

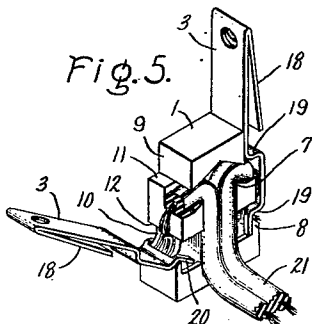
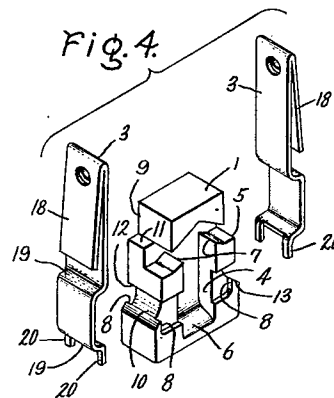
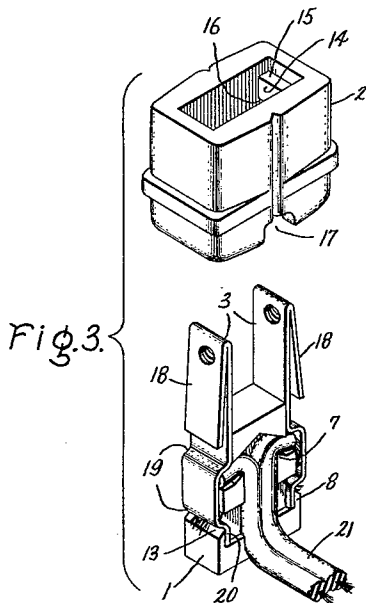
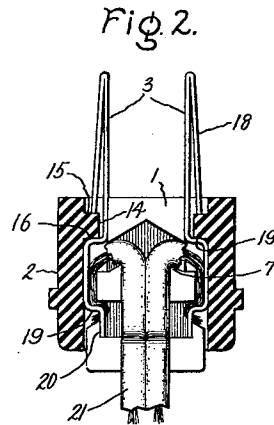
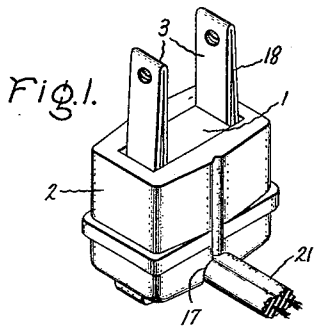
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PLUG CONNECTOR

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UNITED STATES PATENT OFFICE

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PLUG CONNECTOR

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The present invention relates to plug connectors of the type used for connecting an electric cord to a plug receptacle or convenience outlet.

The object of my invention is to provide an improved construction and arrangement of plug connector which does not utilize screws for connecting the wires of the cord to the plug contact blades, which can be easily and quickly connected to and disconnected from a cord, and which is so constructed that there is provided an efficient strain relief for the cord so that pull on the cord is not transmitted to the wire connections of the contact blade.

A further object of my invention is to provide an improved plug construction wherein the contact blades are utilized to hold the plug assembled.

Other objects and advantages of my invention will be pointed out hereinafter, and for a consideration of what I believe to be novel and my invention, attention is directed to the following specification and to the claims appended thereto.

In the drawing, Fig. 1 is a perspective view of a plug connector embodying my invention, a length of wire being shown connected thereto; Fig. 2 is a transverse sectional view of the construction shown in Fig. 1; Fig. 3 is a perspective view showing the connector disassembled; Fig. 4 is a perspective view of the core and contact blades of the connector; Fig. 5 is a perspective view showing the way in which the cord is assembled on the core and held by the contact blades.

Referring to the drawing, the plug connector comprises four elements or parts, a core 1, a housing 2, and two contact blades 3.

The core comprises a rectangular block of suitable material, such as suitable molding compound having walls which define in one side face, which may be termed the front face, a generally T-shaped recess or groove, the leg 4 of which extends vertically of the face and terminates short of the lower end of the core and the side arms 5 of which extend transversely of the face and entirely across it. The wall at the lower ends of leg 4 slopes to form a downwardly and outwardly directed surface 6 over which the cord extends. The lower walls of arm 5 are shaped to define upwardly projecting corners or edges 7 over which the two strands of the cord are bent. In the front and rear faces of the core are recesses which define shoulders 8; and in what may be termed the end faces are upper and lower transverse grooves 9 and 10, which define spaced

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shoulders 11 and 12. The walls which define the lower or bottom edges of grooves 10 are are sloped downwardly, as is indicated at 13.

