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C. E. GILBERT

2,283,889

ELECTRICAL CONNECTOR

Filed Jan. 23, 1941

Fig. 1.

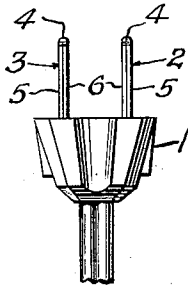


Fig. 2.

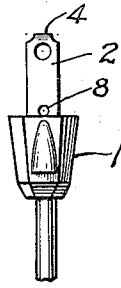


Fig. 3.

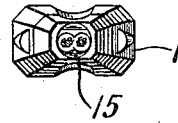


Fig. 5.

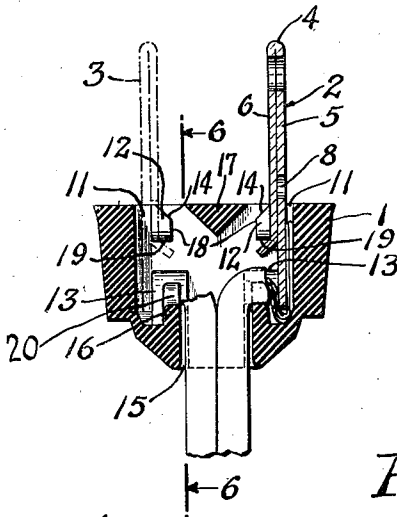


Fig. 4.

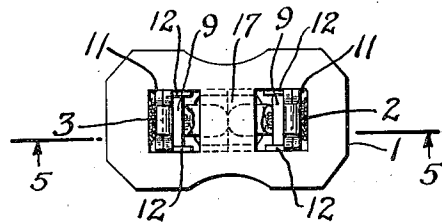


Fig. 6.

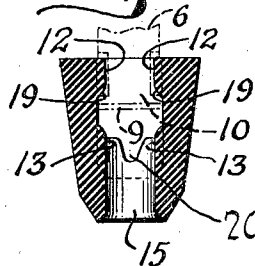
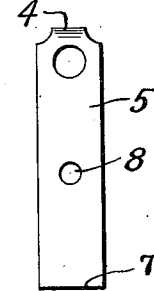
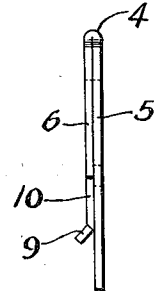
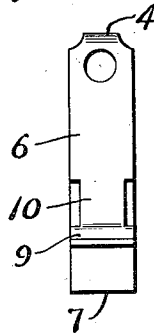
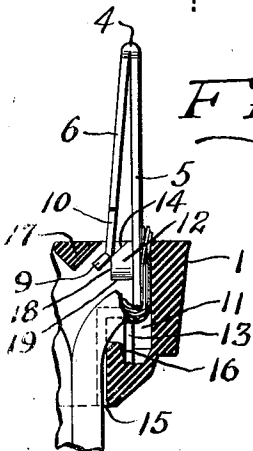


Fig. 8. Fig. 9. Fig. 10.

Fig. 7.



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ELECTRICAL CONNECTOR

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8 Claims. (Cl. 173-361)

This invention relates to a new and useful improvement in electrical connectors such as are used for making electrical connection between outlets and appliances between two electric cords, or for numerous other purposes which will occur to those skilled in the art.

The objects of the invention are the provision of a connector having a minimum of parts, which can be produced at a minimum of cost, in which the contact elements are securely retained and held in correct alinement, and also in secure contact with the conductors without the use of screws, rivets, or other attaching devices, and in which the connection of the conductors to the contact elements is a step in the assembly of the connector itself. Unlike most connectors of this general type, this connector can be disassembled and assembled again with the greatest ease by anyone capable of attaching a cord to any connector.

The form of the invention shown in the drawing and described herein is commonly called an electric plug, and will be so referred to herein, but it will be understood that the invention is not limited thereto, but is applicable to various other types of connector.

In the drawing—

Figures 1, 2 and 3 are, respectively, a front elevation, a side elevation and a top plan view of the plug embodying the invention assembled and connected to a cord having two conductors;

Figure 4 is a plan view of the other or bottom end of the plug;

Figure 5 is an enlarged longitudinal cross-section of the plug on the line 5-5 of Figure 4, viewed as indicated by the arrows;

Figure 6 is an enlarged longitudinal cross-section on the line 6-6 of Figure 5, viewed as indicated by the arrows;

Figure 7 is an enlarged fragmentary view, partly in section, to illustrate the manner in which each contact element is inserted in the body and connection made with a conductor; and

Figures 8, 9 and 10 are, respectively, enlarged views of one side, the edge, and the other side of a contact element.

