(No Model.)

E. WESTON.

ELECTROPLATED COIL FOR ELECTRICAL MEASURING INSTRUMENTS.

No. 392,385. Patented Nov. 6, 1888.

Fig. 1.

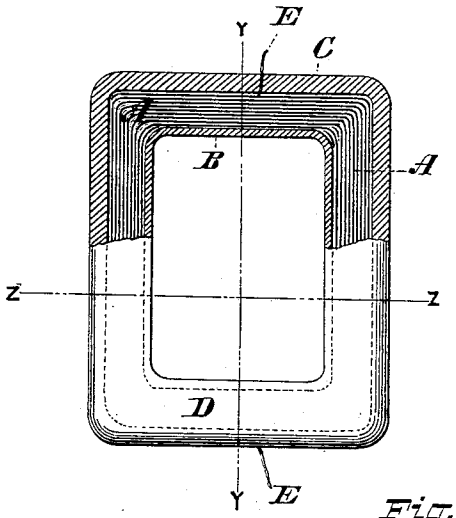


Fig. 2.

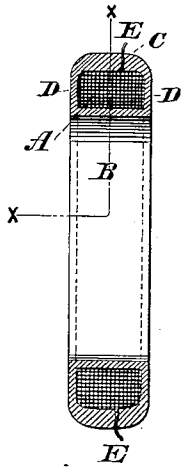


Fig. 3.

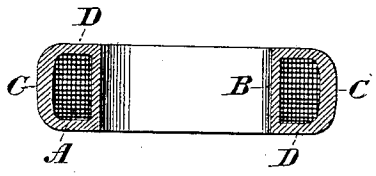


Fig. 4.

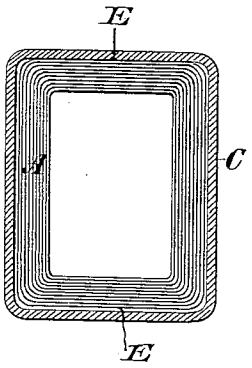


Fig. 5.

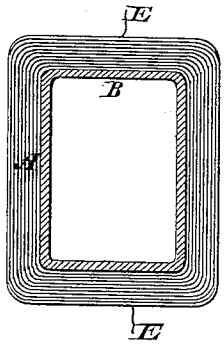
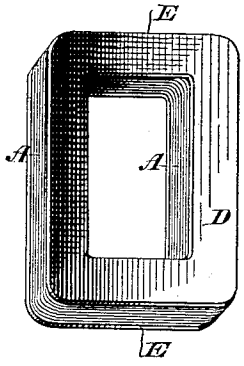


Fig. 6.



WITNESSES:

Gustave Dieterich.

Edgar Goodwin.

INVENTOR.

Edward Weston.

BY Park Benjamin,

His ATTORNEY.

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

EDWARD WESTON, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE WESTON ELECTRICAL INSTRUMENT COMPANY, OF SAME PLACE.

ELECTROPLATED COIL FOR ELECTRICAL MEASURING-INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 392,385, dated November 6, 1888.

Application filed April 9, 1888. Serial No. 270,093. (No model.)

To all whom it may concern:

Be it known that I, EDWARD WESTON, of Newark, Essex county, New Jersey, have invented a new and useful Improvement in Electroplated Coils for Electrical Measuring-Instruments, of which the following is a specification.

My invention relates to a coil which in certain electrical measuring-instruments is supported so as to move freely in a magnetic field, and through which a current to be measured is passed. The passage of the current causes a movement of said coil against a uniform resilient resistance, and the strength of the current is indicated by the extent of movement of said coil.

In another application for Letters Patent, filed on the 17th day of March, 1888, and serially numbered 267,474, I have fully described an apparatus wherein such a coil is used in the manner described.

My present invention has more particular reference to the construction of said coil and to the covering or envelope thereof, which is of diamagnetic metal. It is a well-known fact that when a body of diamagnetic metal—such as copper—is suspended between the poles of a powerful magnet it finds in the field of force a powerful resisting medium which opposes any motion of the metallic mass and speedily brings it to rest. To this end I inclose my coil in a mass of copper, and so render the needle or pointer attached to the coil and indicating the extent of its motion "dead-beat" or free from undue oscillation or vibration. While this envelope of copper may be applied to the coil in the form of plates soldered or otherwise secured together, I find it very much more advantageous and convenient to deposit the copper on the coil by electroplating, because in this way I can produce a perfect envelope without joints of homogeneous metal, which by simple manipulation of the electrode in the plating-bath I can deposit in a thick mass at one point or a thin mass at another, as may be desired.

