1,614,271

Jan. 11, 1927. C. M. ABBOTT

VERNIER ADJUSTING DEVICE FOR RADIODIALS OR THE LIKE

Filed Jan. 29, 1926

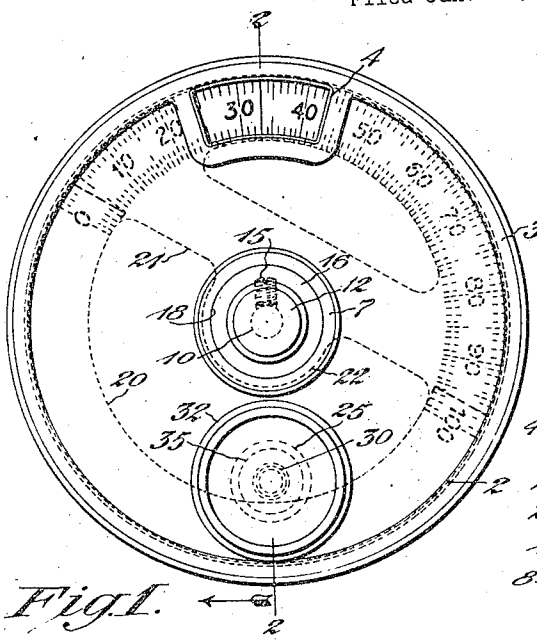

Fig. 1.

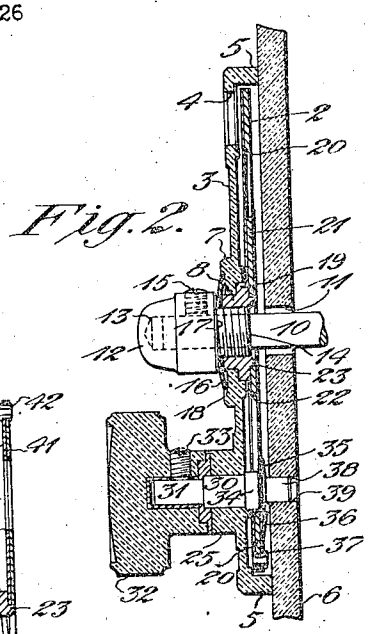

Fig. 2.

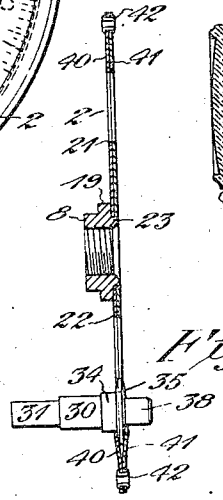

Fig. 5.

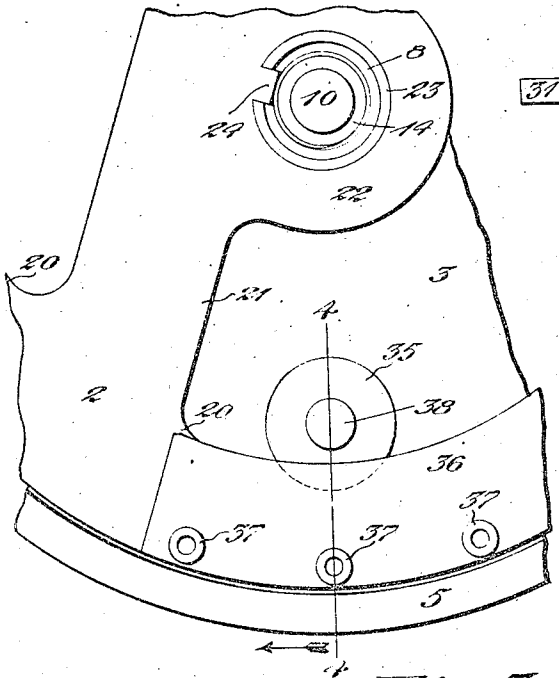

Fig. 3.

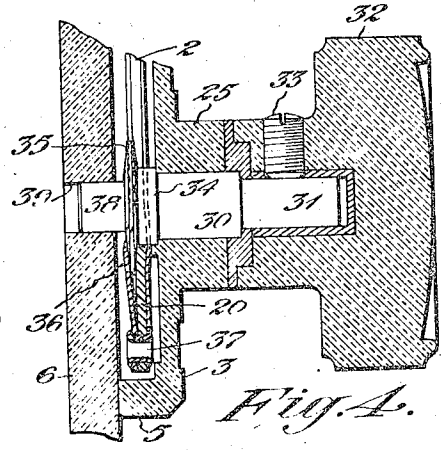

Fig. 4.

Inventor:
Carl M. Abbott
By
Attorneys.

Patented Jan. 11, 1927. 1,614,271

UNITED STATES PATENT OFFICE.

