Nov. 21, 1939. E. R. EVANS 2,181,050

LAMP OR PLUG AND RECEPTACLE THEREFOR

Filed March 10, 1937

Fig. 1

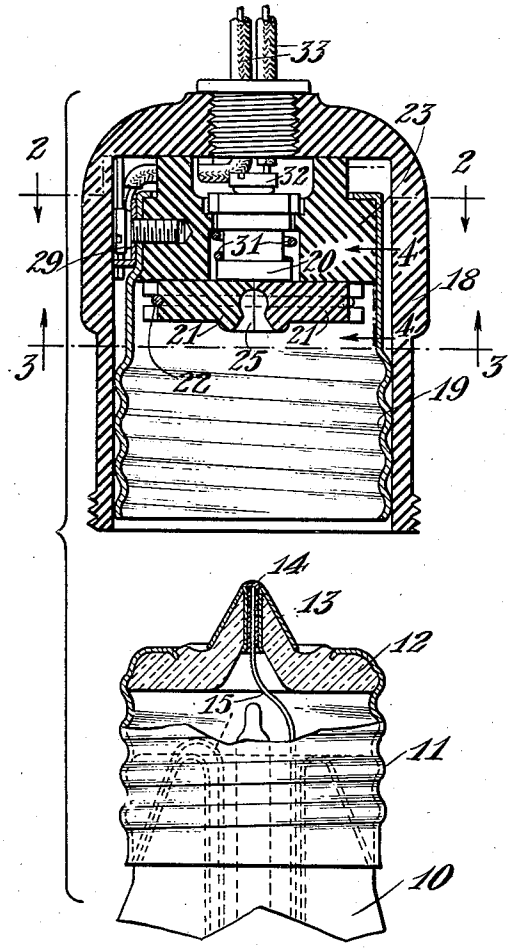


Fig. 5

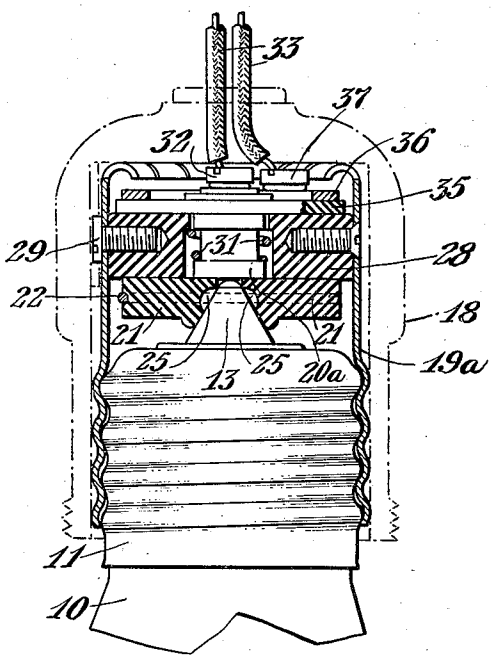


Fig. 2

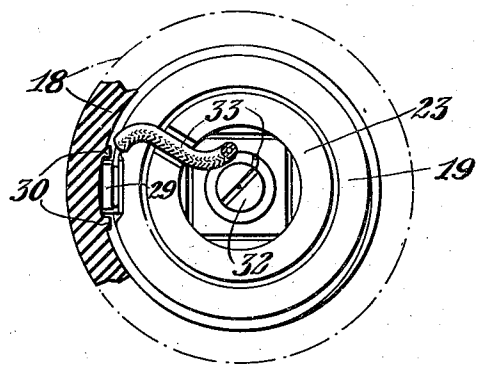


Fig. 3

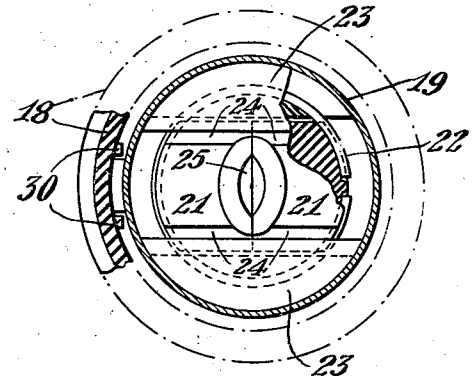
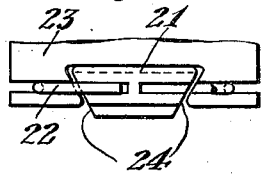


Fig. 4



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LAMP OR PLUG AND RECEPTACLE THEREFOR

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3 Claims. (Cl. 173—358)

This invention relates to electric lamps and sockets or receptacles therefor, or in general to electric connectors of the plug and socket type.