Housing 2 comprises a rectangular shell open at its top and bottom and having an internal contour of a size to receive core 1 after contacts 3 and an electric cord have been assembled on the core, with an easy sliding fit, so that the core with the contacts and cord assembled thereon may be readily slipped into the housing and removed therefrom. The housing may be formed of any suitable material, such as a suitable molding compound. Inside housing 2 on its end walls are projections 14 which extend across the end walls and define upper and lower shoulders or stops 15 and 16. In the front wall of the housing at its lower end is a groove 17 which is in alignment with the leg 4.

Each contact blade comprises a strip of metal, the outer portion of which is formed to provide a spring locking tongue or part 18, the lower end of which in the assembled structure engages shoulder 15 to fasten the core with the contact blades thereon in the housing. In the present instance, locking tongues 18 are formed by reversely bending the strip of metal on itself. However, they may be formed in any other suitable way, the essential thing being that spring tongues are provided for engagement with shoulders 15. The inner portion of each contact blade is shaped to provide shoulders 19 which fit against shoulders 11 and 12 on core 1. Otherwise viewed, the inner end of each contact strip is formed to provide a depression which fits over the projection on core 1 defined between shoulders 11 and 12. At its lower end, the inner portion of each blade is provided with a pair of spaced fingers or prongs 20 which in the assembled structure fit behind shoulders 8. A cord end is indicated at 21.

To assemble the plug connector on a cord end, the insulation is removed from the wires at the end of the cord to provide a length of bare conductor. The end of the cord is then placed in leg 4 of the core as shown clearly in Figs. 2, 3, and 5 and the two wires of the cord with the insulation thereon are turned at right angles and positioned in the arms 5 of the T slot, the insulation terminating at about the ends of the slots. The bared conductors are then turned down at right angles to extend across grooves 10 as shown at the left-hand side of Fig. 5. Next the contact blades are assembled on the core. In assembling the contact blades, a blade is first positioned as shown at the left-hand side of

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Fig. 5, the prongs 20 extending across the tops of the walls which define shoulders 8. It is then turned at an angle to bring the prongs 20 behind shoulders 8 and to bring shoulders 19 on the contact blade into engagement with upper and lower shoulders 11 and 12 on the core 1. This serves to fix the contact blade on the core against up and down movement and also against outward movement at its lower end. It serves also to clamp the bared wire end tightly between the contact blade and the core and effect good electrical connection between the wire and the blade. After the cord end and contact blades have been assembled on the core, the arrangements of the parts is that shown at the lower portion of Fig. 3. The core 1 with the cord end and contact blades assembled thereon is then pushed into housing 2 from the lower side thereof; or, as viewed in Fig. 3, the housing may be pushed down over the core and blades. Locking tongues 18 spring inwardly to permit of the assembling. When pushed into place, the upper shoulders 19 on the contact blades engage shoulder 16 of the housing to limit the telescoping of the core and housing, and locking tongues 18 spring out over shoulders 11 to lock the core with the blades and core end assembled thereon in the housing. Thus the core is locked in the housing against movement in either direction by projections 14.

Leg 4 is of a width and depth such that cord 21 fits snugly therein, and when the core is positioned in the housing, the cord projects angularly from one side of the plug connection at its outer end. In this connection it will be noted that in the assembled structure the core projects somewhat below the housing. When bent up into groove 17, the cord may extend at right angles from the connector. This angular extension of the cord forms a strain relief for the cord. Also the right angular extension of the conductor ends through side arms 5 and over projecting corners or edges 7 provides a further strain relief for the cord. By reason of such arrangement of the cord in the plug connector, pull on the cord is not transmitted to the electrical connection between the conductor ends and the contact blades. As will be clear, the device may be used as either a side outlet connector or as a connector with the cord coming out the end in line with the contact blades.

While I prefer to terminate leg 4 short of the bottom of the core and provide for angular extension of the cord, other arrangements may be used in carrying out my invention. Also, while I have shown the plug connector as being rectangular, other shapes may be used in carrying out the invention.

The conductor ends are squeezed between the inner ends of the contact blades and the core and are firmly held by the housing, thus effecting a tight electrical connection over a substantial area of blade end.

To dismantle the connector, it is necessary merely to squeeze in the locking tongues 18 so they are out of line with shoulder 15 and slip the housing off the core. In this connection, it will be noted that the shoulders 11 are of a depth such that the ends of tongues 18 may be moved out of line with shoulders 15.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my plug connector together with what I now consider to be the best embodiment of the invention; but I desire to have it understood that the embodiment shown is only illustrative and

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that the invention may be carried out by other arrangements and modifications.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A plug connector comprising a core, walls defining passages in the core for electrical conductors, contact blades the inner ends of which have parts in interlocking engagement with the core, and a housing in which the core is positioned with a sliding fit, the outer ends of the contact blades being reversely bent on themselves to provide spring locking tongues which engage the housing to hold the plug connector assembled.

