

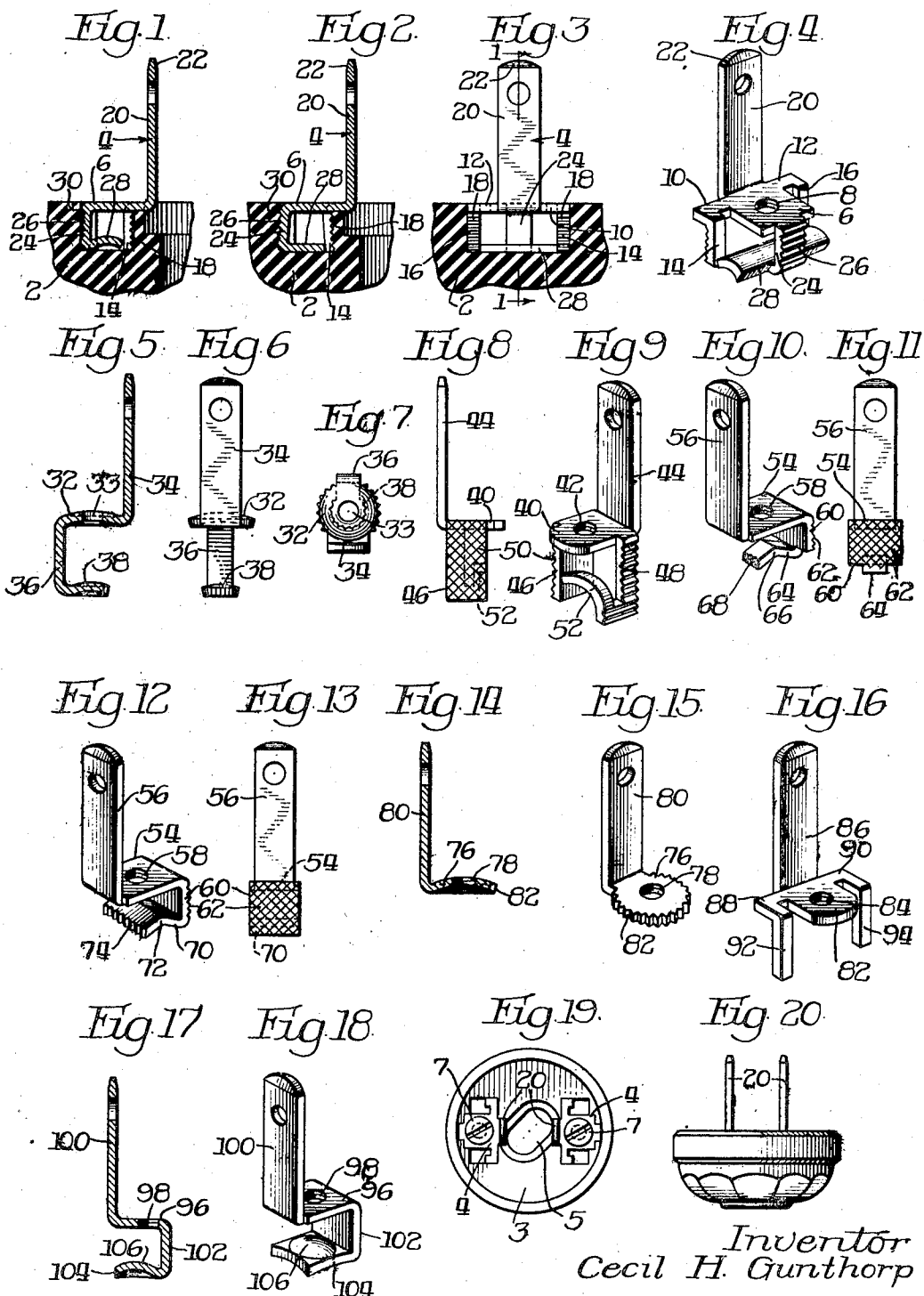
Aug. 4, 1936.

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2,049,585

ELECTRICAL DEVICE

Filed May 23, 1932



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UNITED STATES PATENT OFFICE

2,049,585

ELECTRICAL DEVICE

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Application May 23, 1932, Serial No. 612,931

12 Claims. (Cl. 173—361)

The present invention relates to electrical devices or attachments, and more in particular to attachment plug caps.

