(No Model.)

W. H. BRISTOL.

RECORDING AMPERE METER.

No. 533,269. Patented Jan. 29, 1895.

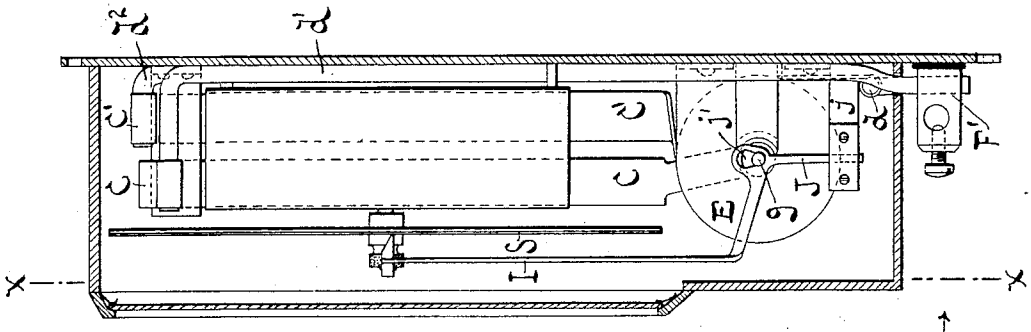

Fig. 2.

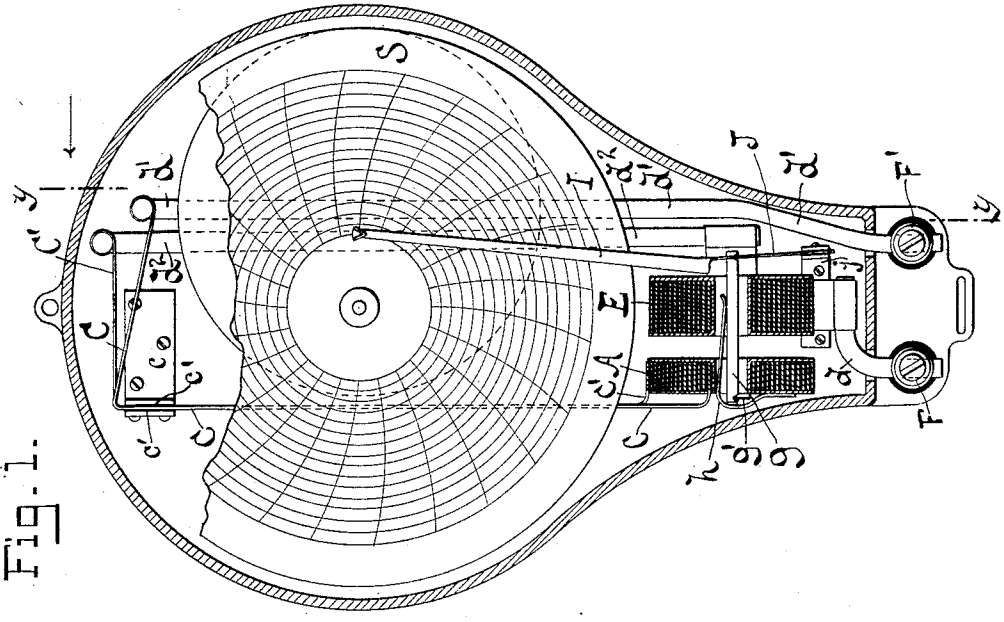

Fig. 1.

WITNESSES:

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WILLIAM H. BRISTOL, OF HOBOKEN, NEW JERSEY.

RECORDING AMPÈRE-METER.

SPECIFICATION forming part of Letters Patent No. 533,269, dated January 29, 1895.

Application filed July 26, 1894. Serial No. 518,624. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BRISTOL, a citizen of the United States of America, and a resident of Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Recording Ampère-Meters, of which the following is a specification.

My invention has reference to electrical devices of that character especially adapted for use in galvanometers, ampère-meters, and similar instruments for indicating and recording an electrical current, or the work done thereby.

My invention consists essentially in certain improvements in the devices shown and described in Letters Patent No. 505,243, granted to me, September 19, 1893, and has for its object to render the instrument capable of carrying large currents as are necessary in ampère-meters, and at the same time to maintain sensitiveness and accuracy.

The nature of my invention and its application to instruments of the class above mentioned will best be understood when described in connection with the accompanying drawings, in which—

Figure 1 represents a vertical section in the plane, *x*, *x*, Fig. 2, of an ampère-meter embodying my invention. Fig. 2 is a vertical cross-section in the plane *y*, *y*, Fig. 1.

Similar letters of reference designate corresponding parts.