As shown in the drawing, and particularly in Figure 5, the plug consists of three parts, the body 1, and contact elements 2 and 3. The body may be molded in a single operation from "Bakelite" or other suitable insulating material.

Each contact element may be made by a single stamping operation from a strip of conducting material bent upon itself as at 4 to form a two-legged blade adapted for insertion into an elec-

trical outlet. One leg 5 of the contact element is somewhat longer than the other leg 6. Preferably, it is of uniform width throughout and terminates in a square end 7. Leg 5 is also provided with an opening 8 positioned so that it will be slightly above the point at which the contact element emerges from the body when the plug is in assembled condition, as shown in Figure 5. The free end of the other leg 6 consists of a latch 9 joined to the main part of the leg by a constricted neck 10, formed by stamping out portions from each edge of the leg. Latch 9 is offset outwardly at an acute angle to the general plane of leg 6, as best shown in Figures 5, 7 and 9.

The body 1 is provided with a recess 11 for each contact element, of which the inner end is closed and the other end opens through the bottom end of the plug. Each recess is rectangular in shape and of solid wall construction with the exception of the inner wall, which consists of a pair of opposed bosses 12 adjacent the open end of each recess, and another pair of opposed bosses 13 of similar height adjacent the closed end of each recess. As will be seen from Figures 5 and 6, bosses 12 and 13 form with the other recess a groove of substantially the same width as the width of the contact element and slightly thicker than the thickness of leg 5 of the contact element. The height of each boss 12 and 13 is limited to that required to form adequate guides and supports for leg 5 of the contact element, so that ample space is left between them for the passage of an insulated conductor (see Fig. 6). The inside upper edge of each projection 12 is cut away at an angle, as shown at 14, for a purpose which will be hereinafter explained.

Body 1 is also provided with the usual opening 15 communicating with the interior of the plug through which the electrical cord can be inserted, which opening is separated from the bottom of each recess by a partial wall 16. Directly opposed to opening 15 at the other end of the body is a V-shaped integral portion 17.

Wall portion 16 is cut at the points opposite the recesses by U-shaped grooves 20. Each of notches 20 should be slightly narrower than the diameter of the insulated conductor.

To assemble this plug and connect it to an electric cord, the two insulated conductors of the cord are first separated and the insulation removed from their ends. Then they are inserted into the plug through opening 15 until the bare ends project a little above the other end of the plug body, V-shaped portion 17 serving as an

effective means for guiding the two wires in opposite directions towards recesses 11.

The free end of long leg 5 is then used to press the bare end of a conductor against the outer end of a recess, after which the leg is inserted in the groove formed by the walls of the recess and the projections 12. Then leg 5 is pushed into the recess, with the result that the bare wire will be folded around its end 7, and will ultimately assume the position shown in Figure 5 in which it is pinched between the outer wall of the recess and the side of leg 5. In addition, the insulated portion of the wire is jammed into groove 20 and bent sharply over its bottom edge before it enters the opening 15. The presence of insulation at groove 20 is insured if the end 7 of the contact element 5 is engaged with the bare conductor close to the end of the insulation before it is pushed into its recess. In this way if the cord is pulled the strain will be largely absorbed by the insulated conductor and removed from the non-insulated ends, and the permanence of the assembly positively assured.

While leg 6 is being inserted into its recess in this way, the offset latch 9 of the other leg has come in contact with the sloping faces 14 of bosses 12, which act as cams to swing this leg inwardly, as shown in Figure 7. Thereafter, the end of leg 6 will slide down faces 18 of bosses 12 until their lower ends are reached, whereupon latch 9 will snap under their lower ends 19, assuming the position shown in Figure 5, neck 10 being narrow enough to pass between bosses 12. The contact elements are now rigidly held in accurate alinement by the walls of the recesses and bosses 12 and 13, and are securely, though removably, locked against longitudinal displacement.