Among the objects of the present invention is to provide an attachment plug employing relatively few parts, which will permit of easy assembly.

Another object of the present invention is to provide novel means for attaching a terminal member to a body of material forming the body of a finished electrical device or attachment.

Still another object of the present invention is to provide novel means for attaching the terminal members of an attachment plug cap to the body thereof, whereby the terminal members are securely held in their proper associated relation therewith, as well as being in substantially parallel relation.

The present invention comprehends the idea of forming a terminal member with suitable means for securing the same to a body of material, as for example, a body of material forming an attachment plug cap, such means being solely associated with the terminal member, whereby this terminal member may be secured to the body of material after the same has been formed and fabricated.

Still another object of the present invention is to provide a novel terminal member or the like which is formed with a part normally received between oppositely disposed portions of a body of material, and which is formed with a raised portion adapted to be expanded after forcing this part into engagement with these portions for securing the terminal member or the like to the body of material.

A still further object of the present invention, is to provide this part with a roughened surface having a plurality of protuberances which are adapted, when the raised portion of this part is expanded, to engage or dig into the oppositely disposed portions for securely holding the terminal member or the like in association with the body of material.

The present invention also includes the idea of providing a novel terminal member or the like which may have one or more depending portions adapted to be received between these oppositely disposed portions of the body of material, and which may or may not be formed with a roughened surface, suitable means being further provided for urging or forcing these surfaces into engagement with the body of material for securing the terminal member or the like thereto. More particularly, the present invention includes the idea of providing these depending portions

with a part formed with a raised portion which is adapted to be expanded to engage with the body of material, as well as to force these surfaces into engagement with this body of material, thereby securely anchoring the terminal member or the like thereto.

Still another object within the purview of the present invention is to provide a novel terminal member or the like which is provided with a plurality of leg portions with which suitable means is associated and which is adapted to cause a spreading of these legs for engagement with the body of material to which the terminal member or the like is to be secured, the present invention contemplating the idea of forming these legs with or without roughened surfaces.

Other objects, features, capabilities and advantages are comprehended by the invention, as will later appear and as are inherently possessed thereby.

Referring to the drawing:

Figure 1 is a fragmentary view in cross section of an electrical device made in accordance with the present invention and disclosing a terminal member or the like therefor in unexpanded condition;

Figure 2 is a fragmentary view in cross section similar to Figure 1 of the drawing, disclosing the terminal member therefor in expanded condition;

Figure 3 is a fragmentary view in cross section similar to Figure 2 of the drawing, but taken in a plane normal thereto;

Figure 4 is a view in perspective of the terminal member shown in Figures 1 to 3 inclusive;

Figure 5 is a view in cross section of another terminal member made in accordance with the present invention;

Figure 6 is a view in elevation of the terminal member shown in Figure 5 of the drawing;

Figure 7 is a top plan view of the terminal members shown in Figures 5 and 6 of the drawing;

Figure 8 is a view in end elevation of still another terminal member made in accordance with the present invention;

Figure 9 is a view in perspective of the embodiment shown in Figure 8 of the drawing;

Figure 10 is a view in perspective of still another terminal member made in accordance with the present invention;

Figure 11 is a front view in elevation of the embodiment shown in Figure 10 of the drawing;

Figure 12 is a view in perspective of still a further terminal member made in accordance with the present invention;

Figure 13 is a view in front elevation of the

terminal member shown in Figure 12 of the drawing;

Figure 14 is a view in cross section of a still further terminal member made in accordance with the present invention;

Figure 15 is a view in perspective of the terminal member shown in Figure 14 of the drawing;

Figure 16 is a view in perspective of still another alternative construction for a terminal member made in accordance with the present invention;

Figure 17 is a view in cross section of a still further alternative arrangement for a terminal member;

Figure 18 is a view in perspective of the embodiment shown in Figure 17 of the drawing;

Figure 19 is a top plan view of an attachment plug cap incorporating terminal members as shown in Figures 1 to 4 inclusive; and

Figure 20 is a view in elevation of the attachment plug cap shown in Figure 19 of the drawing.

