May 10, 1927. 1,628,636

F. DOMINICK

ELECTRIC CIRCUIT CLOSING PLUG

Filed April 23, 1921 2 Sheets-Sheet 1

FIG. 1

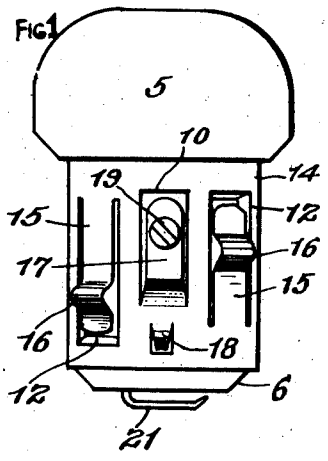


FIG. 2

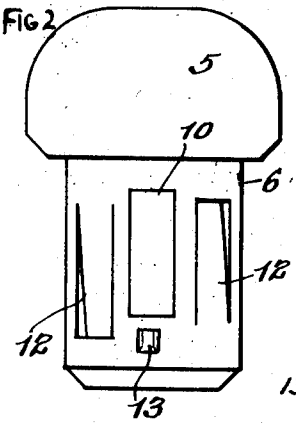


FIG. 3

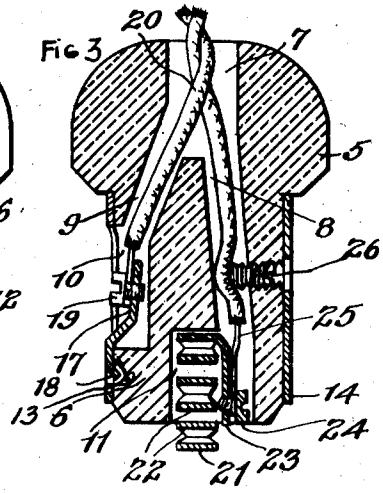


FIG. 4.

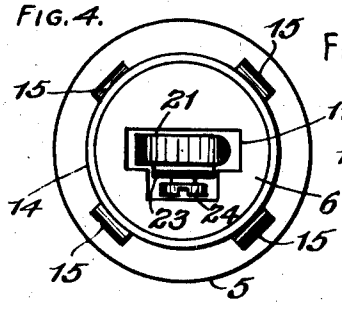


FIG. 5.

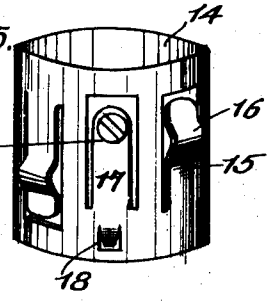


FIG. 6

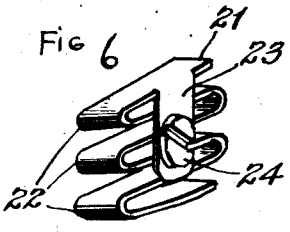
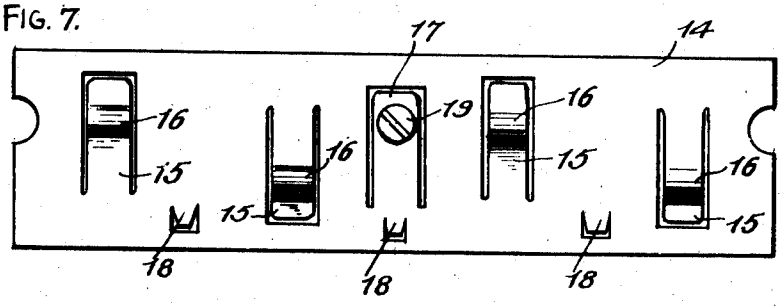


FIG. 7.



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F. DOMINICK

ELECTRIC CIRCUIT CLOSING PLUG

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FIG. 8.

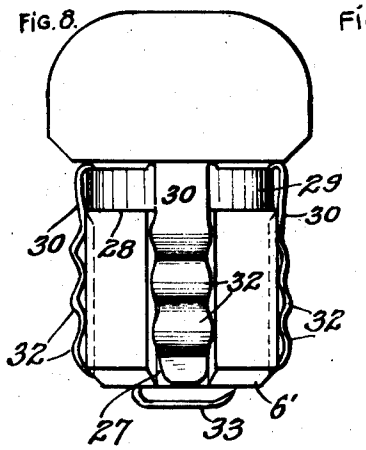


FIG. 9.

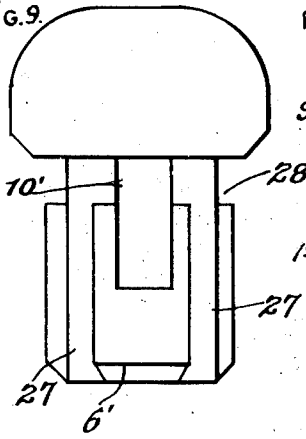


FIG. 10.

