

Jan. 4, 1944.

J. B. CAMPBELL
ELECTRICAL CONNECTOR

2,338,281

Filed Sept. 8, 1942

2 Sheets-Sheet 1

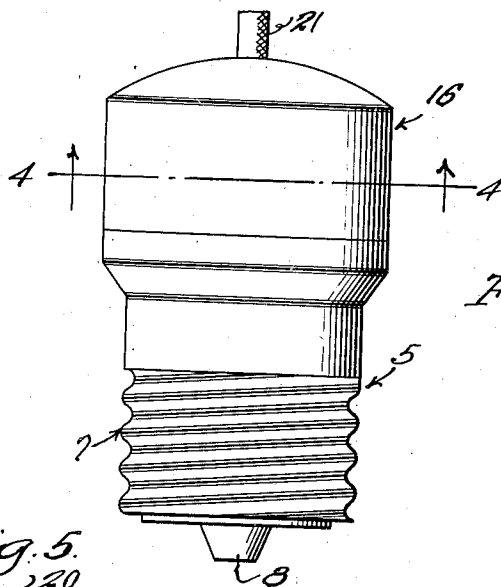


Fig. 1.

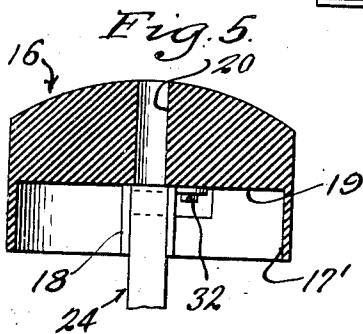


Fig. 5.

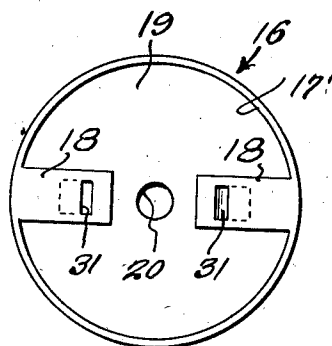


Fig. 6.

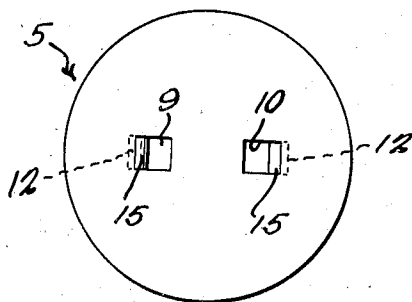


Fig. 7.

