No. 801,497. PATENTED OCT. 10, 1905.

J. J. WOOD.

ELECTRIC METER BEARING.

APPLICATION FILED NOV. 8, 1904.

FIG. 1

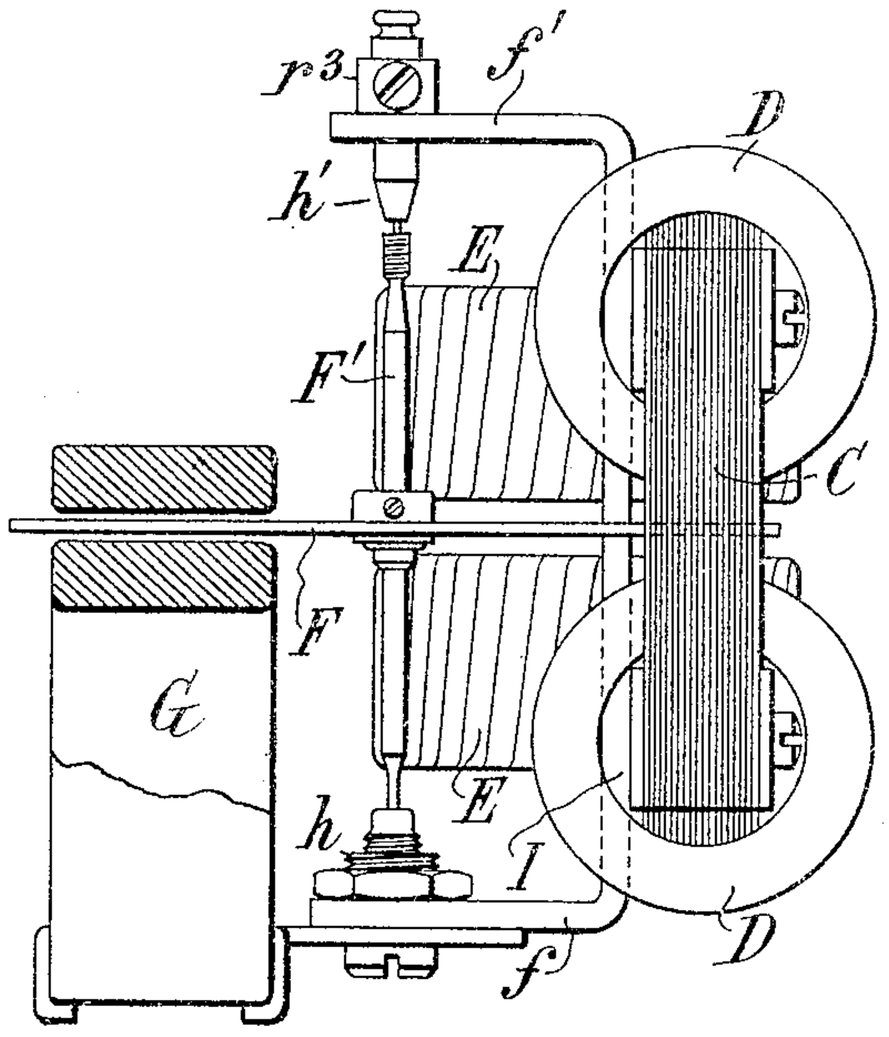


FIG. 2.

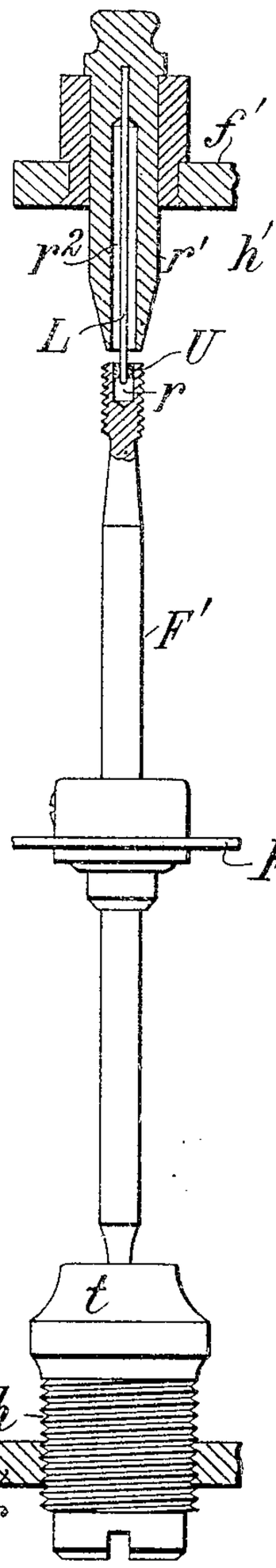


FIG. 3.

