ELECTRIC LAMP AND SWITCH MEANS THEREFOR

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Application March 14, 1955, Serial No. 493,874

2 Claims. (Cl. 240—81)

This invention relates to a new and improved electric lamp and also to new and improved switching means therefor.

One principal object of the invention is to provide a new and improved electric lamp which may be turned on and off by rotating the outer housing of the lamp base. Accordingly, it is another object to provide a new and improved lamp which may be operated by touch in the dark without fumbling for the usual small switch button.

A further object is to provide an improved electric lamp having a base equipped with a rotatable translucent housing serving not only as a switch operating member but also as an enclosure for a night or television light.

It is another object of the invention to provide an improved lamp having a base equipped with a rotatable wheel-like member whereby the energization of the lamp may be controlled.

A further object is to provide a lamp having an improved switch which may be wired without the use of tools and without stripping off the insulation from the insulated wires.

Further objects and advantages of the invention will appear from the following description, taken with the accompanying drawings, in which:

Figure 1 is a perspective view of a lamp of the type of the invention. Figure 2 is a sectional view along line 1—1 of Fig. 1 of a lamp embodiment of the invention.

The lamp 21 comprises a base 23 which is adapted to be supported on a table or the like. A harp 24 is mounted on the lamp socket 22 to support an ordinary lamp shade 24a. The socket 22 is adapted to receive a lamp bulb 25. In this instance, a small auxiliary lamp socket 26 is mounted within the base and is adapted to receive a small lamp bulb 27 which may serve as a night or television lamp, the base 23 being translucent so that light from the lamp 27 will be visible.

In the exemplary lamp 21, the base 23 is given stability by a heavy circular base member 28, which, as shown, is of shallow inverted cup shape. An aperture 30 is formed in the base 28 to receive the threaded lower end 31 of a tubular standard or column. Imbedded above the threaded end portion 31, a shoulder is provided on the standard 32 by a peripheral bead 33 which engages the top of the base member 28. A nut 34 is received on the threaded end portion 31 to secure the standard 32 to the base member. It will be apparent that the main lamp socket 22 is mounted on the upper end of the standard 32.

The energization of the lamp sockets 22 and 26 is selectively controlled by means of a switch mechanism 35 comprising a control member in the form of a rotatable wheel or spider 36. From Fig. 8 it will be seen that the spider 36 is provided with an annular hub 37 having a plurality of spokes 38 radiating therefrom. The hub 37 has an axial aperture 39 which is rotatably received over the standard 32. The hub 37 rests upon the shoulder provided by the bead 33. Thus the spider 36 is rotatable immediately above the base member 28.

As best shown in Fig. 1, an annular cylindrical rim or flange 40 is mounted on the outer end of the spokes 38. It will be seen that the rim projects above the level of the spokes 38.

In the exemplary lamp 21, the base 23 is equipped with an outer housing 41, which is supported by and is rotatable with the spider 36. The illustrated housing 41 has a translucent generally cylindrical side wall portion 42 resting on the spokes 38 and received within the upwardly projecting portion of the rim 40. The side wall portion 42 of the housing is preferably made of translucent paper but may be made of any other suitable translucent material, such as glass or various plastics. It will be realized, moreover, that the housing may be made of an opaque material if the night light feature of the lamp is not required.

In the illustrated construction, the rotatable housing 41 is guided at its upper end by the lamp socket 22. To this end, the housing 41 is provided with a top wall 43, which, as shown, is generally frusto-conical in shape. The lamp socket 22 has a cylindrical lower portion 44 which is received within an axial opening 45 formed in the top wall 43.

A retaining ring 46 holds the lamp shade harp 24 in place on the socket 22, in the manner disclosed and claimed in the co-pending application of Carl Bramming, Serial No. 493,873, filed March 14, 1955, and now abandoned. Moreover, the ring 46 retains the rotatable housing 41 on the base 23. The ring 46 may be slipped upwardly off the lamp socket 22 to permit removal of the harp 24. With the ring 46 removed, the housing 41 may be lifted off the spider 36 and slipped off the lamp socket 22. In this way, access is afforded to the auxiliary lamp socket 26 so that the lamp 27 may be changed.

As indicated in Fig. 2, the illustrated switch mechanism 35 comprises a rotatable annular switch member 47 operable by the rotatable spider 36. Cooperating with the rotatable switch member 47 is a fixed switch member 48 secured to the standard 32. More specifically, the fixed switch member 48 is received around a sleeve 49 mounted on the standard 32. Both switch members 47 and 48 are made of insulating material.