In the accompanying drawings, Figure 1 is a face view of my coil having a covering of electro-deposited metal, part of said coil and envelope being shown in section on the line *x x* of Fig. 2. Figs. 2 and 3 are sections of my coil on the lines *y y* and *z z* of Fig. 1, respectively. Fig. 4 is a vertical transverse section of a coil having only an outer peripherical covering of electro-deposited metal. Fig. 5 is a similar section of a coil having only an inner covering or coil of electro-deposited metal. Fig. 6 is a perspective view of a coil having only side or face pieces of electro-deposited metal.

Similar letters of reference indicate like parts.

A is the coil of insulated wire, which may be of any desired form. It is here shown as quadrangular. The exterior of this coil is covered with electro-deposited copper to form an envelope or covering, which may be regarded as consisting of an inside frame, B, an outer frame, C, and side or face pieces, D D. This envelope is in one piece, as here shown, and for the purposes of the electrical measuring-instrument referred to in my above-noted application it comprises the parts before named; but it is to be understood that I do not limit my present invention to an electro-deposited envelope covering the entire exterior of the coil, because I may for some purposes use only an inner frame, B, or an outer frame, C, or only the side pieces, D D, in each case, however, producing the part of electro-deposition. Thus in Fig. 4 is shown a coil having only an outer frame, C. Fig. 5 represents a coil having only an inner frame, B, or core. Fig. 6 represents a coil having only face or side pieces, D. So, also, I make the coil with any two of these parts, as the frame C and side pieces, D, or frame C and frame or core B, or frame or core B and side pieces, D. I may produce this electro-deposited covering by various methods, one of which I will now specify, by following which any one skilled in the art will easily be able practically to make my invention.

I wind the coil upon any suitable form and permeate it with shellac or any other suitable adhesive material, whereby all the turns of wire are firmly fastened together. When the shellac is dry, I remove the coil from the form and dip it in melted beeswax, so that a film of wax is left adherent. Upon the wax I apply a coating of plumbago and then place the coil in any suitable electro-deposition, both

arranged for copper deposit. In order to effect the deposition of the inside frame, one anode may be supported inside the coil, and generally the anodes are to be arranged so as to effect the deposition at the points needed to secure deposits of the desired continuity and thickness. Any one skilled in the manipulation of electroplating-baths will have no difficulty in making such arrangement.

For practical use I make the outer frame, C, thicker than the inner frame, B, so as to secure the greater mass of diamagnetic metal on the outside of the coil, and hence in the densest part of the magnetic field of force surrounding the coil, by which means I obtain a more efficient retarding effect of the copper when the coil moves in the field.

It will be obvious that by producing the copper core, side pieces, or outer frame, or all of them, in this way, I obtain all parts of strictly homogeneous diamagnetic metal, and so secure uniformity of action thereof in the magnetic field. In delicate instruments of precision this is an important desideratum. So, also, I avoid possibility of portions being unduly thick or thin or more or less dense than others, and the necessity of any soldering or brazing or of cutting the parts to make a proper fit. The terminals E of the coil are carried out through the outer frame, as shown.

I claim—

1. An insulated conductor in coil form having an inner frame or core of electro-deposited metal, substantially as described.

2. An insulated conductor in coil form having an outer peripherical covering or frame of electro-deposited metal, substantially as described.

3. An insulated conductor in coil form having a face or side covering of electro-deposited metal, substantially as described.

4. An insulated conductor in coil form wholly covered on its exterior with electro-deposited metal, substantially as described.

5. An insulated conductor in coil form having a covering of electro-deposited diamagnetic metal, substantially as described.

6. An insulated conductor in coil form wholly covered on its exterior with electro-deposited diamagnetic metal, the deposit on the periphery of the coil being thicker than elsewhere, substantially as described.

EDWARD WESTON.

Witnesses:
PARK BENJAMIN,
EDGAR GOODWIN.