

(No Model.)

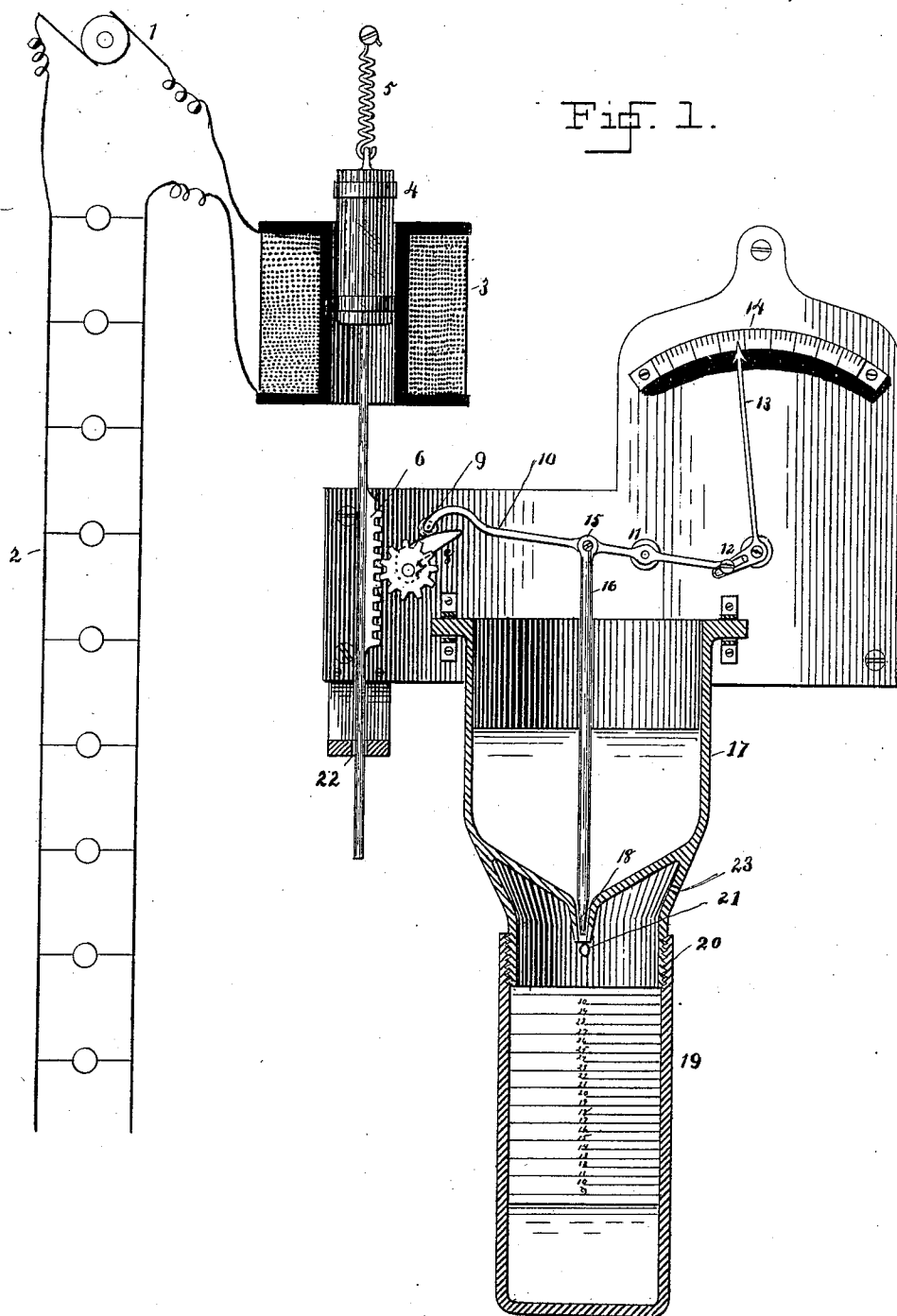
2 Sheets—Sheet 1.

J. C. HENRY.
ELECTRIC METER.

No. 513,264.

Patented Jan. 23, 1894.

Fig. 1.



