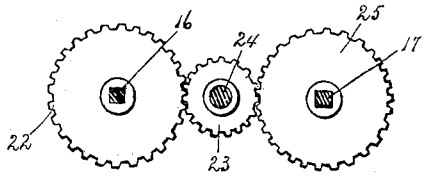
(No Model.)

G. A. LE FEVRE.

DRIVING GEAR FOR ELECTRIC METERS.

No. 599,508. Patented Feb. 22, 1898.

Fig. 3



SECTION AT 3—3

Fig. 1

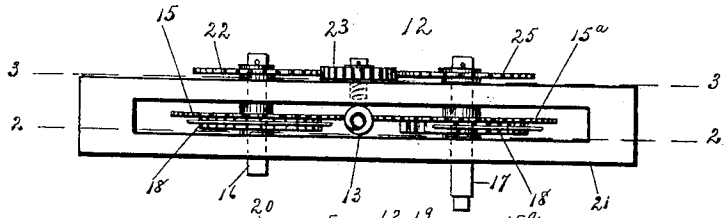
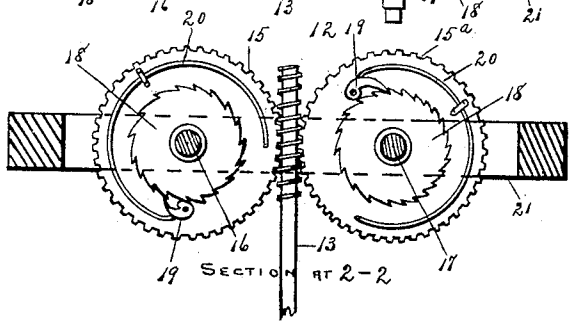


Fig. 2



SECTION AT 2—2

Fig. 4

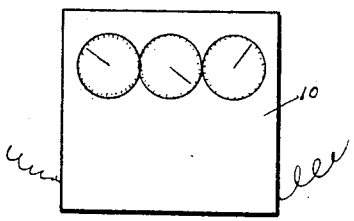
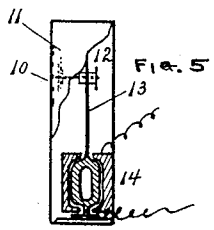


Fig. 5



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GEORGE A. LE FEVRE, OF NEW YORK, N. Y.

DRIVING-GEAR FOR ELECTRIC METERS.

SPECIFICATION forming part of Letters Patent No. 599,508, dated February 22, 1898.

Application filed April 21, 1897. Serial No. 633,142. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. LE FEVRE, of New York, in the county and State of New York, have invented certain new and useful Improvements in Driving-Gears for Electric Meters, of which the following is a full, clear, and exact description.

My invention relates to improvements in driving-gears for electric meters, and especially to the intermediate mechanism between the driving-motor and the registering device, by which the latter is moved in accordance with the current passing through the motor. Many large concerns which have independent dynamos and lighting apparatus also have a street connection with the electric street-line, so that in case of an accident to the local plant the street-current can be turned on until repairs are made. This street-current is measured by a meter, the kind generally employed using a very small motor, through which a part of the current passes, and the motor works a register. The class of meters referred to is that in which a reversal of current reverses the direction of rotation of the motor, this being probably effected by reversing the current in either the field or armature, but not both. The well-known Thomson wattmeter is a meter of this class, in which the reversal of current acts on the field without changing the direction of the current through the armature of the meter-motor, thus reversing the motor and meter; but it is believed that the above effect takes place in nearly if not all wattmeters. It has been found that motors of this kind when turned backward will move the register back, and some concerns, after having used the street-current and having repaired their own plant, will raise the voltage in the local plant, so that the voltage is greater than in the street-line, and consequently the current flows back through the motor to the street, and in this way the motor mechanism and registering device are turned backward, and the local concern has therefore simply borrowed the street-current, and the company controlling the latter is cheated.

The object of my invention is to obviate the above fraud and to produce a driving mechanism operated by the motor, as set forth, which, however, will turn the register forward without regard to the direction of the motor's revolution, so that if an attempt is made to raise the voltage and let the current flow back into the street the register will continue to move forward and will thus make the local party pay for his attempted fraud.

To these ends my invention consists of an intermediate driving connection between the motor and the register, the construction and arrangement of which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a detail plan view of the mechanism embodying my invention. Fig. 2 is a longitudinal section on the line 2 2 of Fig. 1. Fig. 3 is a vertical section on the line 3 3 of Fig. 1. Fig. 4 is a general front view of a meter and accessory mechanism; and Fig. 5 is a broken end view, partly in section, of the meter-case and illustrates in a general way the relative positions of the registering device, the driving mechanism, and the motor.

