Aug. 27, 1935. C. E. GILBERT 2,012,627

ELECTRICAL CONNECTER PLUG

Filed Feb. 28, 1933

Fig. 1

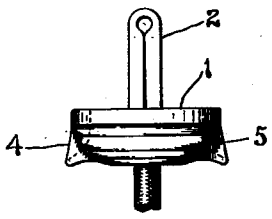


Fig. 2

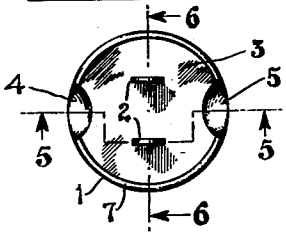


Fig. 3

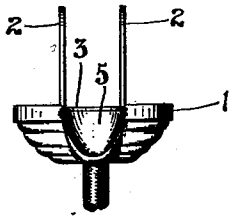


Fig. 4

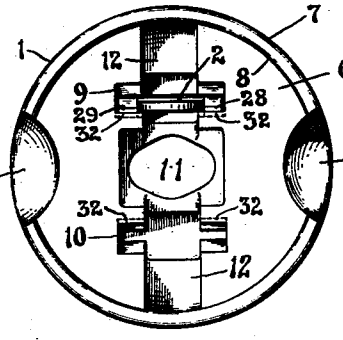


Fig. 5

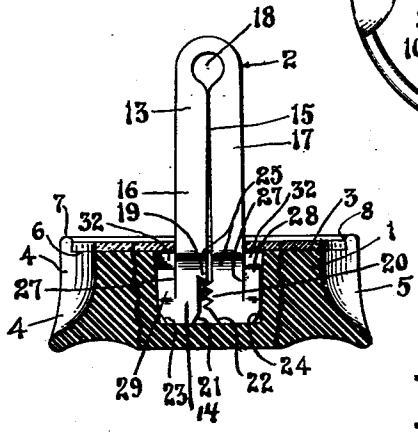


Fig. 6

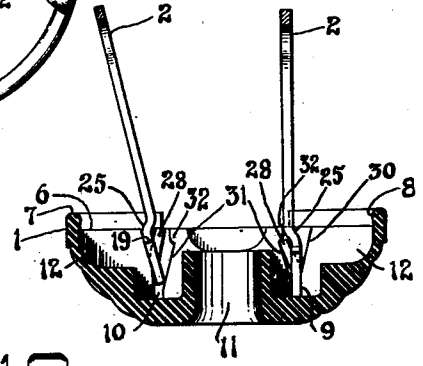


Fig. 10

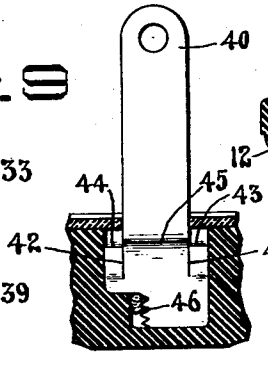


Fig. 7

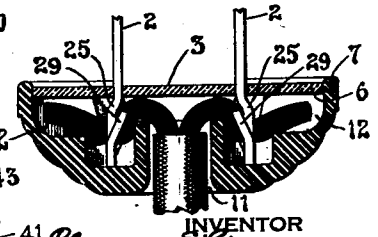


Fig. 8

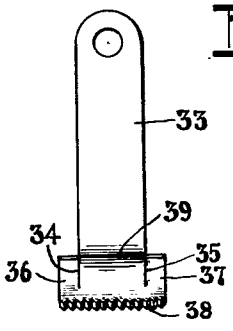
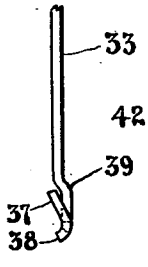


Fig. 9



INVENTOR

Charles E. Gilbert

BY

Darby & Darby

ATTORNEYS

Patented Aug. 27, 1935 2,012,627

UNITED STATES PATENT OFFICE

2,012,627

ELECTRICAL CONNECTER PLUG

Charles E. Gilbert, New York, N. Y.