As shown to best advantage in Fig. 9, the fixed switch member 48 is of annular generally cylindrical form and
is provided with a lower face 50 formed with a series of ratchet-like teeth 51. Sloping contact blades underlie some of the teeth 51, while others are blank to provide off positions. More specifically, an arcuate triple contact member 52 (Fig. 11) is equipped with three sloping switch blades 53, 54 and 55 which underlie three adjacent teeth 51. There are also two single contact members 56 and 57 having inclined switch blades 58 and 59 underlying other teeth 51. One blank tooth 51 is disposed between the contact blades 58 and 59, and two more blank teeth are provided between the single contact blade 59 and the first blade 53 on the opposite side.

The contact members 52, 56 and 57 are adapted to be connected to insulated wires by means of sharp chisel-like prongs 60 extending outwardly and upwardly from the contact members. These prongs 60 are adapted to cut through the insulation 61 on an insulated wire 62, in the manner shown in Fig. 3, so as to make contact with the conductor 63 of the wire. To force the wires 62 against the prongs 60, the fixed switch member 48 is provided with a generally cylindrical cup-shaped housing 64 made of insulating material and having a cylindrical side wall 65 and a flat top wall 66. An aperture 67 is formed in the latter so that the housing 64 may be slipped over a reduced upper end portion 68 on the fixed switch member 48. The wires 62 are admitted to the housing 64 through radial apertures 69 formed in the cylindrical side wall 65. In order that the housing 64 may be properly oriented, the fixed switch member 48 is formed with a pair of unequally spaced longitudinal ribs or fins 70 adapted to be received in longitudinal grooves or channels 71 which are formed in the side wall 65 of the housing. Because of the unequal spacing of the fins 70, the housing 64 will fit in only one position around the fixed switch member 48.

In order that return wires from the sockets 22 and 26 may be applied to one of the supply wires, the fixed switch member 48 is fitted with an arcuate terminal or splicing contact member 72 having three of the prongs 60. The splicing contact member 72 does not have any of the sloping contact blades found on the contact members 52, 56 and 57 but is provided with radial locating lugs 73 adapted to interlock with complementary grooves or slots 74 formed on the upper face 75 of the fixed switch member 48. Similar locating lugs 73 and slots 74 are provided for the contacts 52, 56 and 57.

The various wires 62 are connected to the fixed switch member 48 by inserting the insulated ends of the wires through the radial apertures 69 in the housing 64. This is done with the housing slipped upwardly off the fixed switch member 48. The housing is then pushed forcibly downwardly over the fixed switch member. The downward movement of the housing 64 bends the ends of the wires upwardly and forces them onto the prongs 60. The prongs cut through the insulation 61 and engage the conductors 63 of the wires. It will be apparent that the prongs 60 will retain the wires 62 and the housing 64 in place on the fixed switch member 48, against accidental dislodgment.

For the best advantage in Fig. 9, the rotatable switch member 47 is annular in form and is equipped with an annular contact member 75 having a non-circular aperture 76 received over a non-circular upper end portion 77 formed on the rotatable member 47. In this instance, the aperture 76 and the end portion 77 are octagonal in shape. Three unequally spaced upwardly inclined switch blades 78, 79 and 80 are formed on the contact member 75. It will be understood that all of the switch blades 78, 79 and 80 are connected together by the contact member 75 and are adapted to bridge various combinations of the contact blades 53, 54, 55, 58 and 59 on the fixed switch member 48. In this way, the lamp sockets 22 and 26 may be energized both individually and simultaneously, in the various positions of the movable switch member 47. It will be seen that sloping teeth 81 are formed on the movable switch member 47 under the contact blades 78, 79 and 80 to back up the contact blades when they are flexed downwardly.

The rotatable switch member 47 is slidable axially on the standard 32 and is biased upwardly toward the fixed switch member 48 by means of a coiled compression spring 82 disposed between the movable switch member 47 and the hub 37 of the spider 36. The spider 36 is connected to the rotatable switch member 47 by means of a pair of keys or lugs 83, projecting upwardly from the hub 37. The keys 83 are slidable received in longitudinally extending grooves or slots 84 formed in the switch member 47. Thus, the groove and slot elements permit axial sliding movement of the switch member 47, relative to the spider 36, while constraining the switch member to rotate with the spider.

The exemplary lamp of Figs. 1–12 may be wired in the manner shown in Fig. 13. It will be seen that electric power is derived from a lamp cord 85 comprising a pair of supply leads 86 and 87. The supply lead 86 is connected to the triple contact 52, while the supply lead 87 extends to one of the terminal prongs 60 on the splicing contact 72. Leads 88 and 89 are provided to connect the splicing contact 72 to one side of the main lamp socket 22 and one side of the auxiliary lamp socket 26. The other side of the main lamp socket 22 is connected to the single contact 57 by means of a lead 90. Likewise, a lead 91 extends between the other side of the auxiliary lamp socket 26 and the single contact 56.