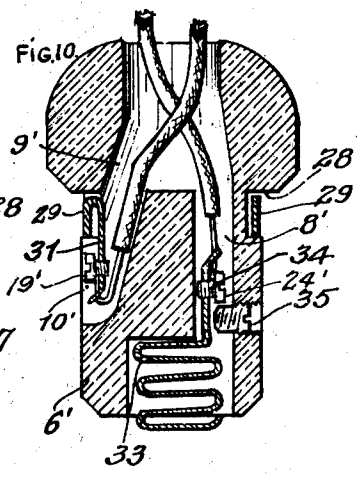


FIG. 11.

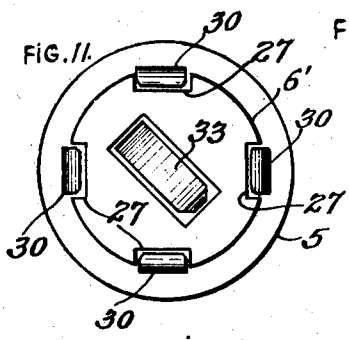


FIG. 12.

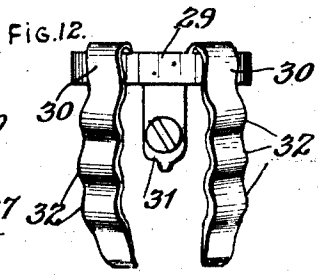


FIG. 13.

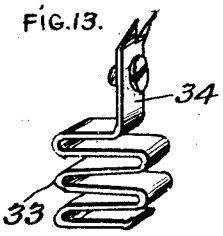
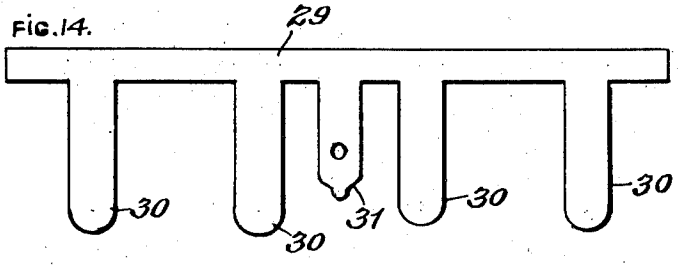


FIG. 14.



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Patented May 10, 1927. 1,628,636

UNITED STATES PATENT OFFICE.

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ELECTRIC-CIRCUIT-CLOSING PLUG.

Application filed April 23, 1921. Serial No. 463,766.

This invention relates to electric circuit closing plugs and has for its primary object to provide a simple, efficient and inexpensive plug which is particularly designed for use in connection with electrical appliances such as electric fans, irons, toasters, washing machines, lamps, etc., which may be easily and quickly inserted into or removed from the socket.

It is another important object of the invention, to provide means carried by the plug for insuring good electrical conductivity between the contact piece of the socket and the current conducting wires leading from the plug to the lamp or other appliance.

In one construction of my invention, I provide a one-piece plug of a suitable insulating material and upon this plug yieldable circuit closing means is engaged to which one of the conducting wires is connected, said means adapted to coact with the corrugated metal liner of the socket member when the plug is forced longitudinally therein whereby the socket and plug are held in assembled relation. In the end of the plug a convolute spring contact plate is arranged and connected to the other of the current conducting wires. This plate is adapted to be engaged with the contact plate of the socket which is connected to the other side of the circuit and is placed under compression when the plug is inserted into the socket as far as possible. Thus a good electrical connection is obtained. When it is desired to disconnect the plug from the socket, it is only necessary to pull upon the conducting wires or cords as the yieldable means on the plug will thereby be readily disengaged from the corrugated liner of the socket. However, this yieldable means exerts sufficient pressure against the socket liner to insure good electrical conductivity and to prevent the accidental disconnection of the plug from the socket.

With the above and other objects in view, the invention consists in the improved circuit closing plug and in the form, construction and relative arrangement of its several parts as will be hereinafter more fully described, illustrated in the accompanying drawings and subsequently incorporated in the subjoined claims.

In the drawings wherein I have illustrated several desirable embodiments of the invention and in which similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a side elevation of one form of the invention;

Figure 2 is a similar view of the plug body, the metal sleeve and the circuit closing contact member being removed;

Figure 3 is a vertical sectional view;

Figure 4 is an end elevation;

Figure 5 is a detail perspective view of the metallic sleeve;

Figure 6 is a similar view of the spring contact member;

Figure 7 is a plan view of the blank from which the metal sleeve is formed;

Figure 8 is a side elevation showing a slightly modified form of the plug;

Figure 9 is a similar view of the plug body, the socket engaging member being removed;

Figure 10 is a vertical sectional view;

Figure 11 is an end elevation;

Figure 12 is a detail side elevation of the socket engaging member;

Figure 13 is a detail perspective view of the spring contact member, and

Figure 14 is a plan view of the blank from which the socket engaging member is formed.

