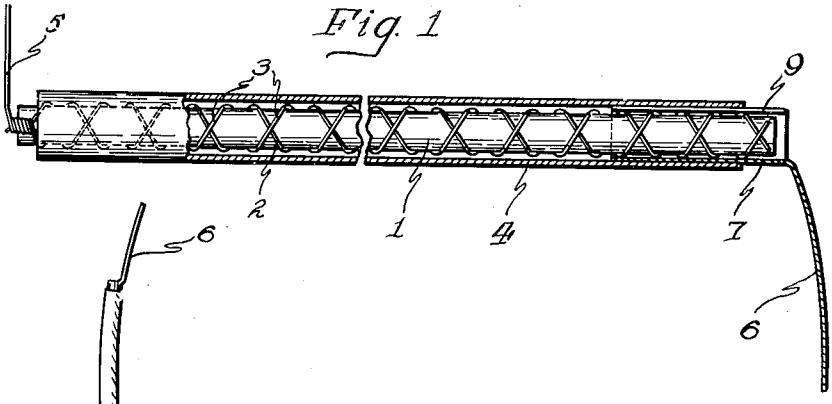
April 7, 1936. D. T. SIEGEL ET AL 2,036,368

NONINDUCTIVE RESISTANCE

Filed Sept. 14, 1934

Fig. 1



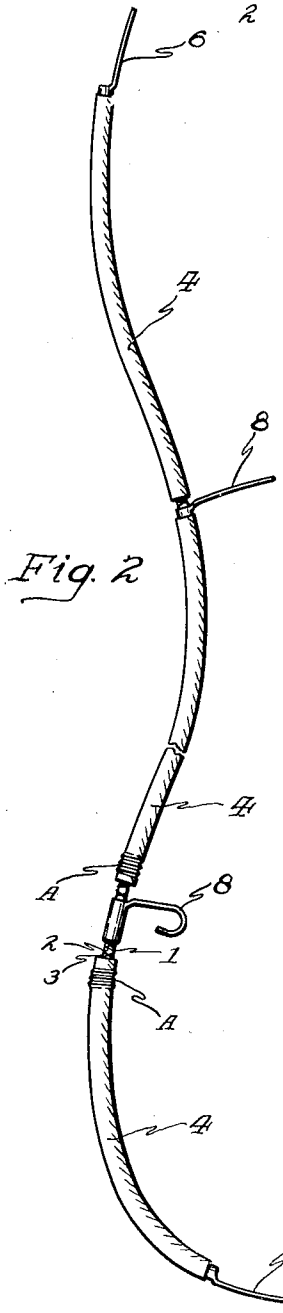


Fig. 2

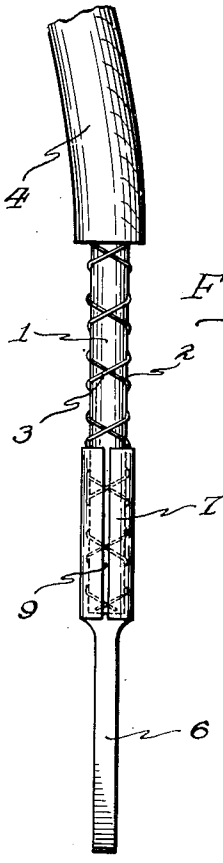


Fig. 3

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NONINDUCTIVE RESISTANCE

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Application September 14, 1934, Serial No. 743,998

1 Claim. (Cl. 201—63)

This invention relates to electrical resistance units, and particularly to noninductive resistance units.

The main objects of this invention are to provide a simple noninductive resistance unit having lineally spaced terminals; to provide such a resistance unit having electrically parallel oppositely wound helical conductors; to provide such a resistance unit having electrically parallel oppositely wound helical conductors electrically contacting each other at the intersections of the helices; to provide such a resistance unit having one or more taps or sub-terminals intermediate spaced end terminals; and to provide a flexible noninductive resistance unit having lineally spaced terminals.

An illustrative embodiment of this invention is shown in the accompanying drawing in which:

Figure 1 is a view partly in section of a noninductive resistance unit.

Fig. 2 is a view showing such a unit arranged with intermediate terminals.

