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G. B. BENANDER

2,166,790

ELECTRICAL DEVICE

Filed June 12, 1936

Fig.1.

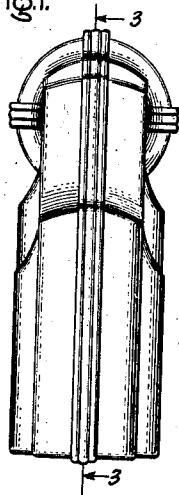


Fig.2.

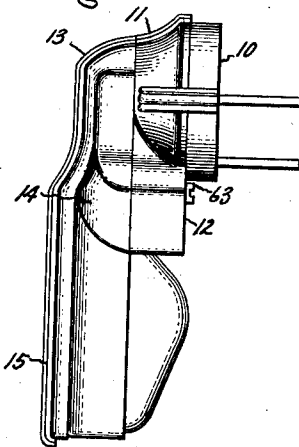


Fig.3.

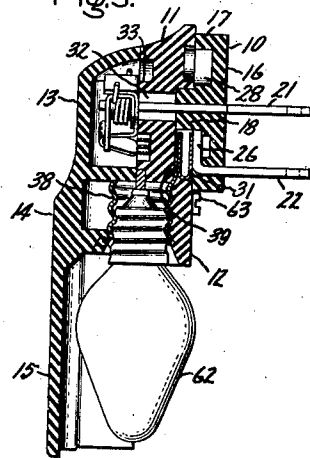


Fig.4.

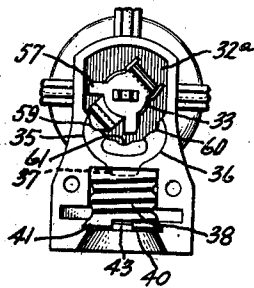


Fig.5.

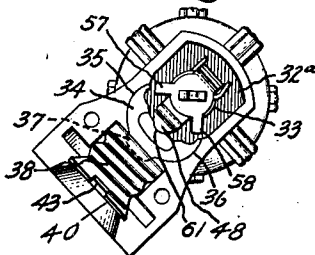


Fig.6.

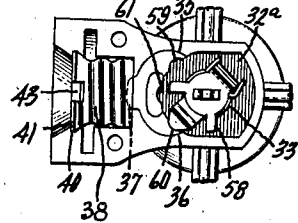
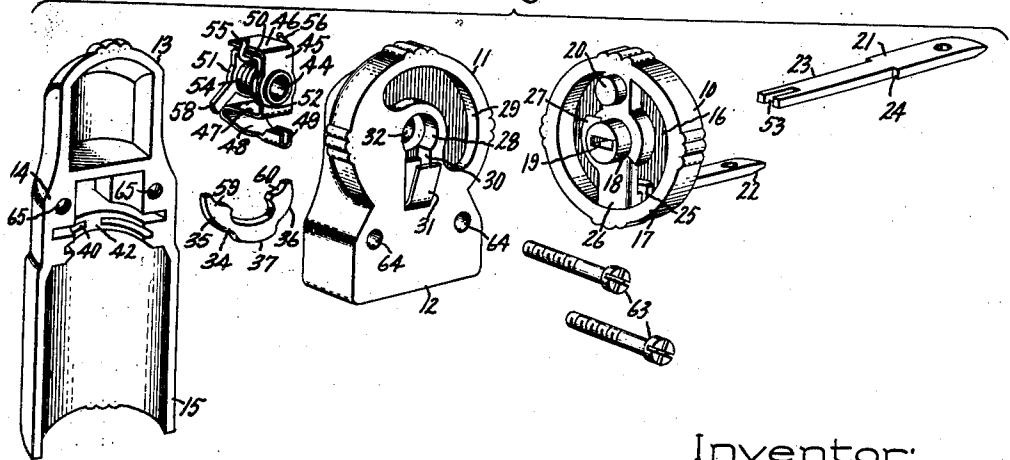


Fig.7.



