(No Model.)

O. B. SHALLENBERGER.

METER FOR ALTERNATING ELECTRIC CURRENTS.

No. 481,975. Patented Sept. 6, 1892.

Fig. 1.

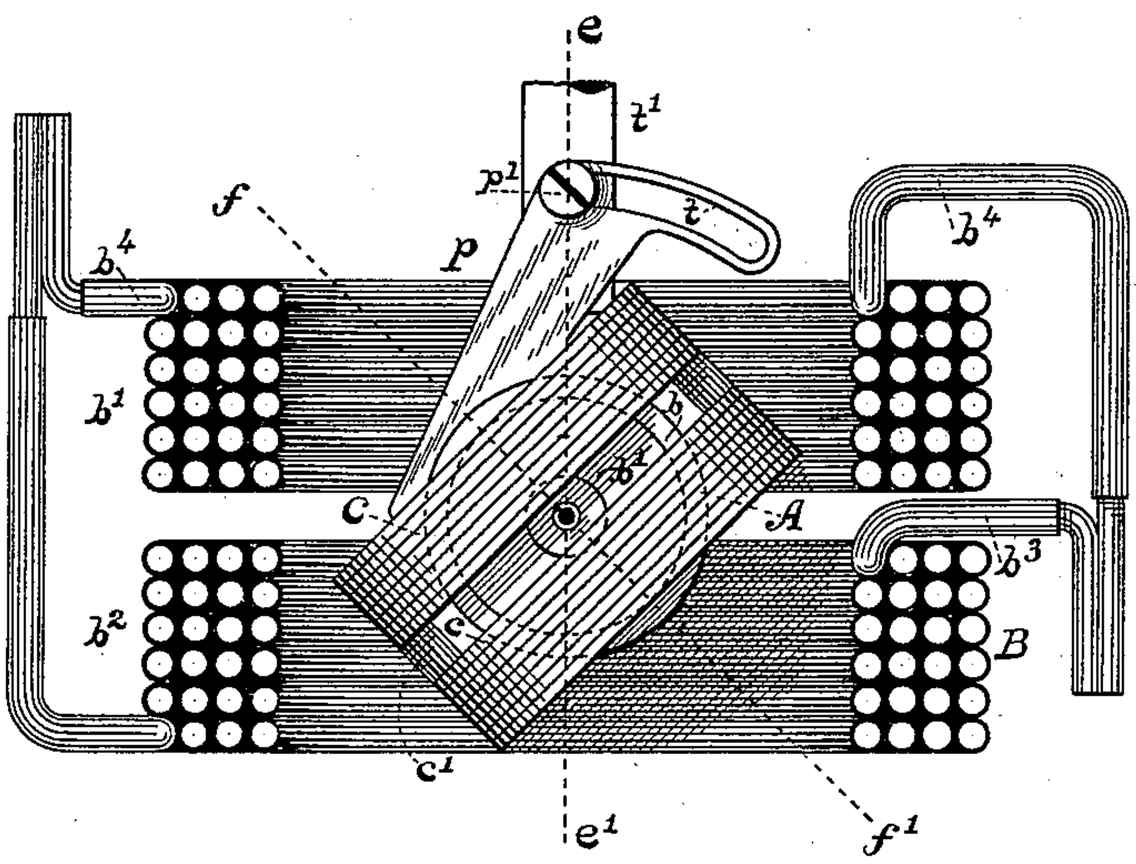

Fig. 2.

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UNITED STATES PATENT OFFICE.

OLIVER B. SHALLENBERGER, OF ROCHESTER, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, OF PITTSBURG, PENNSYLVANIA.

METER FOR ALTERNATING ELECTRIC CURRENTS.

SPECIFICATION forming part of Letters Patent No. 481,975, dated September 6, 1892.

Original application filed October 31, 1888, Serial No. 289,635. Divided and this application filed September 27, 1889. Serial No. 325,291. (No model.)