Referring in detail to the drawings and more particularly to Figures 1 to 7 thereof, 5 designates the body of the circuit closing plug which may be formed of porcelain or any other desired composition insulating material. This plug body is provided with a diametrically reduced cylindrical portion 6. At its larger end the body 5 is axially bored, as at 7, and angularly extending channels or passages 8 and 9 respectively communicate with the inner end of this bore 7. The reduced portion 6 of the plug body is provided with a longitudinally extending rectangular recess 10 which communicates at its upper end with the passage 9. The other passage 8 at its lower end is in communication with one side of a rectangular recess or pocket 11 which is centrally formed in the end of the plug.

The reduced part 6 of the plug body is further provided with spaced longitudinally extending recesses 12. The adjacent recesses gradually increase in depth longitudinally in relatively opposite directions as clearly seen in Figure 2 of the drawings. In addition to the recesses 12, the lower end portion of the part 6 of the plug is provided

in its periphery with circumferentially spaced notches 13 for a purpose which will presently appear.

Upon the reduced part 6 of the plug a metallic shell or sleeve is adapted to be engaged through which one side of the circuit is closed. As shown in Figure 7 of the drawings, this sleeve is stamped from a metal plate to produce a strip 14 of the requisite length having resilient or yieldable tongues 15 alternately extending towards the relatively opposite longitudinal edges of the metal plate. Each of these tongues is provided with a single corrugation 16. In addition to the tongues 15, the plate 14 is also centrally provided with a finger 17 which is angularly offset out of the plane of said plate, as shown in Figure 3. In addition, the metal plate 14 is provided adjacent one of its longitudinal edges with the spaced angularly projecting lugs 18. This plate 14 is preferably of copper, brass or other metal of high electrical conductivity and is adapted to be bent into circular form and the end edges thereof welded or otherwise suitably secured to each other. The metal sleeve or shell thus formed is of such diameter that it may be readily slipped longitudinally over the reduced portion 6 of the plug body so that the angularly disposed lugs 18 will snap into the notches 13 and thereby retain the shell or sleeve in place. The offset finger 17 is positioned within the recess 10 while the several tongues 15 overlie the recesses 12 of the plug body. The finger 17 is provided with a threaded aperture to receive the binding screw 19 whereby the end of one of the conducting wires 20 may be securely fixed in metallic contact with said finger.

The central recess 11 in the end of the plug body receives the contact member shown in Figure 6, which is formed from a metal strip 21 of brass or copper bent upon itself to provide a series of folds 22 therein. Adjacent one of its ends the metal contact strip is provided with an arm 23 on one longitudinal edge thereof disposed at right angles to the plane of said strip. This arm carries the binding screw 24 whereby the end of the other current conducting wire 25 may be secured in metallic contact with said arm. This resilient contact member is adapted to be disposed within the recess with the end thereof from which the arm 23 projects engaged against the base wall of the recess while the fold at the opposite end of the contact member extends beyond the end face of the plug. After the wire 25 has been connected to the arm 23, a set screw 26 threaded in one side of the plug is adjusted into tight engagement against the wire 25 to thereby hold the contact member in place within the recess 11.

In the use of my invention as above described, assuming that all parts are properly assembled as seen in Figure 3, when it is desired to use the lamp, fan or other appliance to which the wires 20 and 25 are connected, the plug is forced longitudinally into the socket member, which as is well known, is provided with a corrugated lining sleeve designed to receive a thread on the plug. By means of my improvement however, the plug is not threaded by a turning movement into the socket but is simply forced by a rectilinear movement into the socket. The corrugations 16 of the resilient tongues 15 will coact with the corrugations of the metal liner of the socket and exert a constant holding pressure thereon to thereby close one side of the circuit and also hold the plug in assembled relation with the socket. When the plug is forced into the socket to the limit of its movement, the free end of the center contact member carried by the plug engages the fixed contact plate of the socket and the folds 22 of said member are compressed. Thus this center contact member of the plug will exert a constant positive pressure against the contact plate of the socket whereby the circuit is closed.

In Figures 8 to 14 inclusive, I have shown a slightly modified form of the invention wherein the part 6′ of the plug body is provided with spaced longitudinally extending channels 27 communicating adjacent to the head of the plug with an annular groove or channel 28. This plug is provided with the passages 8′ and 9′ corresponding to those above referred to in connection with the preferred embodiment of the invention and the rectangular opening 10′ in one side of the plug body communicates with the passage 9′.

