Jan. 6, 1948. D. B. HULL ET AL 2,434,211

ELECTRICAL CONNECTOR

Filed April 12, 1945

Fig. 1

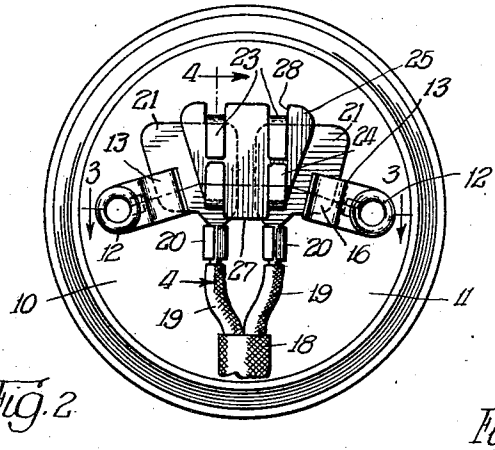


Fig. 2

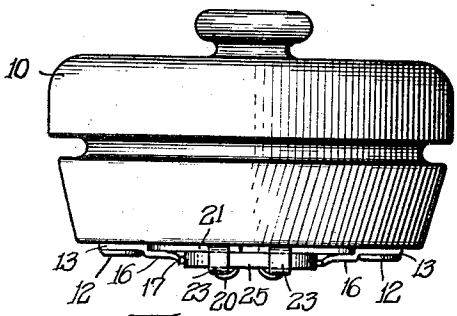


Fig. 3

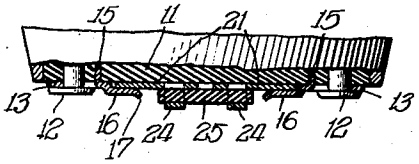


Fig. 4

Fig. 5

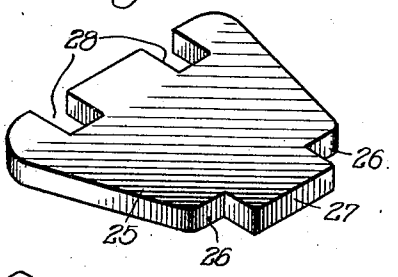


Fig. 6

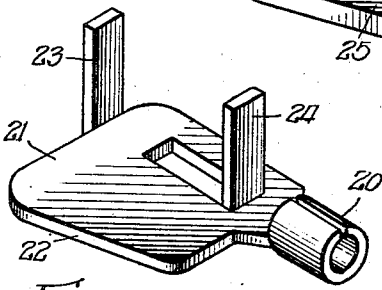
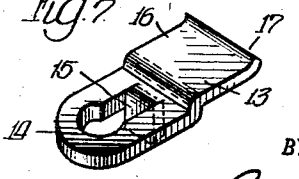
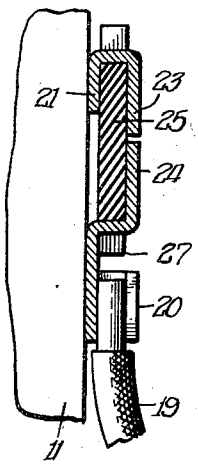


Fig. 7





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UNITED STATES PATENT OFFICE

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ELECTRICAL CONNECTOR

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5 Claims. (Cl. 173—328)

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The present invention relates to an improved connector structure for providing electrical contact between the terminals of an ear receiver of an electronic hearing aid and the transmission cable through which signals are transmitted to said receiver from the amplifier circuit of the hearing aid.

It is an object of the invention to provide a connector structure of the type described whereby a cable may be readily and quickly associated with the receiver or other corresponding element, and which, though readily releasable, is self-tightening in use to maintain an effective electrically conductive connection between the parts.

A further object is to provide a simplified and highly economical cable connector of the type described, not likely to become loosened in use, and which is exceedingly compact in construction, as necessitated by the small size of the receiver to which it is applied.

Other more specific objects and advantages of the invention will be apparent to those skilled in the art upon a full understanding of the improved apparatus herein described.

In the drawings,

Fig. 1 is a rear view of a hearing aid receiver, with the external cover or shield removed, illustrating coacting parts of the connector structure of this invention;

Fig. 2 is a top plan view further illustrating the parts and showing the mode of cooperation thereof in securing proper electrical contact;

Fig. 3 is a fragmentary view partially broken away and in section on a line corresponding to line 3—3 of Fig. 1;

Fig. 4 is an enlarged fragmentary view in section on a line corresponding to line 4—4 of Fig. 1, illustrating details of mechanical structure of the device;

Fig. 5 is an enlarged perspective view of a fiber connector body which is a component of the connector;

Fig. 6 is an enlarged perspective view of one of the lateral wings adapted to be associated with the body of Fig. 5; and

Fig. 7 is an enlarged perspective view of a contact or terminal element coacting with the removable contactor of the present assembly.

This invention relates to an improved cable connector for small wearable receiver of a portable electronic hearing aid, such receiver being of the type normally worn in or adjacent the ear of the user. The invention provides a butterfly type connector for completing an electrical

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connection between fixed terminals on said receiver and the amplifier to receiver cable of the hearing aid, which connection is automatically self-tightening in use, and though being very readily assembled, effectively resists inadvertent displacement during use.

