may be mounted on the fixture by first removing the bowl 37 from the fixture, then mounting the unit on the fixture socket and then mounting the bowl on the support.

The rigid arm 6 supporting the fluorescent lamp socket 11 is hollow and opens into the hollow hub 5 for accommodating wires for connecting the socket 11, and thus lamp 1, into a suitable circuit. Such a circuit is shown in Fig. 5 and may include a reactor 40 connected in series with the incandescent lamp 2 and the fluorescent lamp 1, a condenser 41 for suppressing radio interference and connected in parallel with the discharge path in the fluorescent lamp 1 and switch means 42, such as a glow switch in series with a magnetic vibrator switch, for connecting the filamentary electrodes of the fluorescent lamp 1 in series during lamp starting and for breaking the series connection between the electrodes during lamp operation. In such a circuit the incandescent lamp 2 serves as a ballast for the discharge in the fluorescent lamp. The condenser 41, the switch means 42 and the reactor 40 may be housed in the hollow hub 5 of the holder and the appropriate leads may be connected to the contacts 22 and 26 on the hub 5 for connection to terminals of a power source, such as 115 volt alternating current source.

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

1. In a compact lighting unit, a holder having means for engaging and supporting an annular fluorescent lamp around the holder and contact means on the lamp supporting means for making electrical connections with said lamp, said holder also providing an enclosed space for housing auxiliary electrical equipment for the lamp and having a socket for the base of an electric resistor for the lamp and an adapter for connecting said holder into a socket of a power source for said lamp and joined to said holder by a separable swivel joint.

2. In a compact lighting unit including an annular fluorescent lamp and for insertion in a fixture designed for an incandescent lamp, a holder in the form of a spider having arms for engaging and supporting the annular fluorescent lamp around its hub, a socket on one of said arms for accommodating the lamp base and providing in the interior of the hub an enclosed space for housing auxiliary equipment for the lamp, said hub having also a socket for the base of an incandescent lamp and an adapter for insertion into a socket of an electric power source for the lamps and secured to said hub by a separable swivel joint so that the spider-like part of the

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holder need not be rotated when mounting the unit in a fixture socket.

3. In a compact lighting unit, a lamp holder for a circular tubular electric lamp having an envelope provided with a base in its periphery with the contact prongs of said base inclined inwardly of the lamp, comprising a spider having a rigid arm carrying a socket at its free end for engaging the lamp base and an arm provided with resilient jaws for engaging the lamp envelope at points on its side toward its center and spaced apart a distance less than the diameter of the tubular envelope so that the gripping action of the jaws tends to move the envelope outwardly from between the jaws and the lamp laterally of the holder, said arms being spaced apart an angular distance greater than 90 degrees whereby the gripping action of the jaws holds the base firmly in the socket and the lamp firmly in the holder.

4. In a compact lighting unit, a lamp holder for a circular tubular electric lamp having an envelope provided with a base in its periphery with the contact prongs of said base inclined inwardly of the lamp, comprising a spider having a rigid arm carrying a socket at its free end for engaging the lamp base and a pair of arms provided with resilient jaws for engaging the lamp envelope at points on its side toward its center and spaced apart a distance less than the diameter of the tubular envelope so that the gripping action of the jaws tends to move the envelope outwardly from between the jaws and the lamp laterally of the holder, said arms being spaced apart an angular distance of approximately 120 degrees whereby the gripping action of the jaws holds the base firmly in the socket and the lamp firmly in the holder.

5. In a compact lighting unit for insertion in a

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fixture designed for an incandescent lamp and including an annular electric discharge lamp having an envelope provided with a base in its periphery with the contact prongs of the base inclined inwardly of the lamp, a holder in the form of a spider having a rigid arm carrying a socket at its free end for engaging the lamp base and a pair of arms provided with resilient jaws for engaging the lamp envelope at points on its side toward its center and spaced apart a distance less than the diameter of the tubular envelope so that the gripping action of the jaws tends to move the envelope outwardly from between the jaws and the lamp laterally of the holder, said arms being spaced apart an angular distance of approximately 120° whereby the gripping action of the jaws holds the base firmly in the socket and the lamp firmly in the holder, the hub of said spider providing an enclosed space for housing auxiliary equipment for the discharge lamp and having a socket for the base of an incandescent lamp and an adapter for insertion into a socket of an electric power source for the lamps and secured to said hub by a separable swivel joint so that the spider-like part of the holder need not be rotated when mounting the unit in a fixture socket.

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