May 12, 1925. 1,537,227

W. P. DE WITT

DIAL WITH UNIVERSAL CONNECTIONS

Filed June 26, 1924

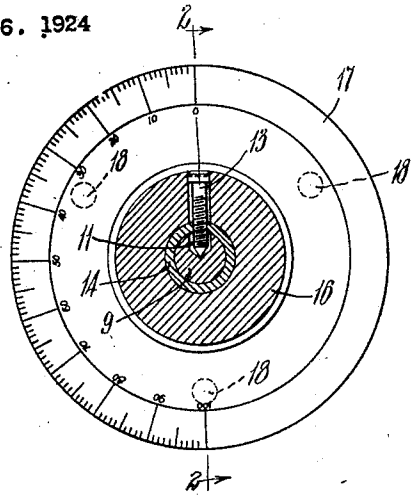


FIG. 1.

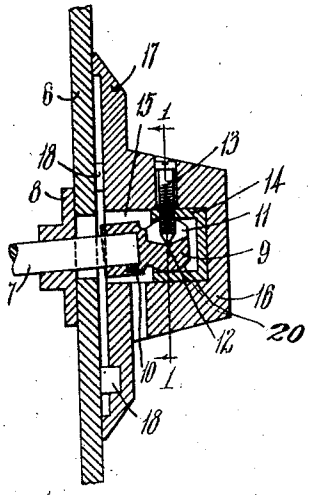


FIG. 2.

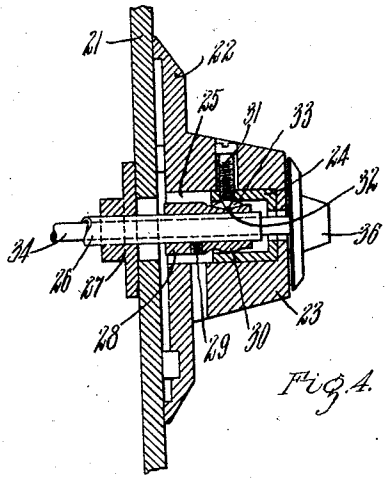


FIG. 4.

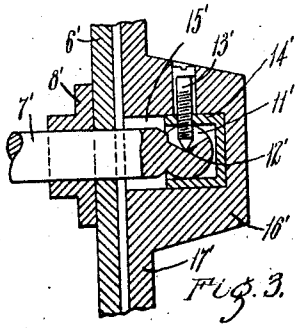


FIG. 3.

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UNITED STATES PATENT OFFICE.

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DIAL WITH UNIVERSAL CONNECTIONS.

Application filed June 26, 1924. Serial No. 722,489.

To all whom it may concern:

Be it known that I, WILLIAM P. DE WITT, a citizen of the United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Dials with Universal Connections, of which the following is a specification.

This invention relates to a dial for radio sets and contemplates the production of a dial embodying a connecting member adapted to be fastened to a shaft, the connecting member and dial being free to tip relatively to each other, but having no lost motion therebetween circumferentially thereof when the dial is rotated in either direction.

The invention is particularly adapted to be used in connection with radio sets for connecting a dial to a shaft, such for example, as the shaft which rotates the movable arm of a rheostat, or the plates of a variable condenser. In radio sets, the shafts referred to are liable to be not exactly normal to the face of the panel, upon which they are rotatably mounted, or if such a result is attained in the set, it requires very accurate and expensive machine work to accomplish the same, and the object of this invention is to provide a connection between the dial and the shaft which it rotates which, even if the shaft is not normal to the front face of the panel, the dial will automatically assume a position in which the inner face of the dial will be parallel to the front face of the panel, no matter into what position the dial may be rotated.

The invention further has for its object to provide a dial of the character described which may be used in radio sets in connection with a vernier variable condenser or vernier rheostat.

To these ends the invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings:—

Figure 1 is a front elevation partly in section on line 1—1 of Fig. 2, of a dial with a universal connection embodying a preferred form of my invention.

Fig. 2 is a sectional elevation taken on line 2—2, Figure 1.

Fig. 3 is a sectional elevation similar to Fig. 2, illustrating a modification of my invention.

Fig. 4 is a sectional elevation of a modified form of my invention adapted to be used in connection with a vernier attachment.

