

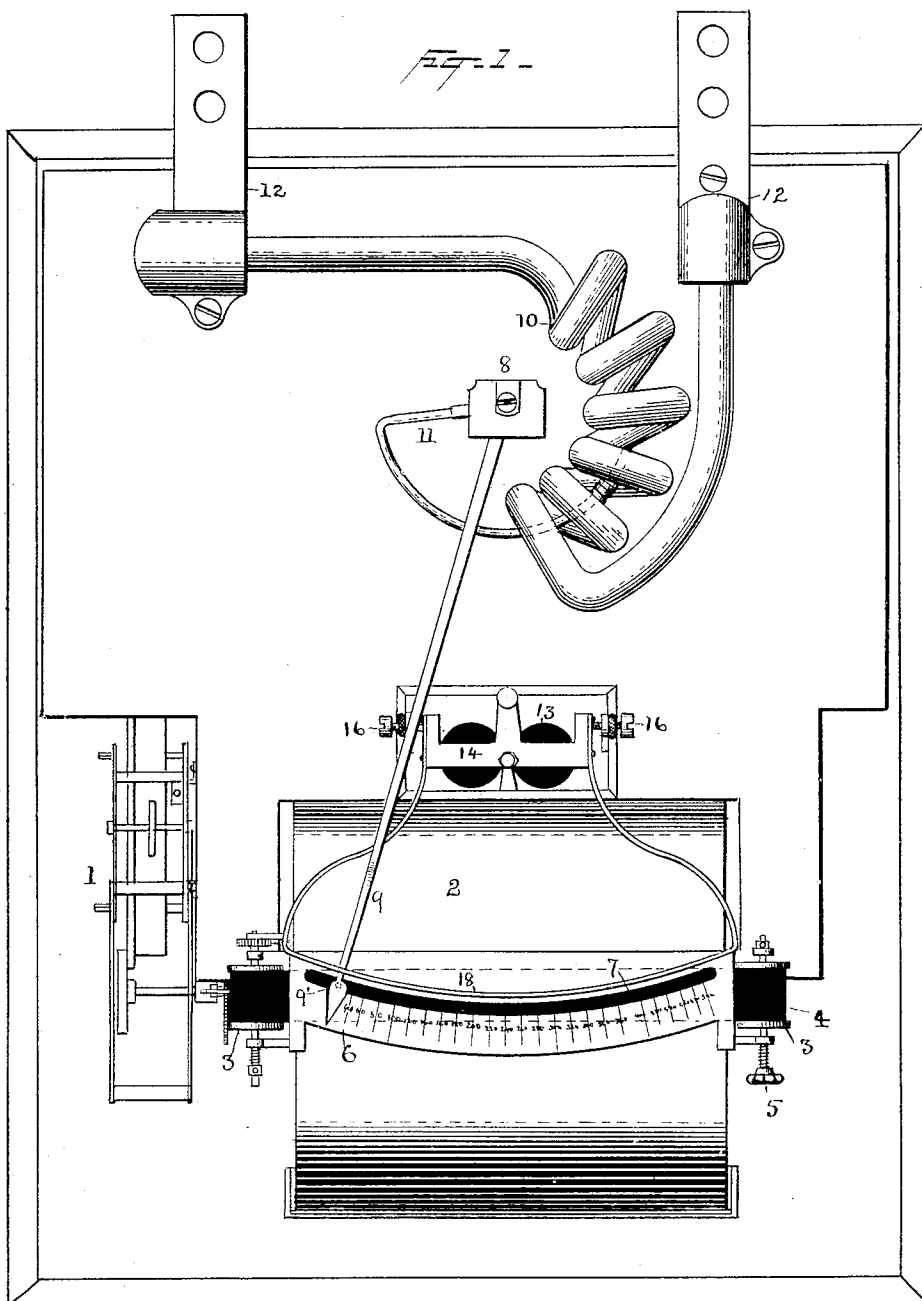
(No Model.)

2 Sheets—Sheet 1.

A. B. HERRICK.
ELECTRIC METER.

No. 461,575.

Patented Oct. 20, 1891.