Application February 28, 1933, Serial No. 658,955

6 Claims. (Cl. 173—361)

My invention relates to electrical connecter plugs and more particularly to connecter plugs used in connection with extension cords or conductors for making separable electrical connection of an electrical appliance with a socket in an electrical circuit.

One of the objects of my invention is to provide an electrical connecter plug so constructed that the insulated wires of an extension cord or conductor may be securely and electrically connected with the connecter blades of the plug without removing the insulation from said wires.

Another object of the invention is to provide an electrical connecter plug provided with removable connecter blades which may be quickly and easily secured in place without the use of tools and in such a manner that they will firmly secure the ends of an extension cord or conductor to the plug and at the same time make electrical contact with the wires of said cord.

A further object of the invention is to provide an electrical connecter plug having slots or recesses therein adapted to receive and rigidly support a pair of removable connecter blades, said slots being so formed that when the blades are in position with respect thereto they cannot be accidentally removed therefrom by reason of any vertical pull exerted thereon.

A further object of the invention is to provide a rugged and efficient electrical connecter plug construction, made of a few parts which are easily assembled without the use of tools, and which is cheap to manufacture.

Other objects of the invention will be more fully described hereinafter and particularly set forth in the appended claims.

The various features of the invention are illustrated in the accompanying drawing in which similar characters of reference are used to indicate corresponding parts in the several views.

Referring to the drawing:

Figure 1 is a view in front elevation of the electrical connecter plug of my invention;

Fig. 2 is a top plan view of the plug as shown in Fig. 1;

Fig. 3 is a view in side elevation of the plug;

Fig. 4 is an enlarged plan view of the plug with the retaining disk removed and with one of the connecter blades shown in position;

Fig. 5 is an enlarged sectional view of the plug taken on the line 5—5 in Fig. 2, looking in the direction of the arrows;

Fig. 6 is an enlarged sectional view taken on the line 6—6 in Fig. 2, looking in the direction of the arrows;

Fig. 7 is an enlarged sectional view similar to Fig. 6 but showing the cord or conductor secured to the plug by the connecter blades;

Fig. 8 is an enlarged side elevational view of a modified form of connecter blade adaptable for use with an electrical connecter plug constructed in accordance with my invention;

Fig. 9 is an edge view of the connecter blade shown in Fig. 8;

Fig. 10 is an enlarged side elevational view of another modified form of contact blade which is adaptable for use with my improved connecter plug construction, the blade being shown in position with respect to the plug which is partially indicated in section.

Referring to the drawing in detail, the improved connecter plug of my invention comprises four parts, namely, a body portion 1; two removable connecter blades 2; and a retaining disk 3.

The body portion of the plug may be made of fibre, bakelite or any other suitable insulating material and is formed in the same general shape as that of the usual connecter plug. The external contour of the body portion is provided with the depressed grip portions 4 and 5 which are adapted to facilitate the handling of the plug when it is to be inserted in a socket or removed therefrom.

The top or prong end of the body portion is provided with a depressed face 6, forming a peripheral shoulder 7. The shoulder 7 is provided with a rounded edge 8. The depressed face 6 is formed with two rectangular shaped recesses or slots 9 and 10 which are positioned on either side of a central aperture 11 in said body portion. These recesses or slots are intended to receive and support therein the removable connecter blades 2. The particular manner in which these slots or recesses are formed is an important feature of my present invention and will be more particularly referred to hereinafter.

The depressed face 6 of the body portion is also formed with a channel portion 12, said channel extends transversely across the body portion and is positioned so that it intersects the central aperture 11 and the recesses or slots 9 and 10.

The connecter blades 2 are adapted to be removably seated in the slots or recesses 9 and 10 of the body portion and may be made in several different shapes. My preferred form of blade is illustrated in Figures 5 and 6. Modified forms of blades are shown in Figures 8, 9 and 10.