To all whom it may concern:

Be it known that I, OLIVER B. SHALLENBERGER, a citizen of the United States, residing in Rochester, county of Beaver, and State of Pennsylvania, have invented a certain new and useful Improvement in Meters for Alternate Electric Currents, (Case No. 357,) of which the following is a specification, the same being a division of an application filed in the United States Patent Office on the 31st day of October, 1888, Serial No. 289,635.

In certain patents issued to me August 14, Nos. 388,003 and 388,004, I have described an apparatus for and a method of measuring alternating electric currents. The present invention relates to certain improvements in the apparatus described in said patents, and it involves various details of construction which will be described in connection with the accompanying drawings.

It will not be here necessary to describe particularly the method of operation of the meter, since that has already been set forth in the patents mentioned, and reference may be had thereto for such description.

In the accompanying drawings, Figure 1 is a plan, partly in section, of a portion of the apparatus. Fig. 2 is an enlarged section of the armature.

Referring to the drawings, A represents a circular armature of metal. This may be a ring or a disk, or of other suitable shape, and may be of soft iron, or it may be of copper or other electric conducting material.

I have obtained excellent results by constructing the armature in the following manner: A ring *b* of soft iron is placed upon a thin disk *b'* of copper. The edge of the disk is then turned over the iron, as shown in Fig. 2, securing the two parts together. The disk is mounted upon a shaft which is carried in suitable bearings. Instead of employing a copper disk *b'* aluminium may sometimes be employed with advantage. This lessens the weight of the armature. The armature is placed within a coiled conductor B of insulated electric conducting material. The coil B is shown as being formed in two sections b' b^2, and the shaft *a* passes between the two sections. These two sections may be connected in circuit either in series or multiple arc for different purposes. The terminals b^3 b^3 and b^4 b^4 of the conductors are led to binding-plates at the top of the meter. These terminals are shown as connected, so that the two sections of the coil are in multiple; but they may be interchanged so that the current will traverse the two sections in series when it is desired.

A second conductor C is placed in inductive relation to the conductor B and the armature A. This conductor C is shown as closed upon itself, and it is preferably composed of a number of flat rings *c*, of copper, arranged in two groups, one on either side of the axis *a*, and bound together by rivets or bolts *c'*. Metal washers may intervene between the separate rings *c* for the purpose of leaving air-spaces between them. This construction better insures, also, that the induced currents shall circulate freely in a direction approximately at right angles to the axis of the conductor. The conductor C is placed with its magnetic axis at an inclination to that of the conductor B. Alternating currents traversing the coil B establish a field of force for the armature, the polar line of which is approximately in the direction *e e'*, and such currents also induce currents in the conductor C. Alternating currents traversing the conductor C establish a field of force for the armature, the polar line or magnetic axis of which is in approximately the direction of *f f'*—that is to say, inclined with reference to the polar line of the conductor B. When the coil B is traversed by alternating electric currents, the armature A will revolve.

For the purpose of adjusting the rate of revolution of the armature A so that under the influence of any given current the indications shall have a corresponding value I have found it convenient to vary the angle at which the conductor C stands with reference to the coil B. For this purpose the conductor C is pivoted upon an arm *t'*, so that it can be turned about the shaft *a*, and an adjusting-plate P, secured to the conductor C, is employed for fixing it at any required angle. A

slot t and set-screw p', entering the arm t', serve to fix it in such position. The conductor may be supported entirely by the plate P; but it is usually preferred to also employ a central support.

I claim as my invention—

1. In an alternate-current electric meter, a coil or closed secondary conductor consisting of continuous rings or circuits of conducting material connected together in parallel circuit, substantially as described.

2. In an electric meter, a closed secondary circuit composed of circuits of conducting material and metallic connections between the successive circuits.

In testimony whereof I have hereunto subscribed my name this 24th day of September, A. D. 1889.

OLIVER B. SHALLENBERGER.

Witnesses:

W. D. UPTEGRAFF,

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