2. A plug connector comprising a core, walls defining a T-shaped recess in a face of the core, the arms of which extend across such face, said recess being adapted to receive an electric cord end, walls defining shoulders on sides of the core, contact blades the inner ends of which have parts in interlocking engagement with said shoulders to position the blades on the core, the inner ends of the blades and the adjacent core being adapted to clamp bared conductor ends, a housing in which the core is positioned with a sliding fit, and means including releasable interlocking parts between the blades and the housing to hold the plug assembled.

3. A plug connector comprising a core, walls defining a longitudinally extending groove in a side surface of the core for the reception of a cord end, walls defining grooves in such side surface of the core which extend angularly with respect to said first-named groove and are adapted to receive the conductor ends of a cord end positioned in said first-named groove, contact blades having portions engageable with the conductor ends of the cord, means including fingers on the lower end of said contact blades and shoulders on the lower end of said core for locating the lower end of each of said contact blades on said core to limit laterally outward movement of the finger end of said blades away from said core, cooperating shoulders on said contact blades and said core for limiting longitudinal movement of the blades away from said core, a housing open at its two ends in which the core is positioned with a sliding fit from the lower end of the housing, and releasable means for holding the connector assembled.

4. In combination, a core having a longitudinally extending groove and two grooves extending angularly with respect thereto in opposite directions, a two-conductor cord having an end positioned in said longitudinally extending groove with its two conductors in said angularly extending grooves, bared wire end of the conductors extending down along the sides of the core, contact blades, interlocking means positioning the contact blades on the core with the wire ends between the blades and the adjacent core surfaces, a housing for the core having a sliding fit therewith, and spring locking members on the blades which engage the housing to hold the structure assembled.

5. A plug connector comprising a rectangular core having upper, lower and opposed end faces, walls defining a longitudinally extending groove in the side surface of the core for the reception of a cord end, said groove terminating short of the upper face of the core, walls defining additional grooves in said side surface of the core extending angularly and in opposite directions from said first named groove and communicating with the latter and opening on said end face of the core to receive the conductor ends of

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the cord when a portion of the cord is positioned in said first named groove, contact blades the inner ends of which have parts in interlocking engagement with the end faces of the core, said blades being adapted to contact bared ends of the cord extending from said additional grooves and positioned between the blades and the end faces of the core, a rectangular housing open at its two ends in which the core is positioned with a sliding fit from the lower end of the housing, and spring locking means carried by the outer ends of the contact blades which when the core with the contact blades assembled thereon is pushed into the housing engage the housing to hold the plug connector assembled.

6. A plug connector comprising a core having side faces bounded in part by opposed end faces, walls defining a T-shaped recess in a side face of the core, the arms of which extend across such face to said end faces, said recess being adapted to receive an electric cord end with the individual wire ends extending into said arms whose shoulders provide strain reliefs for the wires, contact blades positioned along the end faces of the core, the inner ends of said blade having parts in interlocking engagement with the core to hold the blades on the core, means including the inner ends of the blades and the adjacent core for clamping bared conductor ends, a housing open at its two ends in which the core is positioned with a sliding fit from the lower end of the housing with the contact blades projecting from the upper end of the housing, and means at the upper end of the housing including releasable parts between the blades and the housing which, when the core with the contact blades assembled thereon is pushed into the housing, interlock at the upper end of the housing to hold the plug assembled.

7. A plug connector comprising a core having side faces bounded in part by opposed end faces, walls defining a T-shaped recess in a side face of the core, the arms of which extend across such face to said end faces, said recess being adapted to receive an electric cord end with the individual wire ends extending into said arms whose shoulders provide strain reliefs for the wires, contact blades positioned along the end

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faces of the core, the inner ends of said blade having parts in interlocking engagement with the core to hold the blades on the core, means including the inner ends of the blades and the adjacent core for clamping bared conductor ends, a housing open at its two ends in which the core is positioned with a sliding fit from the lower end of the housing only with said blades projecting from the upper end of the housing, and spring locking means carried by the outer ends of the contact blades which engage the housing at its upper end to hold the plug connector assembled.

8. A plug connector comprising a core, contact blades, interengaging means for positioning the contact blades on the core, a housing open at its two ends in which the core is positioned with a sliding fit from the lower end only of the housing with the contact blades projecting from the upper end of the core, inwardly projecting shoulders on the sides of the housing near its upper end, corresponding shoulders on intermediate portions of the contact blades adapted to engage the lower faces of said housing shoulders, spring locking members on the outer ends of the blades which, when the core is pushed into the housing, engage the upper faces of the housing shoulders for locking the core and housing in assembled relation, and walls defining grooves in the connector in which a cord end may be positioned and connected to said contact blades.

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