The majority of plugs in which the contact elements are mounted in the body without rivets or other attaching means, cannot be easily disassembled for the replacement of a broken wire or any other purpose. Therefore, they are useful only to manufacturers or sellers of electric cords or appliances which are equipped with specially constructed assembling machines.

The plug of this invention is designed particularly for sale to the public and to be easily assembled and disassembled without the use of any special machine or tool. The method of assembly has already been described. It will be evident that it can be performed by anyone of average intelligence. Disassembly is even simpler. All that is required is to insert through the opening 8 in leg 5 a pointed instrument, or even a wire or a match, which is strong enough to press the other leg 6 inwardly until latch 9 is disengaged from bosses 12, whereupon the contact element can be removed from its recess without difficulty. Therefore, this plug can be used over and over again in the home by almost anyone.

I claim:

1. An electrical connector consisting of a one-piece body having a recess closed at one end for a contact element, a contact element consisting of a strip of conducting material folded upon itself to form two legs substantially in contact, means in said body adjacent the open end of said recess to separate the free end of one leg from the other when said other leg is forced into said recess and to permit said first-mentioned leg to again move into substantial contact with said other leg when said other leg is fully seated in said recess.

2. An electrical connector consisting of a one-

piece body provided with a recess closed at one end, a contact element consisting of a strip of resilient conducting material bent upon itself to form two legs substantially in contact with each other, a pair of opposed bosses in said body adjacent the open end of said recess, said bosses comprising means for springing the free end of one leg of said contact element away from the other when said other leg is forced into said recess and for permitting said legs to move into substantial contact with each other again when said other leg is fully seated in said recess, locking means on said first-mentioned leg which, when said other leg is fully seated in said recess, lies below said bosses and prevents removal of said contact element from said recess by engagement with said bosses.

3. An electrical connector consisting of a one-piece body provided with a recess closed at one end, a contact element consisting of a strip of resilient conducting material folded upon itself to form two legs in substantial contact with each other, a pair of opposed bosses in said body adjacent the upper end of said recess, a cam surface on each of said bosses for causing one of said legs to separate from the other when said other leg is forced into said recess and to permit said first-mentioned leg to move again into substantial contact with said other leg when said other leg is fully seated in said recess, a latch on said first-mentioned other leg positioned below said bosses when said other leg is fully seated in said recess to prevent removal of said contact element from said recess.

4. An electrical connector consisting of a one-piece body provided with a recess closed at one end, a contact element consisting of a strip of resilient conducting material folded upon itself to form two legs in substantial contact with each other, a pair of opposed bosses in said body adjacent the upper end of said recess, a cam surface on each of said bosses for causing one of said legs to separate from the other when said other leg is forced into said recess and to permit said first-mentioned leg to move again into substantial contact with said other leg when said other leg is fully seated in said recess, a latch on said first-mentioned leg positioned below said bosses when said other leg is fully seated in said recess to prevent removal of said contact element from said recess, said bosses also constituting a part of one wall of said recess.

5. An electrical connector according to claim 2, in which the body is also provided with an opening for the introduction of an electric cord separated from the bottom of said recess by an inwardly-extending projection, the upper edge of which is provided with a transverse substantially U-shaped groove.

6. An electrical connector according to claim 3, in which said body is also provided with an opening for the introduction of an electric cord, said opening being separated from the bottom of said recess by an inwardly-extending projection, the upper end of which is provided with a transverse substantially U-shaped groove.

7. An electrical connector consisting of a one-piece body provided with a recess closed at one end, a contact element consisting of a strip of resilient conducting material bent upon itself to form two legs substantially in contact with each other, a pair of opposed bosses in said body adjacent the open end of said recess, said bosses comprising means for springing the free end of one leg of said contact element away from the

other when said other leg is forced into said recess, and for permitting said legs to move in substantial contact with each other again when said other leg is fully seated in said recess, a latch on said first-mentioned leg engageable with the under-side of said bosses when said other leg is fully seated in said recess to prevent removal of said contact element from said recess, a second pair of opposed bosses adjacent the bottom of said recess, which pair of bosses cooperates with said first-mentioned pair of bosses to maintain said

contact element in correct alinement in said recess.

8. An electrical connector according to claim 2, in which said other leg of said contact element is provided with an opening for the passage of means for manually springing said first-mentioned leg away from said other leg to move said locking means from below said bosses to permit removal of said contact element from said recess.

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