An object of the invention is to provide a shockproof or safety socket and an improved lamp base or plug adapted to be readily inserted into said socket, the lamp base or plug and the socket being as simple and rugged in construction as the ordinary Edison screw plug or lamp base and socket. By "shockproof" is meant a socket in which the possibility of accidental shock from exposed "live" contacts when the lamp or plug is removed from the socket or receptacle, or from touching the contacts of the plug or lamp as it is inserted in or removed from the socket, is obviated or materially reduced.

Prior sockets or receptacles of this character have been of a complicated construction or have not come into general use because they required a specially constructed plug or lamp base which could not be used in connection with the standard sockets or receptacles already in general use to such a large extent that it would be impracticable to replace them. In accordance with a further feature of the invention, the lamp base or plug of the connector embodying the invention although modified from the usual construction as required by the construction of the improved socket is also adapted for insertion in the ordinary socket wherever the latter are already installed.

Another object of the invention is to provide a lamp with a wedge-shaped contact of novel character.

Another object of the invention is to provide a socket or receptacle with movable insulating members adapted to be displaced by the wedge-shaped contact of the cooperating lamp or plug.

A still further object of the invention is to provide, in a socket of the character described, a novel contact device or switch for connecting a contact or contacts of the socket to the supply conductors when the lamp or plug is inserted in the socket.

Other objects and advantages of the invention will be apparent from the following description of the preferred embodiments thereof shown on the accompanying drawing, wherein

Fig. 1 is a longitudinal sectional view of a lamp base and socket or receptacle constructed in accordance with the invention;

Fig. 2 is a cross-section taken on the line 2—2 of Fig. 1;

Fig. 3 is a similar view taken on the line 3—3 of Fig. 1;

Fig. 4 is a sectional detail taken on the line 4—4 of Fig. 1; and

Fig. 5 is a view similar to Fig. 1 of a modified form of socket or receptacle, with the base of the lamp partly inserted in the socket.

Referring to Fig. 1 of the drawing, in accordance with the invention the lamp (or plug) 10 forming one element of the connector is provided with the conventional threaded shell contact 11 which in the case of a lamp is cemented to the lamp bulb in the usual manner, the end of said shell contact being closed by a molded insert 12 carrying the center or tip contact 13. The contact 13 is shown as soldered at 14 to one of the lamp terminal conductors 15, the other of said conductors being connected to the shell contact 11.

Instead of the ordinary flat center contact, the contact 13 projects from the body of the lamp base and is preferably conical or wedge-shaped for a purpose to be described. As shown, the insert 12 which may be of glass has a corresponding conical portion engaging and supporting the contact member 13, and capable of transmitting substantial inward contact pressure to the attached shell contact while obviating distortion of the tip contact. If desired, the contact member 13 may be shortened so that it does not cover all or any substantial part of the projecting portion of the insert 12, and the size, shape and arrangement of these parts of the base may be otherwise varied somewhat if the functions thereof as pointed out hereinafter be borne in mind.

The socket or receptacle forming the second element of the connector comprises a casing or housing 18 of any suitable character, preferably a one-piece molded shell of "Bakelite", "Textolite" or fibre, contact members 19 and 20 adapted to cooperate with the contacts 11 and 13 of the lamp base or plug, and movable or separable co-planar insulating members 21 arranged to shield the contact member 20 from accidental contact with the fingers or a screw-driver, pencil or the like when the lamp or plug is removed from the socket. In this modification of the invention, the contact member 19 is intended to be connected to the grounded side of the supply circuit so that there is no danger of shock or short-circuit although it is exposed.

The insulating members 21 are made of any suitable insulating material and, in the preferred form of the invention, comprise two truncated parts engaging at the center of the socket and held together by resilient means, such as a wire spring 22, a spring formed of a helix coiled into

circular shape with its ends fastened together or any equivalent means. The two insulating members 21 are retained in the socket, as by the grooved end portion of an insulating block 23, the members being slidable in said block. The block 23 is also grooved to receive the spring 22 as shown in Figs. 3 and 4, and is so constructed as to prevent contact of the spring with the center contact member 20 in case the spring breaks after extended use and also to accurately center the members 21 fit loosely in the transverse groove in the block 23 and, as clearly shown in Fig. 4, the tapered sides 24 of said members are at a greater angle with the base surface thereof than the sides of the groove in the block 23 in order to obviate wedging or binding of the same in said groove. As shown in Figs. 3 and 4, the groove in the members 21 or the block 23 is preferably discontinuous to prevent the spring 22 from turning in the groove.

