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SLIDE CONTACT OR WIPER FOR CYLINDRICAL COILS

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*Fig. 1*

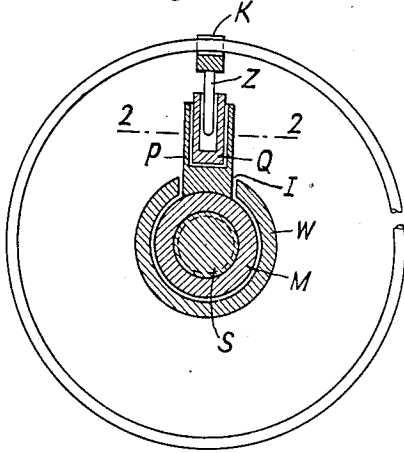


*Fig. 2*

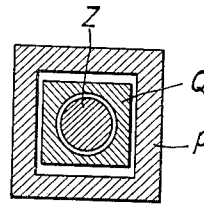


*Fig. 3*

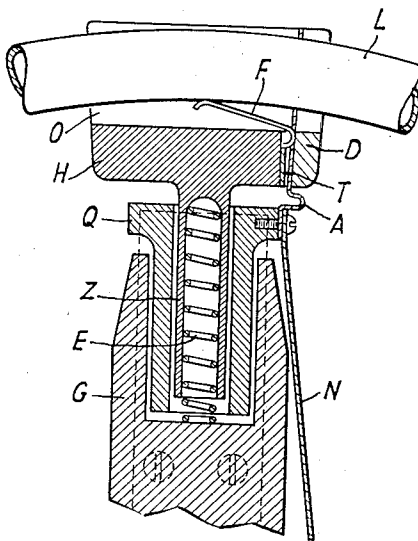
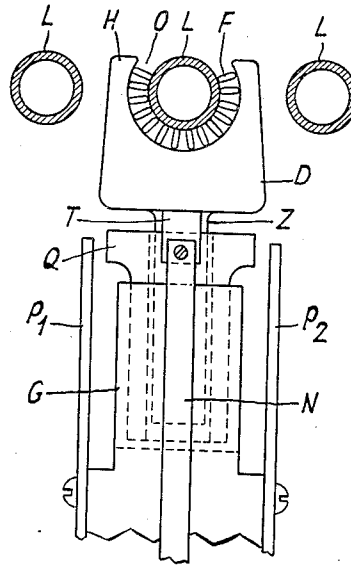


*Fig. 4*



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## UNITED STATES PATENT OFFICE

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SLIDE CONTACT OR WIPER FOR  
CYLINDRICAL COILS

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4 Claims. (CL 173—259)

The present invention relates to a slide contact or wiper for cylindrical coils comprising a tap shiftable along the coil wire and gripping or surrounding the coil wire clip-fashion, particularly suited for radio frequency transmitters. Slide contacts of this kind known in the prior art are but poorly suited for powerful radio frequency currents for the reason that mostly appreciable heating is evolved at the contact point. It has more particularly been ascertained that the quality of the contact of the tap varies very widely and various positions of the wiper.

According to the present invention, the slide contact or wiper consists of several parts, and of these a first part which does not slide along the coil wire is fixedly connected with the operating spindle, where as the portion which is in sliding contact relation with the coil wire in reference to the first part is radially shiftable, while being pivotal or shiftable in a direction parallel to the coil axis and rotatable about the axis of the slide contact, though being driven in the direction along the coil wire by the said first part.

The advantage which the arrangement here disclosed offers may be described as follows: Satisfactory contact is insurable with clip-like tap only when the contact pressure is uniformly good throughout the entire circumference of the clip-like tap. However, it will never be possible in practice to place the coil wire along an exact helix; in fact, slight discrepancies will always happen, and these are in the shape of a variation of the diameter of the helix or a variation in its pitch. Such variations, where a rigid wiper is used, will in most positions of the wiper result in a non-uniform contact pressure distribution upon the periphery of the clip-type tap, and thus impair the quality of the contact. However, in the device here disclosed, the wiper is inherently flexible in such a way that discrepancies in the spires of the coil, i. e. departures from an ideal helix or spiral will be perfectly compensated. As a result, the contact will be uniformly good when shifting the tap, but the wiper is perfectly rigid in the direction of the coil wire, that is to say, tangentially in reference to the coil axis, so that any given position is perfectly reproducible.

This invention will best be understood by referring to the accompanying drawing, in which:

Fig. 1 is a plan view of an inductance coil partly in section;

Fig. 2 is a sectional detail taken on line 2—2 of Fig. 1;

Fig. 3 is a section of the contact member of this invention; and

Fig. 4 is an elevation of Fig. 3.