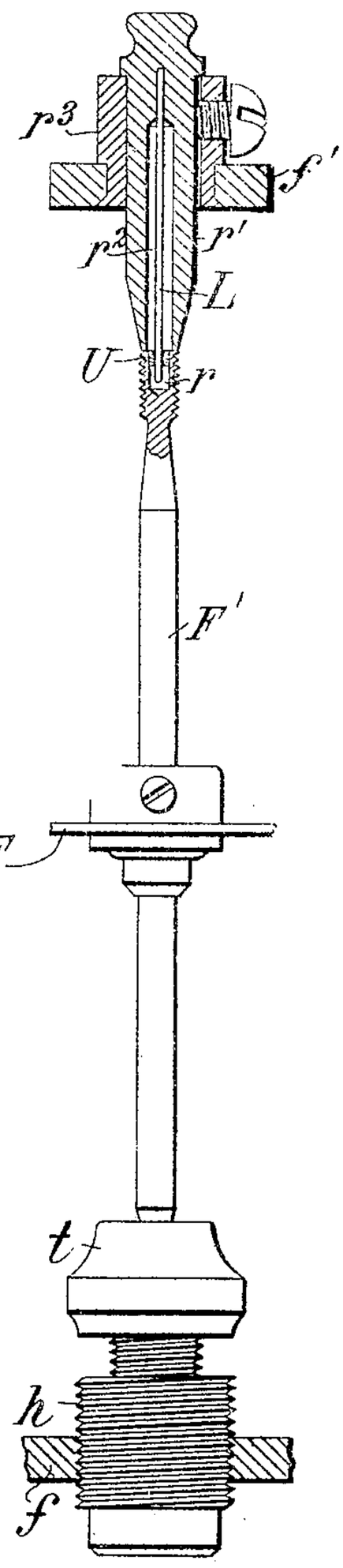
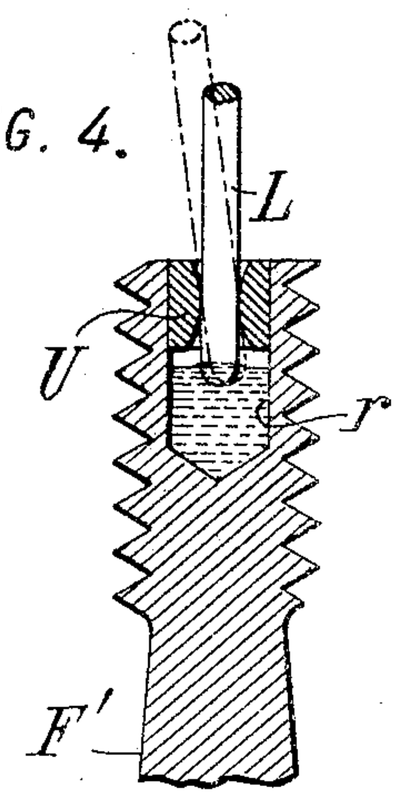


FIG. 4.



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ELECTRIC-METER BEARING.

No. 801,497. Specification of Letters Patent. Patented Oct. 10, 1905.

Application filed November 8, 1904. Serial No. 231,843.

To all whom it may concern:

Be it known that I, JAMES J. WOOD, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Electric-Meter Bearings, of which the following is a specification.

This invention provides an improved spindle-bearing applicable to alternating-current electric meters, or wattmeters of the induction-motor type, or to other similar or analogous uses.

In the accompanying drawings, Figure 1 is a side elevation of the working parts of a wattmeter, illustrating the application of my invention. Fig. 2 is an elevation of the armature-spindle on a larger scale, its upper end and the upper bearing being in section. Fig. 3 is a similar view to Fig. 2, showing the armature-spindle elevated. Fig. 4 is an enlarged or magnified detail of the upper end of the spindle in vertical section.

Referring to Fig. 1, C designates the laminated core, which may be of any construction usual in induction-motor wattmeters, on which core are wound shunt-coils D D and series coils E E. An armature or disk F is mounted on a spindle F′ to rotate between the coils and between the poles of a damping-magnet G, shown partly in section. These parts and their accessories may be constructed and adapted to operate in any manner known or usual with meters of this class or according to any suitable modification thereof, since they form no part of the present invention.