In the illustrated position of the rotatable contact 75, the contact blade 80 is engaging the contact blade 54 of the triple contact 52, but the other contact blades 78 and 79 of the movable contact member 75 are not engaging any of the fixed contact blades. Accordingly, neither of the lamp sockets 22 and 26 is energized.

If the movable contact 75 is rotated 45 degrees in a counterclockwise direction, the movable contact blades 79 and 80 will engage the fixed contact blades 57 and 55, with the result that the main lamp socket 22 will be energized. With a further 45-degree rotation of the movable contact 75, the movable blades 78 and 80 will engage the fixed blades 53 and 56 so as to energize the auxiliary lamp socket 26.

The next successive position of the movable contact 75 is an off position, inasmuch as the movable blades 79 and 80 are in blank positions, while the movable blade 78 engages the fixed blade 54.

Further rotation of the movable contact 75 through 45 degrees brings the movable blades 78 and 80 into engagement with the fixed blades 55, 53 and 57, respectively. As a result, both the main and auxiliary sockets 22 and 26 are energized.

In the next successive position, the blades 78 and 79 of the movable contact 75 engage the fixed blades 56 and 54, while the movable blade 80 is in a blank position. In this way the auxiliary socket 26 is energized. The next successive position is an off position inasmuch as the movable blades 78 and 80 are in blank positions, while the movable blade 79 engages the fixed blade 55.

Still further rotation of the movable contact 75 brings the movable blades 78, 79 and 80 into contact with the fixed blades 57, 56 and 53, with the result that both sockets 22 and 26 are energized.

The operation of the circuit of Fig. 13 may best be summarized in the following tabular form:

<table>
<thead>
<tr>
<th>Position of Contact 75</th>
<th>Blade 78 engages</th>
<th>Blade 79 engages</th>
<th>Blade 80 engages</th>
<th>Socket energized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blank</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank</td>
</tr>
<tr>
<td>(a)</td>
<td>(c)</td>
<td>(d)</td>
<td>(e)</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>(c)</td>
<td>Blank</td>
<td>Blank</td>
<td></td>
</tr>
<tr>
<td>(a)</td>
<td>(b)</td>
<td></td>
<td>Blank</td>
<td></td>
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<tr>
<td>(c)</td>
<td>(d)</td>
<td>Blank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d)</td>
<td>(e)</td>
<td></td>
<td>Blank</td>
<td></td>
</tr>
</tbody>
</table>
5

Fig. 14 illustrates a modified circuit which is the same as the circuit of Fig. 13 except that the lamp sockets 22 and 26 are replaced by a single main socket 92 of the position of the contacts 10. The lamp 6 contains a three-light bulb 93 having two lamp filament 94 and 95 which may be energized individually or simultaneously to provide three levels of illumination. A lead 96 extends between one side of both filament 94 and 95 and the splicing contact 72. The other side of the filament 94 is connected to the single contact 72 by means of a lead 10. Likewise, the other side of the filament 95 is connected to the single contact 56 by means of a lead 98.

The operation of the circuit of Fig. 14 may best be presented in the following tabular form, showing which of the filaments of the three-light bulb are energized in each of the eight positions of the switch.

<table>
<thead>
<tr>
<th>Position of Contact 75</th>
<th>Blade 76 Engages</th>
<th>Blade 79 Engages</th>
<th>Blade 80 Engages</th>
<th>Filament Energized</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 (off)</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank</td>
<td>Off.</td>
</tr>
<tr>
<td>#2 (off)</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank.</td>
</tr>
<tr>
<td>#3 (off)</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank.</td>
</tr>
<tr>
<td>#4 (off)</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank.</td>
</tr>
<tr>
<td>#5 (off)</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank.</td>
</tr>
<tr>
<td>#6 (off)</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank.</td>
</tr>
<tr>
<td>#7 (off)</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank.</td>
</tr>
<tr>
<td>#8 (off)</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank</td>
<td>Blank.</td>
</tr>
</tbody>
</table>

Fig. 15 shows a slightly modified form of exemplary lamp 99 which is the same as the lamp of Figs. 1–12, except that the translucent housing 41 is replaced by a housing 100 which may be made of a ceramic or other suitable material and need not be translucent. The wheel or spider 36 remains the same as in the lamp of Figs. 1–12 so as to serve the purpose of operating the lamp switch 35. However, the spider 36 in the lamp of Fig. 15 does not support the housing 100 as in the lamp of Figs. 1–12. Instead, the housing 100 is supported on a second or auxiliary spider 101 having an annular hub 102 which is received around the standard 32 immediately above the sleeve 49. It will be recalled that this sleeve 49 serves to support the fixed switch member 48.