The preferred form of connecter blade may be made of any suitable conducting material and is formed so that it is provided with a contact prong end 13 and an enlarged base portion 14

which is adapted to be seated in either of the recesses or slots 9 or 10 in the body portion 1.

The blade is provided with an elongated slot 15 which extends from the bottom edge of the base to a point near the upper end of the prong end portion 13. Said slot forms the blade into two flexible side portions 16 and 17. Preferably said slot 15 is enlarged at its upper end to form an aperture 18 for engagement with the usual projection in the contact member of an electrical outlet.

The slot 15 is slightly offset at the base portion of the connecter blade so as to form a shoulder 19 in the side portion 16. Said shoulder is provided with a downwardly projecting edge the purpose of which will be referred to later on herein.

The side portion 17 of the slotted blade at the base portion thereof is provided with the serrations or teeth 20. The lower ends of the side portions 16 and 17 at their edges adjacent the slot 15 are provided with the beveled corners 21 and 22. The outer lower corners of the base portion are also beveled as at 23 and 24.

The base portion 14 of the blade is offset from the contact prong end 13 so that it is formed with a shoulder 25 and so that it lies in a plane parallel to said contact prong end. The base portion is also provided with slits 27 which form in said base the tongue portions 28 and 29. Said tongue portions are bent outwardly from the plane of said base as clearly shown in Figure 6.

The retaining disk 3 is made of a thin piece of flexible insulating material such as is generally used for similar retaining disks employed for covering the top of the usual type of plug connecter. The retaining disk is provided with spaced slots therein and through which the connecter blades 2 are adapted to extend when said disk is in assembled position with the body portion of the plug.

The retaining disk 3 is of such size and shape as to make a snug fit over the depressed face 6 or the top of the body portion of the plug and within the confines of the shoulder 7 of said top and so its edge will be retained under the rounded edge 8 of said shoulder.

The retaining disk in my improved connecter plug construction serves the double purpose of closing the prong end of the body portion and also to hold the connecter blades in proper position with respect to the slots or recesses 9 and 10.

I will now describe the particular formation of the slots or recesses 9 and 10, located in the depressed face 6 of the body portion 1. These recesses or slots are each formed in a manner which is clearly indicated in Figure 6. The recess or slot is of a general rectangular shape and is made of a width throughout its depth which is slightly greater than the thickness of the base portion 14 of the connecter blade so that said base portion may be readily inserted in the slot or recess and removed therefrom. The open end of the slot or recess is made slightly wider than the lower end of the same so that there is presented an inclined side portion 30 which extends from the opening of the slot to approximately the lower or closed end thereof. The other side of the slot is provided with an inclined portion 31 which extends upwardly from the lower part of the slot and terminates at its upper end in a lip or projecting edge 32.

The length of the slot or recess throughout its depth is made slightly less than the normal length of the slotted connecter blade at its base portion 14 so that it is necessary to compress the side portions 16 and 17 inwardly when the said base is to be positioned in said slot or recess.

In depth, the slot or recess is made substantially equal to the height of the base portion 14 of the connecter blade 2.

When it is desired to assemble the connecter plug for use in connection with an electric cord or conductor, the cord or conductor is first passed through the central aperture 11 of the body portion of the plug and the woven covering therefor is slipped back so as to expose the ends of the two insulated wires. The end of one of the insulated wires is inserted in the slot 15 at the base portion 14 of one of the connecter blades, the insertion of the wire being facilitated by reason of the beveled corners 21 and 22 at the bottom edge of the side portions of the base. When the end of the wire is thus positioned in said slot 15, the teeth or serrations 24 formed on the edge of the side portion 17 of the blade will engage in the insulation surrounding said wire. The insertion of the insulated wire in the slot of the blade will cause the side portions 16 and 17 of the base to be spread slightly away from each other and due to the spring or resiliency of said side portions, the wire will be held securely in the slot and the serration or teeth 24 will be caused to pierce the insulation around said wire. The shoulder 19 formed in the base by the offsetting of the slot 15, will prevent the insulated wire from being forced into the upper portion of the blade and due to the pointed formation thereof it will also tend to grip and pierce the insulation over the wire.