CARL M. ABBOTT, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO MARTIN-COPELAND COMPANY, OF PROVIDENCE, RHODE ISLAND, A TRUSTEESHIP CONSISTING OF EDGAR W. MARTIN, OF BARRINGTON, RHODE ISLAND; LAURENCE C. MARTIN, OF PROVIDENCE, RHODE ISLAND; AND GEORGE W. BLEECKER, OF CHICAGO, ILLINOIS.

VERNIER-ADJUSTING DEVICE FOR RADIODIALS OR THE LIKE.

Application filed January 29, 1926. Serial No. 84,738.

This invention relates to an improved vernier adjusting-device for the dials of radio receiving sets or for other apparatus.

One object of the invention is to provide a device of the type specified which is simple in construction, compact in size, and economical to manuf cture.

Another object of the invention is to provide a device of the type specified having mechanism for turning the dial which operates positively and accurately without play or lost motion, and which is proof against derangement or getting out of order and durable in use over long periods.

Another object of the invention is to provide a tuning dial and its adjusting-means embodied in a complete unit which may be readily applied to the panel of the radio set for operating any of the instruments thereof, and which is universally attachable to practically all types of radio apparatus.

Further objects of the improvement are set forth in the following specification which describes a preferred embodiment of the invention as illustrated in the accompanying drawings. In the drawings:

Fig. 1 is a front view of the improved vernier dial, showing it as applied to use on the panel of a radio receiving set;

Fig. 2 is a sectional view of the same taken on line 2—2 of Fig. 1;

Fig. 3 is an enlarged rear view of the dial showing its operating-mechanism;

Fig. 4 is a sectional view of the same taken on line 4—4 of Fig. 3; and

Fig. 5 is a view similar to Fig. 2, showing a modification in the form of the operating-mechanism of the dial.

My invention in its prferred form embodies a dial 2, a relatively fixed disk or cover-plate 3, having a sight-opening 4 through which the indicia on the dial may be read, and adjusting-means on the front of the cover-plate from which the dial is turned; these parts being combined in a single unit which is attachable to the panel of a radio set containing the instrument to be operated in connection with the dial. The fixed disk or cover-plate 3 is preferably constructed of dielectric material, such as vulcanized rubber, bakelite or similar composition, and is recessed on its rearward side to adapt it to enclose the dial 2. As shown in Fig. 2, the disk or plate 3 is formed with a continuous peripheral flange or rim 5 which seats against the panel 6 of the radio set when the device is applied thereto. The cover-plate 3 has a central hub 7 bored to receive a suitable metal sleeve or bushing 8, preferably of brass or other wear-resisting material, which is rotatable therein.

The spindle 10 which operates the instrument to which the dial is connected projects through an opening 11 in the panel 6, and also through the bore of the bushing 8 in the hub of the cover-plate 3. A knob or cap 12, provided with an axial bore 13 for receiving the end of the spindle 10, has a reduced portion 14 which is externally threaded to screw into the bore of the bushing 8. A set-screw 15 screwed through the side of the knob 12 binds against the spindle 10 to lock the knob rotatively therewith. A cupped or concavo-convex spring-washer 16 encircles the reduced portion 14 of the knob 12 and is held against a shoulder 17 on the knob with its peripheral rim received within a recess 18 on the face of the central hub 7 of the cover-plate 3. As before noted, the bushing 8 is adapted to turn within the bore of the hub 7, and on its inner side is a flange 19 seated in a recess at the rear of the hub. The spring-washer 16 bearing on the opposite face of the hub 7 acts to draw the parts together to provide a slight resistance to the turning movement of the knob 12 and the spindle 10 rotated therefrom.

The dial 2 which is enclosed within the recess of the cover-plate 3 consists preferably of a metal disk or plate, cut away as indicated by the dotted lines in Fig. 1 to save metal and reduce its weight. Preferably, the dial 2 is constructed with a peripheral rim or annulus 20 supported from a cross-bar 21 which is formed with an offset hub-portion 22. The hub-portion 22 is provided with a hole which fits over a reduced annulus 23 projecting from the rear of the bushing 8. This part of the bushing 8 may be swaged or riveted over the edge of the

hole in the hub-portion 22 of the dial 2 and the latter keyed to the bushing at 24 as indicated in Fig. 3.

Below the center of the cover-plate 3 is a second hub 25 projecting forwardly therefrom and bored to receive the dial-adjusting shaft or spindle 30. The outer end of the spindle 30 is reduced in diameter at 31 and fitted to the metal-lined bore of a knob 32, the latter being preferably constructed of dielectric material such as vulcanized rubber or bakelite. The knob 32 is secured fast with the spindle or shaft 30 by means of a set-screw 33 reaching through its shank and binding against the spindle. An enlargement 34 on the spindle or shaft 30 abuts the rearward face of the hub 25 on the cover-plate 3 to hold the shaft from longitudinal displacement.