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UNITED STATES PATENT OFFICE

2,166,790

ELECTRICAL DEVICE

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Application June 12, 1936, Serial No. 84,885

15 Claims. (Cl. 240-73)

The present invention relates to electrical devices and has for its object to provide an improved construction embodying a combined or unitary electrical device comprising an attaching member for connecting the unitary device to an electric circuit, an attachment member to which a current consuming device may be connected, and a switch interposed between the attaching member and the attachment member for opening and closing an electric circuit between the attaching and attachment members.

For a consideration of what I believe to be novel and my invention, attention is directed to the following specification and the claims appended thereto.

In the present instance, I have elected to show my invention as embodied in an electrical device termed usually a "night light", the same comprising a plug adapted to be plugged into an electrical receptacle, and a lamp socket adapted to receive an electric lamp. It is to be understood, however, this is only by way of example and that the invention may be embodied in other forms of electrical devices.

In the drawing, Fig. 1 is a front view of a construction embodying my invention; Fig. 2 is a side view thereof; Fig. 3 is a vertical sectional view taken on line 3-3, Fig. 1; Figs. 4, 5 and 6 are front views, with the cap or cover part removed, showing the parts in three different positions, the switch being closed in Figs. 4 and 6 and open in Fig. 5, and Fig. 7 is an exploded view showing the various parts in perspective.

Referring to the drawing, 10 indicates a plug base; 11 indicates a switch base formed integral with which is a part 12 of the casing of a screw shell lamp socket, and 13 indicates a cap or cover formed integral with which is another part 14 of the casing of a screw shell lamp socket and a shade or reflector 15 for an electric lamp.

Plug base 10 is formed from suitable insulating material, such as a suitable molding material, and comprises an annular wall 16, a rim 17, a central projecting boss 18 provided with a rectangular opening 19, and a projecting stop pin 20 at one side of the boss 18. Carried by the plug base are two plug contact prongs or uprights 21 and 22. The contact prong or upright 21 has an extension 23 of reduced width providing shoulders 24. The extension 23 extends through opening 19, the shoulders 24 engaging the outer surface of wall 16 to position prong 21 relatively to the plug base. The contact prong or upright 22 extends through an opening 25 near the edge of the plug base and at its inner end is provided

with an integral radially extending arm 26 which terminates adjacent to the boss 18 and is provided with an arcuate extension 27 which partially encircles the boss.

The boss 18 on the plug base is located in a circular recess 28 in the rear of switch base 11 and the stop pin 20 is located in an arcuate slot 29 in the rear of switch base 11. With this arrangement, plug base 10 and switch base 11 may be turned relatively to each other, the turning movement taking place about boss 18 and contact prong 21 as a center and being limited by stop pin 20 engaging the ends of slot 29. Located in a notch 30 in the rear of switch base 11 is a U-shaped spring contact member 31 which engages with the radially extending arm 26 on contact prong 22 and the extension 27 on such arm. When the plug base and switch base are turned relatively to each other, the U-shaped spring contact member 31 remains always in engagement with arm 26 or its extension 27 so that spring contact 31 is always in electrical connection with the contact prong or upright 22.

At the bottom of recess 28 is an opening 32 which extends through to the front of the switch base and through which extension 23 of contact prong 21 extends to a point beyond the switch base. This is shown clearly in Fig. 3. The front side of the switch base is hollowed out as is indicated at 32^a and at its center is a boss 33 having a flat end surface and through which opening 32 extends.

In the front face of the switch base is a recess in which is mounted an arc-shaped contact plate 34. The two ends 35 and 36 of the contact plate form contacts to be engaged by a switch contact and the central portion 37 forms the center contact of a screw shell lamp socket, the same projecting down into the lamp socket, as shown in dotted lines in Figs. 4, 5 and 6.

Located in the lamp socket casing formed by the extension 12 on the switch base 11 and the extension 14 on the cap 13 is a screw shell 38 formed integral with which is an ear 39, which projects through an opening in the switch base 11 to a position behind and in electrical engagement with the U-shaped contact member 31. By this arrangement, it will be seen that the screw shell is electrically connected to the contact prong 22 through the U-shaped contact 31 and the ear 39. The extension 12 on the switch base and extension 14 on the cap are suitably shaped to receive the screw shell as shown particularly in Figs. 3 and 7.

