

J. MAYER.
ELECTRIC METER.
APPLICATION FILED MAY 13, 1912.

1,078,206.

Patented Nov. 11, 1913.

Fig. 1

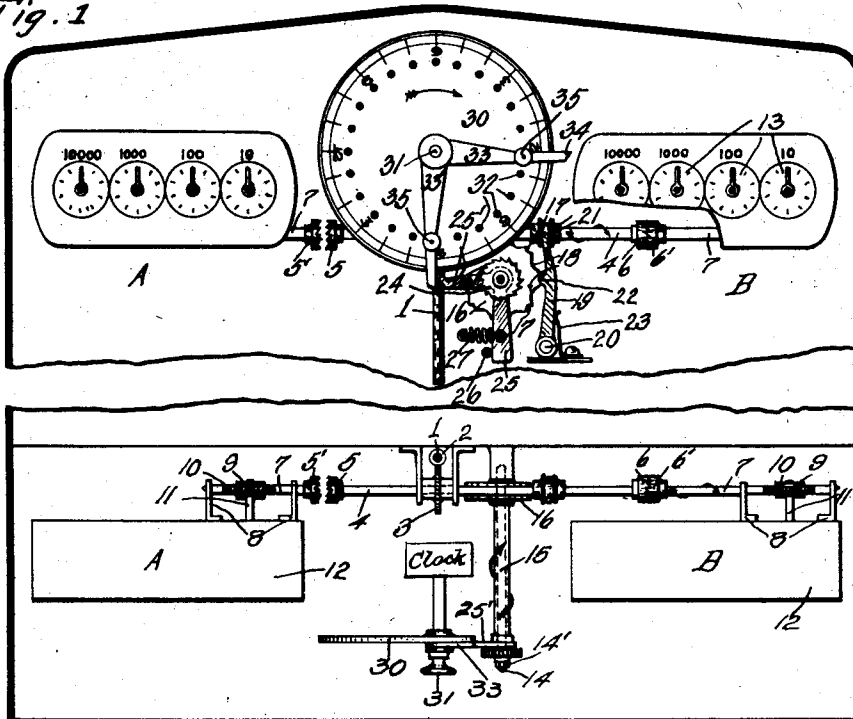


Fig. 2

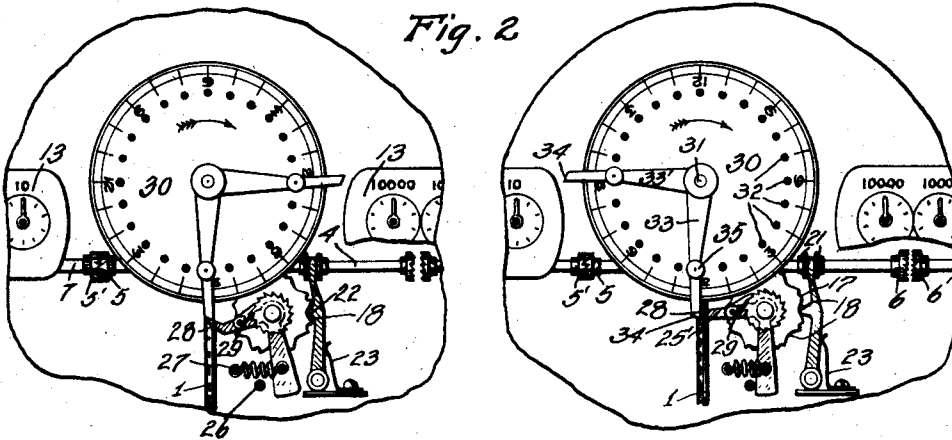


Fig. 3

Fig. 4

WITNESSES:

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ELECTRIC METER.

1,078,206.

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To all whom it may concern:

Be it known that I, JOSEPH MAYER, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Electric Meters, of which the following is a specification.

This invention relates to registering devices for electric meters.

10 In order to encourage the use of current during certain hours of the day when the load upon the circuit is normally light, it is advantageous to establish a lighter rate for use of current during the major portion
15 of the day and a heavier rate during the period when the maximum or so-called peak load is borne.