The other insulated wire of the cord or conductor is connected to the other connecter blade of the plug assembly in a similar manner.

The insulated wires of the cord or conductor are inserted in the slots of the connecter blades so that the end portion of the same will extend beyond the plane of base.

The connecter blades 2 with the conductor wires connected thereto are then inserted in their respective slots or recesses 9 and 10 such operation being facilitated by reason of the beveled corners 23 and 24 formed on the base edge of the blade.

By reason of the fact that the length of the recess or slot is slightly less than the normal length of the slotted base portion 14 of the blade, it is necessary that the side portions 16 and 17 of the blade be compressed against the insulated wire in order that the base will fit in the slots. When this is done the serrations or teeth 20 will be caused to bite completely through the insulation and make electrical contact with the wires, and as the base of the blade is forced into the slots in the body portion of the plug, the wire will be firmly gripped and held by the blade in said slot or recess.

The connecter blades when being inserted in their respective recesses or slots 9 and 10 are held in a tilted position as indicated in Figure 6 and so that the projecting tongues 28 and 29 of the base portion are directed toward the side of the slots that is formed with the projecting edge or lip 32. When the base of the blade has been completely inserted in its slots or recess in the body portion it will assume an upright position as illustrated in Figure 6 and the projecting tongues 28 and 29 will become engaged under the projecting edge or lip 32 of the slot and said blade will become locked in said slot or recess of the base against any vertical or upward pull.

The blade may be inserted into the slot in the tilted manner above described by reason of the enlarged opening of the slot and the inclined side 30. When the blades 2 are in position in the slots or recesses in the body portion, the sides of the bent out tongue portions of the base rest against the inclined side portion 31 of the said slot formation.

The insulated wires of the conductor when forced into the slots or recesses 9 and 10 by the connecter blades 2 will be further clamped against the upper edges of the slot or recesses and the ends of said wires and the portions thereof protruding through the central aperture 11 will lie in the channel 12 formed in the recessed face of the body portion of the plug.

To complete the assembly of the connecter plug the retaining disk 3 is slipped over the prong ends of the connecter blades and is snapped into position under the rounded edge 8 of the peripheral shoulder 7 formed in the body portion. The holes in said disk 3 through which the prong end of the connecter blade projects are so positioned that when the disk is in place with respect to the body portion of the plug, said disk will rigidly hold and prevent the connecter blades from being moved laterally in the slot so as to disengage the projecting tongues 28 and 29 from under the projecting lips 32 of said slots or recesses 9 and 10.

In disassembling the plug all that is necessary is to remove the insulating disk 3 from out of engagement with the edge 8 of the shoulder 7 and lift it from the body portion of the plug. The blades are then rocked towards the inclined side 30 of the slot or recess in the body portion so that the tongues 28 and 29 become disengaged from under the projection or lip 32 and the blade is then lifted out of said slot or recess and the wire removed from the slots in said blades.

In Figure 8 I have shown a modified form of blade which may be used with a plug body portion constructed as above described. With this type of connecter blade the insulated wire is forced into the slots or recesses of the body portion of the plug by the blade which is made of a solid piece of conducting material 33. The base portion of this type of blade is formed with the slits 34 and 35 forming tongue portions 36, 37. Said tongues are bent outwardly from the base as clearly shown in Figure 9. The lower edge of the base portion is formed with the serrations or teeth 38. The base portion of the blade is offset from the prong portion in the same manner as the blade previously described and so as to form the shoulder 39.