The screw shell casing is provided with an

annular groove 40 formed in part in the switch base extension 12 and in part in the cap extension 14 in which an out-turned flange 41 on the screw shell is located. Flange 41 serves to hold the screw shell in its casing. The screw shell is held from turning in its casing by means of transverse walls 42 in groove 40 which fit into notches 43 on the screw shell flange 41.

Mounted on the end of extension 23 is a switch structure comprising a central sleeve 44, to the inner end of which is fixed an outer frame comprising a back wall 45, a top wall 46 and a bottom wall 47. Formed integral with bottom wall 47 is a rearwardly extending spring contact arm 48 having a contact head 49 at its end adapted to engage with the switch contacts 35 and 36. The end of extension 23 extends loosely through sleeve 44 and has fixed on its outer end an inner frame comprising a top wall 50, a front wall 51 and a rear wall 52. The rear wall 52 has a circular opening through which the sleeve 44 projects and the front wall 51 has a rectangular opening of the size and shape of extension 23 through which the outer end of extension 23 projects, the outer end being staked over, as shown particularly in Figs. 4, 5 and 6, so as to hold the parts on extension 23. To enable the ready staking over of the end of extension 23, it is provided with a slot 53 in its end forming two arms, the ends of which may be peened over, one in each direction. By this arrangement, the inner and outer frames are carried by contact prong extension 23, the inner frame being held from turning on the extension and the outer frame being free to turn thereon. Surrounding sleeve 44 is a coiled spring 54, the two ends 55 and 56 of which engage opposite sides of top walls 46 and 50. This serves to hold the two frames yieldingly in alignment. Carried by front wall 51 of the inner frame are two spaced radially extending fingers 57 and 58 which stand in the path of movement of and are adapted to be engaged by spring contact arm 48. Contact head 49 has a rounded outer surface, as shown particularly in Fig. 7 and is adapted to engage in depressions or notches 59 and 60 in the ends of contacts 35 and 36 and in a depression or notch 61 in the portion of the switch base between contacts 35 and 36 to hold the switch arm in definite adjusted positions.

In Figs. 2 and 3, a lamp 62 is shown as being threaded into the lamp socket.

The plug base 10 and switch base 11 are held in assembled relation, as shown in Figs. 2 and 3, by the extension 23 of contact prong 21. The cap 13 is fixed to switch base 11 by screws 63 which extend through openings 64 in the switch base and thread into openings 65 in the cap.

When a lamp is screwed into the lamp socket, the screw shell contact of the lamp engages the screw shell 38 of the lamp socket and the center contact of the lamp engages the center contact 37 of the arc-shaped contact plate 34. This is shown in Fig. 3. As a result, one terminal of the lamp filament is directly connected to contact prong 22 by way of socket screw shell 38, ear 39, and U-shaped contact strip 31. The other terminal of the lamp filament is in engagement with contact plate 34 and through the switch is adapted to be connected to and disconnected from the contact prong 21, contact prong 21 being connected to the spring contact arm 48 of the switch structure by the extension 23.

In the use of the device, the contact prongs 21 and 22 are inserted into a plug receptacle so as to connect the two prongs to an electric circuit.

