April 4, 1950 H. E. WALDRON 2,503,012

ELECTRIC PLUG

Filed June 13, 1947

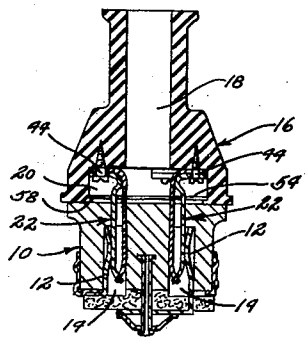


FIG. 1

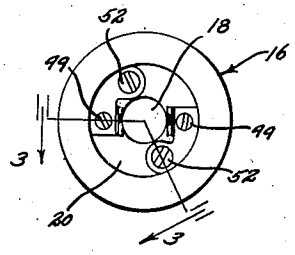


FIG. 2

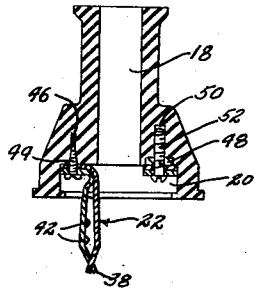


FIG. 3

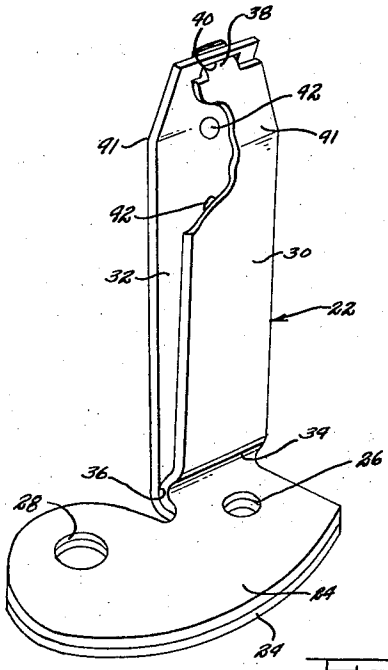


FIG. 4

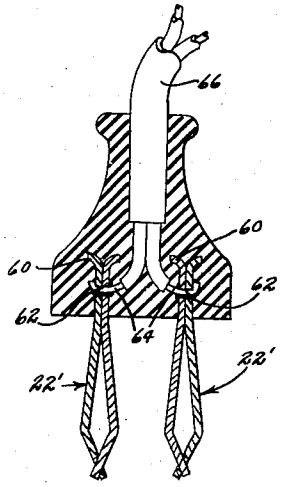


FIG. 5

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Patented Apr. 4, 1950

2,503,012

UNITED STATES PATENT OFFICE

2,503,012

ELECTRIC PLUG

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Application June 13, 1947, Serial No. 754,504

2 Claims. (Cl. 173—361)

1

This invention relates to an improved electrical connector and more particularly to improved spring strip metal contact blades used therein adapted to be inserted into suitable sockets in the circuit.

It has been found by actual experience with the more common type of socket and plug connector, such as those in which the plug is bodily removed from the receptacle in order to break the electric circuit, the plug is quite often subjected to abuses which distort various parts thereof, particularly the contact blades and renders them highly unsatisfactory for use.

As is well known, the solid and rigid blade contacts of an ordinary electric plug of the cap type often fit very loosely in the contact containing openings or recesses of a cooperating electric socket, thereby providing poor electrical contact between the blade contacts of the plug and the contacts of the socket, as well as permitting accidental separation of the plug from the socket.

It is an object of the present invention to provide an electric plug with improved blades or prong contacts of a resilient nature and of such form as to insure a good electrical contact between the same and the contacts of an electric socket, and to insure such functional engagement of the contacts of the plug with the contacts of the socket as to prevent accidental separation of the plug from the socket.

Another object of the invention is to provide a plug having improved prongs which will fit the standard sockets heretofore used without alteration of the socket.

A further object of the invention is to provide a contact prong embodying a pair of resilient leg or blade members which normally are divergent with respect to one another, but movable to a substantially parallel relation when engaged within a socket, thereby insuring contact with the blades throughout their lengths.

A still further object of the invention is to form the resilient legs of the prongs of resilient material and to interlock the free ends of the legs to provide a closed end portion the parts of which are free for relative movement.

Other objects and advantages of the invention will more fully appear from the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a longitudinal sectional view of the plug, engaged in a socket member;

Fig. 2 is a bottom end view of the plug with the cover removed;

2

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2, and

Fig. 4 is an enlarged perspective view of one of the prongs, a portion of one blade being broken away.

Fig. 5 is a cross sectional view showing a modified form of the invention;

Referring to the drawings, a conventional form of socket 10 includes contact plates 12 which are positioned in openings 14 into which the prongs of the plug may be inserted to make the electrical connections. This socket is of usual construction and forms no part of the present invention other than to illustrate an application of the improved plug.

The plug comprises a housing 16 of insulating material, preferably molded rubber, having a central aperture 18 for the passage of electrical wires therethrough. One end of the housing 16 is recessed as at 20 for receiving the prongs generally indicated at 22.

