ROTARY ATTACHMENT PLUG

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By

Attorneys
UNITED STATES PATENT OFFICE

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ROTARY ATTACHMENT PLUG

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1 Claim. (Cl. 173—324)

1. This invention relates to a rotary attachment plug and has for its primary object to avoid the twisting and entangling of electrical conductor cables of the type commonly employed as iron cords and the like.

Another object is to permit free rotation between the opposite end portions of the plug and at the same time assure perfect electrical conductivity through the plug.

The above and other objects may be attained by employing this invention which embodies among its features a pair of axially aligned non-conducting bodies each having an axial bore, a spindle extending through the bores, means on each end of the spindle yielding to urge the bodies toward one another, a pair of ring shaped conductors carried by one of said bodies, an independent lead from each conductor extending beyond one end of the plug, a pair of contacts on the opposite non-conducting body, each having electrical contact with a separate ring shaped conductor and an independent lead from each contact extending beyond the end of the plug opposite that from which the first mentioned leads extend.

Other features include employing anti-friction bearings between adjacent ends of the non-conducting bodies, and utilizing the bearings as the conductors and contacts.

In the drawings:
Figure 1 is an end view of a rotary attachment plug embodying the features of this invention.
Figure 2 is a side view thereof.
Figure 3 is an enlarged longitudinal sectional view through the plug.
Figure 4 is a transverse sectional view taken substantially along the line 4—4 of Figure 3.
Figure 5 is a transverse sectional view taken substantially along the line 5—5 of Figure 3.
Figure 6 is an end view of a modified form of plug embodying the features of this invention.
Figure 7 is a side view of Figure 6.
Figure 8 is a longitudinal sectional view on an enlarged scale through the modified type of plug.
Figure 9 is a transverse sectional view taken substantially along the line 9—9 of Figure 8.
Figure 10 is an enlarged side view of the type of plug illustrated in Figure 1 showing the same adapted for use with an ordinary plug receptacle, and
Figure 11 is a view similar to Figure 10 of the modified form of device illustrated in Figures 6 through 9 inclusive.

Referring to the drawings in detail my improved attachment plug designated generally 15 comprises a substantially circular cylindrical body of non-conducting material 16 and a like body 17. Carried by the body 16 adjacent one end are spaced circumferential conductor rings 18 and 19, and formed on the exterior of the body 16 adjacent the end opposite that near which the rings 18 and 19 are supported are external screw threads 20 the purpose of which will be more fully hereinafter explained. Extending longitudinally through the body 18 is an opening 21 which aligns axially with an opening 22 formed in the body 17, and extending through said openings 21 and 22 is a spindle 23 formed substantially midway between its ends with an outstanding annular flange 24 which serves as a spacer to keep the bodies 16 and 17 in spaced relation. Opposite ends of the spindle 23 are screw threaded as at 25, and threaded thereon are nuts 26 which bear against the outer ends of compression coil springs 27 the inner ends of which bear against opposite ends of the bodies 16 and 17, yielding to urge said bodies toward one another longitudinally of the spindle 23. Formed on the body 17 near the end opposite that disposed toward the body 16 are external screw threads 28, the purpose of which will be more fully hereinafter explained. Extending longitudinally of the body 16 are spaced peripheral grooves 29 for the accommodation of leads as will be more fully hereinafter explained, and formed diametrically opposite one another in the body 17 are longitudinal grooves 30 the purpose of which will be more fully hereinafter explained.

Attached in any suitable manner to the ring 18 to form a good electrical contact therewith is a conductor or lead 31 which lies in a groove 29 and extends outwardly beyond the end of the body 16, while a similar lead 32 is soldered or otherwise connected to the ring 19 and extends longitudinally of the body 16 through the opposite groove 29 substantially parallel with the lead 31 previously described. Both leads are encased in a conventional insulating covering 33 and are brought together in a conventional manner to form a conductor cable 34.

Seated in opposite grooves are contacts 35 and 36 respectively which as illustrated in Figure 3 project beyond the end of body 17 which faces the body 16 and frictionally engage the rings 18 and 19 respectively. Leading from each of the respective contacts 36 and 37 is a conductor 38 each of which is encased in a conventional insulating cover 39 and extends longitudinally through the respective groove 30 to the end of
the plug where the conductors and insulating casings are brought together in a conventional cable 40.

Threaded on the threads 38 of the body 17 is a cap 41, and a similar cap 42 is threaded on the threads 20 of the body 16 in order to enclose the leads 33 and 39. The cap 42 is provided with an extension 44 which overlies the adjacent end of the cap 41 in order protectively to encompass the conductor rings 18 and 19 and respective leads 33 and 39.