Fig. 3 is an enlarged view of one end of a resistance unit showing a terminal fastened thereon.

In the form shown in the drawing, the improved noninductive resistance unit comprises a core 1 about which a pair of conductors 2 and 3 are wound helically, each conductor being wound in an opposite angular direction relative to the other. As shown in Figure 1 the ends of the conductors at each end of the resistance unit are connected together by or to form a terminal, thus making the conductors electrically in parallel; and the resistance unit as a whole is finally provided with a tubular cover 4 preferably of an insulating material.

The pitch of the conductor windings is such that each turn or convolution is spaced away from the next turn or convolution and the pitches of the two conductor helices are substantially the same; thus each convolution of one conductor helix intersects a corresponding convolution of the other conductor helix and, in the form shown, the two helices contact each other electrically at each such intersection.

As shown at the left-hand side of Figure 1, the two conductors are joined by twisting them together and a terminal 5 is formed by permitting the end of one or both of the conductors to extend outwardly from the unit core. As shown at the right-hand side of Figure 1 a separate terminal 6, having a sleeve-like body part 7, is clamped over and contacts both the conductors at that end of the resistance unit.

The cover 4 is preferably braided on the resistance unit by means of any well-known apparatus for performing that operation and may be either braided tightly about the core and winding or loosely so as to be slidable on the unit.

As shown in Figure 2, the resistance unit is provided with a plurality of sub-terminals or taps 8, intermediate the end terminals, which are arranged to contact each of the conductor helices.

As shown, the sub-terminals 8 are each provided with a sleeve-like body portion which is clamped over the resistance unit and against the conductors, the cover 4 being split annularly and shifted back from the point of incision, as at A in Figure 2, to bare the conductor helices and allow the clamping on of the sub-terminals 8; the body portion of the terminal being split, as at 9 in Fig. 3, whereby the same can be set over the conductor and then contracted to tightly clamp against or embrace the same.

In a flexible noninductive resistance unit, the core 1 is preferably of cotton, asbestos, or other suitable material as may be desired, and the cover 4 is woven so as to allow the desired flexibility therein. In units where sub-terminals or taps are provided, the conductor helices 2 and 3 are preferably formed of bare uninsulated wire in order to facilitate the connection of the sub-terminals. However, it is to be understood that the hereindescribed noninductive resistance units may be wound with insulated conductors; or the conductor helices may be insulated from each other by any other suitable means.

In operation the terminals of the improved resistance unit are connected to the electrical devices with which the unit is to be associated and, the terminals being lineally spaced and connected to both of the conductor helices, the two conductors are electrically in parallel with each other. Thus the flow of current through the resistance unit is from end to end and the pitch of the two windings being substantially equal, the potential at each point of intersection between the windings is the same. Therefore, there is no possibility of short-circuiting between the two conductor helices and the unit is substantially noncapacitative. The unit is noninductive, due to the fact that the two conductor helices are wound in opposite angular directions whereby any induction set up by one winding is automatically counter-acted by an equal, opposite induction set up by the other winding.

The main advantages of our invention lie in the fact that by our arrangement a resistance unit having lineally spaced terminals is provided

which could not be had in such arrangements where the resistance element is first wound about a core in one direction and then doubled back upon itself in order to render the unit noninductive.

Furthermore, by our arrangement, it is a comparatively simple matter to provide taps or subterminals at any point along the length of the resistance unit since the potential between he two conductors is zero at each point where the conductor helices cross or intersect, and by merely clamping on or otherwise providing a terminal which will contact both conductor helices, a balance between the two conductors is always had and the potential between one end terminal and any sub-terminal is determined solely by the lineal distance between such terminals.

Although but one specific embodiment of this invention is herein shown and described, it is to be understood that the details as set forth may be altered or omitted without departing from the spirit of the invention as defined by the following claim.

We claim:

An electrical resistance unit comprising a flexible dielectric core having a pair of bare conductors helically found thereon, each in an opposite angular direction and with substantially the same pitch, the turns of said conductors intersecting and electrically contacting each other, a terminal adjacent each end of said unit electrically connecting the adjacent ends of said conductors in parallel, and a sub-terminal intermediate the ends of said unit and electrically contacting both said conductors.

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