March 10, 1931. M. H. SHOENBERG ET AL 1,795,741

CIRCUIT CONTROLLING DEVICE

Filed Oct. 31, 1928

FIG. 1.

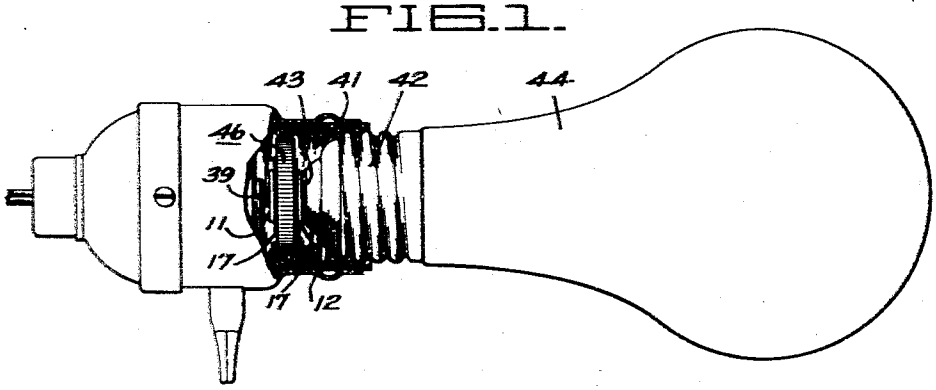


FIG. 2.

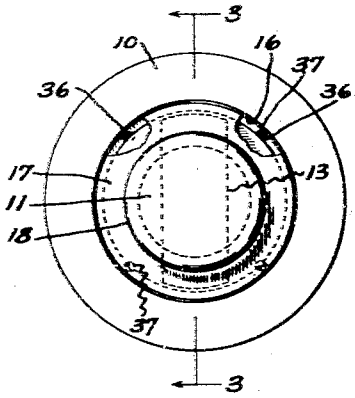


FIG. 3.

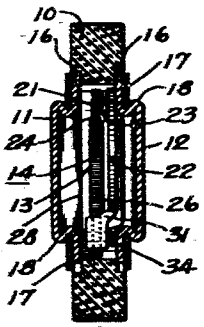


FIG. 4.

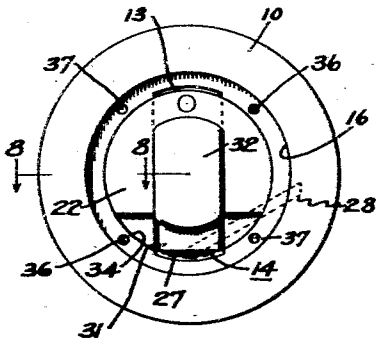


FIG. 5.

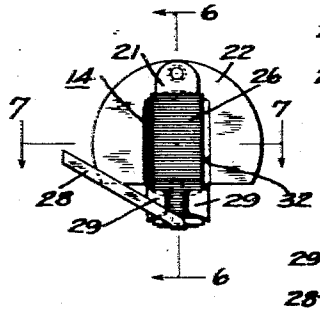


FIG. 6.

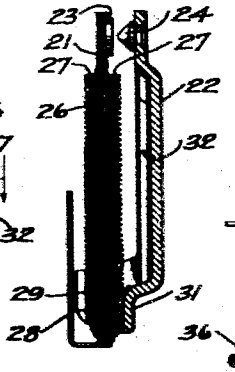


FIG. 7.

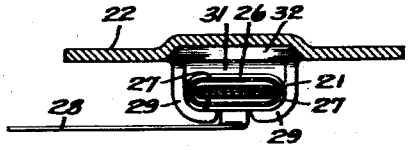


FIG. 8.

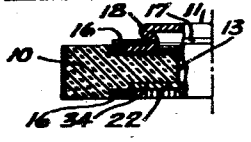
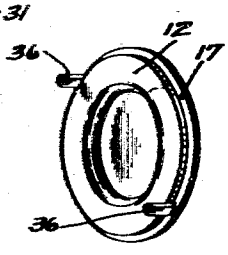


FIG. 9.