The meter-case 10 can of course be of any usual kind, as it really has nothing to do with my invention, and the case usually has the registering mechanism arranged in the front upper part, as shown at 11, and behind this I locate the intermediate driving mechanism 12, which is operated by the prolonged armature-shaft 13, which is turned by the motor 14, through which the current passes. Obviously the armature-shaft can be sectional or a single shaft, and at its upper end it is screw-threaded, so as to engage the worm-wheels 15 and 15^a, which are oppositely arranged and journaled loosely on their supporting-shafts 16 and 17, each worm-wheel connecting with its shaft by a ratchet-wheel 18, a pawl 19, pivoted on the worm-wheel to engage the ratchet-wheel, and a spring 20, secured to the worm-wheel and pressing the pawl into engagement with the ratchet-wheel. This is a very common arrangement for driving the shaft from a loose wheel and will be clearly understood. The ratchet-wheels are of similar pitch, and the worm-wheels will of course both turn constantly by reason of their connection with the shaft 13; but when the shaft is turned in one direction one pawl 19 will engage the ratchet-wheel 18 and so move the shaft to which the

ratchet-wheel is fixed, while the pawl on the opposite ratchet-wheel will ride over the teeth of the wheel without turning the shaft. The object of this will appear presently. The shafts 16 and 17 are journaled in a suitable supporting-frame 21.

The shafts 16 and 17 are geared together by the gear-wheel 22 on the shaft 16, the intermediate gear 23, which is journaled on the stud 24 on the frame 21, and the gear-wheel 25 on the shaft 17. The latter shaft is coupled in any ordinary way to the registering mechanism, which can be of the usual kind.

Referring now to the drawings, we will suppose the current entering from the street works the motor 14 and causes the shaft 13 to turn from left to right. This causes the wheel 15 to turn from right to left and the wheel 15^a to turn from left to right. Consequently the pawl 19 on the wheel 15 rides over the teeth of the ratchet-wheel on the shaft 16 without actuating the latter, and the pawl 19 on the wheel 15^a engages the teeth of the ratchet-wheel 18 on the shaft 17 and turns the latter, thus working the register. If, now, the current is run through the motor in the opposite direction, the above action is reversed, the pawl 19 on the wheel 15 engages the ratchet-wheel 18 of the shaft 16 and turns the latter shaft, while the pawl 19 on the wheel 15^a rides over the teeth of the ratchet-wheel 18 on the shaft 17. The shaft, therefore, is not operated by the wheel 15^a, but is turned by reason of the connection with the shaft 16 shown in Fig. 3 and including the gears 22, 23, and 25. The direction of the rotation of the shaft 17 is constant, and thus the register is moved forward without regard to the direction of the rotation of the armature-shaft of the motor. In the foregoing description I have referred to a particular style of gearing for accomplishing this constant movement of the register; but I do not confine my invention to the particular gearing described, as I claim, broadly, the connection between the motor and register whereby such constant motion is produced.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an apparatus of the kind described, the combination of a registering device, a motor, and an operative driving connection between the register and motor whereby the register is moved constantly forward without reference to the direction of the motor's rotation.

2. In an apparatus of the kind described, the combination with the motor, and the registering device, of an intermediate gear mechanism connecting the motor and registering device, said intermediate mechanism being constructed to turn the registering device forward without reference to the direction of the motor's rotation, substantially as described.

3. In an apparatus of the kind described, the combination with the registering device and the motor, of a driving-shaft connected with the registering device to drive it, the motor-shaft, and a gear-and-ratchet connection between the motor-shaft and driving-shaft whereby the latter is turned forward without regard to the direction of the motor-shaft, substantially as described.

4. In a device of the kind described, the combination with the motor-shaft and the driving-shaft, of a counter-shaft parallel with the driving-shaft, gear-wheels loose on the said shafts and connected with the said shafts by pawls and ratchet-wheels of similar pitch, and a gear connection between the counter-shaft and driving-shaft whereby the latter is turned constantly forward without regard to the direction of the motor-shaft, substantially as described.

5. A device of the kind described, comprising a revoluble screw-shaft, parallel shafts journaled adjacent to the screw-shaft, one of said parallel shafts serving as a driving-shaft, worm-wheels loose on the parallel shafts and geared to the screw-shaft, ratchet-wheels of similar pitch secured to the parallel shafts and connected by pawls with the worm-wheels, and gear-wheels fixed to the parallel shafts and connected together by an idler, substantially as described.

GEORGE A. LE FEVRE.

Witnesses:
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J. E. OLDRIN.