Referring now more in detail to the drawing, an embodiment selected to illustrate the present invention is shown as comprising a body of material 2 to which is secured a terminal member 4. This terminal member is more clearly disclosed in Figure 4 of the drawing, and comprises a securing portion including a base 6 formed with a screw-threaded opening 8 adapted to be threadedly engaged by a wire binding screw for holding the wire in intimate contact with the terminal member. Extending laterally and in opposite directions from the base 6 are the arms 10 and 12 which terminate in downwardly depending legs 14 and 16, respectively, each of which is provided with roughened surfaces, such as 18, which may be formed with a plurality of protuberances for engaging with the body of material 2, as will be later more fully disclosed. In the present embodiment, these surfaces are shown as being serrated in formation, but it is of course understood that this roughening may take other forms.

Between the arms 10 and 12, and formed integral with the base 6, is an upstanding contact portion or blade 20 which may be provided with an end 22 having sloping portions adapted to guide this terminal member during its movement. The outer edge of the base 6, oppositely disposed in relation to the contact 20, terminates in a downwardly depending leg 24 which is formed with an outer roughened surface 26 similar to the roughened surfaces 18 of the leg portions 14 and 16, this leg portion 24 terminating at its lower end in an elongated spreader member 28 which is of such a length as to engage with the spaced leg portions 14 and 16 and extends between these two spaced legs and the leg portion 24. This spreader member 28 may be of arcuate construction in cross section with a central raised portion which is adapted, upon application of pressure, to be straightened or flattened, as clearly shown in Figures 2 and 3 of the drawing.

In attaching the terminal member 4 to a body of material 2, the body of material 2 is preferably formed with a recess 30 which is of such a depth as to receive the base 6 and its associated elements, whereby this base 6 may be substantially flush with the surface of the body of material 6 when the terminal member is finally secured thereto in its proper position. The terminal member is inserted in the recess 30, as shown in Figure 1 of the drawing, and a suitable punch of three-point construction is inserted in

contacting relation with the spreader member 28, the central point thereof being inserted through the screw-threaded opening 8, and the points on either side being substantially opposite the leg portions 14 and 16. With this three-point punch in contacting position with the spreader member 28, pressure is applied thereto, whereby the spreader member 28 is flattened, as clearly shown in Figures 2 and 3 of the drawing, to spread the legs 14 and 16 away from the leg 24, whereby the protuberances of the roughened surfaces of the legs 14, 16, and 24 engage with the oppositely disposed portions of the body of material 2 for securing the terminal member thereto, the roughened surfaces of these legs 15 serving to anchor the terminal member in its proper position and to prevent its removal.

In Figures 5, 6, and 7 is disclosed another terminal member made in accordance with the present invention, the same comprising a securing portion including base 32 having a threaded opening 33 and being provided with an integral contact portion 34 extending upwardly therefrom on one side and a leg portion 36 extending therefrom in oppositely disposed relation. This leg portion 36 terminates in a part 38 disposed in substantially parallel relation to the base 32. In this embodiment, the base 32 and the part 38 are adapted to be received between oppositely disposed portions of material, such as the body of material 2, and are formed with central raised portions adapted to be flattened out, whereby the normal diameter thereof is increased, these portions 32 and 38 being provided with roughened edges formed with a plurality of protuberances which, upon expansion of these parts, are adapted to engage with these oppositely disposed portions of the body of material 2, whereby the protuberances dig into and engage with this material for securely holding the terminal member in association with the body of material 2. As clearly shown in Figure 6 of the drawing; these edges of the base 32 and part 38 are formed with serrations which are normally inclined to the axis of the terminal member, but which, upon an expansion of these parts 32 and 38 are substantially in parallel relation therewith. The base 32 and part 38 may be conveniently expanded or flattened as by means of a punch, contact of this punch with the part 38 being gained through the screw-threaded opening 33 provided in the base 32.