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Patented Mar. 10, 1931 1,795,741

UNITED STATES PATENT OFFICE

MILTON H. SHOENBERG AND LESTER SCHON, OF SAN FRANCISCO, CALIFORNIA; SAID SCHON ASSIGNOR TO SAID SHOENBERG

CIRCUIT-CONTROLLING DEVICE

Application filed October 31, 1928. Serial No. 316,155.

This invention relates generally to circuit controlling devices intended to be inserted within a lamp socket or receptacle in such a position as not to interfere with engagement of the socket by a complementary connecting device. Devices of this character are disclosed in Shoenberg Patent No. 1,400,914 and Shoenberg and Schon Patent No. 1,602,088.

It is a general object of this invention to improve upon devices of the general character outlined above, whereby they can be cheaply and conveniently manufactured in large quantities.

It is a further object of this invention to generally improve upon the construction of contact terminals employed in the construction of devices insertable within a lamp socket or lamp receptacle.

It is a further object of this invention to generally improve upon the mounting of circuit interrupters or other controlling elements employed in such devices.

Further objects of the invention will appear from the following description in which we have set forth the preferred embodiment of our invention. It is to be understood that the appended claims are to be accorded a range of equivalents consistent with the state of the prior art.

Referring to the drawing:

Figure 1 is a side elevational view partly in cross section illustrating our device inserted within a lamp socket which is also cooperatively associated with an electric lamp.

Fig. 2 is an enlarged plan view of the device shown in Fig. 1.

Fig. 3 is a cross sectional view taken along the line 3—3 of Fig. 2.

Fig. 4 is a plan view of the device shown in Fig. 2, with one of the terminal contacts removed.

Fig. 5 is a plan view of the circuit controlling element and its associated mounting drawn to the same scale as Figs. 2, 3 and 4.

Fig. 6 is a greatly enlarged cross section taken along the line 6—6 of Fig. 5.

Fig. 7 is a greatly enlarged cross section taken along the line 7—7 of Fig. 5.

Fig. 8 is a cross sectional view taken along the line 8—8 of Fig. 4.

Fig. 9 is a perspective detail of one of the contact terminals.

With ordinary standard electric light sockets or receptacles, as for example the Edison type of socket, it is possible to unscrew a lamp base a certain amount from the socket before the base is entirely disengaged from the socket threads. It is within the space which can be made available in this manner, that we position the device of this invention. Since this space is relatively small, it is evident that the construction of such a device presents many problems; for example the device must be made relatively thin and at the same time must incorporate a controlling element which will be reliable in operation. In the preferred embodiment of our invention in which we utilize a bimetallic form of circuit interrupter, provision must be made for conducting away the heat developed. The construction of the device must also be relatively simple and capable of ready manufacture and assembly.

The device which we have shown in the drawing affords a satisfactory solution of the above difficulties, and includes generally a body member 10 to which are secured contact terminals 11 and 12. While the body member may be made of a number of parts and of various materials, we prefer to form it as a single piece disc of insulating material, as for example a phenolic condensate product or hard fiber. Body member 10 is formed with a chamber or recess 13 in order to provide means for positioning a circuit controller element 14. In the preferred embodiment of the invention contact terminals 11 and 12 serve to enclose recess 13, and thus we have shown recess 13 arranged centrally of the body member 11, while contact terminals 11 and 12 are arranged centrally of each face of the body. In order to provide sufficient material between the contact terminals to prevent the terminals from being crushed together, recess 13 is preferably comparatively elongated.