To support the housing 100, three spokes 103 extend from the hub 102. In this instance, the spokes 103 are bent into generally Z-shaped form so as to define depending spoke portions 104 terminating in downwardly offset, radial end portions 105 which actually support the lower margin of the housing 100. It will be seen that the lower end of the housing 100 is provided with an inwardly projecting flange 106 which rests upon the downwardly offset spoke portions 105. The inner margin of the flange 106 defines an aperture 107 which is received over the depending spoke portions 104. The upper end of the housing 100 may be apertured and adapted to be received around the lamp socket 22 as in the embodiment of Figs. 1–12.

It will be understood that the lamp of Figs. 1–12 may be turned on and off simply by rotating the lamp base housing 41. In one of the positions of the lamp base housing, the main lamp 25 will be illuminated, while in other positions the small auxiliary lamp 27 will be lighted to provide a night or television light within the lamp base housing. In still other positions of the housing both of the lamps will be lighted.

While the rotatable switch operating spider or wheel 36 provides an ideal support for the lamp base housing, it may be employed alone as the switch operating member, as in the lamp of Fig. 15, with the lamp base housing supported on the auxiliary spider 101. In this case the lamp base housing need not be rotatable and may be of any desired shape. Moreover, it need not be translucent.

Either of the lamps of Figs. 1 and 15 may be turned on very readily, even in the dark, without fumbling for the usual small switch button. The spider or wheel at the lower end of the lamp is easily located by touch alone. Moreover, there is very little danger of upsetting the lamp by searching in the dark for the switch operating spider. It is an even simpler matter to locate and rotate the lamp base housing, in the dark, of the lamp of the type as shown in Fig. 15.

The switch of the exemplary lamps may be wired up without using a screw driver or any other tool. This is done simply by inserting the wires through the radial apertures 69 in the switch housing 64 and then pushing the housing downwardly over the fixed switch member 48. Such movement of the switch housing forces the ends of the wires against the contact prongs 60, with the result that the prongs penetrate the insulation and couple the conductors of the wires.

It will be evident that all of the various wires employed in connecting up the lamp are connected to fixed points on the lamp switch. Accordingly, the rotation of the switch operating spider 36 is not accompanied by any twisting or other movement of the wires. Consequently, the spider may be rotated continuously in one direction.

The ratchet-like teeth and contact blades on the switch members act as detents to prevent rotation of the spider in the reverse direction. As best illustrated in Figs. 1 and 2, all of the wires may be brought to and from the switch through the tubular standard.

Various other modifications, alternative constructions and equivalents may be employed without departing from the true spirit and scope of the invention as exemplified in the foregoing description and defined in the following claims.

I claim:

1. An electric lamp, comprising, in combination, a generally circular base generally of inverted cup shape and having an axial aperture therein, a tubular cylindrical standard mounted in said aperture and extending upwardly from said base, a lamp socket mounted on the upper end of said standard and having a cylindrical housing, a spider having an annular hub rotatably received over said standard immediately above said base, said spider including a plurality of spokes extending radially from said hub and an annular cylindrical rim mounted on the outer ends of said spokes and projecting thereabove, a generally cylindrical housing received in said rim around said standard and supported on said spider, said housing having a top wall with an axial aperture therethrough receiving said cylindrical socket housing for rotatably supporting said top wall thereon, a fixed annular insulating switch member rotatably received on said standard between said fixed switch member and said spider, a movable contact member surrounding said movable switch member and having a plurality of sloping ratchet-like blades engageable with said fixed blades and teeth, a coil spring around said standard between said spider and said movable switch member for biasing said movable switch upwardly, and axially slidable key and slot means for rotatably connecting said movable member to said spider.

2. In an electric lamp, the combination comprising a base, a cylindrical standard extending upwardly from said base, a spider having an annular hub rotatably received over said standard immediately above said base, said spider including a plurality of spokes extending radially from said hub and an annular cylindrical rim mounted on the outer ends of said spokes, a fixed annular insulating switch member received around and fixed to said standard above said spider, said fixed switch member having a lower face formed with a plurality of ratchet-like teeth, a plurality of fixed contact members having sloping contact blades underlying said teeth, a movable annular insulating switch member rotatably received on said standard between said fixed switch member and
said spider, a movable contact member surmounting said
movable switch member and having a plurality of slop-
ing ratchet-like blades engageable with said fixed blades
and teeth, a coil spring around said standard between said
spider and said movable switch member for biasing said
movable switch upwardly, and axially slidable key and
slot means for rotatably connecting said movable mem-
ber to said spider.

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