An exemplified embodiment of the invention is shown in Fig. 1. The tap K, gripping or surrounding the coil wire L of an antenna variometer clip-fashion, is supported by a cylindrical pin Z which engages in the cylindrical bore of a hollow body Q in such a way that it is shiftable in reference to the same in the cylinder axis, as well as rotatable about the same. The said hollow body Q is prismatic on the outside, and it fits into a recess of the prismatic part P, which recesses is also prismatic, in such a way that, as more clearly shown in Fig. 2, it is capable of being shifted in relation to its inside narrow limits in a direction at right angles to the plane of the drawing, while being firmly guided by part P in a direction parallel to the coil wire.

Part P is attached to a nut M which is seated upon a spindle S fixedly disposed in the coil axis and is guided along the screw of the said spindle, the pitch of the spindle or worm corresponding to the pitch of the coil. The motion of the nut and thus of the entire wiper is effected by a hollow shaft W surrounding both the nut and the spindle, part P protruding through a slot I extending in a direction parallel to the axis thereof. The hollow shaft extends outside the interior of the coil and supports the operating handle with which setting of clip K is effected.

Details of the construction of the slide contact may be seen from Figs. 3 and 4 which show the slide contact in section taken on two planes at right angles to each other. The slide contact is represented by a hollow body H with cylindrical bore  $\emptyset$  which embraces the tubular coil conductor L about two-thirds of its circumference. The remainder of the contour is open so that it is possible to support the coil in the usual way by means of securing means attached on the outside. The diameter of the bore  $\emptyset$  is slightly greater than the outside diameter of the coil tube. Contacting is insured by the agency of a row of separate springs uniformly and radially distributed over the circumference, said springs consisting of cylindrical wires bent hook-fashion. For the purpose of securing and contacting of the various springs, the hollow body has an annular groove at its end face in which the ends of the springs are radially fitted. The ends of spring F are held in position by means of a contact plate T fitted thereon whose form matches the cross-section of the hollow body as well as

a flange-like pressure or locker plate D fitted in turn, upon the said contact plate and screwed fast upon the hollow part. The same arrangement, fundamentally speaking, is suited also in connection with a rigid slide contact or wiper.

The said hollow body supports a cylindrical pin Z which is immersed in the cylindrical bore of the part Q which is prismatic on the outside. The said part Q, in turn, is firmly guided and held in the fork G in a direction parallel to the coil wire. The said fork G corresponds to part P in embodiment Fig. 1 and is united in a similar manner with the operating handle. The two open ends of the fork are shut by two plates P1 and P2 screwed thereon; these plates afford a certain freedom of movement for part Q in a direction parallel to the coil axis.

The cylindrical pin Z, in turn, has a cylindrical bore in which is fitted a compression or coil spring E which tends to separate the hollow body H from the part G. The force of the said spring is made so high that it will compensate lack of symmetry of the spring forces of the contact springs F owing to the fact that the upper part of the circumference is left open.

Collection from the springs F is effected by way of the contact plate T which has a compensating loop A. The lower portion of plate T is screwed fast on movable part Q and thereby is connected also with the springy strip N whose lower end (not shown) is in contact with the hollow shaft W (Fig. 1). If still larger currents are to be handled, it will be found advantageous to extend the pressure plate T over its entire width out of the hollow body and to screw the same together directly with several strips or lugs N, each of the latter bearing separately upon the circumference of the hollow shaft W. Current may be collected from the latter by means of slide contacts.

What is claimed is:

1. A sliding contact for a conductor comprising a hollow body portion, an opening in said hollow body portion which is slightly greater

than the conductor, means to move said contact around a portion of the conductor, said means including a plurality of spring members radially disposed within said opening in said hollow body and arranged to separately contact and grip said conductor around substantially two-thirds of the cross-sectional diameter when said contact is moved.

2. A sliding contact for a high frequency conductor comprising a hollow body portion having a horse shoe shaped channel opening located therein, a plurality of spring members radially spaced apart from each other within the opening in said hollow body portion to separately contact and grip said conductor around substantially more than half of its cross-sectional diameter.

3. A sliding contact for a high frequency conductor comprising a hollow body portion having an opening therein and a plurality of slots cut on one of its faces, a plate member covering said slots, and a plurality of spring contact members arranged to extend in the opening of said hollow body portion and said slots to be spaced apart from each other and secured by said plate member to contact and grip said conductor around substantially more than half of its cross-sectional diameter.

4. A sliding contact for a high frequency conductor comprising a hollow body portion having an opening therein and a plurality of slots cut on one of its faces, a plate member covering said slots, a plurality of spring contact members arranged to extend in the opening of said hollow body portion and said slots to be spaced apart from each other and secured by said plate member to contact and grip said conductor around substantially more than half of its cross-sectional diameter, and a movable arm having a square aperture therein, said hollow body secured within said square aperture in said arm, the movable arm having means for changing its position along the length of said conductor.

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