O. WHITE.

ELECTRICITY METER.

APPLICATION FILED OCT. 14, 1916.

1,285,518. Patented Nov. 19, 1918.

Fig. 1.

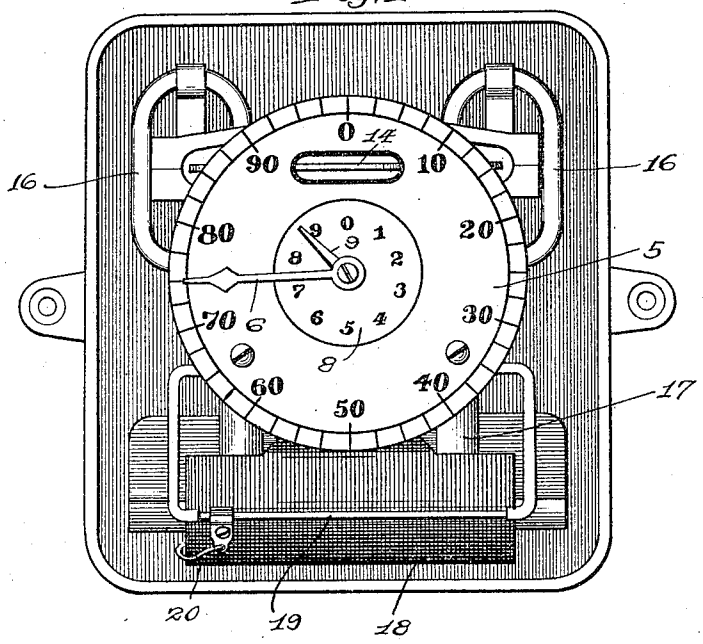


Fig. 3.

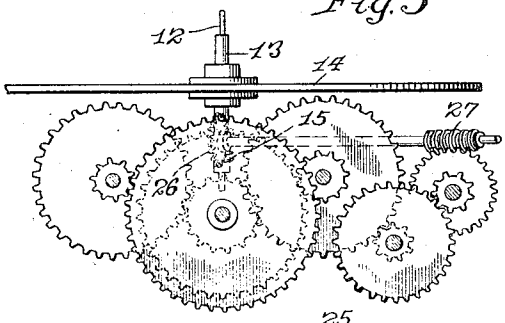


Fig. 4.

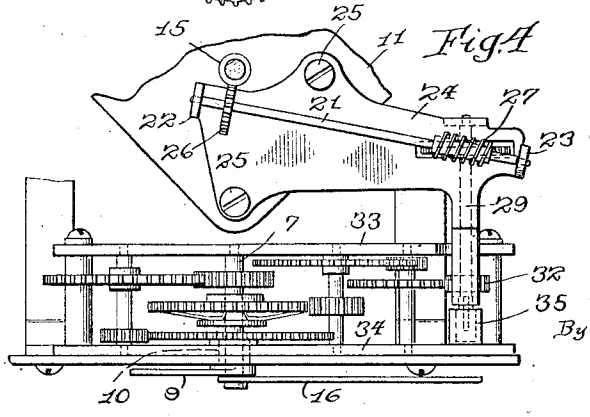
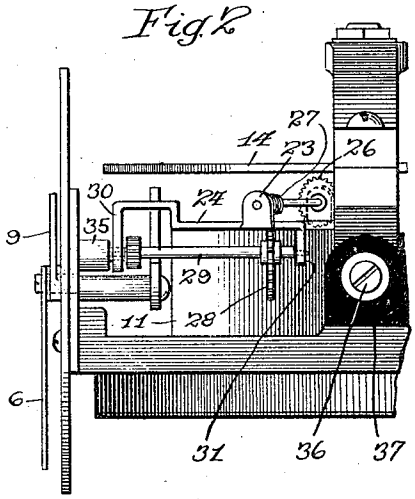


Fig. 2.



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UNITED STATES PATENT OFFICE.

OTIS WHITE, OF SPRINGFIELD, ILLINOIS, ASSIGNOR TO SANGAMO ELECTRIC COMPANY, OF SPRINGFIELD, ILLINOIS, A CORPORATION OF ILLINOIS.

ELECTRICITY-METER.

1,285,518. Specification of Letters Patent. Patented Nov. 19, 1918.

Application filed October 14, 1916. Serial No. 125,732.

To all whom it may concern:

Be it known that I, OTIS WHITE, a citizen of the United States, and a resident of Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Electricity-Meters, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to electricity meters of the mercury motor type, and has for its object to provide improved gearing for transmitting motion from the usual rotating armature to the indicating devices. I accomplish my object as illustrated in the drawings and as hereinafter described. That which I regard as new is set forth in the claims.

In the accompanying drawings,—

Figure 1 is a face view of a direct-current watthour meter;

Fig. 2 is a side elevation of certain parts of the meter shown in Fig. 1, the greater part of the indicating-hand driving train being omitted;

Fig. 3 is an edge view of the damping disk, showing the worm carried thereby and the gearing by which power is transmitted from such worm to the registering devices; and

Fig. 4 is a plan view of certain of the parts shown in Fig. 2, the damping disk being removed and the indicating-hand driving train supplied.