The contact terminals 11 and 12 are of novel construction and are formed of a disc of sheet material having good conductivity, such as copper. The peripheral portion of

each contact terminal is positioned within an annular recess 16 provided in body member 10. The exposed peripheral portion of each terminal is preferably covered by a member 17 of insulating material, as for example thin fiber. Member 17 can be in the form of an annular ring, and in manufacture it is preferably attached to the contact terminal by providing each terminal with an annular crimped portion 18. This construction not only properly retains members 17 in place, but likewise reinforces the contact terminals.

One form of circuit controller and its associated mounting is shown in detail in Figs. 5, 6 and 7. As previously mentioned this controller in its preferred form is an interrupter for recurrently varying current supplied by the socket. Thus we have shown a bimetallic strip 21 having one end secured to a mounting 22. This mounting for convenience is formed of pressed sheet metal so as to be relatively flat. The free end of bimetallic strip 21 carries a contact 23 which cooperates with another contact 24, contact 24 being fixed to the mounting 22.

To provide a resistance element for heating bimetallic strip 21, we have shown a winding 26 of relatively fine resistance wire. For example this wire can be of nichrome or other alloy having high resistivity, and having a coating of enamel or other suitable insulation. It is preferably wound in a plurality of layers as shown, the layers being separated by insulating material 27. One terminal of this winding is connected to mounting 22, while the other terminal is formed by a relatively thin metal ribbon 28. Ribbon 28 is also electrically connected to the bimetallic strip 21 and thus to the contact 23. To provide a convenient means for securing bimetallic strip 21 to the mounting 22 without providing a direct electrical connection between these parts, we preferably provide a pair of integral tabs 29 on the mounting 22, and these tabs are bent about the end portion of the winding 26. Generally this clamping of tabs 29 upon the outer layer of winding is sufficient to establish contact between one winding terminal and the mounting 22. Mounting 22 adjacent the tabs 29 is provided with an offset portion 31 to properly position bimetallic strip 21 with respect to contact 24, and to space the winding 26 from direct contact with mounting 22. Likewise interference with flexing of strip 21 is prevented by providing a pressed-in depression 32 extending from the offset portion 31 to a point adjacent the contact 24.

In order to accommodate and properly position the mounting 22 upon the body member 10, one face of the body member is provided with another annular recess 34 set in deeper than the adjacent recess 16. Recess 34 is only slightly greater in diameter than the diameter of mounting 22, so that when the mounting and controller element is positioned within the recess, the element is retained in properly alined position with respect to the elongated recess 13.

In order to retain the contact terminals upon the body member, we preferably provide each terminal with a plurality of integral tabs 36 and these tabs have a driving fit with apertures 37 provided in the body members. To prevent direct short circuiting between the contact terminals, the tabs of one contact terminal are staggered with respect to the tabs of the other terminal. When the contact terminal 12 is in position, it will be noted that a certain portion of the periphery of mounting 22 is imposed between terminal 12 and the body member. Mounting 22 is sufficiently thick that contact terminal 12 securely clamps the mounting in fixed relationship with respect to the body member and also makes electrical connection with the same. During assembly the ribbon 28 is preferably extended between the contact terminal 11 and body member 10 so that contact terminal 11 is electrically connected with bimetallic strip 21 and contact 23.

The device is inserted in a lamp socket as shown in Fig. 1. This socket includes a central contact 39 and a threaded sleeve 41, sleeve 41 being engaged by a complementary connector 42. Connector 42, which also has a central contact 43, may be the standard base of an electric lamp 44. Our circuit controlling device has been indicated generally at 46, and the contact terminals 11 and 12 make electrical connection with contact 39 of the socket and central contact 43 of the connector 42. Since contact terminal 11 is electrically connected to ribbon 28 and thus to contact 23, contacts 23 and 24 are connected in series with the terminal contacts 11 and 12. As has been previously explained the resistance winding 26 is connected in shunt with contacts 23 and 24. When the circuit to the lamp is initially completed contacts 23 and 24 are open, but heating of resistance 26 due to the flow of current thru the same flexes bimetallic strip 21 and causes contacts 23 and 24 to be closed. The lamp then burns brightly and resistance 26 is short circuited or shunted out. The cooling of bimetallic strip 21 then permits contacts 23 and 24 to open to substantially reduce the current supplied to the lamp and to again supply current to the resistance winding 26. This type of circuit interrupter operates periodically to recurrently vary current supplied to the lamp, so that the lamp is recurrently flashed.