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2 Sheets-Sheet 2

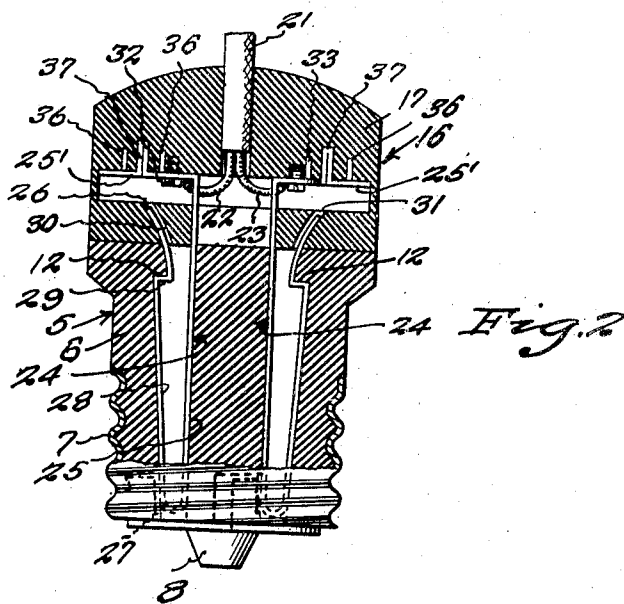


Fig. 3

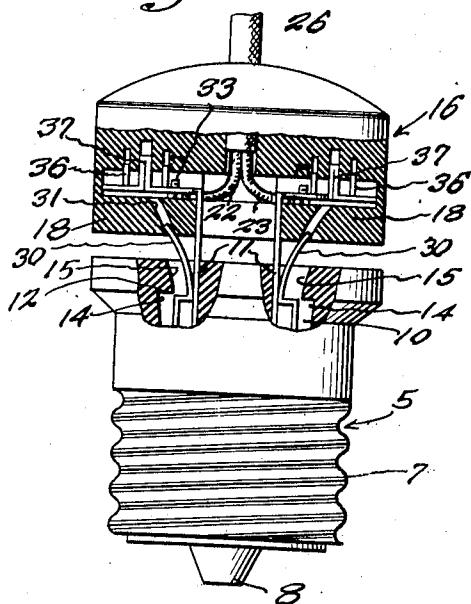
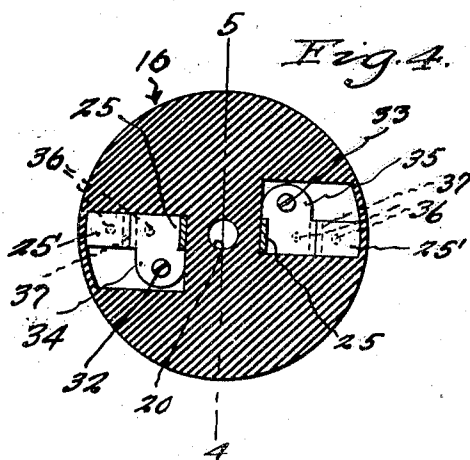


Fig. 4



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UNITED STATES PATENT OFFICE

2,338,281

ELECTRICAL CONNECTOR

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Application September 8, 1942, Serial No. 457,663

2 Claims. (Cl. 173-343)

The invention relates to improvements in electrical connectors of the type consisting of a receptacle and a separable plug, and more particularly to an arrangement of this character incorporating self-locking features, whereby the electrical connection effected by assembling the plug on the receiver is not disturbed by any pull upon the cord attached to the plug and separation of the plug from the receiver can be effected only by moving the plug body relative to the receiver, and the primary object of the invention is to provide a simple, practical, and efficient device of this character.

Other important objects and advantages of the invention will be apparent from a reading of the following description taken in connection with the appended drawings, wherein for purposes of illustration I have shown a preferred embodiment of the invention.

In the drawings:

Figure 1 is a general side elevational view of the connector showing the plug assembled with the receiver.

Figure 2 is a general transverse vertical sectional view taken through Figure 1.

Figure 3 is a view similar to Figure 1 but showing the plug partly separated from the receiver and with portions cut away to disclose internal construction.

Figure 4 is a horizontal view taken through Figure 1 along the line 4-4 and looking upwardly in the direction of the arrow.

Figure 5 is a transverse sectional view taken through Figure 4 along the line 5-5 and looking toward the left in the direction of the arrow.

Figure 6 is a bottom plan view of Figure 5.

Figure 7 is a top plan view of the receiver.

Referring in detail to the drawings, the numeral 5 generally designates the receiver which consists of a generally cylindrical insulated body 6 having a threaded metal ferrule 7 on its lower part to screw into a wall socket or the like (not shown). A center contact 8 is arranged in a usual manner at the center of the bottom of the receiver. The receiver body 6 is formed longitudinally with a pair of diametrically opposed laterally spaced channels 9 and 10 whose inner sides 11 are substantially straight and parallel to the axis of the receiver and whose outer sides are divergently and upwardly tapered so that there is a wider aperture toward the upper part of the channels than at the lower end thereof, as clearly shown in Figure 2 of the drawings. Adjacent the upper ends of the channels the outer divergent walls have shoulders 12

whose faces are substantially at right angles to the axis of the receiver body, the shoulders projecting in a radially inward direction from the outer walls 14 and being downwardly and inwardly curved at their upper part as indicated by the numerals 15.

The plug which is generally designated 16 comprises a cylindrical dielectric body 17 which has a depending annular rim 17' from diametrically opposite sides of which there project in a radially inward direction two diametrically aligned lugs 18 which are spaced from the bottom 19 of the plug body proper. An axial bore 20 is provided in the plug body to pass the electrical cord 21 into the hollow portion of the plug body to allow the wires 22 and 23 of the cord to be connected in a manner to be described.