The object of my invention is the provision of means to record upon separate dials
20 the consumption of current during specific periods of time.

The invention consists in the combination with an electric meter of duplicate recording apparatus and automatic switching devices
25 controlled and operated by clock work as will be fully described in the following specification illustrated in the accompanying drawings and finally set forth in the appended claims.

30 In said drawings Figure 1 is a fragmentary front elevation of an electric meter showing an embodiment of my invention. Fig. 2 is a top plan view of Fig. 1. Figs. 3 and 4 are fragmentary front views of a
35 portion of apparatus illustrated in Fig. 1 showing the mechanism in different stages of its operation.

Referring to the drawings, the reference numeral 1 designates a spindle rotatable
40 with the armature disk (not shown) of an electric current wattmeter. Said spindle is provided at its upper end with a worm 2 in mesh with a worm gear 3 splined or otherwise mounted upon a transverse shaft 4 to
45 affect the rotation and permit of relative longitudinal movement of the latter.

The shaft 4 is provided at each end thereof with a fixedly secured toothed clutch element 5 and 6, each adapted to operatively
50 engage with a complementary clutch element 5' and 6' respectively being rigidly mounted upon similarly formed mandrels 7 in axial alinement with the shaft 4. The

mandrels 7 are rotatably mounted in brackets 8 and are each provided with a worm 9
55 in mesh with worm gear 10 actuating, through spindle 11, a train of gears (not shown) within the casing 12. The revolutions of the shaft 4 are recorded upon the dials 13 exteriorly of said casing. Said
60 shaft 4 is movable longitudinally and adapted to engage one or the other of clutch elements 5 and 6 with its complementary element 5' or 6' at opposite extremities of its movement, to actuate predeterminedly
65 the registering apparatus upon one side indicated collectively by the character A or that upon the other side indicated by B.

Timing devices are provided for shunting the actuating shaft to record the consumption of current upon one register or the other to be described as follows:

The reference numeral 14 denotes a column arranged transversely of shaft 4 and rigidly secured to frame work of the apparatus. Rotatably mounted upon said
75 column and secured thereon as by threaded nut 14', is a sleeve 15 having at one end in vertical alinement with said shaft a cam-wheel 16, whose peripheral configuration includes a plurality of serrations or notches
80 17 and 18 alternately arranged thereabout. Said notches 17 are positioned in the apices of the outwardly protruding cam-ports between the notches 18, and their bottom
85 edges extend radially beyond the bottom edges of the notches 18 for a distance corresponding to the distance necessary to move shaft 4 to engage one of said clutches 5-5' or 6-6' and disengage the other.

19 indicates a lever pivoted at 20 whose opposite forked end is retained between collars 21 fixed on said shaft 4. A lug 22 of said arm wipes upon the periphery of cam-wheel 16 urged thereagainst by spring 23
90 and communicates motion to the shaft 5 as controlled by the contour of the cam-wheel.

24 denotes a ratchet wheel fixedly secured with the sleeve 15. The number of ratchet
100 teeth correspond to the number of notches aforesaid of the cam-wheel. A bell-crank is loosely mounted upon said sleeve to allow of the relative rotation of the latter. Said crank is formed with an arm 25 normally
105 abutting upon a pin or fixed stop 26 being

yieldably held thereagainst by coil spring 27. A rectangularly directed arm 25' is formed with a bill 28; a spring-pressed pawl 29 is pivoted to arm 25' whose outer end is in engagement with the teeth of ratchet wheel 24 whereby oscillating movements of the bell-crank are communicated to the ratchet wheel in step by step rotation.

30 denotes a dial rotated with a spindle 31 once in 24 hours by suitable clock work (not shown). The said dial is divided peripherally into twenty-four equal divisions corresponding to the hours, each said division being provided as shown, with a hole 32 arranged concentrically about the dial. Pivottally secured at one end to said spindle 31 are legs 33 and 33' whose outer ends project beyond the circumference of the dial said projecting ends 34 being desirably beveled, as shown. Positioned in said legs 32 are pins 35 projecting below the lower surface of the legs and adapted to be secured within said holes.

