

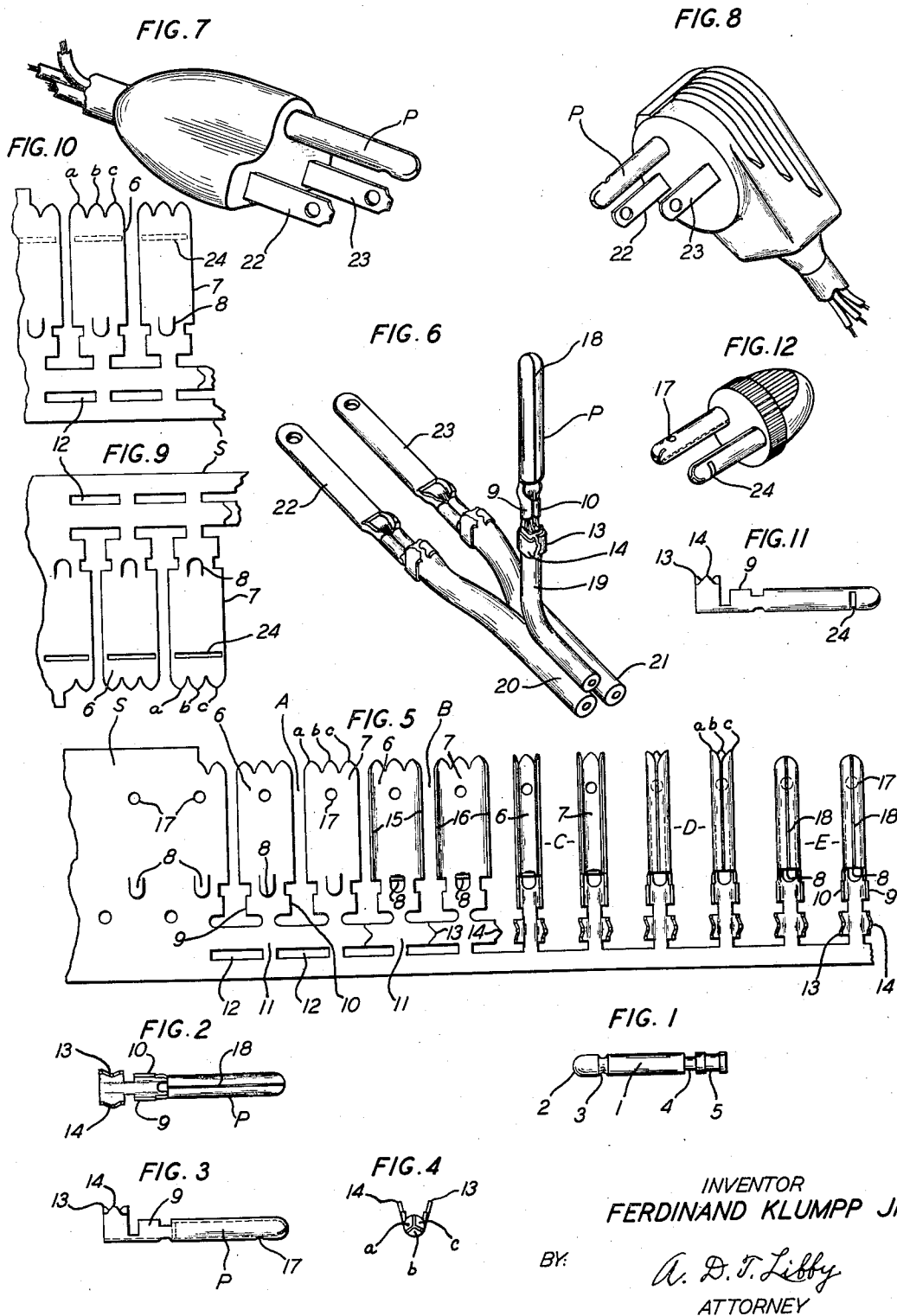
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F. KLUMPP, JR

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METHOD OF MAKING AN ELECTRICAL CONDUCTOR TERMINAL

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METHOD OF MAKING AN ELECTRICAL CONDUCTOR TERMINAL

Ferdinand Klumpp, Jr., Union, N. J.

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This invention relates to a new type of an electrical plug wherein three prongs are used instead of the usual two. The reason for this is that during the summer of this year, 1954, the Underwriters' Laboratories notified all manufacturers of electrically operated appliances such as hand tools, washing machines, air conditioners and others, that they must do away with the two prong plug for making connection to such electrical structures. The reason for this requirement is that many people had been electrocuted by contact with appliances wherein one side of the electrical supply circuit had come in contact with the metal of the machine so that when a person touched the machine they got a shock and in many cases ones violent enough to cause death. To obviate this trouble a ground contact member or prong must be added to a plug having the usual contact blades and this ground prong is connected to a wire that is electrically connected to a ground member. Another requirement set up is that this ground contact must be round so that the three contact plug can be inserted only in the proper manner, i. e., with the ground prong adapted to enter a round hole in the supply outlet receptacle being used. After investigation I have found that these plugs have been using a ground prong made on a screw machine and such a part has been made from a solid piece and the connecting wire must be soldered thereto; however in the process of moulding the plug carrying these three contact elements the pressure moulding and the oxidation against the solders causes the wire to be loosened from the ground contact. Furthermore, the screw machine part is expensive and slows up the soldering operation and I have found that this present method of construction is entirely impractical.