Referring to the drawings, the letter E designates a coil or solenoid secured to the back of the casing, and A is a movable coil or solenoid arranged in line with the stationary coil or solenoid E, the former being moved toward the latter when the two coils or solenoids are vitalized.

The coil or solenoid A is suspended opposite to coil or solenoid E, by means of two flexible metallic strips C and C′ pendent from a bracket *c* near the top of the casing, from which bracket they are insulated by plates *c′ c′* of non-conducting material. The lower terminal of strip C is in electrical connection with the center of coil or solenoid A, while strip C′ is in connection with the outer terminal thereof.

In practice I make the strips C C′, which I shall herein term the conducting supports, of copper about eight inches long, one inch wide and .025 inches thick, so that they offer comparatively little resistance to the current and, owing to their length, but little resistance to the motion of the coil or solenoid.

F F′ are the binding posts for the attachment of the wires from the source of electricity, one of which (F) is connected by a heavy conductor *d* with the outer terminal of coil E, while the other (F′) is connected by a similar conductor *d′* to the upper end of conducting support C.

The inner terminal of coil or solenoid E is connected by a conductor d^2 with the upper end of conducting support C′. The current entering at post F passes through coil or solenoid E, over conducting strip d^2, conducting support C′, through coil or solenoid A, over conducting support C, and conductor *d′*, to F′; thereby vitalizing the coils or solenoids and causing motion of coil or solenoid A in the direction of coil or solenoid E to a greater or less extent according to the amount of the current.

I is a pointer, recording arm, or like device arranged opposite a scale or chart S in the usual manner. This pointer is carried by a flexible support J secured to a bracket *j* on the base, from which it is insulated.

g is a rod passing through the bores of the coils or solenoids and provided near its opposite ends with V shaped notches. The object of this rod is to connect the movable coil or solenoid A with the pointer I and to transmit the motion of the coil or solenoid to said pointer.

The notch at one end of the rod *g* rests upon a bridge piece *g′* formed with a knife edge bearing, while the notch at the opposite end of said rod rests on a knife edge forming the lower side of the slot *j′*. A spring *h* secured to coil or solenoid A and pressing upon the rod holds the latter down upon the knife edges.

It will be readily seen that when the coil or solenoid A moves toward the coil or solenoid E, the flexible support J is deflected about its point of attachment and consequently the end of the arm or pointer I, which forms a prolongation of said support, participates in said movement about the point of attachment of

the support as a center and moves through a greatly increased arc, thereby permitting gears, levers and similar multiplying devices to be dispensed with. In the present example I have shown the support J and the pointer or arm proper made integral, but of course they may be made separate and united in any usual manner.

While I prefer to use the devices herein described for communicating the motion of coil or solenoid A to the pointer, it is evident that the knife edge connection may be omitted, and that the support J may be hinged instead of being flexible.

It is evident that the movable coil or solenoid may be supported from below, instead of suspended, by the use of similar conducting supports; the only objection to this arrangement being the increased space then occupied by the instrument.

In the present construction the electrical connections between the conducting supports and the movable coil or solenoid are continuous, and the danger of failure by reason of contact joints is avoided.

While I have herein described the movable coil or solenoid as in connection with the flexible pointer through the rod *g*, it is evident that the supports C C′ or other movable part may be connected to said pointer.

What I claim as new is—

1. In an electrical measuring instrument, the combination of a stationary coil or solenoid, a movable coil or solenoid, two swinging conductors suspending said coil or solenoid from above and connecting with the terminals of the same, a swinging indicating or recording arm, and a connection between the movable coil and the indicating or recording arm on one side of its point of attachment, substantially as described.

2. In an electrical measuring instrument, the combination of a stationary coil or solenoid, a movable coil or solenoid, two flexible conducting supports for said coil or solenoid connecting with the terminals of the same, an indicating or recording arm, a flexible support for the same, and a knife edge connection between the movable coil or solenoid and the support, substantially as described.

3. In an electrical measuring instrument, the combination of a stationary coil or solenoid, a movable coil or solenoid, two flexible conducting supports for said coil or solenoid connecting with the terminals of the same, an indicating or recording arm, a flexible support for the same, knife-edge bearings formed on the movable coil or solenoid and the flexible support, a notched rod connecting said bearings, and a spring bearing on said rod, substantially as described.

4. In an electrical measuring instrument, the combination of a stationary coil or solenoid, a movable coil or solenoid, two swinging supports for the said coil or solenoid connected with the terminals of the same, an indicating or recording arm, a separate swinging support for the same, and an operative connection between the movable coil and the latter support, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in the presence of two witnesses, this 23d day of July, 1894.

W. H. BRISTOL.

Witnesses:
CHAS. W. THOMAS,
A. FABER DU FAUR, Jr.