The device is supported by the contact prongs and the plug base 10 is held stationary by reason of the prongs being held in the plug receptacle. The switch casing 11, cap 13, the lamp socket and lamp shade may be turned relatively to the switch base 10, the amount of turning being limited by stop pin 20 engaging the ends of slot 29. Since the contact prong 21 is held stationary, the inner frame of the switch mechanism comprising walls 50, 51 and 52 and fingers 57 and 58 is held stationary. When the switch base is in a position relative to the plug base, as shown in Fig. 5, the spring contact arm 48 of the switch mechanism is in engagement with notch 61 in the insulating material of the switch base so that the switch is open and the circuit through the lamp is incomplete. When the switch base is turned from the position shown in Fig. 5 to the position shown in Fig. 4, where the lamp socket is vertical, or to the position shown in Fig. 6, where the lamp socket is horizontal, the switch is closed, the spring contact arm 48 being moved into engagement with contact 35 in the one instance, as shown in Fig. 4, and into engagement with contact 36 in the other instance, as shown in Fig. 6. In moving the switch casing from one position to another, as the switch casing turns, the spring contact arm 48 and the outer frame comprising walls 45, 46 and 47 move with it, the outer frame turning relatively to the inner frame and being held from turning relatively to the switch base by reason of the engagement of head 49 in notch 59, 60 or 61. This serves to put the spring 54 under tension. As the switch base continues to move, the spring contact arm 48 engages either one or the other of the fingers 57 or 58, which fingers are stationary, with the result that upon further movement of the switch base, the spring contact arm is moved out of the notch 59, 60 or 61 with which it is in engagement and by the spring is snapped into the next notch. There is thus obtained a snap action of the switch which gives a quick make and break of the circuit. When the spring contact arm 48 is in engagement with either contact 35 or 36, the circuit through the lamp filament is completed through the contact prong 21. It will thus be seen that when the lamp socket and its shade are in either a vertical position or a horizontal position, the circuit through the lamp is closed, while when in a position at 45° to the vertical, as shown in Fig. 5, the circuit is open. There is thus one position of the lamp in which the switch is open and two positions in which it is closed. In other words, the circuit is closed through the lamp whenever the lamp is either in line with the plane of the contact prongs or at a right angle to the plane of the contact prongs. It is desirable usually that the lamp operate when in a vertical position and with this arrangement, the circuit may be closed through the lamp when in a vertical position, whether the plug receptacle to which the device is connected has its contact openings arranged horizontally or vertically. However, it is to be understood that in carrying out my invention, I may utilize only two positions, one in which the switch is closed and one in which the switch is open, or I may utilize three positions, as shown in the present instance, or I may utilize more than three positions.

The electrical device is relatively simple in structure, easy to assemble, comprises relatively few parts, and is capable of being manufactured at low cost. This is due in part to placing one of the contact prongs at the center of the plug

base so that the switch base may rotate about it as a center, and mounting the switch mechanism on an extension of such contact prong, and I consider this as being one of the novel features of my construction.

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

1. A unitary structure comprising a plug base having contact prongs, one of which is located centrally of the plug base and has an extension projecting to the rear thereof, a switch base rotatably mounted on the plug base, and switch mechanism mounted on the end of the prong extension actuated by turning movement of said switch base on the plug base.

2. A unitary structure comprising a plug base having contact prongs, a switch base movably mounted thereon, a lamp socket carried by the switch base having a screw shell continuously connected to one contact prong and a center contact, and switch mechanism actuated by movement of the switch base for connecting the center contact to another contact prong.

3. In combination, a plug having contact prongs, a lamp socket pivotally mounted on the plug at an angle thereto and movable from a position in line with the plane of the contact prongs to a position at a right angle thereto, and an electric switch interposed between the lamp socket and the contact prongs for connecting the lamp socket to and disconnecting it from said prongs, said switch being closed when the lamp socket is in line with or at a right angle to the plane of the contact prongs and being open when said lamp socket is in an intermediate position.

4. A unitary structure for connection to a plug receptacle comprising a base, contact prongs on the base, a lamp receptacle on the base having a screw shell member and a center contact member, a switch mechanism mounted on an extension of one of the contact prongs and operable by a turning movement of the lamp receptacle to connect said contact prong to one of said lamp receptacle members, and means for connecting the other of said lamp receptacle members to another contact prong.

5. A unitary structure comprising a plug base, a switch base, a contact prong for the plug base having an extension which projects through the switch base and serves to hold the bases in assembled relation, said switch base being rotatable about said prong as a center a switch contact arm on the switch base electrically connected to said extension, a cap and lamp shade carried by the switch base, a lamp socket having two contacts, one of which is connected to and disconnected from said contact prong by turning movement of said switch contact arm, a second contact prong on the plug base, and means connecting the second contact prong to the other lamp socket contact.

6. A unitary structure comprising a plug base having contact prongs, a switch base rotatably mounted on the plug base, one of said contact prongs having an extension which projects through the switch base to a point beyond it, a switch movement having a contact arm mounted on said prong extension, a lamp socket carried by the switch base having lamp contacts, one of which is engaged with and disengaged from said contact arm by turning movement of the switch base relatively to the plug base, and means connecting the other lamp socket contact to the other contact prong.