Referring to the drawings, the reference numeral 10 designates a generally circular receiver of the type described above, which, in the illustrated embodiment, is designed for insertion in the aural channel of the user. On its outer surface, but beneath a cap or shield which is not shown in the drawings, the body of the receiver is provided with an insulating mounting body or chassis 11 of suitable material. This body has secured thereto by rivets 12 a pair of opposed fixed contacts 13. The specific construction of these contacts is illustrated in Fig. 7, the same consisting of an apertured ear 14 punched, slitted and offset to provide a downwardly extending locating lug 15, and provided with an offset contact leaf or tongue 16 rounded at its extremity 17. In the assembly of these contacts 13, the lug 15 is positioned in an appropriate recess provided therefor in the insulating body 11, the respective contacts 13 being disposed at an angle to a line through the center of the securing rivets 12, with the contact tongues 16 in spaced relation to the adjacent surface body 11, as clearly illustrated in Figs. 2 and 3. It will be appreciated that the rivets 12 are availed of as binding posts or terminals internally of body 11, to which corresponding terminals of the internal receiver structure (not shown) are connected. The purpose of disposing the contacts 13 in the angular manner described will hereinafter appear.

The reference numeral 18 designates a cable sheath surrounding the two component insulated wires 19 which constitute a cable connecting the receiver with the amplifier of the hearing aid (not shown). The extremities of these wires of the cable are stripped back and are clamped in electrically conductive relation in the deformable split sleeve type connectors 20 of a pair of oppositely disposed flaring wing members 21. The specific construction of these wing members is illustrated in Fig. 6, it being understood that the same are similar except that the element shown in Fig. 6 is designed as the left-hand wing of the butterfly connector under consideration, while the right-hand wing will be similar though oppositely disposed in the manner shown in Fig. 1. Each connector wing 21 has an upwardly and outwardly flaring side 22, a bendable securing

lug 23 integral therewith and projecting normal to the wing, and a further, similar, aligned securing lug 24 formed by slitting and offsetting the material of the wing.

The reference numeral 25 designates a generally keystone-shaped base member for the butterfly connector, this member being fabricated of a sheet or block of insulating material such as a synthetic phenol-formaldehyde condensation resin, or the like. Member 25 has a lateral shoulder 26 on either side of a central separator projection 27 and is slotted at 28 on the opposite side thereof in alignment with said shoulders. The wing members 21 are assembled to the body member 25 by superimposing the latter on the former with the securing lugs 23, 24 disposed in slots 28 and adjacent shoulders 26 respectively. The lugs are then crimped over parallel to the surface of the body, in the manner clearly illustrated in Fig. 4, to secure the parts in assembled relation.

As clearly appears in Fig. 1, the inclination of the flaring sides 22 of the connector wings 21 is such that the said wings are enabled to nest snugly against the fixed contacts 13 when disposed parallel to chassis 11 and drawn downwardly under the contact tongues 16 of said contacts. As illustrated in Figs. 2 and 3, the spacing of the contacts is such that an effective frictional, electrically conductive connection is effected between the contact tongues and connector wings. While the connector is readily assembled in the manner described and may be disconnected when desired, the possibility of inadvertent displacement of the parts is largely prevented, for tension on the cable wires 19 merely serves to draw the connector into tighter engagement with the contacts.

The device is simple and inexpensive, yet very rugged considering its size. The parts of the connector unit are readily assembled and applied to the receiver 10 and are exceedingly compact in character.

We claim:

1. In a contact assembly of the type described, a body having a pair of spaced contact tongues thereon, said tongues being of angled outline including elements contacting and secured to the body and further elements spaced from the body in inclined relation to one another to provide a contact slot restricted adjacent its lower end so as to restrain downward movement of a connector therein, and a connector engageable in said slot, comprising an insulating support and a pair of conducting wing members secured on opposite sides thereof, at least one of said wing members having an inclined surface and being wedgingly engageable in said slot in contact with said further element of one of said tongues to effect electrical connection therewith, downward movement of the connector being restrained by coaction of said wing members with said tongues.

2. In a small hearing aid contact assembly of the type described, an insulating body having a pair of contact tongues secured thereon, said tongues being of angled outline including elements contacting and secured to the body and further elements spaced from the body in spaced and inclined relation to one another to provide in association with the body an upwardly and outwardly divergent contact slot, and a connector engageable in said slot, comprising an insulating support and a pair of wing members associated therewith and insulated from one another by the support, said wing members having oppositely disposed, inclined surfaces wedgingly engageable in said slot with said further elements to effect electrical connection with the contact tongues.

3. In a small hearing aid contact assembly of the type described, an insulating body having a pair of contact tongues secured thereon, said tongues being of angled outline including elements contacting and secured to the body and further elements spaced from the body in spaced and inclined relation to one another to provide in association with the body an upwardly and outwardly divergent contact slot, and a connector engageable in said slot, comprising an insulating support and a pair of wing members associated therewith and insulated from one another by the support, said wing members having offset lugs securing the same in locked relation to said support and being provided with oppositely disposed, inclined surfaces wedgingly engageable in said slot with said further elements to effect electrical connection with the contact tongues.

4. A contact assembly for electrically connecting an electrical conductor to a further electrical member, comprising an insulating support having a pair of oppositely disposed conducting wings associated therewith which are connected to the conductor, means to hold the wings and support in assembled relation, comprising pairs of integral, spaced lugs on said respective wings which lugs are bent toward one another into retaining engagement with said support, and a pair of spaced contacts on said electrical member, said contacts being disposed in convergent relation on the electrical member and said wings having flaring surfaces frictionally engageable with said contacts whereby downward thrust on the connector serves merely to increase the effectiveness of the engagement of the wings and contacts.

5. A contact assembly for electrically connecting an electrical conductor to a further electrical member, comprising an insulating support having a pair of oppositely disposed conducting wings associated therewith which are connected to the conductor, said insulating member having positioning means and said wings having pairs of spaced lugs bent toward one another around and engaged with the member adjacent said positioning means to hold the wings and member in assembled relation, and a pair of spaced contacts on said electrical member, said contacts being disposed in convergent relation on the electrical member and said wings having flaring surfaces frictionally engageable with said contacts whereby downward thrust on the connector serves merely to increase the effectiveness of the engagement of the wings and contacts.

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