The contact 20 is disposed in a central aperture in the insulating block 23 and opposite said contact, the ends of the insulating members 21 are cut away to form a tapered cavity 25 adapted to receive the end of the wedge-shaped tip contact 13 of the lamp base whereby the shield members 21 will be spread apart as the lamp is inserted in the socket to expose the contact member 20 (see Fig. 5). Thus the live contact of the socket is shielded when the lamp is removed from the socket but the lamp may be inserted in the socket and turned until contact is made with the tip of the lamp in the usual manner. While the specific form and mounting of the insulating members 21 shown have been chosen merely to illustrate a suitable construction which may be altered without departing from the scope of the invention, this construction has the advantages of ruggedness, durability and simplicity. In addition, it will be noted that in the event the spring 22 breaks, the socket will function as an ordinary unprotected socket.

The elements of the socket may be mounted in the casing 18 in any desired manner. As shown, the end of the contact member 19 is spun over the block 23 and also secured thereto by the terminal screw 29 extending through the shell contact into the block 23. The body portion of the casing 18 may be provided with internal ribs 30 (see Fig. 2) cooperating with the head of the screw 29 to prevent the shell from turning in the housing. The center contact 20 is preferably a round pin or stud urged toward the open end of the socket by a spring 31 and having its outer end drilled and tapped to receive the second terminal screw 32. There is thus no possibility of a loose or high resistance joint between the terminal and the contact face, and since the spring 31 does not carry any current its resiliency will remain constant. The outer end of the contact member 20 may be of substantially square cross-section, as shown in Fig. 2, so that it cannot turn in the supporting member 23. The block 23 with the elements of the socket carried thereby may be withdrawn through the mouth of the casing 18 in order to attach the supply conductors 33 to the terminals 32 and 29. If desired, means may be provided to lock the member 23 in the casing or the casing may be made of two interlocked sections according to usual practice.

If desired, the socket embodying the invention may be constructed to complete the circuit to the shell contact 19 upon the insertion of the lamp or plug in the socket so that accidental shock is avoided in the event that the shell terminal is not connected to the grounded side of the supply circuit. This modification of the invention is shown in Fig. 5, which illustrates a construction similar to that shown in Figs. 1–4 except that the center contact member 20*a*, corresponding to the member 20 of Fig. 1, carries an insulating disc 35 supporting a circular contact ring 36 adapted to engage the end of the shell contact member 19*a* when the center contact member 20*a* is moved by engagement with the tip contact 13 of the lamp as it is inserted in the socket. The supply conductors 33 are connected to the terminals 32 and 37, the latter of which is connected to the contact ring 36. Thus the contact member 20*a* is shielded and the contact member 19*a* is disconnected from the supply circuit until the lamp is inserted in the socket and turned until it firmly engages the contact member 20*a*. If desired, the contact ring 36 may be mounted on the block 28, corresponding to the block 23, and the contact shell 19*a* may be movable to effect contact therewith as the lamp presses against the contact 20*a*. Various other modifications will occur to those skilled in the art and may be made without departing from the scope of the invention as defined in the appended claims.

I claim:

1. A connector having threaded plug and socket elements, said plug comprising a wedge-shaped center contact member projecting from the body portion of the plug and of substantial length, a contact member in said socket adapted to be engaged by said first-mentioned contact member and slidably mounted insulating elements covering said socket contact member and constructed and arranged to be moved by the projecting wedge-shaped contact member of the plug to permit engagement thereof with said socket contact member as the elements of the connector are threaded together.

2. In a socket or receptacle, a center contact member, a grooved supporting member embracing the same, two insulating members disposed in the groove in said supporting member and movable to expose said contact member and resilient means engaging said insulating members to position the same with the inner ends thereof adjacent said contact member until spread apart to expose the latter.

3. In a socket or receptacle, a center contact member, separable co-planar insulating members shielding the contact surface of said contact member and mounted for transverse opposed movement in said socket or receptacle, and resilient means engaging said insulating members and tending to hold them together.

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