R. S. WHITE.

ELECTRIC METER BRUSH.

APPLICATION FILED JULY 26, 1913. RENEWED FEB. 27, 1915.

1,155,021. Patented Sept. 28, 1915.

Fig. 2.

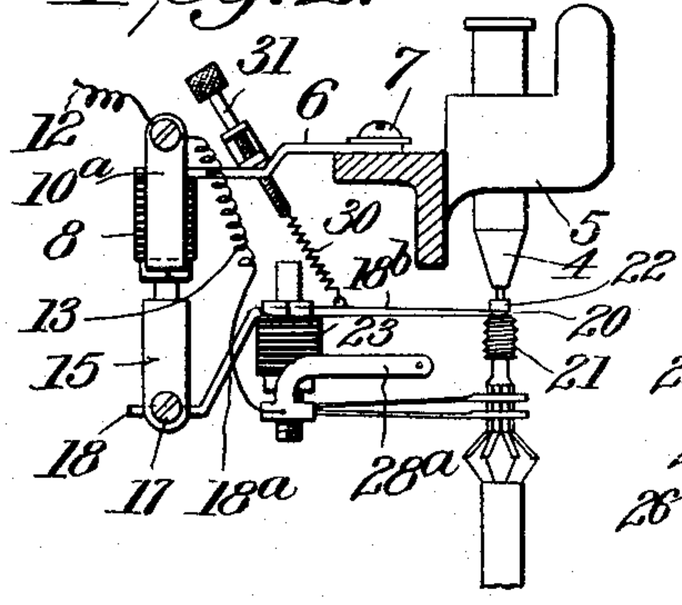


Fig. 3.

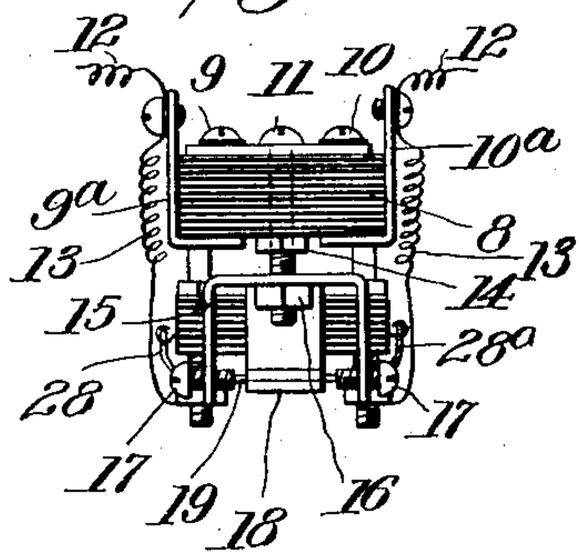


Fig. 1.

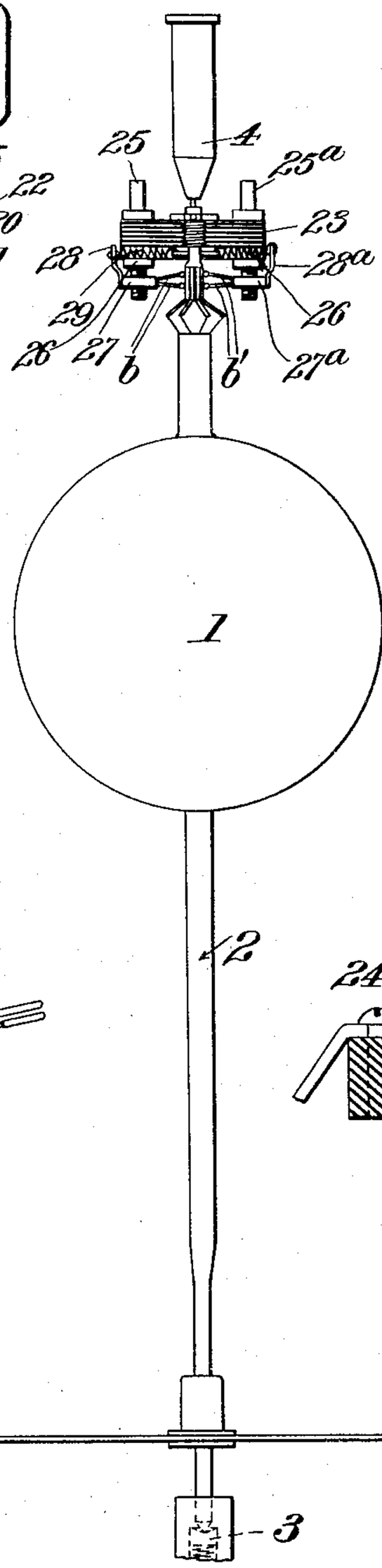


Fig. 4.

