J. H. HODDE & O. WHITE.

TWO-PART SPINDLE.

APPLICATION FILED JAN. 22, 1909.

1,119,754. Patented Dec. 1, 1914.

Fig. 1.

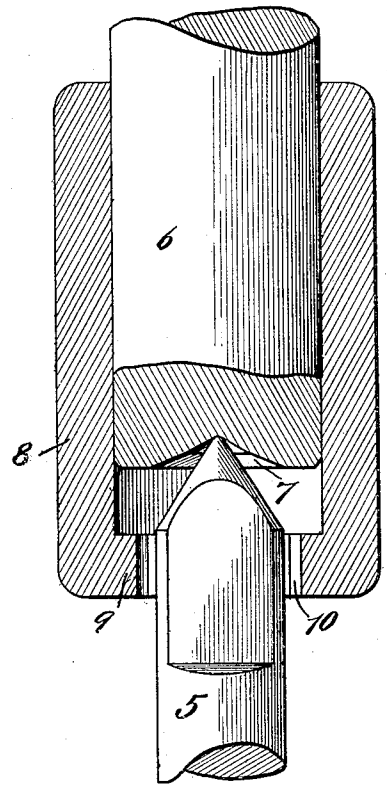


Fig. 2.

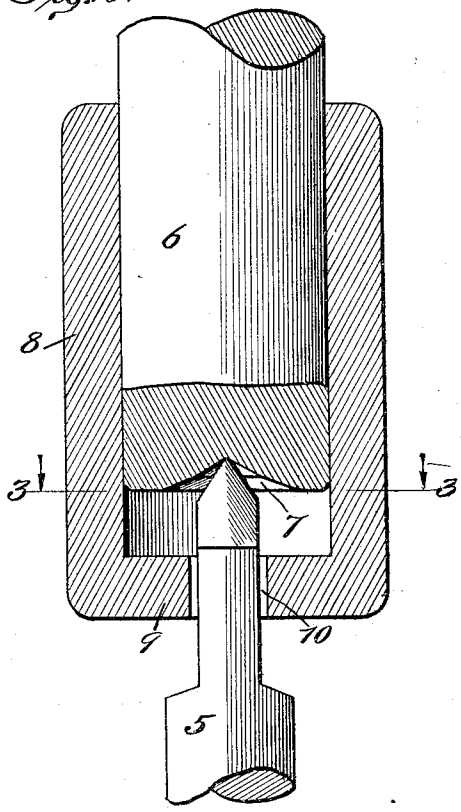
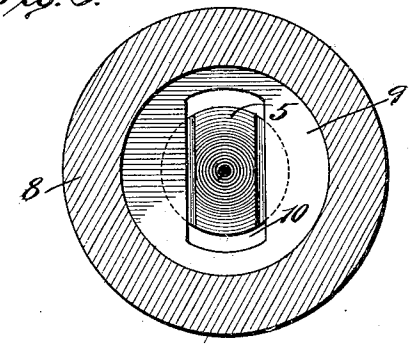


Fig. 3.



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UNITED STATES PATENT OFFICE.

JACOB H. HODDE AND OTIS WHITE, OF SPRINGFIELD, ILLINOIS, ASSIGNORS TO SANGAMO ELECTRIC COMPANY, OF SPRINGFIELD, ILLINOIS, A CORPORATION OF ILLINOIS.

TWO-PART SPINDLE.

1,119,754. Specification of Letters Patent. Patented Dec. 1, 1914.

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To all whom it may concern:

Be it known that we, JACOB H. HODDE and OTIS WHITE, citizens of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Two-Part Spindles, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in two-part spindles, such as are used in electrical mercury motor meters in which it has been found desirable to provide three supports for the armature spindle. In such meters, in which the jewels for the spindle are supported in separate parts, it has been found exceedingly difficult, if not impossible, to so assemble and adjust such parts as to get the jewels in perfect alinement to make it practical to use a one-part spindle. Various methods of mounting and joining two-part spindles for use in such circumstances have been attempted, but so far as we are aware no construction has given entire satisfaction in use in such meters, the friction in every instance being so great as to cause a material inaccuracy on low load.

It is the object of our invention to provide a spindle which shall overcome the difficulties heretofore encountered and by the use of which in meters the friction may be so reduced that accurate results may be obtained at all times. We accomplish this object by the means illustrated in the drawings and hereinafter specifically described. That which we believe to be new will be pointed out in the claims.

In the drawings:—Figure 1 is a view, partly in section, showing our improved coupling means by which our object is attained, the view being very much larger than the actual device as employed in a meter. Fig. 2 is a side view, also partly in section, of the parts shown in Fig. 1. Fig. 3 is a section through the device on line 3—3 of Fig. 2, showing an end view of the lower spindle member.

Referring to the drawings:—5 indicates the lower member of a vertical two-part spindle, provided with a conical upper or inner end very slightly rounded at its point. This inner end of the member 5 is cut away at each side to provide bearing surfaces or edges, as hereinafter described.

6 indicates the upper member of the spindle, provided at its lower or inner end with a conical recess 7 which is very slightly rounded at its center.

8 indicates a sleeve suitably secured upon the lower end of the member 6, said sleeve being provided with a head 9 at its lower end, said head, in the construction shown, being made integral with the sleeve. The head 9 is provided with an opening 10 to receive the upper end of the member 5, the center of the recess 7 resting upon the point of the member 5. This opening 10 is of such a size as to provide a slight play between the member 5 and the head 9 and consequently between the two members 5 and 6 of the spindle. As best shown in Fig. 3, the distance at the ends of the opening 10 from the member 5 is slightly greater than the distance from said member along the sides of the opening, this being in order to provide the same amount of play in every direction, as will be readily understood.

In the use of our improved two-part vertical spindle in meters, the friction between the bearing parts of the members 5 and 6 is very small, there being very slight pressure between the two bearings, and the two parts being always centered relative to each other by such bearings. When power is applied to one of the members to rotate it, one or the other of the edges of the faces formed by cutting away the upper end of the member 5 will be brought to bear against the adjacent side of the opening 10, and the rotation of such driven member will cause a corresponding rotation of the other member. As this spindle is used in meters, the lower member 5 is the member which is driven by the action of the armature, and the upper member, connected with the usual time-train or other recording apparatus (not shown), is driven by the rotation of the member 5.

While we have described our improved two-part spindle in connection with electric mercury motor meters, it will be understood that we do not wish to be restricted to the use of our spindle in such meters. It may of course be used in any other device to which a divided or two-part vertical spindle is appropriate and in which great delicacy of action is required.

What we claim as our invention and desire to secure by Letters Patent is:—

1. In a two-part spindle, the combination of two members in substantial alinement with each other, one of said members having

a flared recess in one end and the other member having a tapered end relatively sharper than the flare of said recess and adapted to bear therein, whereby one of said members is free to rock slightly relatively to the other, and means fixedly connected with one of said members and loosely engaging the other substantially non-rotatably, whereby said members are caused to rotate in unison while free to oscillate to a limited extent relatively to each other.

2. In a two-part spindle, the combination of two members in substantial alinement with each other, one of said members having a flared recess in one end and the other member having a tapered end relatively sharper than the flare of said recess and adapted to bear therein, whereby one of said members is free to rock slightly relatively to the other, one of said members being flattened a short distance from the end, and a sleeve fixedly mounted upon the other of said members and loosely engaging said flattened member, whereby said members are caused to rotate in unison while free to oscillate to a limited extent relatively to each other.

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