Hence it is the object of my invention to provide a ground contact member made from strip material of suitable metal such as copper or high grade copper alloy by making the pin from strip material. I have found that it can be made much cheaper and better than the present form as will be discerned from the description of the structure which follows:

Figure 1 shows the present form of an extra plug contact member for grounding the structure.

Figure 2 shows one form of my new extra plug contact member.

Figure 3 is a side view of Figure 2.

Figure 4 is an end view of Figure 3 looking right to left.

Figure 5 shows the process steps used in making the plug member of Figures 2, 3 and 4.

Figure 6 shows the adaptation of my new form of plug member associated with the usual plug blades.

Figure 7 shows one type of a molded plug with the structure shown in Figure 6 molded therein.

Figure 8 is a view similar to Figure 7 but of a different form of plug.

Figure 9 is a partial view of the left end of the strip shown in Figure 5 but reversed in position to better show

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a transverse groove in the blades to take the place of the holes 17 to which reference will be made later.

Figure 10 is a view showing the same pair of blades as shown in Figure 9 but in normal operative position.

Figure 11 is a view similar to Figure 3 but showing the circular groove as made in Figure 9.

Figure 12 is a view of a plug showing the two ways of making the terminal.

In Figure 1 the plug contact 1 is made from solid metal stock of about $\frac{3}{16}$ " diameter, on a screw machine. Near the rounded end 2 is a circular groove 3 which may be used to position the contact member during the molding operation. At the opposite end the two grooves 4 and 5 are used to receive the end of a conductor which must be soldered into at least the inner groove 4 but in the process of molding the pressure which is inserted into the mold and the oxidation against the solder, causes the wire to become loose on this ground contact member.

From my experience with this type of a contact I have found it expensive and impractical as will be seen from the description of my new and improved device, which is made from a strip S of suitable metal such as brass, the sheet is passed automatically through a punch press and the units may be formed singly or in multiple. As shown in Figure 5 the first step A is shown at 6 and 7 when two blades are made simultaneously. Each blade has at its free end three arcuately formed ends a, b, c, each covering 120 degrees in the final finished form, see step E and Figure 4. At the same time a stop 8 is formed from the strip S along with parts 9 and 10 which engages the bare wire of a conductor. Also inwardly positioned material 11 is left adjacent the blanked out portions 12 to provide longer fingers for locking around the insulation of the conductor. During the next step B the blades 6 and 7 have the stops 8 moved to final position and the portions 11 formed with interlocking parts 13 and 14 and the edges 15 and 16 of the blades will be partially turned upwardly. During the next step C the forming operation is continued and on to step D and in the final step E the ends a, b and c are brought into closed contact whereby the plug body part that is anchored in a mold, is fully closed on a line contact 18 so no molding material will get into the contact member which would be objectionable. It will be noted that in the first operation a hole 17 is made in the blades to serve to position the contact member during the molding operation. In other words the hole 17 does what the groove 3 does in the member 1. As an alternative a transverse groove 24 may be formed in the blades as shown in Figures 9, 10 and 11 which serves the same purpose as the groove 3 in Figure 1.

In Figure 6 the new contact member P is shown securely connected to a conductor 19 through the medium of the lugs 9 and 10, 13 and 14 as above described without the use of solder, while the conductors 20 and 21 are connected to the contact blades 22 and 23 in a well known manner such as shown in my Patent 2,558,052 issued June 26, 1951.

After the parts have been assembled as shown in Figure 6 they are ready to be molded into a satisfactory form either like that shown in Figure 8 where a rubber composition is used, or in Figure 7 wherein the material may be a transparent plastic, but in either form it will be noted that the contact plug P extends out at least an eighth of an inch or more beyond the blades 22 and 23 so that this grounding contact will engage the cooperating contact in the structure being used before the blades engage their cooperating contact.

In Figure 12, I have shown a two conductor plug made with my new contact members. It will be readily understood that since the plug contact members are made in strip form, the strip can be rolled up as it leaves the form-

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ing press and then this roll can be shipped as a unit to a user or mounted on another machine and a twin conductor cable attached to terminals before the terminals or plug members are separated from the original strip of which they once formed a part. This strip construction saves a lot of time which would be consumed if each plug had to be handled separately.

From the foregoing it will be seen that I have produced a new and better device than the present form shown in Figure 1.

Having thus described my invention,

What I claim is:

1. A process for making an electrical conductor terminal for the special purpose defined herein, which consists in passing a strip of suitable metal through a punch press, punching out at least one forming blank at a time for a terminal, leaving one end of the blank free while the opposite end is anchored through an intermediate piece and a connecting lug to an adjacent edge of the strip, at the same time forming a stop finger and parts for at least engaging the bare wire of a conductor between the said stop and said intermediate piece, then partially bending up the longitudinal edges of the blank and at the same time moving the stop finger to its final stop position to prevent material from getting into this end of the terminal and blanking out the arms for engaging the insulation of a conductor, then further forming up the said sides and the conductor engaging fingers, then closing in the sides into close engagement to form a single line contact and a closed cylindrical plug and finally closing in the free end of the said plug as and for the purpose described.

2. The process for making an electrical conductor terminal as set forth in claim 1, further defined in that the

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free end of the formed blank is formed with three arcuately formed projections whereby when the blank is formed to its final position whereby the two side edges come together, the arcuately formed projections come close together to form substantially a closed end.

3. The process for making an electrical conductor terminal as set forth in claim 1, further defined in that the free end of the formed blank is formed with three arcuately formed projections whereby when the blank is formed to its final position whereby the two side edges come together, the arcuately formed projections come together to form a closed end and further defined in that a formation may be made in the blank positioned inwardly a short distance from the said projections for the purpose described.

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