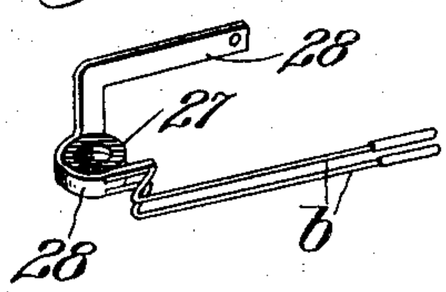
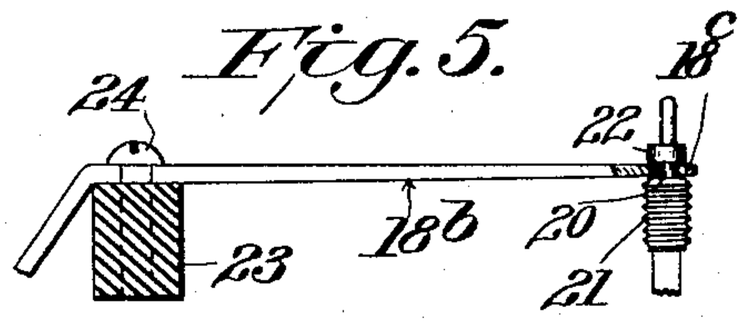


Fig. 5.



Witnesses

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ELECTRIC-METER BRUSH.

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Application filed July 26, 1913, Serial No. 781,313. Renewed February 27, 1915. Serial No. 11,068.

To all whom it may concern:

Be it known that I, ROGER S. WHITE, citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Electric-Meter Brushes, of which the following is a specification.

In motor operated electric meters the armature shaft or spindle is usually arranged in vertical position and its lower end is mounted upon a jewel bearing, which latter is spring supported so that in case of jarring of the meter, the bearing will not be damaged. Owing to the yielding mounting of the armature supporting bearing, the armature spindle is permitted to have a limited endwise or axial movement. Hence, as ordinarily constructed, any endwise movement of the armature spindle causes a relative movement between the brushes and the commutator, as the engaging portions of the brushes are held in such manner as to permit the commutator to slide endwise between them. After a meter has been in use for some time, the commutator becomes more or less oxidized or coated with dirt, except at the points where the meter brushes engage it, where the frictional contact between the brushes and the commutator maintains clean annular contact surfaces upon the latter, which, however, are of no greater width than the engaging surfaces of the brushes and which, in the course of time, become worn, forming slight grooves in the surface of the commutator. When the meter is jarred, so as to cause an endwise movement of the armature spindle, the commutator is moved relatively to the brushes, causing the latter to ride off of the clean contact surfaces or grooves onto the oxidized or otherwise unclean portions of the commutator, and this results in more or less sparking and roughening of the brushes and commutator, as well as a variation in the resistance of the contacts, which, of course, affects the accuracy of the meter and is otherwise objectionable.

The purpose of my invention is to provide a motor operated electric meter in which the faults above mentioned are obviated.

In carrying out the invention, I provide means for causing the engaging portions of the brushes to move with the spindle and commutator, when the latter are moved axially, so that the brushes, after being set in any given position on the commutator, will always engage the same annular contact lines thereon, regardless of the endwise movement of the commutator and spindle.

In the accompanying drawing, which illustrates my invention, Figure 1 is a view showing the armature of a motor operated meter in elevation, and the brushes and a portion of the supporting means for the brushes in front elevation; Fig. 2 is a side elevation of the brushes and their supporting means, portions of the meter frame and armature spindle also being shown; Fig. 3 is a rear elevation of the brush supporting devices; Fig. 4 is an enlarged perspective view of one of the brushes; and, Fig. 5 is an enlarged view of the connections between the armature spindle and the brush support.

Referring to the drawing, 1 indicates the armature of a motor operated meter, which armature is mounted in the usual way upon a vertically arranged spindle 2, which is supported at its lower end upon a step bearing consisting of a jewel mounted upon a spring and indicated in dotted lines at 3, the upper end of the spindle extending into an opening in a bearing 4, which is suitably supported by the meter frame 5. The yielding support for the armature permits the latter to play slightly up and down in case the meter is jarred, and this avoids injury to the jewel bearing.