For a complete understanding of the preferred construction of the electric meter reference is made to my application Serial No. 193,210, filed February 11, 1904.

The armature-spindle F′ has its lower end mounted, as usual, in any suitable step-bearing *h*, a jeweled bearing being commonly used, while its upper end is pivotally engaged with a bearing *h*′. These bearings are shown as supported, respectively, on arms *f* and *f*′ bent from a plate I, any other suitable supports being of course admissible.

It is desirable that the upper bearing *h*′ be made yielding or flexible in order to take up the vibration incident to an alternating-current meter, and not only to diminish the humming noise, but to reduce the wear of the jewel incident to the vibration of the spindle. Certain practical difficulties have been encountered in the construction of such vibratory bearings, which it is the object of my present invention to overcome.

The upper end of the spindle is counterbored to form a socket *r*, into which freely enters the lower end of a fixed journal or pivot-pin L. This pin L is elastic, being made of resilient wire, such as piano-wire, the upper end of which is driven tight into a socket in a bearing-sleeve *r*′, which for the greater part of its length is counterbored at r^2, forming a long tubular chamber in which the pivot-pin L has ample room to vibrate. The bearing-piece *r*′ is fastened by a set-screw in a boss r^3, fixed on the bracket-arm *f*′, so that the bearing-piece can be readily adjusted to the desired height.

The socket *r* in the spindle instead of being barely large enough to make a working fit with the pin L is bored considerably larger than this pin, and into its upper end is forced a bushing U. This bushing is preferably of phosphor-bronze and after being set in place is reamed out and burnished into the shape shown by holding the burnisher at proper angles with the axis of the bushing, so that the bearing-surface within the bushing is flared at each end, or, in other words, is convex in longitudinal section, as shown. The pivot-pin L engages this convex face of the bushing at substantially a single point in its length, so as to provide a substantially linear bearing along a circumferential line—that is to say, a line coinciding with the level where the bore or throat of the bushing is of least diameter. An important advantage of this construction is that the bearing is not impaired by any want of exact alinement between the bearing-pin and the spindle, since the pin might be deflected to a considerable angle, even as far as shown in dotted lines in Fig. 4, without impairing the operation of the bearing or developing friction such as would be caused by such a bending of the pin in a sleeve having the usual uniformly cylindrical bearing-surface.

In the operation of the instrument the pin L is in constant vibration, as also is the spindle F′, so that the two are repeatedly thrown to relative angular positions out of a true line, (although not ordinarily to so great an angle as indicated by the dotted lines in Fig. 4.) The making of the bearing-surface in a separate bushing U permits of the use of

phosphor-bronze, whose coefficient of friction against the steel pin is much less than would be that of the steel spindle itself. A further advantage is that the bushing U by contracting the mouth of the socket *r* practically closes it, so as to prevent the escape of oil therefrom and protect the oil therein from access of dust, so that gumming of the oil is prevented.

It is common with electric meters of the class indicated to screw up the bearing-spindle F and jam it against the upper bearing when the meter is being shipped. For this purpose a nut *t* is commonly provided screwing upon the lower bearing and engaging the foot of the spindle to elevate it. It is shown thus elevated in Fig. 3. It is apparent from this figure that such screwing up of the spindle presses its upper end against the lower end of the bearing-sleeve *r'*, which latter affords a solid abutment for it, and this operation is without any effect upon the delicate pivotal construction afforded by the vibratory pin L.

The end of the pin dips into the oil in the socket *r* in the manner indicated in Fig. 4. The oil is carried up on the pin by capillary action in sufficient quantity to lubricate the points of contact.

I claim as my invention—

1. In an electric meter, an armature-spindle having a socket in its upper end forming an oil-cup, and a flexible pin the free lower end of which enters said socket.

2. In an electric meter, an armature-spindle having an oil-receiving socket in its upper end, and a stationary pivot-pin entering said socket, said socket being contracted at its mouth to form a bearing for said pin.

3. In an electric meter, an armature-spindle bearing comprising a flexible pin and a surrounding bushing, the one rotating and the other stationary, the inner face of the bushing being convex in longitudinal section and engaging the pin at substantially a single point in its length to provide a substantially linear bearing making a good fit and at the same time permitting relative lateral movement due to the flexure of the pin.

4. In an electric meter, an armature-spindle having an oil-receiving socket in its upper end, a bushing fixed in the upper end of said socket, the bearing-hole in said bushing being convex in longitudinal section, and a pivot-pin entering through the hole in said bushing into said socket.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JAMES J. WOOD.

Witnesses:
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