The plug has two similar spring prongs or blades 24 each of which comprises a straight inner longitudinal portion 25 which terminates at its upper end in a substantially right angularly and laterally bent portion 25', while terminating at the opposite end in a hairpin bend 27 which leads into an upwardly and laterally outwardly deflected portion 28 which adjacent its upper end has a right angularly and laterally inwardly directed lock portion 29 to conform to the shoulder 12, the lock portion 29 having an upwardly and laterally outwardly curved cam portion 30 which substantially conforms to the curvature 15 above the shoulder and also with the curvature of slots 31 which are formed in the lugs 18 of the plug body. The prongs or blades have the portions 25 and 28 thereof sprung to have divergent tendencies so that the portions 25 normally engage the inner walls 11, of the channels 9 and 10 whereas the portions 28 normally engage the outer walls 14 of the said channels. In view of the normal tendency of the portions 28 in a laterally outward direction, once the prongs are fully inserted in the channels of the receiver, the lock portions 29 engage under the shoulders 12 and positively lock the prongs against withdrawal by any means which does not effect laterally inward movement of the portions 28 of the prongs and consequent displacement of the lock portions 29 from the shoulders 12. Suitable contact means for engagement by the prongs is provided within the receiver to effect electrical connection with the ferrule 7 and with the center contact 8.

The laterally inward portions of the parts 25' on the upper ends of the prongs have binding post screws 32 and 33 located in oppositely projecting lateral lugs 34 and 35 arranged within

the space between the lugs 18 and the top 19 of the plug body, to which the wires 22 and 23 are fastened in a usual manner. In addition the parts 25' have small lugs or pins 36 arranged in pairs, and between them an upset portion 37, both the pins and the upset portion being loosely arranged in accommodating openings formed in the top 19 of the body, so that the parts 25' are free for vertical or axial motion in the plug body limited only by the space between the top surface 19 and the upper surface of the lugs 18. In constructing the device of the invention this space will be gauged to provide for sufficient movement of the prongs relative to the plug body to enable the plug body, by partial separation from the receiver 5, as indicated in Figure 3 of the drawings to operate its cam slots 31 against the cam portions 30 on the prongs to effect laterally inward deflection of the portions 28 of the said prongs and unseating of the lock portions 29 from the locking shoulders 12, in which condition the prongs may be withdrawn from the channels 9 and 10 and the plug 16 entirely separated from the receiver 5. It will be observed that to lockably connect the plug to the receiver and to lock the prongs of the plug in the channels of the receiver it is necessary only to bring the plug and receiver together in the usual manner.

Although there is shown and described herein a preferred embodiment of the invention, it is to be definitely understood that it is not desired to limit the application of the invention thereto except as may be required by the scope of the subjoined claims.

Having described the invention, what is claimed as new is:

1. A self-locking electrical connector of the character indicated, said connector comprising a receiver consisting of a dielectric body formed with a pair of diametrically opposed longitudinally arranged channels, the laterally outward walls of said channels having radially inwardly projecting locking shoulders, a plug having a pair of diametrically arranged laterally spaced spring prongs thereon, said prongs being arranged to enter the said channels as the plug and receiver are assembled, said prongs having outwardly spring-pressed portions including locking knees adapted to engage under said locking shoulders

on the outer walls of the channels to positively prevent withdrawal of the prongs from contact position in the receiver, said outwardly spring-pressed locking knees of the prongs being formed with cam surfaces, and portions of said plug being formed with cam surfaces cooperating with the first-mentioned cam surfaces, and means permitting limited axial movement of the plug relatively to the prongs, whereby withdrawal movement of the plug relative to the receiver produces laterally inward deflection of the spring-pressed portions of the prongs so as to dislodge the locking portions from the locking shoulders and allow the prongs to be withdrawn from the channels.

2. A self-locking electrical connector of the character indicated, said connector comprising a receiver consisting of a dielectric body formed with a pair of diametrically opposed longitudinally arranged channels, the laterally outward walls of said channels having radially inwardly projecting locking shoulders, a plug having a pair of diametrically arranged laterally spaced spring prongs thereon, said prongs being arranged to enter the said channels as the plug and receiver are assembled, said prongs having outwardly spring-pressed portions including locking knees adapted to engage under said locking shoulders on the outer walls of the channels to positively prevent withdrawal of the prongs from contact position in the receiver, said outwardly spring-pressed locking knees of the prongs being formed with cam surfaces, and portions of said plug being formed with cam surfaces cooperating with the first-mentioned cam surfaces, whereby withdrawal movement of the plug relative to the receiver produces laterally inward deflection of the spring-pressed portions of the prongs so as to dislodge the locking portions from the locking shoulders and allow the prongs to be withdrawn from the channels, and means connecting said prongs to the plug to permit limited axial movement of the plug relative to the prongs so as to allow said cam surfaces to act on the prongs to release them from locking position, said connecting means consisting of a pair of pins with an upset portion between them arranged in accommodating openings in said plug.

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