A plate 6 is secured to the frame 5 by screws 7 and extends rearwardly from the line of the motor spindle, and a block of insulating material 8 is secured to the underside of said plate by screws 9, 10, and 11. The screws 9 and 10 are insulated from the plate 6 and extend through the block 8 and engage metal strips 9^a and 10^a, which serve as terminals for the conductors 12 and 13, which carry the armature current. The screw 11 passes centrally through the insulating block 8 and the block is held thereon by a nut 14. A yoke 15 is threaded onto the lower end of the screw 11, and this yoke is held in position by a nut 16. In the arms of the yoke are arranged adjustable bearings 17, and a metal plate 18 is provided with a pintle 19 which engages the bearings so that the plate 18 is hinged between the arms of the yoke and adapted to swing vertically. This plate or bar extends upwardly, as shown at 18^a, and thence horizontally, as shown at 18^b, and its forward end is forked as indicated at 18^c, and engages a groove 20 formed between a worm

21 and an extension 22, at the upper end thereof. A block of insulation 23 is secured to the part 18[b] of the lever 18 by a screw 24 which passes centrally into the block. At the ends of the block, studs 25 and 25[a] extend through perforations in the block and these studs are provided with clamping nuts 26, which hold them securely. The lower ends of the studs are threaded, as shown. Upon the threaded portion of the stud 25 is mounted an internally threaded collar 27 of insulating material, adapted to turn freely on the threads of the stud, and crimped or otherwise secured to this collar is a metal strip 28, having an upwardly and forwardly extending arm, as shown. A brush *b* is also secured to said strip and adapted to bear upon the commutator. Upon the stud 25[a] is arranged a similar insulating collar 27[a], strip 28[a] and brush *b'*. The arms 28 and 28[a] are connected by a light spring 29 which causes the brushes to bear lightly against the commutator. A spring 30, connected with the plate or lever 18 and with an adjusting screw 31, mounted upon the plate 6, sustains the brush holding devices and thereby prevents undue friction between the lever 18 and the armature spindle.

In operation, if the meter is jolted and the armature moves axially from normal position, the lever 18, which engages the spindle, will rock and cause the brushes to move with the commutator and to the same extent, thereby causing the engaging portions of the brushes to maintain a fixed relation to the ends of the commutator in all positions of the armature. The friction between the brushes and the commutator will maintain clean annular contact surfaces on the latter and the brushes will remain upon these annular paths at all times regardless of the vertical movements of the commutator. The brushes may be set at any desired points vertically of the commutator by loosening the lock nuts 26 and turning the studs 25 so as to raise or lower the collars 27 and 27[a], which carry the brushes. The pressure of the brushes upon the commutator may be adjusted by changing the tension of the spring 29, and the yoke 15 may also be turned upon the screw 11 to adjust the brushes to the commutator.

What I claim is:

1. In a motor-operated meter, an armature having a commutator, bearings for the armature permitting end-play and rotary movement of the same, brushes for engaging the commutator, and means for causing the brushes to move with the commutator when the armature plays endwise in its bearings under working conditions.

2. In a motor-operated meter, an armature having a commutator, bearings for the armature permitting end-play and rotary movement of the same, brushes for engaging the commutator, and means for causing the brushes to move with the commutator when the armature plays endwise in its bearings, under working conditions comprising movable brush-supporting means connected to the armature spindle.

3. In a motor-operated meter, an armature having a commutator, bearings for the armature permitting end-play and rotary movement of the same, brushes for engaging the commutator, and a pivotally mounted supporting member for said brushes operatively related to the armature spindle so as to move therewith when the spindle plays endwise in its bearings.

4. In a motor-operated meter, an armature having a commutator and mounted for rotary and axial movement, brushes for engaging the commutator, and a pivotally mounted supporting member for said brushes having an arm engaging the armature spindle.

5. In a motor-operated meter, an armature having a vertically arranged spindle and a commutator and mounted for axial and rotary movement, brushes for engaging the commutator, a supporting member for the brushes movable vertically and connected to the spindle, and a sustaining spring for said member.

6. In a motor-operated meter, an armature having a vertically arranged spindle and a commutator and mounted for axial and rotary movement, a member pivoted at one end to a suitable support and having its other end engaging said spindle, and brushes carried by said member and engaging the commutator.

7. In a motor-operated meter, an armature having a vertically arranged spindle and a commutator and mounted for axial and rotary movement, an adjustable yoke supported adjacent the spindle, a member pivotally supported at one end in said yoke and having its other end engaging said spindle, and brushes carried by said member and engaging the commutator.

In testimony whereof I have affixed my signature, in presence of two witnesses.

ROGER S. WHITE.

Witnesses:
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JOHN H. SIGGERS.