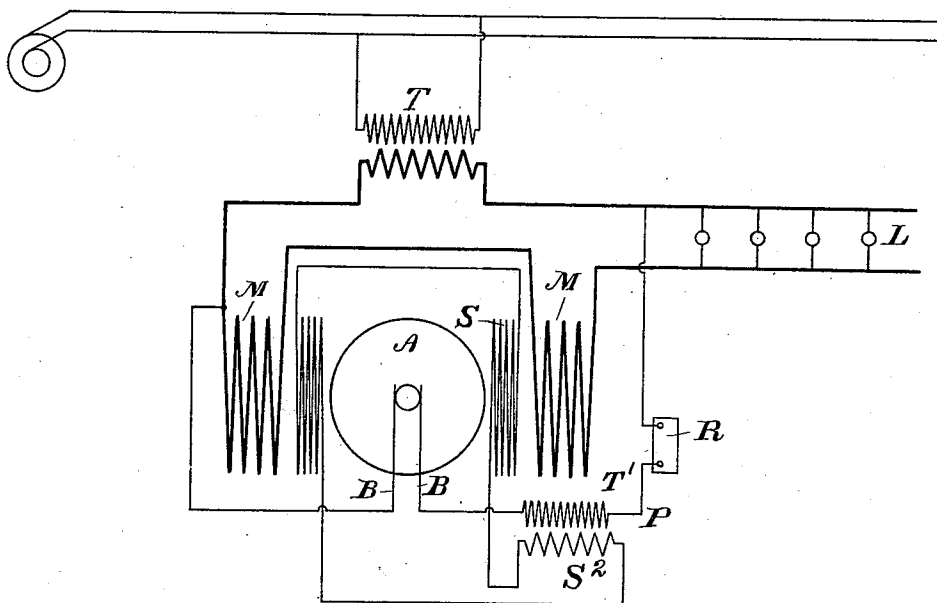


(No Model.)

E. THOMSON.
ELECTRIC METER.

No. 521,685.

Patented June 19, 1894.



WITNESSES.
A. F. Macdonald.
J. G. Pluston.

INVENTOR-
Edwin Thomson, by
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UNITED STATES PATENT OFFICE

ELIHU THOMSON, OF SWAMPSCOTT, MASSACHUSETTS, ASSIGNOR TO THE
GENERAL ELECTRIC COMPANY, OF NEW YORK.

ELECTRIC METER.

SPECIFICATION forming part of Letters Patent No. 521,685, dated June 19, 1894.

Original application filed February 21, 1894, Serial No. 501,012. Divided and this application filed April 14, 1894. Serial No. 507,509. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, residing at Swampscott, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Electric Meters, of which the following is a specification.

My invention relates to electric meters such as have been described by me in my Patent No. 448,894, upon which my present invention is an improvement; and has for its object to provide a method and means of starting such a meter under small loads, and particularly to a means of providing an initial field or energy-supplying circuit sufficient to overcome the friction coefficient of such meters as I have described: for which purpose I provide, in addition to the series coil of the meter, an auxiliary or shunt coil wound in relation to the armature in such a way as to furnish the field required.

In my application Serial No. 501,012, filed February 21, 1894, of which this application is a division, I have shown a means of constructing a meter with such a field coil as is herein described, and in that application I have made claims which generically will cover the apparatus herein described; I therefore wish in this application to limit myself to the method and construction herein particularly pointed out, that is to say, to the method of supplying such field by means of a shunt coil fed from the circuit supplying the armature by induction, as by means of a small transformer.

The accompanying drawing shows a diagrammatic representation of an apparatus designed to carry out the objects of my invention.

Referring by letter, T is a transformer or other source of electric energy (it being immaterial what form of energy-supplying device is used).

L, L represent lamps or other translating devices, current for which is to be measured by the meter.

A is the armature of the meter, constructed preferably, but not necessarily, in accordance with the patent already referred to.

B, B are the brushes.

M is the series coil of the meter, being as represented in series with the main supplying the translating devices with energy, and being traversed by the main current or by a definite portion of it.

R is a resistance presently to be referred to.

S is the shunt coil supplying the initial field.

T' is the transformer the primary P of which is in circuit with the armature and the resistance R, while the initial shunt coil S is in circuit with the secondary S² of the transformer.

As will be readily understood from the description in my patent to which I have made reference, the current supplied to the armature is constant, and the variations in the series field coil M are depended upon to furnish variations in speed of the meter according to the amount of current consumed. As illustrated, the auxiliary shunt coil is energized by the shunt circuit supplying the armature, being supplied with current by induction through the transformer T', as will be readily understood.

The resistance R should preferably be non-inductive in character so as not to modify the current in the shunt except by its ohmic resistance; although if located at sufficient distance from the meter it may be made inductive in character if desired, as it will not then affect the registration.

The winding of the coil S is made just the amount necessary to provide a field sufficient to overcome the friction of the moving parts of the meter, it being arranged thus so that the meter will be as nearly as possible balanced, and any current passing through the translating devices will thus be properly measured. I may wind this coil with a greater or less degree of accuracy or I may provide one or more of them without varying from my invention. The field provided by the coil or coils may fall short of such an amount as will balance by a short margin, or may be sufficient to cause a very slight or almost imperceptible rotation of the armature, and still be within my invention. The advantage of feeding the initial field by induction is that it provides an easy adjustment of the force of the initial coil S by varying the inductive effect of the transformation. The

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secondary coil S² may be of comparatively coarse wire and few turns, while the coil P may be of very fine wire such as is adapted to the shunt circuit of the armature, the arrangement effecting a saving in cost.

5 What I claim as new, and desire to secure by Letters Patent of the United States, is—

10 1. The method of energizing an initial or starting field for an electric meter, which consists in feeding a coil adapted to provide such a field by induction from an armature circuit in shunt to the mains supplying the current to be measured.

15 2. In an electric meter and in combination, a coil in series with the mains, an armature in shunt to such mains, and a starting coil supplied with current by transformation from the armature circuit.

3. In an electric meter and in combination,

a coil in series with the mains, an armature in shunt to such mains, a resistance in series with the armature, and a starting coil supplied with current by transformation from the armature circuit. 20

4. In an electric meter and in combination, 25 a coil in series with the mains, an armature, a shunt circuit supplying the armature, a transformer having its primary in the shunt circuit, a resistance in series with the shunt circuit, and a starting coil in series with the secondary of the transformer. 30

In witness whereof I have hereunto set my hand this 11th day of April, 1894.

ELIHU THOMSON.

Witnesses:

JOHN W. GIBBONEY,
HENRY C. WESTENDARP.