As shown most clearly in Figs. 3 and 4, the spindle or shaft 30 is provided with a bevel-sided driving-disk or pinion 35 constructed integral therewith, or keyed thereon, and adapted to engage with the side of the rim or annulus 20 of the dial 2 to rotate the latter. Preferably, the marginal portion of the annulus 20 with which the inclined side of the disk or pinion 35 engages is deformed or offset slightly at an angle to adapt it to conform to the bevel of the pinion, whereby to provide for the maximum contact between the inclined face of the pinion and the side of the annulus. An overlying strip or section 36 of sheet-metal or other resilient material is formed to the shape of the annulus 20 on the dial 2 and disposed to overlap the side thereof throughout substantially one-half of its circumference, see Fig 1. This strip or flange 36 is preferably of slightly thinner metal than that of the dial to adapt it to flex sufficiently to admit the beveled pinion 35 between it and the side of the annulus. The outer marginal rim of the strip or flange 36 is secured fast against the marginal rim of the annulus 20 by any suitable means such as the hollow rivets 37 shown in Figs. 3 and 4. In other cases the strip may be brazed, spot-welded or otherwise suitably secured to the rim of the annulus 20, provision being made for the strip to spring away from the annulus on its inner rim whereby the disk or pinion 35 may be inserted therebetween.

Referring particularly to Fig. 4, it is to be noted that the operating-shaft or spindle 30 has a reduced portion 38 projecting from its rearward end and adapted to be received within a hole or bore 39 in the panel 6. This engagement of the spindle with the bore in the panel holds the cover-plate 3 from turning on the front of the panel, so that when the disk 35 is turned from the knob 32 it will transmit a turning movement to the dial 2.

It will be understood that the resilient pressure of the strip 36 on the side of the disk 35 provides an efficient friction contact or traction between the disk and the annulus 20 on the dial 2 which, when the disk is rotated, causes rotation of the dial without chance of slippage or lost motion. In fact, the turning of the dial from the disk is accomplished with a smooth, velvety action, without the slightest backlash, and the improved adjusting-means thus provides for more accurate setting of the dial and the instrument connected therewith. Usually, the graduated scale and indicia for the dial are printed or otherwise marked on a paper or celluloid disk overlying and fastened to the face of the metal disk 2 so that as the latter is turned they show through the sight-opening 4.

The device is practically proof against deterioration over long periods of use, the wear on the pinion and the engaging surfaces of the dial actually improving the contact between these parts rather than reducing the frictional traction. It will also be observed that the improved operating-means for adjusting the dial is extremely simple in construction and arrangement and it is therefore economical to manufacture. As another feature of the improvement, the mechanism contains no delicate parts liable to wear out and no gears which are always subject to lost motion and backlash in their operation.

In Fig. 5 another example of the friction contact means between the driving pinion and dial is shown. In this modification of the mechanism the dial disk 40 and its overlapping element 41 are of the same form and construction, both being punched or stamped out to the same shape and contour and of the same thickness of spring metal. The peripheral rims of the two disks are either welded or riveted together as shown at 42, and with the friction disk or pinion 35 inserted therebetween their sides spring apart at an angle conforming to the beveled sides of the disk. With this form of device the method of operation is the same as above explained, the frictional engagement between the beveled sides of the disk 35 and the sides of the spring elements 40 and 41 operating to turn the dial with a smooth, even motion without play or backlash.

While I have herein illustrated and described the invention as embodied in a preferred form of mechanism, it is obvious that various modifications other than that shown may be made in the structure and arrangement of the parts of the device without departing from the spirit or scope of the invention.

Therefore, without limiting myself in this respect, I claim:

1. A vernier adjusting-device for dials or

the like comprising an annulus, a second coaxial annulus overlying the face of the first annulus and fixedly secured thereto circumferentially thereof to adapt its rim to flex in relation to that of the first annulus, and a friction-wheel projecting between the rims of the annuli and engaging therewith to rotate the dial.

2. In a vernier adjusting-device for dials or the like, the combination of an annulus on the dial, a resilient element overlying and conforming to the lateral face of the annulus and fixedly secured thereto circumferentially thereof, and a friction disk engaging between the rims of the resilient element and the annulus to rotate the latter to turn the dial.

3. In a vernier adjusting-device for dials or the like, the combination of a rotatable disk, a flexible annulus overlying the lateral face of the disk and secured thereto at its rim, and a bevel-sided pinion inserted between the disk and the annulus to frictionally engage the opposite faces thereof to rotate the disk from its turning movement.

4. In a vernier adjusting-device, the combination of a spindle, a disk rotatively attached to said spindle, a flexible annulus overlying the side of the disk and secured thereto at its rim, and a bevel-sided pinion engaging between the disk and the annulus to adapt it to rotate the latter through frictional contact therewith.

5. In a vernier adjusting-device for dials or the like, the combination of a rotatable disk having a flexible annulus, a second disk arranged coaxially of the first disk and provided with a flexible annulus overlying that of the first disk with their rims joined together, a bevel-sided pinion engaging between the opposite faces of the annuli, and means for turning the pinion to rotate the disks by frictional driving contact therewith.

In testimony whereof I affix my signature.

CARL M. ABBOTT.