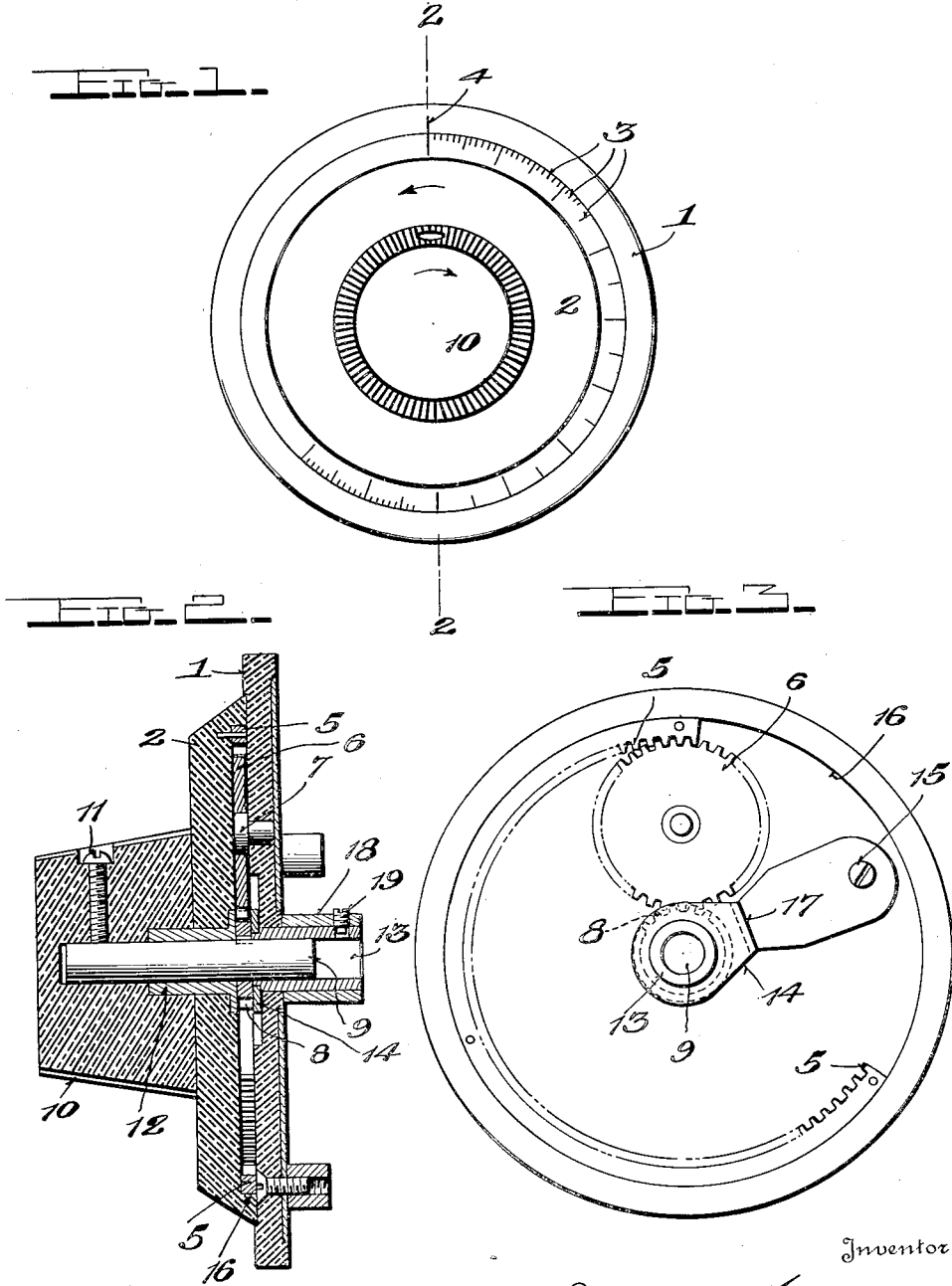


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R. H. MOORE  
VERNIER TUNING DIAL  
Filed Aug. 15, 1922



Inventor

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# UNITED STATES PATENT OFFICE.

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## VERNIER TUNING DIAL.

Application filed August 15, 1922. Serial No. 581,998.

*To all whom it may concern:*

Be it known that I, ROBERT H. MOORE, a citizen of the United States, residing at 198 Broad Street, Providence, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in a Vernier Tuning Dial, of which the following is a specification.

This invention relates to certain new and useful improvements in a vernier tuning dial for use with radio structures or outfits and it has for its object to provide a tuning dial which operates at a comparatively slow speed or movement relative to a manipulating handle or knob.

The invention further resides in a tuning dial wherein the dial element is movable relative to the operating handle or knob through an internal system of gearing connecting the two elements.

Further the invention resides in the salient features of construction and the arrangements and combinations of parts hereinafter described and claimed, reference being had to the accompanying drawing, wherein,

Figure 1, is a front elevation of the improved vernier tuning dial;

Figure 2, is an axial cross-section taken about on line 2—2 of Fig. 1; and

Figure 3, is a bottom plan view of the dial element, showing the internal gearing.