In Figures 8 and 9 of the drawing is disclosed another terminal member made in accordance with the present invention, and the same comprises a securing portion including base 40 formed with a screw-threaded opening 42, this base having an integral upstanding contact portion 44. The edges of the base 40 terminate in downwardly depending legs 46 and 48 which are formed with roughened surfaces 50 for engagement with oppositely disposed portions of material, such as a body of material 2, as hereinbefore referred to. The depending leg 48 is of somewhat different construction from the leg 46, as will be seen from Figure 9 of the drawing, and is formed with the integral portion 52, cut away from the leg 48, as well as the base 40, and is bent into contact with the leg 46. This portion 52 is curved in formation, and it will be readily apparent that when the legs 46 and 48 are inserted within a recess, such as the recess 30, and pressure applied to the top of the member 52, the same will tend to straighten out and cause a spreading of

the legs 46 and 48 apart, thereby causing the roughened surfaces 50 of these legs to dig into and engage with the material 2 for securing the terminal member thereto.

In Figures 10 and 11 is disclosed still another terminal member made in accordance with the present invention, and the same comprises a securing portion including base 54 formed with a screw-threaded opening 58 and having an integral upstanding contact portion 56, this base terminating in opposite relation to the contacting member 56 in a downwardly depending leg 60 having a roughened outer surface 62. This downwardly depending leg 60 is formed with an integral part 64 extending substantially in parallel relation to the base 54 which has a raised portion 66 substantially beneath the screw-threaded opening 58. This part 64 has its inner end roughened, as at 68, for engagement with the material to which the terminal member is to be secured. In order to secure this terminal member to a body of material such as 2, the latter is formed with a suitable recess to receive the downwardly depending legs 60 and the laterally extending part 64. When this terminal member is secured in this recess of material, the roughened surface 68 at the end of the part 64 is adapted to engage with this material so that upon application of pressure, as by means of a punch inserted through the opening 58 and in engagement with the raised part 66, the part 64 will be flattened, thus causing an outward movement of the leg 60, whereby the protuberances thereof will engage and dig into the material for holding the terminal in place.

In Figures 12 and 13 is disclosed a terminal substantially similar to the terminal member shown in Figures 10 and 11 of the drawing, and the same comprises a securing portion including base 54 having a screw-threaded opening 58, this base 54 having an integral upstanding contact portion 56 and terminates in opposite relation therewith in a downwardly depending leg 60 having a roughened surface 62. The terminal member of the present embodiment varies from that shown in Figures 10 and 11 of the drawing in that the laterally extending part 70 which is formed with a central raised portion 72 and a roughened edge 74 is coextensive in width with the leg 60, this construction not being present in the embodiment shown in Figures 10 and 11. This terminal member, of course, is secured to a body of material in a manner similar to that described in connection with the terminal member shown in Figures 10 and 11.

In Figures 14 and 15 is disclosed still another terminal member made in accordance with the present invention, the same comprising a securing portion including a base 76 having a screw-threaded opening 78 and being provided with an integral upstanding contact portion 80. The construction of the base 76 corresponds in all essential details to the base 32 of the terminal member shown in Figures 5 to 7 inclusive, and has its edge formed with serrations 82 normally inclined to the axis of the opening 78. The central part of the base 76 is raised as clearly shown, and upon application of pressure to the top surface thereof is adapted to be flattened, whereby the normal diameter thereof is increased, this flattening of the base causing an expansion thereof, whereby the roughened edge 82 is adapted to engage with adjacent portions of material,

such as the body of material 2, for securing this terminal member in association therewith.

In Figure 16 of the drawing is disclosed still a further terminal member made in accordance with the present invention, and the same comprises a securing portion including a base 82 formed with a screw-threaded opening 84 and having an integral and upstanding contact portion 86. Extending laterally of the base 82 are arm portions 88 and 90 which terminate in depending legs 92 and 94. This terminal member may be secured to a body of material, such as the material 2, by providing openings which are so spaced as to cause a spreading of these legs 92 and 94 apart when the terminal member is forced into position, whereby these legs 92 and 94 are angularly disposed in relation to the center of these openings so as to have their ends in engagement with the outer wall portions of the openings for securely holding the terminal member in its proper position.

In Figures 17 and 18 of the drawing is disclosed still another terminal member made in accordance with the present invention, the same comprising a securing portion including a base 96 formed with a screw-threaded opening 98, this base having an integral upstanding contact portion 100. In opposite relation to the contact member 100, the base 96 terminates in a downwardly depending leg 102 formed with the laterally extending part 104, which is substantially in parallel relation to the base 96. The central portion of this part 104 is raised as at 106, this raised part 106 being adapted, upon application of pressure as by means of a punch inserted through the opening 98, to cause a spreading of the part 104, whereby the edges and corners thereof engage with adjacent portions of the material to which the same is to be secured.

