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ELECTRICAL INDICATING INSTRUMENT

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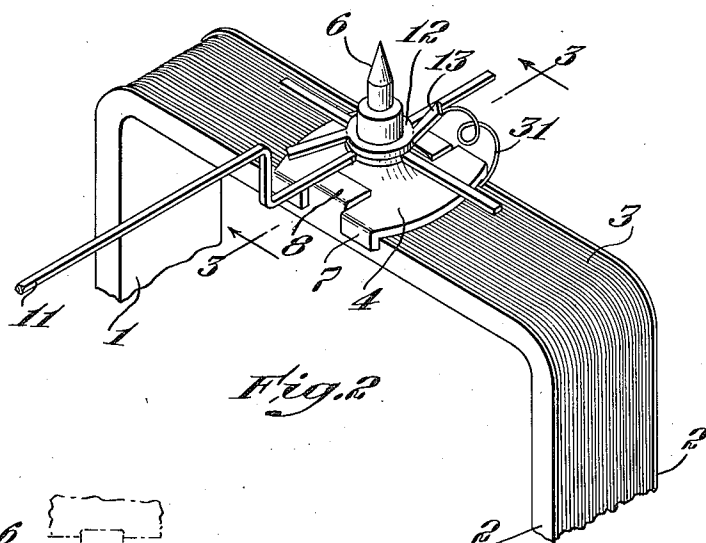


Fig. 2

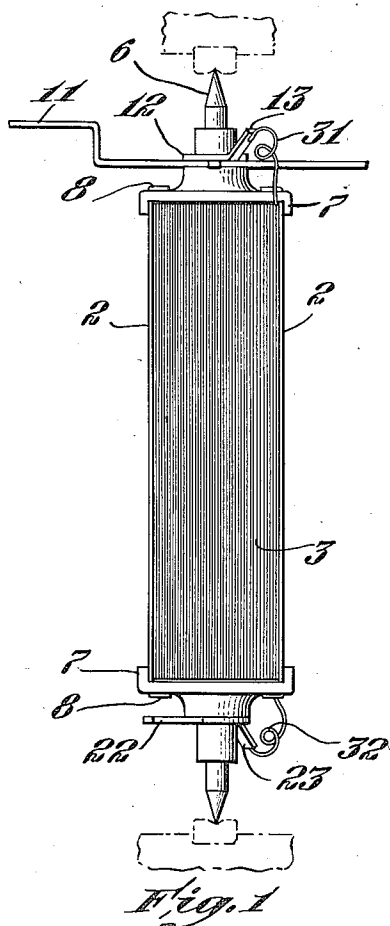


Fig. 1

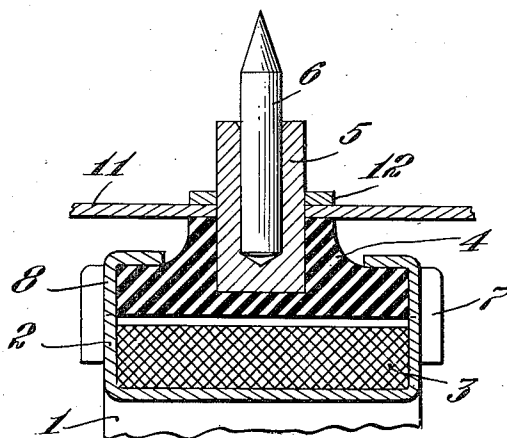


Fig. 3

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ELECTRICAL INDICATING INSTRUMENT

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6 Claims. (Cl. 171—95)

This invention relates to electrical meters of the pivoted coil type and more particularly to the ultra-sensitive type, such as milliammeters, millivoltmeters, microammeters and microvoltmeters, which usually comprise a rectangular coil form having side flanges to confine the windings of the coil, together with two pivot assemblies, each including a base and a pivot pin mounted on the base, the bases seating on the outer sides of the opposite ends of the coil with their pivot pins projecting outwardly along an axis extending through the center of the coil. To attain sensitivity and accuracy in such instruments the weight of the pivoted coil assembly must be kept very low and the pivot pins must be accurately centered both transversely and longitudinally of the coil windings. It is also necessary to insulate the coil from the pivoted supports. Heretofore it has been customary to cement the pivot assemblies to the periphery of the coil with an intermediate piece of silk or paper to serve as insulation. In making the coil assemblies the wire is wound on the form, cement is applied near the end of the wire to keep it from unwinding, the coil and pivot assemblies are placed in jigs to center the pivots on the coil, the cement and insulation are applied, the pivot bases are pressed against opposite ends of the coil and held there until the cement has set. This procedure is not only slow and tedious, particularly because of the delicacy of the minute parts, but unless great care is taken short circuits occur and the pivot assemblies are not accurately centered on the coil, resulting in an instrument which is inoperative or inaccurate.

Objects of the present invention are to provide an instrument of the character referred to which can be manufactured rapidly and economically, which is sensitive and accurate and which is durable and reliable in use.

According to the present invention the meter comprises a movable coil including a coil form having side flanges, together with means for pivotally supporting the coil including a base seating on the periphery of the coil form, the base having recesses and the aforesaid flanges having integral tabs fitting into the recesses to position the base relatively to the coil form. The tabs may be bent over the outer side of the base, in which case the tabs serve not only to position the base but also to hold it on the form. Preferably the base also has surfaces overlapping the sides of the aforesaid flanges to interlock the base and form transversely of the coil windings, the aforesaid tabs serving to position the

base and form longitudinally of the coil windings, that is circumferentially of the coil. The aforesaid surfaces overlapping the sides of the flanges are preferably in the form of legs which straddle the coil form. By making the aforesaid base of Bakelite or other insulating material it is unnecessary to insert the usual layer of silk or paper between the base and coil when the parts are assembled.