The two prongs 22 are duplicates and each comprises two sheet metal stampings, preferably of resilient material such as spring brass. Each stamping embodies a base portion 24, shaped to fit within the recess 20 of the housing 16 and is apertured as at 26 and 28 for the reception of screws, hereinafter more fully referred to.

Formed integrally with the base portion 24 and extending outwardly at right angles thereto, is a contact portion 30 of a length to project a suitable distance from the face of the housing 16.

The base portion of one stamping is superimposed upon the base portion of the other stamping, as illustrated in Fig. 4, and the contact portion 30 of one stamping is positioned opposite the contact portion 32 of the other stamping. The contact portions 30 and 32 are spaced and extend generally in divergent relation throughout the major portion of their length. The contact portion 30, adjacent its juncture with the base 24, is partially reversely bent, as at 34, to provide a portion 36 which abuts the contact portion 32 near its base permitting the spacing of the outwardly extending contact portions 30 and 32.

The free ends of the contact portions 30 and 32 are bowed slightly toward each other and are brought into contact by a sliding lock arrangement. The outer end of the contact portion 30 is provided with an outwardly projecting tab 38 which is slidingly received in a slot 40 in the outer end of the contact portion 32. This inter-engagement of the ends prevents relative lateral movement of the contact portions 30 and 32 and presents a closed end portion to facilitate insertion

of the prong into the opening of a socket. Offset sections **41** are provided by the divergent blades and the inwardly bowed ends which assure good contact with the terminals in the socket.

Heretofore, when a two part prong has been used, it is generally constructed by bending a sheet of material upon itself but in such constructions the flexing of the contact members causes a fatigue of the metal at the bend and become broken and separated. In the present design the two parts are securely held together, but relative movement is permitted by the slip connection. Thus the connection serves as a fulcrum for the flexing of the parts but it does not fatigue the material.

In order to retain a predetermined maximum thickness of the two parts under maximum flexing toward each other, as in operating position, depressed knobs **42** are stamped into one of the contact portions, projecting toward the other contact portion shown in the contact portion **32**.

The two base portions **24**, provided with the apertures **26** and **28** are secured in the recess **20** by screws **44** threaded into molded apertures **46** in the housing **16**. The apertures **46** are of smaller diameter than the screws so that when the screws are inserted the threads thereof cut into the wall of the aperture and securely hold the contact prongs in position.

A screw threaded washer or nut **48** is molded in the base of the recess **20** and is in axial alignment with a molded aperture **50** in the housing **16**. Screws **52** are received in the apertures **28** for securing the electric wires thereto in contact with the prongs. The screws are threaded into the threaded openings of the washers **48** and into the walls of the apertures **50**, the latter being slightly of less diameter than the diameter of the threaded portion of the screws **52**. This arrangement further increases the holding of the prongs within the recess **20**.

An insulating cover **54**, having apertures **56** is placed over the prongs **22** and is snapped over an inwardly extending flange **58** at the outer end of the recess **20**. The housing being molded of rubber, permits flexing of the flange **58** as the cover **54** is forced under the flange. The flange **58** then retains the cover **54** in position.

In use, the plug is presented to the socket, the prongs **22** being aligned with respective recesses **14** of the socket, which when forced thereinto, presents the prongs against the contact plates **12**, the two contact portions **30** and **32** flexing between the contact plates **12** and the wall of the recess **14**. This action effects a tight frictional engagement.

In a modified form of the invention, Fig. 5, I have shown a plug in which the prongs are molded on the body portion. The outwardly projecting portion of the prongs are substantially the same as shown in Figs. 1 to 4 inclusive, but in place of the base portion **24**, which are secured to the body portion by screws, the prongs are molded in the body portion with the electrical wires attached thereto. In this construction the assembly operation is eliminated. The inner ends of the prongs **22'** are provided with oppositely turned flanges **60**, or other suitable projections, for anchoring the prongs within the molded body. Aligned apertures **62** are formed in the prongs. The bare end **64** of the electrical wire is received in the apertures and held in place by soldering. The body portion which is of insulating material, is then molded around the joints of the assembly, the two-strand wire **66** and prongs **22'** being properly located and held for molding in suitable jigs.

It will be understood that various changes including the size, shape and arrangement of parts may be made without departing from the spirit of my invention and it is not my intention to limit its scope other than by the terms of the appended claims.

I claim:

1. An electric plug comprising a body member of insulating material, a pair of spaced contact prongs projecting outwardly from one face of said body member, each prong formed of two resilient conducting blades which are spaced apart throughout the major portion of their length, one of said blades having an opening therethrough adjacent its outer end, the other blade having a projection at its outer end received in the opening of the first named blade.

2. An electric plug comprising a body member of insulating material, a pair of spaced contact prongs projecting outwardly from one face of said body member, each prong formed of two resilient conducting blades which are spaced apart throughout the major portion of their length, one of said blades having an opening therethrough adjacent its outer end, the other blade having a projection at its outer end received in the opening of the first named blade, and projecting means on one of said blades extending toward the other of said blades.

HAROLD E. WALDRON.

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