7. A unitary structure comprising a flat disk-like plug base having contact prongs projecting from one side thereof, a switch base rotatably mounted on the plug base, a lamp socket carried by the switch base, a switch movement mounted on the outer face of the switch base operated by turning movement of the switch base on the plug base to open and close a circuit between the lamp socket contacts and the plug prongs, and a removable cap fixed to the switch base to house the switch movement.

8. A unitary structure comprising a flat disk-like plug base having contact prongs projecting from one side thereof, a switch base rotatably mounted on the plug base, a lamp socket comprising a housing and contacts carried by the switch base, a switch movement mounted on the outer face of the switch base operated by turning movement of the switch base on the plug base to open and close a circuit between the lamp socket contacts and the plug prongs, a removable cap fixed to the switch base to house the switch movement, and an extension integral with said cap forming a part of the lamp socket housing.

9. A unitary structure comprising a plug base, contact prongs projecting from one face of the plug base, a switch base rotatably mounted on the plug base having an angularly extending integral portion which forms one part of a lamp socket housing, a switch movement mounted on the outer side of the switch base, a cap enclosing the switch movement provided with an extension which forms the other part of the lamp socket housing; and lamp socket contacts in the lamp socket housing, said switch base when turned on the plug base serving to effect the closing of a circuit between the lamp socket contacts and the contact prongs.

10. In combination, a plug base and a switch base mounted to rotate one on the other, a contact prong projecting centrally through said bases and extending beyond the outer faces thereof, a switch contact on the end of the prong which projects beyond the switch base, a cap which houses the switch contact, said cap and switch base being provided with extensions which form a lamp socket housing, a second contact prong projecting from the plug base having a curved extension located between the two bases, lamp socket contacts in said lamp housing, means connecting one of said lamp socket contacts to said curved extension, and means through which said switch contact is connected to and disconnected from said other lamp socket contact when the switch base is turned on the plug base.

11. In combination, a plug base having contact prongs, a split casing which provides a combined switch housing and lamp socket, the switch housing being located directly behind the plug base and the lamp socket housing to one side thereof, lamp contacts in the lamp socket housing, means connecting one of the lamp socket contacts to one of the contact prongs, and a switch in the switch housing operated by relative movement between the plug base and the split casing for connecting the other lamp socket contact to the other contact prong.

12. In combination, a plug base having contact prongs, a switch base pivotally mounted on the plug base, one of said contact prongs having an extension which projects through the switch base and serves to hold the two bases in assembled relation, a lamp socket having contacts carried by the switch base, and switch mechanism carried

by the switch base for closing a circuit between the lamp contacts and the contact prongs.

13. In combination, a plug base having contact prongs; a switch base mounted on the plug base, one of said contact prongs having an extension which projects through the switch base and serves to hold the two bases in assembled relation, a cap attached to the switch base and forming with it a switch movement housing, extensions carried by the switch base and cap to form a lamp socket housing, lamp socket contacts in the lamp socket housing, and a switch movement in the switch movement housing for closing a circuit between the lamp socket contacts and the contact prongs.

14. In combination, a plug base having spaced contact prongs; a switch base rotatably mounted thereon to turn through an angle of ninety degrees, a lamp socket carried by and extending at an angle to the axis of the switch base and so positioned that the ninety degree turning movement of the switch base carries it from a position in line with the plane of the contact prongs to a position at a right angle thereto, said lamp socket having contacts, and switch

means actuated by turning movement of the switch base on the plug base for closing a circuit between the plug contacts and the lamp socket contacts when the switch base is in either of its extreme positions relative to the plug base, said circuit being open when it is in an intermediate position.

15. In combination, a plug base having contact prongs, a switch base pivotally mounted upon the plug base, one of said contact prongs having an extension which projects through the switch base, switch mechanism carried by the extension, a lamp socket having contacts carried by the switch base, one of said contacts comprising an arc-shaped plate having opposed contact stops separated by an insulating stop, and the other of said contacts having means continuously engaging the other contact prong, said switch mechanism having a contact arm engaging said stops whereby rotation of said switch base operates said switch mechanisms to position said arm at said stops to energize and deenergize said lamp contacts.

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