In this construction the metallic socket engaging member is stamped from a plate of brass or copper into the form shown in Figure 14 to provide a relatively narrow strip 29 having the spaced tongues 30 projecting from one edge thereof and being also provided with a central finger 31. This strip is bent into circular form as shown in Figure 12 and the tongues 30 are corrugated as at 32 and bent from the edge of said strip 29 to extend exteriorly of the annular band and in substantially parallel relation to its axis. The finger 31 is bent from the edge of the strip 29 in the reverse direction and is disposed inwardly of said annular band. Thus when the strip 29 is bent into annular form and positioned within the groove or channel 28 and has its ends suitably connected to each other, the corrugated tongues 30 are positioned in line with the longitudinal channels 27 in the plug body while the finger 31 is disposed within the opening 10′. This finger is connected to one of the current conducting wires in the manner above explained.

In this alternative embodiment of the in-

vention, the center resilient contact member 33 carried by the plug is provided with an arm 34 extending longitudinally from one end of the series of folds. This arm projects into the passage 8′ of the plug body as shown in Figure 10, and carries the binding screw to which the other of the conducting wires is connected. The set screw 35 threaded in the side of the plug body is adapted to be adjusted into binding engagement with the arm 34 to tightly clamp the same against the wall of the channel 8′.

In the use of this last described form of the plug, when the plug is forced longitudinally into the socket, the series of corrugations 32 on the tongues 30 coact with the corrugated metal liner of the socket and also close one side of the circuit while the center contact of the plug engages the contact plate of the socket as above explained. In either form of the invention, the plug can be readily disconnected from the socket by simply pulling upon the wires or cords, thereby causing the corrugated tongues 32 to yield and move over the corrugations of the metal socket liner. Therefore, the radial pressure of these corrugated tongues against the liner is sufficiently great to prevent an accidental disconnection of the plug from the socket when the device is in use. By means of my improved construction, the connection or disconnection can be easily and quickly effected, while at the same time the plug is a one-piece construction and all of the parts remain permanently connected.

While I have herein shown and described several preferred embodiments of my improved circuit closing plug, it will nevertheless be apparent that the device is susceptible of embodiment in many other alternative constructions, and I accordingly reserve the privilege of adopting all such legitimate changes as may be clearly embodied within the spirit and scope of the invention as claimed.

I claim:

1. A circuit closing plug having conductor receiving apertures and side and end recesses, a contact sleeve surrounding one end of said plug and provided with an offset finger extending into the side recess, and a folded spring band within the end recess having an arm disposd at a right angle to the plane of said band.

2. A circuit closing plug having conductor receiving apertures and side and end recesses, side and end contacts within said recesses having conductors connected therewith, a screw engaging the wall of said plug and one of said conductors, a contact within the end recess comprising a folded spring band bearing at one end against said plug and extending at its other end beyond the open end of said recess and connected with the last named conductor.

3. A circuit closing plug having conductor receiving apertures and side and end recesses, and provided with longitudinally extending surface recesses, the adjacent surface recesses gradually increasing in depth longitudinally in relatively opposite directions, and a contact sleeve surrounding one end of said plug and provided with resilient corrugated tongues alternately extending toward the relatively opposite edges of said sleeve adapted to engage the corresponding recesses of said plug.

4. A circuit closing plug having conductor receiving apertures and side and end recesses, side and end contacts in said recesses, said plug being also provided with longitudinally extending surface recesses gradually increasing in depth longitudinally in relatively opposite directions, the lower end of said plug being also provided with circumferentially spaced notches, and a sleeve engaging one end of said plug provided with resilient corrugated tongues alternately extending toward the relatively opposite edges of said sleeve engaging the longitudinally extending recesses of said plug, and provided also with spaced angularly projecting lips to engage the circumferentially spaced notches of said plug.

5. A circuit closing plug having conductor receiving apertures and recesses, contacts within said recesses, one of said contacts comprising a folded spring band bearing at one end against the plug, and its other end extending out beyond the recess, a conducting wire connected to the band within the recess, and set screw extending through the plug and engaging the conducting wire for holding the band contact within the recess.

6. A circuit closing plug having conductor receiving apertures and recesses, contacts within said recesses, one of said contacts comprising a folded spring band bearing at one end against the plug, and its other end extending out beyond the recess, an arm carried by the band, a conducting wire connected to the arm, and a set screw extending through the plug and engaging the conducting wire for holding the contact connected thereto within the recess.

In testimony that I claim the foregoing as my invention, I have signed my name hereunder.

FRANKLIN DOMINICK.