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METHOD OF AND MEANS FOR TAPPING A CONDUCTOR

Filed Jan. 6, 1930

FIG. 1

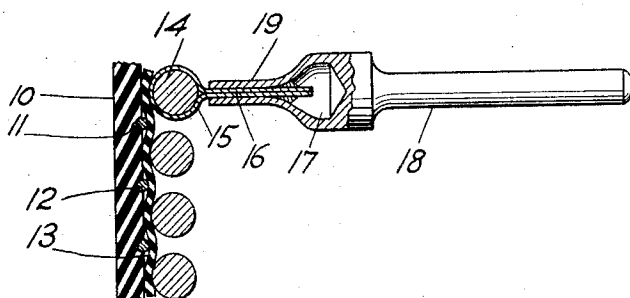


FIG. 2

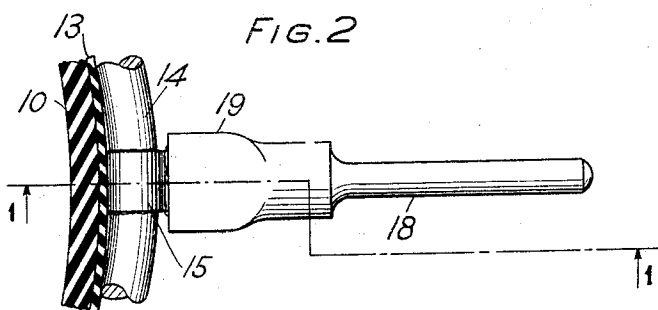
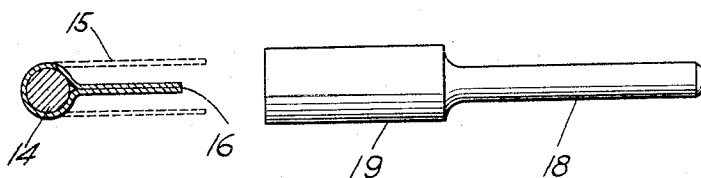


FIG. 3



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METHOD OF AND MEANS FOR TAPPING A CONDUCTOR

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This invention relates to a method of and means for tapping a conductor to provide an electrical connection thereto in a form which is mechanically rigid and which has a relatively low effective resistance, particularly for use in an inductive coupler.

An object of the invention is to provide a tap which is mechanically rigid and secure and which has a relatively low value of effective resistance.

Another object of the invention is to provide a tapped coil which is continuous throughout its entire length and the turns of which are closely spaced.

In the practice of radio communication, for example, it is often desired to employ a coupler having turns of wire which are closely wound, adjacent turns being separated by a distance equal to or less than the diameter of the wire. For purposes of adjustment, it is often desired to have taps or connections taken off from the coil at various points intermediate between the ends.

Heretofore the application of a tap has in many instances necessitated interfering with the electrical continuity of the winding at the point where the tap is made. The discontinuity may be an actual break in the conductor or it may result from the conductor being twisted or doubled back upon itself so that its effective resistance, especially at high radio frequencies, is considerably increased in the neighborhood of the point at which the tapped connection is formed.

In accordance with the present invention, a tapped connection is formed by wrapping a short ribbon of conductive material about the wire and soldering or otherwise fastening it in place. The ends of the ribbon are then fastened together flatwise to form a relatively stiff projecting fin. A hollow prong or tip of conducting material is placed over the fin and secured thereto.

The projecting prong is suitable for engagement by a connector of any desired form leading to an external circuit, for example, by a flexible conductor terminated in a socket member.

The invention is described in detail here-

inafter with reference to the accompanying drawing in which

Fig. 1 is a view of the completed tap shown partially in section through the line 1—1 of

Fig. 2, which is a plan view of the tap; and in which

Fig. 3 is a view of the parts of the tap disassembled.

Fig. 1 shows a tap applied to an inductive coupler, a portion of the supporting form of the coupler being shown at 10. The supporting form is provided with a groove 11 in which is wound an inner conductor 12. Over the conductor 12 and form 10 is placed an insulatory wrapping 13. An outer conductor 14 is wound upon the wrapping 13 in a depression or channel formed therein by adjacent turns of the inner conductor 12.

A short length of conductive ribbon 15 is wrapped about the outer conductor 14 and fastened thereto by soldering or other suitable means. The ends of the ribbon 15 are fastened together to form a stiff projecting fin 16. The fin 16 is inserted within a socket 17 in one end of the prong 18, and the sleeve 19 enclosing the socket 17 is compressed tightly over the fin 16 and securely fastened thereto.

Fig. 2 shows a plan view of the completed tap together with a portion of the supporting form 10, insulatory wrapping 13 and outer conductor 14. The relative positions of the ribbon 15, prong 18 and sleeve 19 are clearly shown by this figure in conjunction with Fig. 1.

The manner of assembling the parts of the tap is best understood by reference to Fig. 3.

The tap is preferably applied during the process of winding the outer conductor 14 upon the wrapping 13. The conductor is wound to a position within a short distance of the place where the first tapped connection is desired. Before the conductor is laid down upon the wrapping 13 at the exact position of the desired tap, the conductive ribbon 15 is wrapped about conductor 14 as shown in dotted lines in Fig. 3. The ribbon is soldered to the conductor and the ends of the ribbon are soldered together to form a

stiff projecting fin as shown at 16. The prong 18 with sleeve 19 attached thereto is then placed over the fin 16 so that the latter is within the socket 17. The sleeve 19 is then compressed tightly over the fin 16 and formed as shown in Figs. 1 and 2. The sleeve may be attached to the fin 16 by soldering or other suitable means in addition to the pressure developed by the compression of the sleeve.

The exposed surfaces of the ribbon 15 are carefully freed from excess solder or other foreign material in order that in the finished coil the capacity between adjacent turns will not be increased by projecting particles of metal or of dielectric substance. The conductor 14 with the completed tap attached is then wound further upon the insulatory wrapping 13 until the position specified for the next tap is reached, at which point the process may be repeated as described.

The conductive ribbon 15, which may be of phosphor bronze or copper, should be relatively thin so that the spacing between the adjacent turns of the conductor 14 is not materially lessened by the presence of the ribbon and the possibility of a short circuit occurring between the turns is thereby minimized.

The projecting prong 18 is adapted to be engaged by any suitable electrical connecting means such as a flexible conductor terminated in a spring-actuated contact socket member.

Taps constructed in accordance with this invention have satisfactory mechanical rigidity and, in addition, a relatively low value of effective resistance. It is not necessary to break, bend or twist the conductor 14 in order to form and apply the tap as described. The conductor remains for all practical purposes electrically the same where the tap is applied as at other points within the winding. The impedance of the winding, particularly for radio frequency currents, is therefore substantially uniformly distributed along its entire length.

While a cylindrical prong has been illustrated having a hollow cylindrical sleeve portion, many other designs and shapes may be employed without departing from the spirit of this invention.

What is claimed is:

In a cylindrical inductance coil having a closely spaced winding, a tap connection comprising a short length of thin stiff metallic ribbon wrapped about the wire of the coil and conductively fastened thereto over substantially the entire circumference of the wire, the ends of the ribbon being joined together flatwise to form a fin projecting in a direction perpendicular to the axis of said coil, and a connector having a socket at one end and a tip at the other, said connector being placed with the socket end over the fin

and the jaws of the socket portion being flattened to engage the fin and conductively fastened thereto.

In witness whereof, I hereunto subscribe my name this 3rd day of January, 1930.

WILLIAM C. TINUS.