In the use of this type of connecter blade the serrations or teeth 38 bite into the insulation of the wire as it is forced into the slot or recess of the base portions and thus makes the desired electrical contact with the wire. The blade is inserted and becomes locked in the slot or recess in the same manner as in the case of the blade previously referred to.

In Figure 10 a further modified form of blades is shown. This blade is made of a solid piece of conducting material 40. The base portion of the blade is provided with the slits 41 and 42 which form the tongues 43 and 44. Said tongues are bent outwardly from the plane of the base in the same manner as the tongues formed in the previously described blades. The base portion of this type of blade is also offset from the plane of the prong portion thus forming a shoulder 45. The lower left hand corner of the base is formed with a square shaped cut out or notched portion therein having the serration or teeth 46 provided along one of the sides of said notched portion.

This construction of blade is forced in the slot or recess of the body portion so that the insulated wire is positioned in the cut out or notched portion thereof. As the wire is forced into the slot or recess, the wire is forced against the sides of the slot and the serrations or teeth 46 bite into the insulation and cause the blade to make electrical contact with the wire.

From the foregoing it will be seen that I have provided an exceedingly simple and efficient construction for an electrical connecter plug which is made of a few simple parts which are cheap to manufacture and which may be assembled quickly and without the use of tools. When the parts are in assembled relation it presents a ruggedly constructed connecter plug which will not get out of order and which will withstand unusual strains that may be placed on the cord or conducter wires connected thereto.

It will be understood, of course, that the term "plug" as used in the specification and claims is not limited to forms having the general appearance of those shown in the drawing but includes any other forms having the characteristics described and claimed, irrespective of superficial appearance.

What is claimed is,

1. An electric plug comprising a body portion provided with a recess open at one end for receiving and supporting therein a contact blade, a contact blade removably seated in said recess and provided with means to pierce the insulation of an insulated wire and to make contact with the wire within when said blade is seated in said recess, means formed in said recess engaging with the contact blade to retain the same in wire contacting position against longitudinal displacement, and means for maintaining said contact blade in locked engagement with said retaining means of said recess against lateral displacement.

2. An electric plug comprising a body provided with a longitudinal recess, a contact blade removably seated within said recess and having an offset upwardly extending tongue, a shoulder on the wall of said recess the under side of which engages with said tongue to retain said contact blade against longitudinal displacement, means on said contact blade for piercing the insulation of an insulated wire and making contact with the wire within, and means for retaining said contact blade against lateral displacement.

3. An electric plug comprising a body provided with a longitudinal recess for the reception of an insulated wire and a contact blade, a removable contact blade one end of which is seated within said recess, said end terminating in means for piercing the insulation of an insulated wire and making contact with the wire within, means for maintaining said blade in said recess in wire contacting position against longitudinal displacement, and means for retaining said blade against lateral displacement.

4. An electric plug comprising a body having a recess for the receipt of an insulated wire and a contact blade, a removable contact blade one end of which is seated within said recess, said end terminating in means for piercing the insulation of an insulated wire and making contact with the wire within, an offset tongue on said blade, a shoulder on the wall of said recess engaging with said tongue to maintain said blade in wire con-

tacting position and against longitudinal displacement, and means for maintaining said blade against lateral displacement.

5. An electric plug comprising a body having a recess within it open at one end, a removable contact blade seated within said recess and having an offset end provided with means for piercing the insulation of an insulated wire and making contact with the wire within, means on said blade engaging with cooperating means in said recess to maintain said blade against longitudinal displacement, and separate means for maintaining said blade against lateral displacement.

6. An electric plug comprising a body having a longitudinal recess within it open at one end, a removable contact blade one end of which is seated within said recess, a side edge of said end being provided with means for piercing the insulation of an insulated wire and making contact with the wire within and also for wedging said wire against the side wall of said recess, means on said blade engaging with means in said recess for maintaining said blade against longitudinal displacement, and means for maintaining said blade against lateral displacement.

CHARLES E. GILBERT.