Witnesses:

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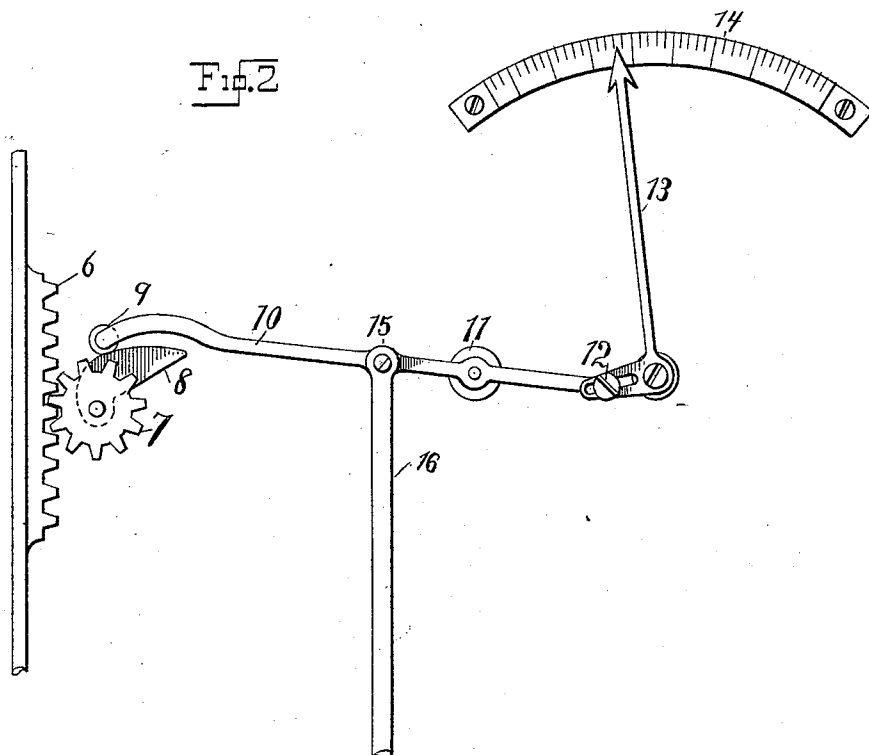
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2 Sheets—Sheet 2.

J. C. HENRY.
ELECTRIC METER.

No. 513,264.

Patented Jan. 23, 1894.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN C. HENRY, OF NEW YORK, N. Y.

ELECTRIC METER.

SPECIFICATION forming part of Letters Patent No. 513,264, dated January 23, 1894.

Application filed December 24, 1891. Serial No. 416,027. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. HENRY, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Electric Meters, of which the following is a specification.

This invention relates to electric meters, or apparatus for indicating and registering the number of watts of electrical energy absorbed by translating devices.

The object is to provide an indicator and register adapted for electric circuits wherein a visual observation will show the amount of energy being absorbed at the instant of observation and also a registering apparatus to measure the total amount consumed during any given time.

Referring to the accompanying drawings forming part hereof: Figure 1 represents the improved Watts meter in sectional elevation, also showing in diagram the translating circuit and Fig. 2 is an enlarged detail view of the indicator mechanism.

In the drawings 2 represents an incandescent lamp circuit. 1 represents a dynamo or the source of energy. 3 represents a solenoid in said circuit. 4 represents a core adapted to be influenced by said solenoid.

5 represents a spring under tension adapted to support the weight of and retract the solenoid's core.

6 is a rack carried by the solenoid core which passes through the guide 22.

7 is a pinion revolved by the rack 6. 8 is an irregular cam secured to said pinion.

9 is a flanged friction roller which rides on the periphery of the cam.

10 is a controlling arm which is fulcrumed at 11.

12 is a pin fitted in the slots of an arm from the indicating needle or pointer 13.

14 is a scale or dial which may represent any predetermined units such as lamps, watts or horse power.

17 is a supply receptacle capable of containing liquid. 19 is another or registering vessel preferably temporarily secured to the bottom of the first. The receptacle 17 has an opening or outlet at 18, which permits the fluid to escape from the supply receptacle 17 to the registering receptacle 19. Such open-

ing is controlled by the valve or plunger 16 connected with arm 10, and which is raised or lowered from its seat 18. A suitable backing or support for the fulcrum 11, and certain other parts is shown, but any preferred support may be used.