In Figures 19 and 20, the body of material 2 may be formed to conform to the body 3 of the attachment plug cap which has an opening 5 to receive wires leading into the same, this body 3 having the terminal members 4 disposed in opposite relation to the opening 5 and having the contact portions 20 thereof in substantially parallel relation, the screw-threaded openings 8 of the bases thereof being engaged by the wire binding screws 7 for connecting the ends of these wires to these terminal members.

In connection with the embodiments disclosed in Figures 5 to 7 inclusive, 14, 15, 17, and 18, the raised portions are shown as being formed with a curved raised portion conforming substantially to an element of a sphere, that is to say, the raised portions are convexly disposed upwardly, although it is of course understood that these raised portions may be formed in any desired manner.

It will be quite apparent from the above disclosure that the terminal members shown herein are of such a construction as to be readily and easily secured to a body of material, and are provided with elements adapted to have intimate engagement and contact with this material whereby the same are securely held in association therewith.

While I have herein described and upon the drawing shown illustrative embodiments of the invention, it is to be understood that the invention is not limited thereto but may comprehend other constructions, arrangements of parts, details and features without departing from the spirit of the invention.

I claim:

1. A terminal member comprising an apertured base, a contact portion extending therefrom, and a leg portion depending from said base and having a part extending therefrom in substantially parallel relation to said base, said part having a raised depressible and expansible portion, disposed below said aperture.
2. A terminal member comprising an apertured base, a contact portion extending therefrom, and a leg portion depending from said base and having a surface formed with protuberances, said leg portion having a part extending laterally thereof and having a raised depressible and expansible portion disposed below said aperture.
3. A terminal member comprising an apertured base, a contact portion extending therefrom, and a leg portion depending from said base and having a surface formed with protuberances, said leg portion having a part extending laterally thereof and having a raised depressible and expansible portion disposed below said aperture, said part having an edge formed with protuberances.
4. A terminal member comprising an apertured base, a contact portion extending therefrom, a leg portion depending from said base and having a part extending laterally therefrom and below said aperture, said base and part having a raised depressible and expansible portion.
5. A terminal member comprising an apertured base, a contact portion extending therefrom, a leg portion depending from said base and having a part extending laterally therefrom and below said aperture, said base and part having a raised depressible and expansible portion and being formed with an edge having protuberances.
6. A terminal member comprising an apertured base, a contact portion extending from one side thereof, and a leg extending from the other side of said base, said leg including a laterally extending raised depressible and expansible part disposed below said aperture.
7. An electrical device comprising a body having a recessed portion, a terminal member secured thereto, said terminal member comprising a base, a contact portion extending from one side thereof, and a leg extending from the other side of said base and received in said recessed portion, said leg including a laterally extending raised part, said base having an aperture disposed above said raised part to receive a tool to depress and expand the same whereby said leg is fixed in said recess and said terminal member is secured to said body.
8. A terminal member comprising an apertured circular base, a contact portion extending therefrom, a leg depending from said base and having a circular part extending laterally therefrom and below said aperture and of different diameter than said apertured base, said base and part having a raised depressible and expansible portion.
9. A terminal member comprising an apertured circular base, a contact portion extending therefrom, a leg depending from said base and having a circular part extending laterally therefrom and below said aperture and of less diameter than said apertured base, said base and part having a raised depressible and expansible portion.
10. A terminal member comprising an apertured base, a contact portion extending therefrom, a leg portion depending from said base and having a part extending laterally therefrom and below said aperture, said base and part being substantially circular with protuberances on the edges thereof and having a raised depressible and expansible portion.
11. A terminal member comprising an apertured base, a contact portion extending therefrom, a leg portion depending from said base and having a part extending laterally therefrom and below said aperture, said part having a raised depressible and expansible portion extending transversely of said part and coextensive with the width thereof.
12. A terminal member comprising an apertured base, a contact portion and a leg extending in opposite directions from said base, said leg being provided with a laterally extending raised depressible and expansible part disposed below said aperture.

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