Referring more in detail to the accompanying drawing the numeral 1 designates the base or a fixed part which may be mounted on a case or other box-like structure containing the condensing coil or condenser. The dial element 2 has its periphery beveled and provided with scale markings 3 which are movable past a zero marking 4 provided on the base. The bottom or inner face of the dial element is hollowed out to form a chamber in which the internal gearing is arranged and housed. This gearing comprises a segmental internal gear 5 secured to either the base or the dial element, a transmission or intermediate gear 6 journaled on a pin 7 carried by the other part, and a drive pinion 8 which is fixed on a shaft 9. In the present instance, the internal gear 5 is fixed on the dial element while the gear 6 is journaled on the base 1. By such arrangement it will be noted that when the shaft 9 and its keyed pinion 8 are rotated in one direction, the

dial element will be moved in the opposite direction but at a greatly reduced speed by reason of the gear ratio. Thus, when the knob 10, which is fixed on the shaft 9 by a set screw 11, is turned to the right the dial 2 will move at a slower speed to the left, as indicated by the arrows in Figure 1.

The dial element 2 is provided with a hub sleeve 12 through which the shaft extends for rotary movement, said sleeve having a flanged base set in the inner face of the dial element and its outer end extended to fit in a counter-bore in the knob 10 to support, in part, the knob. The shaft 9 extends beyond the sleeve extension where it is engaged by the set screw 11. The inner end of the shaft is journaled in a hollow or tubular shaft 13 which in turn, is journaled in the base 1 and is fixedly secured in the bracket 14. This bracket is attached, by screw 15, within the gear chamber 16 and has an offset, as at 17, adjacent the drive pinion 8 to partially form a housing therefor. Thus, the gear 8 is inclosed between the base flange of sleeve 12 and the offset bracket portion to which the tubular shaft 13 is secured. A lock collar 18 is slipped over the projecting end of the tubular shaft and secured thereto, as by a set screw 19.

In practice, the condenser or condensing coil is connected to the dial shaft 13. As the knob is rotated to drive the pinion 8, the gear 6 will remain in a fixed position because of its mounting on the base while the segmental gear or rack 5 will move tangentially about said gear 6 until it reaches the end of the series of teeth where it will be prevented from riding off or out of mesh with said gear 6 by bracket 14 which serves as a stop in both directions of rotation. By reason of the reducing gears the dial element 2 will be caused to revolve very slowly, which movement is especially desired when adjusting a radio receiving set. The tubular shaft 13 and hub sleeve 12 may be considered as a unitary shaft through which the operating shaft 9 extends, so that the two shafts are, in effect, rotatable one within the other but connected through reducing gearing for differential rotary movement.

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

1. A tuning dial comprising a base, a dial

element movable thereover and having its inner face provided with a gear chamber, a segmental gear secured in the chamber, a meshing gear journaled on the base, an operating shaft journaled in the dial element, a gear fixed on the shaft and meshing with the second gear, a tubular shaft journaled in the base and forming a journal support for the first shaft, and a handle on the outer end of said first shaft.

2. A tuning dial comprising a rotatable dial element, a shaft extending therethrough and supporting a driving gear on one end portion and an operating handle on the opposite end portion, a base, a dial shaft extending through the base in axial alignment with the first shaft and secured to the dial element outwardly of the gear, and meshing gears carried on the dial element and base and driven from said first gear.

3. In a tuning dial, a base element, a dial element movable over the base element, a segmental internal gear carried by one of said elements, a transmission gear rotatably carried by the other element and in mesh with the segmental gear, a shaft carried by the base element and rotatably supporting the dial element, a drive pinion fixed on the shaft and meshed with the transmission gear, means to mount the shaft, including a part engaging the transmission gear so as to act as a stop to prevent disengagement of said transmission and segmental gears, and a knob fixed on the shaft.

4. In a tuning dial, a base, a dial element movable over the base element, a segmental internal gear carried by one of said elements, a transmission gear rotatably carried by the other element and in mesh with the segmental gear, a shaft carried by the base element and rotatably supporting the dial element, a drive pinion fixed on the shaft and meshed with the transmission gear, a knob fixed on the shaft, and means engaging the transmission gear to prevent

disengagement of the transmission gear from the segmental gear.

5. In a tuning dial, a base element, a dial element movable over the base element, a segmental internal gear carried by one of the said elements, operating means, means actuated by the operating means and engaging the segmental gear to effect movement of the dial element, and means to prevent the last named means from riding off of the ends of the segmental gear.

6. In a tuning dial, a base, a dial element movable over one face of the base, a sleeve extending through the dial element and having a flanged inner end engaged with the dial element, a shaft extending through the sleeve, a knob rigidly connected to one end of the shaft, a tubular shaft receiving the opposite end of the first shaft, means actuated by the first shaft to operate the dial element, a bracket carried by the dial element and having the tubular shaft secured thereto, and means to secure the tubular shaft in position.

7. In a tuning dial, a base, a dial element movable over the base and having gear teeth, a shaft extending through the dial element, operating means affixed to the shaft, sectional tubular means receiving and supporting the shaft and engaged with the dial element and base respectively, a gear carried by the base and meshed with the gear teeth of the dial element and a gear on the shaft meshed with said first gear and disposed between the sections of the tubular means for effecting movement of the dial element upon actuation of said operating means.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT H. MOORE.

Witnesses:

S. N. BARRY,  
J. A. MILLER.