(No Model.)

J. PERRY.

ELECTRIC METER.

No. 486,123. Patented Nov. 15, 1892.

Fig. 1.

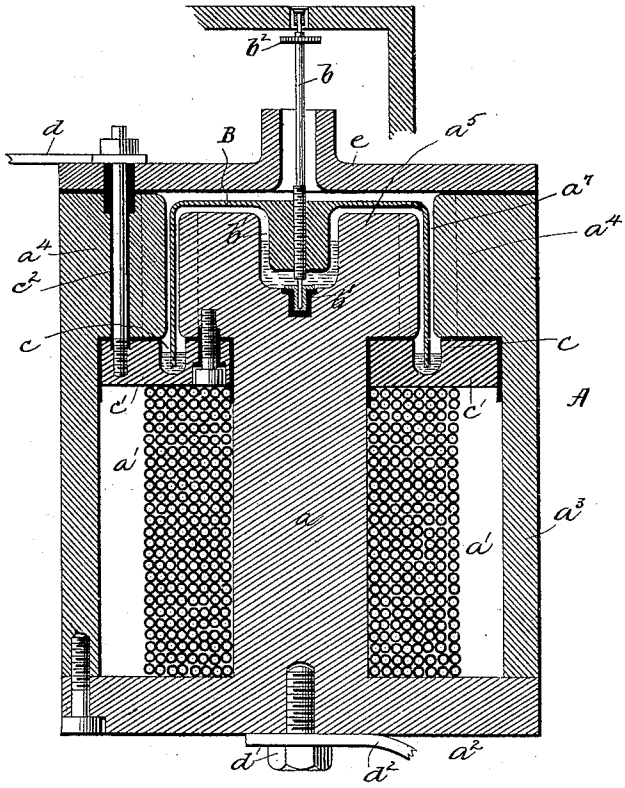
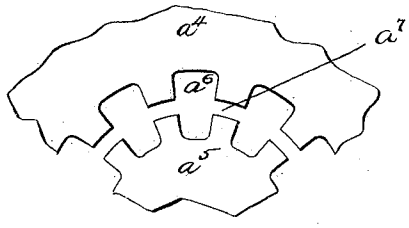


Fig. 2.



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JOHN PERRY, OF LONDON, ENGLAND.

ELECTRIC METER.

SPECIFICATION forming part of Letters Patent No. 486,123, dated November 15, 1892.

Application filed June 8, 1892. Serial No. 435,953. (No model.) Patented in England January 17, 1890, No. 873; in France November 17, 1890, No. 209,583, and in Belgium November 18, 1890, No. 92,766.

To all whom it may concern:

Be it known that I, JOHN PERRY, a subject of the Queen of Great Britain, residing at London, England, have invented certain new and useful Improvements in Electric Meters, (which were patented in Great Britain January 17, 1890, No. 873; in France November 17, 1890, No. 209,583, and in Belgium November 18, 1890, No. 92,766,) of which the following is a specification.

This invention relates to electric meters, and has special reference to that class of supply-meters in which electric motors are used.

The objects of the invention are to provide a construction of great compactness, involving few parts, obviating a large amount of friction, and accurate in its measurement of the energy passing through.

With these ends in view the invention consists of the construction which will hereinafter be described and claimed.

In the accompanying drawings, Figure 1 represents a vertical section of one form of my improved meter, and Fig. 2 represents a detail of the same.

In the meter illustrated, A represents an electro-magnet of the form known as "tubular." It consists of a core a, a coil a', surrounding the same, a disk or head a^3 across one end of the coil, a tube a^3, connected with the disk surrounding the coil and extending past the ends of the coil opposite the disk, where it is provided with a cylindric pole a^4, coaxial with the core a. This end of the core is provided with an enlarged cylindric head or pole-piece a^5, which extends horizontally to within a short distance of the polar face a^4, forming a continuous annular armature-space a^7. These opposite polar surfaces are provided with vertical grooves a^6, as illustrated in Fig. 2, the grooves in the two faces standing opposite each other, so that weak and strong fields will be alternately presented to the armature. The armature consists of an inverted-cup-shaped conducting-body B of iron, copper, or other suitable material. It is mounted upon a vertical shaft b, one bearing of which is in the bottom of a central circular cavity b' in the head or pole-piece a^5 and the other in a part of the frame above, as illustrated. This shaft also carries a wheel b^2, gearing with the counting mechanism. (Not here shown.) The hub of the armature extends down into the cavity b' for a purpose which will hereinafter appear. The sides or cylindric portions of the armature extend down past the polar faces and into an annular groove c, formed in a metallic ring c', surrounding the core and insulated from all the surrounding parts. This groove, as also the central cavity b', into which the hub projects, contains a quantity of mercury, with which the edge of the cylinder and the hub are in constant contact.

c^2 is a metallic bolt passing through the pole a^4, from which it is properly insulated, and into the ring c'. Its outer end projects and is fitted with a nut for binding a wire d, over which the incoming current flows. Screw d' in the bottom of the magnet holds the wire d^2, carrying the outgoing current. The whole device is fitted with a protecting-plate e, properly insulated. The current to be measured enters from wire d and flows through bolt c^2, ring c', mercury c from the edges of the armature to its hub at the center, thence to the mercury in cavity b' to the core a, and finally out through d' and d^2. The current thus flowing causes the armature to rotate in accordance with a well-known law, and the speed of rotation will be dependent upon the amount of current flowing. The number of revolutions will be communicated to the counting mechanism through the shaft b. A meter thus operated, however, is subject to variations due to the friction of the moving parts, inertia, and other causes, and is therefore liable to be inaccurate. To overcome difficulties of this nature, I make use of Foucault currents to resist the motion of the armature, and thereby make the armature more sensitive and positive in its movement. This I accomplish by the magnet A, hereinafter described. The field of force produced by said magnet when a constant current flows in the coil a' is, by reason of the grooves in the polar

faces, alternately strong and weak all around the armature-space, which induces in the armature as it rotates Foucault currents, which resist the rotary movement of the armature, or, in other words, act as a damper upon it.

It is to be observed that the magnet utilized to produce the Foucault currents may be either an electro-magnet or a permanent magnet; but in either case it is preferred that the current which magnetizes it should be such as produces saturation, so that small changes in the current shall not produce much change in the magnetization. This current may be derived from the supply-leads.

The part of the armature which dips into the mercury-troughs may be of iron, aluminum, nickel, or any other metal which does not readily become amalgamated, or the whole armature may be of such a metal; or it may be of copper or other metal plated with nickel, or some other metal that is not affected by the mercury.

I desire it further understood that my invention is not limited to a tubular field-magnet such as herein described, as I may use field-magnets of any other form so long as the polar faces are coaxial with the armature.

Having thus described my invention, I claim—

1. In an electric meter, the combination, with an armature consisting of a conductor shaped with coaxial surfaces of revolution, respectively receiving and giving out electric current, of a field magnet or magnets having polar surfaces arranged coaxially with the armature, said polar surfaces being interrupted or discontinuous, for the purpose set forth.

2. An electric meter consisting of a rotary circular body, in combination with means for sending a current from its edge to its center, or vice versa, and means for producing Foucault currents in the body, for the purpose set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN PERRY.

Witnesses:
JAMES PERRY,
THOS. S. GIRDLER.