May 24, 1927. 1,630,075

E. ROSS

ROTOR PLATE SPINDLE MOUNTING FOR VARIABLE CONDENSERS

Filed Feb. 23, 1926

Fig. 1.

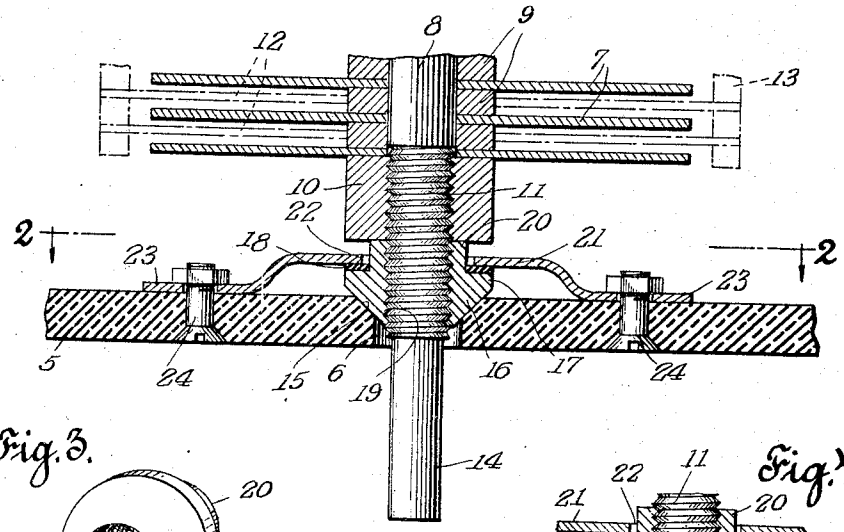


Fig. 3.

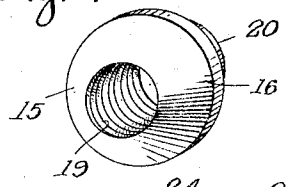


Fig. 4.

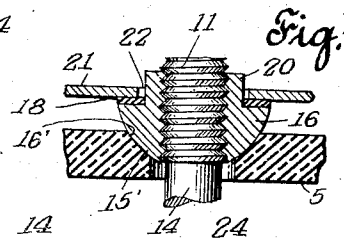
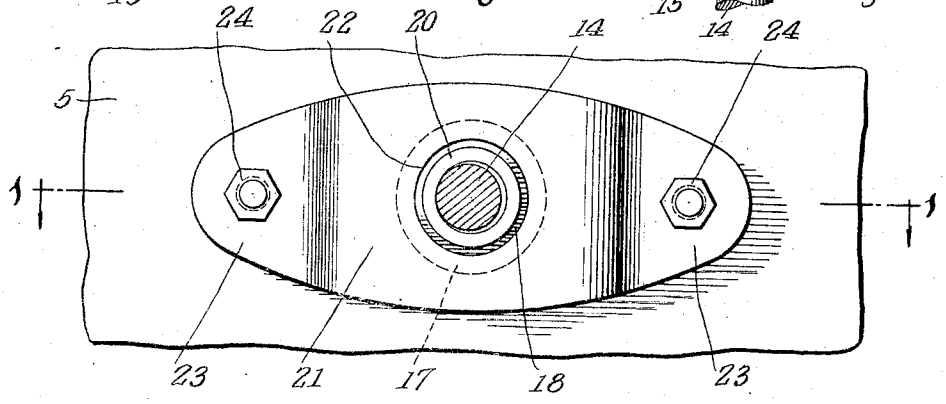


Fig. 2.



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UNITED STATES PATENT OFFICE.

ERNEST ROSS, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO U. S. TOOL CO., INC., OF EAST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ROTOR-PLATE SPINDLE MOUNTING FOR VARIABLE CONDENSERS.

Application filed February 23, 1926. Serial No. 89,846.

This invention relates to radio receiving apparatus and more particularly to the variable condensers provided therein, such condensers being ordinarily composed of a series of stator plates held in uniform spaced relation within a rigid frame, and an interleaved series of rotor plates mounted in such manner as to be manually adjustable with respect to the area presented between the stator plates whereby the apparatus may be tuned to receive impulses varying in wave length.

As such adjustments are necessarily very fine, delicate and inconsiderable in degree, it follows that the rotor plate carrying spindle should be so mounted as to rotate, readily responsive to manipulation, in a smoothly uniform manner, avoiding irregularities detrimental to the best attainable results.

It is therefore one of the principal objects of the invention to provide a bearing in which the spindle is essentially self-adjusting without being unduly loose, thus providing against distortion of the bearing mounting.

A further feature is in the provision of means adapted to produce a smooth, even turning of the spindle under a constant, unvarying tension.