While we have described our invention as being utilized with a circuit interrupter of the shunt type, a series type interrupter can also be employed. In this case the resistance winding upon the bimetallic strip 21

is of comparatively low resistance in contrast to the high resistance winding employed in the shunt type, and is normally connected in series with contacts 23 and 24. These contacts 23 and 24 are normally closed and when the circuit to the lamp socket is completed, sufficient current flows thru the resistance winding to burn the lamp brightly. The resistance winding is also heated to flex bimetallic strip 21 in a direction to open contacts 23 and 24. Opening of these contacts interrupts the current flow and permits winding 26 to cool thus causing bimetallic strip 21 to again close contacts 23 and 24.

We claim:

1. A device adapted to be inserted within an electric socket whereby the socket can still cooperate with a complementary plug connector, said device comprising a flat body member insertable within the socket, terminal contacts secured to opposite faces of said body member and a flat annular insulating ring secured to one of said contacts, said one contact engaging both sides of the inner circumference of said annular ring.

2. A device adapted to be inserted within a lamp socket or receptacle whereby the receptacle can still cooperate with a complementary connector comprising a relatively flat body member insertable within the socket, terminal contacts secured to opposite faces of said body, and insulating material covering a portion of at least one contact, said contact having a crimped portion serving to engage said insulating material.

3. A device adapted to be inserted within a lamp socket or receptacle whereby the receptacle can still cooperate with a complementary connector comprising a relatively flat body member insertable within the socket, terminal contacts secured to opposite faces of said body, and an annular member of insulating material adapted to cover a portion of each contact, each of said contacts having a crimped portion to engage and retain its associated insulating member.

4. A device adapted to be inserted within a lamp socket or receptacle whereby the receptacle can still cooperate with a complementary connector comprising a relatively flat body member insertable within the socket and having an inner chamber, a contact terminal secured to one face of said member, a circuit controlling element disposed within said chamber, and a wafer-like mounting for said element retained along its circumference upon the body by said terminal contact.

5. A device adapted to be inserted within a lamp socket or receptacle whereby the receptacle can still cooperate with a complementary connector comprising a relatively flat body member insertable within the socket, a circuit controlling element, a terminal contact secured to one face of said body, and a wafer-like member interposed between the edge of said terminal contact and said body, said element being secured to said last named member.

6. A device adapted to be inserted within a lamp socket or receptacle whereby the receptacle can still cooperate with a complementary connector comprising a relatively flat body member insertable within the socket, a contact terminal secured to one face of said body member, a relatively flat plate having a portion thereof interposed between said contact terminal and the body member, and a current controlling element mounted upon said plate.

7. A device adapted to be inserted within a lamp socket or receptacle whereby the receptacle can still cooperate with a complementary connector comprising a relatively flat body member insertable within the socket, a contact terminal secured to one face of said body member, a relatively flat plate having a portion thereof interposed between said contact terminal and the body member, and a current controlling element mounted upon said plate, said body having an inner chamber to receive said element.

8. A device adapted to be inserted within a lamp socket or receptacle whereby the receptacle can still cooperate with a complementary connector comprising a relatively flat body member insertable within the socket, said body member being formed of a single piece of insulating material having a recess formed in the same, a terminal contact secured to one face of said body member, a relatively flat member disposed to span said recess and having a portion thereof clamped between said terminal contact and said body member, a current control element mounted upon said member and disposed within said recess, and another contact terminal mounted on the body, said contact terminals being electrically connected to said control element.

In testimony whereof, we have hereunto set our hands.

MILTON H. SHOENBERG.
LESTER SCHON.