The operation is as follows: The current which supplies the lamps 2, passes through the solenoid 3, and draws its core 4 and accompanying rack 6, down. Engaging with the teeth of the rack 6, is the pinion 7 to which is secured the cam 8. As this cam turns it raises or lowers the actuating lever 10, and its connections, which are, the pointer 13, and the valve plunger 16. Thus the pointer 13, indicates on the gage 14, the amount of energy being absorbed by the lamps while the plunger 16, makes a corresponding opening or outlet between the receptacle 17 and the registering receptacle 19. The receiver 17 is filled with a liquid such as mercury, glycerine or selected oil which is allowed to escape through the valve directly in proportion to the position of the controlling arm 10, and the pointer 13. To illustrate, one dram of liquid may pass through the valve while ten lamps are burning for one hour, or while one lamp is burning for ten hours. The total amount is registered on the graduated glass receptacle 19. This vessel 19 is removed for inspection and its contents may be returned to the supply receptacle 17. 20 represents a screw thread to facilitate this removal. A vent opening is shown at 23, which allows the air to escape.

The indicator is primarily for the convenience of the customer who can at any time ascertain the strength of the current at the time the observation is made. As the indicator and register are controlled by the same mechanism the record and the sum of the indications should naturally agree. The solenoid is shown in series with the lamp mains. For convenience of explanation it may be in shunt.

In the construction of solenoids some difficulty is found in having them move their cores directly in proportion to the amount of current consumed. To avoid having unequal graduations on the dial and to have the valve opening directly in proportion to the current surrounding the solenoid I prefer to confine the correction to one point. This is done by

changing the shape of the cam 8. Its periphery is arranged or shaped to correct irregularities in any of the other parts.

In the claims below I refer to the solenoidal magnet 3 and its core 4, with connected parts 5, 6 and 7, as "irregularly actuated devices for controlling" the indicator or register. It is obvious that the irregularly-moving mechanism 8, 9, with its connected parts is capable of application to various kinds of meters or indicators, in fact to any location where the correction of the irregular movement of the meter controlling or driving devices is desired. It is further obvious that other parts of this invention, as for example the liquid register *per se*, is capable of use with various mechanisms which differ in whole or in part from other parts of the device herein shown as illustrative of my invention.

Having thus described my invention, I desire to claim as new therein—

1. In a meter for registering electric currents the combination of a solenoid and its core actuated by the current to be measured, a gage and an irregular mechanical movement actuated by the core and connected with said gage so as to move its indicator in opposite directions, substantially as described.

2. In a registering or indicating apparatus an irregular-shaped member moved by the controlling mechanism adapted to correct irregularities therein and to transmit regular movements in opposite directions to connected registers or indicators.

3. In an electric meter the combination of a solenoid adapted to be connected to a source of supply of current, a receptacle containing liquid with an opening therefrom and a valve in said opening adapted to be controlled by the solenoid, and an index pointer connected with said solenoid to indicate the passing current, substantially as described.

4. A current indicator having a pointer and regular graduations on its scale, a solenoid and core and interposed mechanism of an irregular form adapted to control said indicator and to indicate correctly irregular movements of said core and arranged to move the pointer in opposite directions.

5. In combination with the mains of an electric circuit, a solenoid controlled thereby—a rack and pinion connected to the core of said solenoid, an irregular mechanical movement connected to said pinion and registering and indicating mechanism and an indicator or pointer controlled by said irregular movement the latter being arranged to move the indicator in opposite directions.

6. In an electric meter, the combination of a solenoid and its core influenced by the current to be measured, reciprocating mechanism from said core, rotary mechanism actuated thereby, a cam connected to the rotating member, a lever actuated by said cam and a pointer connected with said lever.

7. In combination with an indicator or register and irregularly actuated devices for controlling the same, an irregularly moving transmitting mechanism interposed between said devices and said indicator or register, whose irregularities of movement are proportioned and arranged to correct the irregularities of movement of said devices.

8. In a meter in combination with the indicator or register and the irregularly moving controlling devices therefor, the intermediate transmitting mechanism, comprising a cam and a lever or part moving thereon, whereby the irregular movements of the controlling devices are corrected.

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Witnesses:

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