In the modification illustrated in Figures 6 to 9 inclusive my improved attachment plug designated generally 45 comprises a pair of substantially semi-spherical bodies 46 and 47 respectively each of which is provided with a longitudinal bore 48 for the reception of a spindle 49 opposite ends of which are screw threaded to receive nuts 50 by means of which compression coil springs 51 are brought to bear against opposite ends of the bodies 46 and 47. Fitted in the body 46 are the races 52 and 53 of concentrically spaced anti-friction bearings, the opposite races 54 and 55 which are fitted into the body 47, so that the two bodies may rotate independently about the axis of the spindle 49. Connected to the race 52 is a conductor strip 56 which is illustrated as embodied in the body 46 and a like strip 57 has electrical contact with the race 53 and likewise is embodied in the body 46. Leads 58 are connected to the contact strips 56 and 57 and lead outwardly through the end of the plug through a longitudinal passage 59. Similar contact strips 60 and 61 respectively are connected to the races 54 and 55 and like the strips 56 and 57 are embodied in the body 47. Leads 62 are connected to the strips 60 and 61 and lead outwardly through the end of the body 47 through an axial opening formed in the spindle 49. It will thus be seen that electrical contact will be established between the leads 58 and the leads 62 through the anti-friction bearings. A protecting flange 63 is carried by the body 46 and overlies the adjacent end of the body 47 in order to exclude dust and dirt from the interior thereof.

In the modifications illustrated in Figures 10 and 11 in place of the leads 38 and 62 respectively I employ blades 63 and 64 respectively which are adapted to be introduced into a conventional outlet plug connection.

It will be understood that when the structure illustrated in Figures 1 to 5 inclusive is employed, power, for instance, supplied to the cable 34 will pass through the conductors 31 and 32 to the rings 18 and 19 from whence it will be picked up by the contacts 38 and 39 respectively and will pass through the conductors 38 in the conventional manner. Due to the fact that the parts 16 and 17 are mounted to rotate about the longitudinal axis of the spindle 43 it will be obvious that the cords 34 and 40 may be twisted and turned about their longitudinal axes without danger of entanglement. Likewise when the plug illustrated in Figures 6 through 9 inclusive is employed the cords leading to the plug will be kept from entanglement and the current will pass for instance through the conductors 58 to the contacts 56 and 57 and thence through the anti-friction bearings to the contacts 60 and 61 from whence it will pass to the leads 62 and out through the opposite end of the plug.

While in the foregoing there has been shown and described the preferred embodiment of this invention it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

I claim:

A rotary attachment plug comprising a pair of aligned cylindrical bodies of uniform diameter each having a longitudinal axial opening extending therethrough, a shaft extending through said openings, an outstanding annular flange on the shaft midway between opposite ends, a compression coil spring encircling the shaft adjacent each end, one end of each spring bearing on an adjacent body yieldingly to hold the body against the flange, a nut threaded on each end of the shaft to retain its respective spring in engagement with an adjacent body, a pair of annular longitudinally spaced conductor rings encircling one body adjacent the end nearest the flange on the shaft, a pair of yielding diametrically spaced wiping contacts carried by the opposite body each bearing on a different conductor ring, a conductor connected to each conductor ring and leading beyond the end of the body remote from the conductor rings, a conductor connected to each yielding contact and leading beyond the end of the body remote from the contacts, each body being formed adjacent its end remote from the adjacent body with external screw threads, a cap threaded on each body in concentric relation thereto and telescoping skirts on the caps for enclosing the conductor rings and the contacts.

ARTHUR LAMBI.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>277,842</td>
<td>Weston</td>
<td>May 15, 1884</td>
</tr>
<tr>
<td>689,456</td>
<td>Bell</td>
<td>Dec. 10, 1901</td>
</tr>
<tr>
<td>827,310</td>
<td>Howes</td>
<td>July 31, 1906</td>
</tr>
<tr>
<td>917,548</td>
<td>Conway</td>
<td>Apr. 6, 1909</td>
</tr>
<tr>
<td>1,174,379</td>
<td>Bacon</td>
<td>Mar. 7, 1916</td>
</tr>
<tr>
<td>1,247,660</td>
<td>Garrison</td>
<td>Nov. 27, 1917</td>
</tr>
<tr>
<td>1,591,791</td>
<td>Sprout</td>
<td>July 6, 1926</td>
</tr>
<tr>
<td>1,934,799</td>
<td>Gunby</td>
<td>Nov. 14, 1933</td>
</tr>
</tbody>
</table>

FOREIGN PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>687,051</td>
<td>France</td>
<td>Apr. 22, 1930</td>
</tr>
</tbody>
</table>