Witnesses
Norris A. Clark
W. P. Peters

Inventor
A. B. Herrick,
By his Attorneys
Syer & Seely

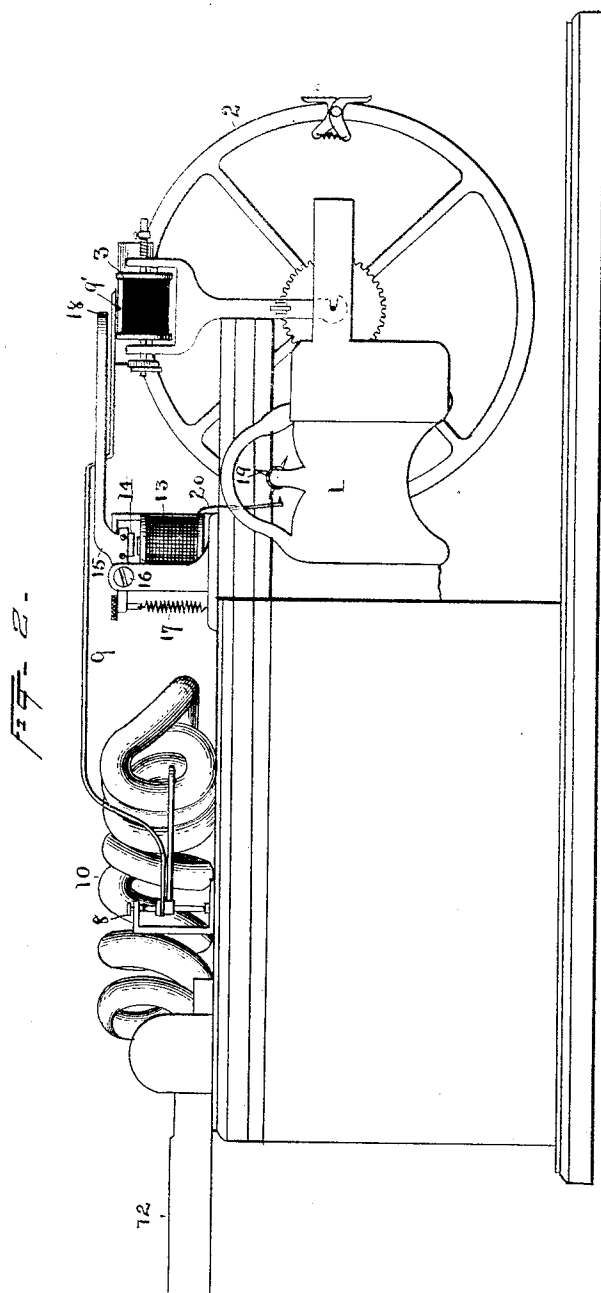
(No Model.)

2 Sheets—Sheet 2.

A. B. HERRICK.
ELECTRIC METER.

No. 461,575.

Patented Oct. 20, 1891.



Witnesses
Forris A. Clark
W. H. H. H.

Inventor
A. B. Herrick
By his Attorneys
Dyer & Seely

UNITED STATES PATENT OFFICE.

ALBERT B. HERRICK, OF NEW YORK, N. Y.

ELECTRIC METER.

SPECIFICATION forming part of Letters Patent No. 461,575, dated October 20, 1891.

Application filed October 16, 1890. Serial No. 368,332. (No model.)

To all whom it may concern:

Be it known that I, ALBERT B. HERRICK, a citizen of the United States, residing at New York city, in the county and State of New York, have invented a certain new and useful Improvement in Electrical Indicators, of which the following is a specification.

My improvement is especially adapted for indicators in which a pointer or index-hand is moved over a scale by changes in a line current, and in a system in which it is desired to make a record of the current at regular intervals, as will be hereinafter set forth.

The invention consists in certain apparatus and combinations of devices for marking the indications of the instrument on a suitable surface, in an instrument of the character indicated, and for reducing the power required to move the pointer or recording-hand.

The features of invention will be set forth in the several claims at the end of this specification.

In the drawings, Figure 1 is a face view of an ammeter embodying the invention, and Fig. 2 is a side view of the same with the inclosing case removed.