For the purpose of illustration a typical embodiment of the invention is shown in the accompanying drawing in which

Fig. 1 is a side view of the coil;

Fig. 2 is a perspective view of the upper end of the coil; and

Fig. 3 is a section on line 3—3 of Fig. 2.

The particular embodiment of the invention chosen for the purpose of illustration comprises a rectangular coil form 1 having side flanges 2 and windings 3 wound in the channel formed by the side flanges. At each end of the coil is provided with a pivot assembly comprising a base 4, a socket 5 and a bearing pin 6 which cooperates with a suitable bearing as indicated in broken lines in Fig. 1. The base 4 is preferably formed of Bakelite or other molded insulating material and the socket 5 is preferably molded in the base. The pivot pin 6 is mounted in the socket 5 with a pressed fit. At each of its four corners the base 4 is provided with a leg 7 which extends inwardly along the outside of one of the flanges 2. Between the two legs on each side of the coil is a recess, and formed integrally with the side flanges 2 are tabs 8 which extend through the recesses and thence bend over the outer surface of the base to hold the base on the coil. The distance between the legs 7 on opposite sides of the coil is substantially equal to the width of the coil form so that the base fits snugly over the form, thereby to center the pivot assembly transversely of the coil winding. By making the width of the tabs 8 substantially equal to the width of the recesses in the base the pivot assembly is centered longitudinally of the coil windings.

The indicating pointer 11 is mounted on the socket 5 with a pressed fit and over the indicator is mounted a cross-shaped member 12 having a tab 13, to which one end of the coil 3 is attached, and also having arms upon which weights may be adjustably mounted for the purpose of balancing the entire coil assembly. As shown in Figs. 1 and 2 one end 31 of the coil is connected to the tab 13 of one pivot assembly and the other end 32 of the coil is connected to the corresponding tab 23 of the other pivot assembly.

From the foregoing it will be evident that the mounting of the pivot on the coil merely involves dropping the base 4 into position on the coil, with the legs 7 straddling the flanges 2 of the coil form and the tabs 8 of the coil form extending through the recesses between the legs 7, and then bending over the outer ends of the tabs 8. Thus the pivot assembly is centered automatically both transversely and circumferentially of the coil. Inasmuch as the base 4 is formed of insulation material and seats on the flanges 2 there is no danger of short circuiting the windings as in the case of metal bases seating on the windings with only a layer of silk or paper in between. Moreover this construction avoids the slow and tedious hand method of centering the pivots on the coil by means of jigs and fixtures. By applying the pivot assemblies to the coil immediately after the coil is wound the assemblies keep the ends of the wire from swinging outwardly, thereby eliminating the customary step of cementing the wire ends.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. In an electrical meter of the type having a movable coil, a coil form having side flanges at its periphery and means for pivotally supporting the coil to rotate about an axis, said means including a base of insulation material seating on the periphery of the coil form and a pivot mounted on the base, the base having recesses and the flanges having integral tabs fitting into the recesses.

2. In an electrical meter of the type having a movable coil, a coil form having side flanges at its periphery and means for pivotally supporting the coil to rotate about an axis, said means including a base of insulation material seating on the periphery of the coil form and a pivot mounted on the base, the base having recesses and the flanges having integral tabs fitting into the recesses, the tabs being bent over the outside of the base to hold the base on the form.

3. In an electrical meter of the type having a movable coil, a coil form having side flanges at its

periphery and means for pivotally supporting the coil to rotate about an axis, said means including a base of insulation material seating on the periphery of the coil form and a pivot mounted on the base, the base having surfaces overlapping the sides of said flanges to interlock the base and form transversely of the coil windings, the base also having recesses and the flanges having integral tabs fitting into the recesses to interlock the base longitudinally of the coil windings.

4. In an electrical meter of the type having a movable coil, a coil form having side flanges at its periphery and means for pivotally supporting the coil to rotate about an axis, said means including a base of insulation material seating on the periphery of the coil form and a pivot mounted on the base, the base having surfaces overlapping the sides of said flanges to interlock the base and form transversely of the coil windings, the base also having recesses and the flanges having integral tabs fitting into the recesses to interlock the base longitudinally of the coil windings, the tabs being bent over the outside of the base to hold the base on the form.

5. In an electrical meter of the type having a movable coil, a coil form having side flanges at its periphery and means for pivotally supporting the coil to rotate about an axis, said means including a base of insulation material seating on the periphery of the coil form and a pivot mounted on the base, the base having legs straddling the coil form to center the base transversely of the coil windings and said flanges having integral tabs extending into recesses in the base to center the base longitudinally of the coil windings.

6. In an electrical meter of the type having a movable coil, a coil form having side flanges at its periphery and means for pivotally supporting the coil to rotate about an axis, said means including a base of insulation material seating on the periphery of the coil form and a pivot mounted on the base, the base having legs straddling the coil form to center the base transversely of the coil windings and said flanges having integral tabs extending into recesses in the base to center the base longitudinally of the coil windings, the tabs being bent over the outside of the base to hold the base on the form.

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