Another aim is to produce means for maintaining the spindle against longitudinal movement and which will act to reseat the same should it be temporarily moved by pressure applied to the control knob in transmission of rotation, shocks, jars or other causes.

These and other objects, which will become manifest as the description progresses, are attained by the novel construction and combination of parts hereafter described and illustrated in the annexed drawing, the same being a component part of the disclosure, and in which:—

Figure 1 is a fragmentary sectional view of a rotor plate spindle mounting made in conformity with the invention, the section being taken in a plane represented by the line 1—1 of Fig. 2.

Figure 2 is a transverse sectional view taken on line 2—2 of Fig. 1.

Figure 3 is a perspective view of a conical sleeve in detail as used in the construction.

Figure 4 is a fragmentary sectional view, similar to Fig. 1, but showing a modified form of bearing.

Condensers of the type indicated are usually mounted in a support frame having two upright end plates 5, (the front end plate of which only is shown) and designated in the drawing by the numeral 5, in which is an opening 6.

A plurality of stator plates 7, of any preferred profile, are mounted on a spindle 8 and held in uniform spaced relation by intervening spacers 9, the plates and spacers being rigidly clamped upon the spindle by a nut 10 adjustable on the screw-threaded portion 11 of the spindle, a shoulder or similar nut on the opposite end of the spindle, not shown, taking the thrust of the spindle.

The rotor plates 7 are interleaved with stator plates 12, secured in a frame represented at 13, these elements being shown in broken lines as constituting no part of the present invention.

As shown in Fig. 1, the reduced outer end 14 of the spindle extends through the opening 6 in the end plate 5 and is adapted to receive a graduated dial and twirling knob, not shown, of any preferred character, by which the spindle 8 may be manipulated in the usual manner.

The opening 6 in the end plate 5 is countersunk to produce a conical cavity 15 in the inner side of the end plate and fitting this cavity is a metal conical sleeve 16 having an inner shouldered hub 17 on which is seated a washer 18, preferably of fiber or like non-metallic material.

The sleeve 16 is internally threaded, as at 19, and extending from its shoulder is an annular element 20 to contact with the outer face of the nut 10, causing locking engagement of the parts upon the rotor spindle.

An oblong spring plate 21, preferably of phosphor bronze, is provided with a central opening 22 through which the cone extension 20 freely passes, the under side of the plate being seated on the washer 18.

The ends of the plate 21 are offset downwardly, as at 23, and provided with openings to receive screw bolts 24 passed through the end plate 5.

In order to provide a more effective self-alignment of the spindle 8, the screw threaded sleeve 16 may be formed curved

semi-spherically at its bearing portion 16′ to suit a similar shaped cavity 15′ in the plate 5, as seen in Fig. 4.

In operation the rotor elements are assembled and clamped on the spindle as a unit and the sleeve 16 seated in the cavity in the end plate 5, where it is held frictionally by the spring plate 21.

Upon inserting the spindle to engage the threads within the sleeve and bringing the nut 10 into forcible contact with the hub 20, the assembly is completed ready to attach a control knob.

It will be manifest that the sleeve is held resiliently in its seat, under uniform pressure and that a smooth even movement may be imparted to the spindle, assuring a high degree of accuracy in the setting of the device.

From the foregoing it will be seen that a simple device for this purpose has been disclosed in the preferred form of its embodiment, but it is not desired to restrict the details to the exact construction shown, it being obvious that changes, not involving the exercise of invention, may be made without conflicting with the scope of the appended claims.

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

1. A spindle bearing comprising a support plate through which one end of the spindle projects, a conical metallic sleeve threaded on said spindle and rotatably mounted in the plate, and a spring attached to said support plate, said spring having an opening through which a part of said sleeve extends to press its conical portion into a bearing in the support plate.

2. In a spindle bearing, the combination with a spindle and a support plate through which one end of the spindle projects, of a conical metallic sleeve threaded on said spindle, said sleeve being rotatably mounted in the plate, a shoulder on said sleeve, a hub extending from said shoulder, a flat spring having an opening to loosely receive said hub, the margin of the opening being seated on said shoulder, a fiber washer interposed between said spring and shoulder, and means to secure said spring to the support plate.

3. In a spindle mounting, the combination with a spindle and a support plate for one end of said spindle, of an internally threaded sleeve secured thereon, said sleeve being rotatably mounted in the support plate, a shouldered hub on the base of said sleeve, a resilient plate having an opening to pass over said hub and rest on the shoulder thereof, an anti-friction washer between the resilient plate and shoulder, and clamp means at each end of said resilient plate to secure it to said support plate.

This specification signed and witnessed this 8th day of February, 1926.

ERNEST ROSS.