1 is a clock-work mechanism or other motor, which turns the cylinder 2 at a uniform rate, which in the apparatus illustrated is once in twenty-four hours. Supported on said cylinder is a paper sheet, which may be suitably ruled for receiving the record.

3 3 are bobbins, one at either end of the cylinder and adjacent to its periphery, which hold an ink-ribbon or similar device 4, and this ribbon may be fed from one bobbin to the other by means of the thumb-pieces 5 when necessary to bring a fresh section of the ribbon into operative position. Over the ribbon is preferably placed an index-plate 6, with a slot 7, which is an arc of a circle having its center at the pivot 8 of the index-hand or pointer 9. Near the end of the pointer on its under side, and in line with the slot, is a marking-point 9'. To this pointer is connected an armature for the solenoid or coil 10 by means of an arm 11. As shown, said coil is composed of a heavy conducting-rod bent to form a single spiral of a suitable number of turns, and is adapted to be connected to the main circuit by connectors 12. The coil and armature form segments of circles,

the latter moving in the former, as is well understood by those familiar with this class of instruments.

13 is a magnet supported near the drum and having an armature 14, which is supported by the frame 15, pivoted at 16, and having a retracting-spring 17. This frame is provided with a cross-piece 18, which extends over but not in contact with the index-hand, for the whole range of its movement, in a manner analogous to a construction heretofore used in recording-thermometers. Driven by the clock-work is a wheel or circuit-controller 19, having teeth, cams, or other devices so arranged as to close or change the circuit through magnet 13 at regular intervals—say once a minute.

In the apparatus illustrated the teeth of the circuit-wheel connect wire 20 leading from the magnet to the clock-work frame, which is connected in any suitable manner to a source of current and to the other terminal of the magnet.

The operation of the above-described apparatus is as follows: The clock is wound up and serves to move the recording-surface at a regular speed. At regular predetermined intervals—say of one minute—circuit-controller 19 closes or changes the circuit of magnet 13, attracting its armature and moving the frame 15 toward the drum, the cross-piece 18 striking against the index-hand at whatever point on the scale it may be held at that moment by the line current, and forcing the point 9' against the ink-ribbon and said ribbon against the paper, whereby the current at that particular moment is recorded. The circuit of the magnet is at once restored to its former condition at the circuit-controller, and the retracting-spring returns the armature and frame to their position of rest. At the expiration of another minute the above operation is repeated, and so on through an entire revolution of the drum 2.

Heretofore in recording-indicators it has been common to have the recording-point of the index-hand moved over the recording-surface in continuous contact therewith; but this arrangement is objectionable, first, because it increases the power required to move the pointer back and forth over the scale, and, second, because the power thus required is not constant, but is changed by various causes

affecting the friction between the recording-point and the recording-surface, thus causing errors in the record. In my apparatus the pointer is so mounted that it is perfectly free to move under the influence of current changes in the line and in solenoid 10, while at the same time the record can be made at any moment, as already described.

I claim—

1. The combination, in an electric meter, of a recording-surface, a hand carrying a recording-point, means for moving said hand over but not in contact with the recording-surface by the current to be measured, and a magnet, armature, circuit-controller, and a time mechanism therefor for making a record periodically, substantially as described.

2. The combination, in an electric meter, of a recording-surface, a recording-point movable over but out of contact with the recording-surface, a solenoid in the main line, an ar-

mature therefor connected to and moving the recording-point, and a circuit-controller, circuit, magnet, and armature for making a record periodically, substantially as set forth.

3. The combination, in an electric meter, of a recording-surface, a hand carrying a recording-point movable over but out of contact with said surface, a coil carrying the current to be measured for moving said hand, a bar or frame extending over the pointer throughout the range of its movement, an armature connected to said bar, a magnet, a circuit therefor, and a circuit-controller, whereby the point may be pressed forward to make a record, substantially as described.

This specification signed and witnessed this 13th day of October, 1890.

ALBERT B. HERRICK.

Witnesses:

I. L. SALM HODGES,
JOHN SAXELBY LOBB