The operation of the invention may be described as follows: Rotation of the armature disk actuates the shaft 4 and thereby one or the other of registers A or B. In the example illustrated it is presumed that a period in which the normal load is light endured from 12 o'clock midnight until 6 o'clock p. m. The current consumed during said time and bearing a uniform rate is recorded upon register A. During the period from 6 o'clock p. m. to the following midnight wherein the heavy load of the day is carried, a higher rate is charged for current whose consumption is recorded on the register B. With the dial 30 rotating by the action of said clockwork in the direction indicated by the arrows in the views and with the legs 33, 33' secured in the positions shown, the projecting ends 34 of said legs successively engage in their rotation the bill end 28 of said bell-crank and in their progressive rotation rock the latter in opposition to the spring 27 as indicated in Fig. 3. By reference to said view, it will be seen that the light-load period from 12 midnight to 6 p. m. in which the consumption record is indicated upon register A is about completed. The arm 19 having its lug 22 within the deeper notches 18, the pressure of spring 23 forces the shaft 45 to the left hand in the view engaging elements 5—5' causing the register A to be operative. Said oscillation of the bell-crank causes the pawl 29 to retract therewith and engage in the next inwardly adjacent notch of the ratchet wheel 24. Further rotative movement of the dial carrying therewith leg 33' causes the bill 28 of the bell-crank to be dislodged whereupon the spring 27 asserts itself and oscillates the bell-crank in to the position indicated in Fig. 1. Said movement causes the pawl 29

to actuate the ratchet tooth the equivalent distance of the length of one of its teeth and effects a like movement of the cam-wheel 16 corresponding to the distance between the bottoms of the respective adjoining notches 17 and 18, thus in Fig. 1 it will be seen that the lug 22 has been shifted from the notch 18 to engage within the notch 17. The outward movement given to the fork lever 19 effecting the throw of the shaft 4 to disengage the clutch 5—5' and engage the clutch 6—6' causing the register B to be operated. Thus during the peak load period from 6 p. m. to 12 midnight as in the example, the consumption of current may be recorded upon a separate register and charged for accordingly. The dial 30 in its progressive rotation similarly carries, at about 12 midnight, the lug 33 into engagement with the arm 25' deflecting the latter as before described and upon its release urging the ratchet 24 forward one notch, causing, a rotation of the cam-wheel 16 the equivalent distance between the notches 17 and 18. The lug 22 again entering the deeper notch 18 through pressure of spring 23 causes the lever 19 to force the shaft 4 longitudinally reengaging the clutch 5—5' to actuate the register A, as originally.

Having described my invention, what I claim is:

1. The combination with a meter of two registering devices, a shaft rotated by said meter and slidable longitudinally to operatively engage one or the other of said registers, a spring-pressed lever tending to urge said shaft in one direction, a cam-wheel adapted at each alternate partial rotation to move said lever in the opposite direction, a ratchet wheel rigidly connected to said cam-wheel, a pivoted arm provided with a pawl arranged to actuate said ratchet wheel, a spring tending to maintain said arm in its forward position, a dial provided with divisional spaces denoting the hours, clockwork for rotating said dial and means adjustable upon the dial to engage and move said arm whereby the cam wheel is actuated to shift said shaft.

2. The combination with a meter, of two registering devices, an operating shaft for each registering device, an axially movable shaft for alternately engaging the first named shafts, a spring-pressed member for normally holding in engagement the axially movable shaft and one register operating shaft, a dial, operating members carried by the dial, and means interposed between the operating members and spring-pressed member for axially moving said second named shaft.

3. The combination with a meter, of two registering devices, an axially movable shaft for alternately engaging each registering device, a spring-pressed arm for normally

holding the shaft in engagement with one
registering device, a dial, operating fingers
carried by said dial, a cam interposed be-
tween said arm and fingers, pawl and
5 ratchet mechanism for rotating said cam,
an arm for supporting said pawl adapted
to be engaged by said fingers, said cam upon
its periphery having alternate notches of

different depth for shifting the spring-
pressed arm.

Signed at Seattle, Washington, this 4th
day of May, 1912.

JOSEPH MAYER.

Witnesses:

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C. DAIGH.