In the meter illustrated the indicating device comprises two concentric dials of different diameters which are best placed upon the same dial-plate. One of these dials, preferably that of greater diameter, is employed to show current consumption or flow up to one hundred units of measurement, such as watthours, the peripheral portion of such dial being subdivided in a convenient way and numbered appropriately. In the drawings, 5 indicates the outer dial, which, in the illustration, is provided with numbered decimal subdivisions. This outer dial is provided with a large hand 6 which is mounted upon a shaft 7 concentric with said dials and driven in the manner hereinafter described. 8 indicates the small inner dial, the peripheral portion of which is marked with numbers from zero to nine, and it is provided with a small hand 9, which is mounted on a sleeve 10 driven at one-tenth the speed of the shaft 7, as hereinafter described. It will be apparent, therefore, that for each complete cycle of the long hand 6 the short hand 9 will move through an arc of thirty-six degrees; consequently the inner dial will indicate hundreds, while the large outer dial will indicate tens and units. Thus, the registration may be easily read at a glance without possibility of mistake even by the inexpert. While I have shown only two concentric dials, it will be understood that a greater number may be employed if desired, the principle being the same.

11 indicates the mercury chamber casing, which in the meter illustrated, is made of cast iron, and in which is mounted the usual disk armature having a vertically-disposed shaft 12 which projects upward out of the mercury chamber and carries a sleeve 13 on which is mounted the usual damping disk 14. The sleeve 13, which is arranged to rotate with the shaft 12, also carries a worm 15 by which the rotary motion of the armature shaft is transmitted to the hands 6 and 9, as hereinafter described. 16 indicates the usual permanent damping magnets, and 17 the usual electromagnet over the poles of which the armature is mounted to rotate. 18 indicates the usual shunt coil by which the magnet 17 is energized, 19 a resistance, and 20 a slide coöperating therewith to provide for light load adjustment in the usual way. The general construction of the type of meter illustrated is according to the principles set forth in Letters Patent granted to Robert C. Lanphier, No. 910,548, dated January 26, 1909,—the light load adjustment feature being more particularly set forth in Letters Patent No. 843,155 granted to him February 5, 1907, in which such light load adjustment devices are applied to an alternating current meter.

The hands 6 and 9 are operated from the worm 15 by mechanism which will now be described. 21 indicates a shaft which is mounted in bearings provided in lugs 22—23 carried by a bracket 24 which is mounted upon the top of the mercury chamber casing 11, and is secured in place by screws 25. The shaft 21 carries near its inner end a worm-gear 26 which meshes with the worm 15, as shown in Fig. 4. It also carries near its outer end a worm 27 which meshes with a worm-wheel 28 mounted upon a shaft 29, at the opposite side of the bracket 24, hav-

ing bearings in lugs 30—31 depending from said bracket, as best shown in Fig. 2. Said bracket is provided with a suitable slot through which the worm-gear 28 extends into engagement with the worm 27. It will be noted from an inspection of Fig. 4 that the shaft 21 extends angularly across the top of the mercury chamber casing 11 and that it forms an obtuse angle with the shaft 29, the latter shaft being perpendicular to the dial-plate, which is at the front of the meter. The worms 15 and 27 are, of course, arranged so that they properly engage their respective worm-gears notwithstanding the angular position of the shaft 21. By this construction a very large speed reduction is obtained without using a train of spur reducing gears, and I am able to mount both the shafts 21 and 29 upon a single bracket which may be handled as a unit without disarrangement of the parts, thereby permitting proper adjustment of endshake and proper location in the meter without adjustment or fitting. The shaft 29 in addition to the worm-gear 28 carries a pinion 32 by which the motion of the shaft 29 is transmitted through a suitable train of clock gears to the shaft 7 and sleeve 10, as best shown in Fig. 4. It is believed to be unnecessary to identify the several gears making up the clockwork by reference numerals, as they are a simple set of reducing gears arranged to drive the shaft 7 and the sleeve 10, which is loosely mounted on said shaft, at different speeds, the sleeve 10 moving one-tenth as fast as the shaft 7. This clockwork is carried between two pillar plates 33—34 in the usual way, and the pillar plate 34 is provided with a lug 35 having a socket to receive the adjacent end of the shaft 29, thereby properly locating said shaft and the pinion 32 carried thereby with reference to the clockwork.

The mercury chamber casing 11, in the construction shown, is made of cast-iron or of cast steel, instead of being made of non-conducting material as has heretofore been the practice, said casing being provided with contacts 36 at opposite sides thereof and insulated therefrom by means of insulating blocks 37, as shown in Fig. 2, which contacts are inserted through the walls of the mercury chamber so as to make contact with the mercury therein. The meter is connected up by means of these contacts in the usual way. The advantage of making the mercury chamber casing of cast metal is that the cost of making the meter is materially reduced, and various parts of the meter, such as the bracket 24, may be secured to the mercury chamber casing without danger of cracking it.

That which I claim as my invention, and desire to secure by Letters Patent, is,—

1. In an electricity meter, the combination with electric motor mechanism comprising an armature shaft, a worm carried thereby to rotate therewith, and a registering train, of a bracket, a transmission shaft mounted at one side of said bracket, a worm-gear and a worm carried by said transmission shaft, said worm-gear meshing with the worm on the armature shaft, a second shaft mounted at the other side of said bracket, a worm-gear carried by the latter shaft and meshing with the worm on the transmission shaft, and a pinion carried by the second shaft and operatively engaging said registering train.

2. A transmission unit for electricity meters, comprising an integral bracket, a pair of shafts mounted thereon and removable therewith, said shafts forming an obtuse angle with each other, a worm and a worm-gear carried by one of said shafts, and a worm-gear and a pinion carried by the other of said shafts, the latter worm-gear meshing with said worm.

3. A transmission unit for electricity meters, comprising a bracket, a pair of shafts mounted thereon at opposite sides thereof, a worm and a worm-gear carried by one of said shafts, and a worm-gear and a pinion carried by the other of said shafts, the latter worm-gear meshing with said worm.

OTIS WHITE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."