Like numerals refer to like parts in the views of the drawings.

In the drawings, referring to Figs. 1 and 2, 6 is the panel of a radio set. 7 is a shaft rotatably mounted in a bearing 8 fast to said panel 6, the outer end of said shaft projecting through the panel 6 and into a connecting member 9 which is fastened by a screw 10 thereto. The connecting member 9 has a slot 11 at its outer end extending longitudinally thereof, and the bottom of said slot is provided with a slight depression 12 into which the inner end of a pin 13 projects. The pin 13 is preferably screw threaded and has screw-threaded engagement with a sleeve 14 located in the inner end of a recess 15 provided in the knob 16 of a dial 17. The dial 17 is preferably provided with a plurality of cork inserts 18 which bear against the front face of the panel 6 and supply a frictional resistance to the accidental rotation of the dial. The extreme inner end or point of the pin 13 coincides with the axial line of the shaft 7, or of the connecting member 9, and the diameter of the pin 13 is substantially the same as the width of the slot 11.

It will be seen by this construction that the dial can tip laterally thereof upon the connecting member 9, the pin 13 constituting a pivot and the slot 11 allowing the pin to tip laterally as viewed in Fig. 2, about the extreme inner end of said pin.

The outer end of the connecting member 9 is made of a spherical shape on its periphery as at 20, and the periphery of this outer end of the connecting member projects into the sleeve 14 and bears against the inner side walls thereof, so that there will be no play of the dial transversely of the shaft 7, but it will fit the spherical ended portion of the connecting member 9 no matter in what position it may be tipped. The pin 13 being of approximately the same diameter as the width of the slot 11, the pressure which is brought to bear upon the pin in rotating the

shaft 7 and the connecting member 9, will be taken not by the extreme point of the pin 13 in the depression 12, but will be taken by the diametrically opposite sides of the pin as it bears against the opposite sides of the slot 11, and moreover, it will be particularly noted that there will be no play or lost motion between the dial and the shaft circumferentially thereof when the dial is rotated in either direction.

It will thus be seen that with the construction hereinbefore described, the inner face of the dial will always assume a position parallel to the front face of the panel, whether or not the shaft is normal to the front face of the panel.

In Fig. 3 a modified form of my invention is illustrated in which the parts are substantially the same, except that the connecting member 9 is made of a spherical shape integral with the shaft 7′, and the slot for the connecting pin is made in the end of the shaft.

Referring to Fig. 3, 6′ is the panel, 7′ the shaft, 8′ the bearing for the shaft, 11′ the longitudinal slot in the end of the shaft, 12′ the depression in the bottom of the slot 11′, 13′ the connecting pin, 14′ the sleeve, 15′ the recess in the dial, 16′ the knob on the dial, and 17′ the dial. The parts operate in the same manner as hereinbefore described in relation to the embodiment of my invention illustrated in Figs. 1 and 2.

Referring now to the embodiment of my invention illustrated in Fig. 4, which illustrates the same in a form adapted to be used with vernier attachments employing a hollow shaft for one rotary member of the attachment, and another shaft rotatably mounted in the hollow shaft for another portion of the attachment, 21 is a panel, 22 a dial with a knob 23 and with a sleeve 24 fitting tightly in a recess 25 provided in the knob of said dial. 26 is a hollow shaft rotatably mounted in a bearing 27 fast to the panel 21. This hollow shaft has a connecting member 28 fast to its outer end, the connecting member being attached to the shaft by a screw 29. The outer end of the connecting member 28 is spherical shaped as at 30 and fits in the sleeve 24, being free to tip in said sleeve, but held from withdrawal therefrom by a screw 31 which has screw-threaded engagement with the sleeve 24, and the pointed end of which projects into a depression 32 formed in the bottom of a slot 33 which extends longitudinally of the connecting member 28 at the outer end thereof. The diameter of the screw 31 is approximately the same as the width of the slot 33. A shaft 34 is rotatably mounted in the hollow shaft 26 and projects through the dial 22 and sleeve 25 at its outer end, said shaft 34 having a dial 35 fast to its outer end and provided with a knob 36, whereby the shaft 34 may be conveniently rotated in a manner well known to those skilled in the art.

It will be seen that with this construction, as in the embodiment of my invention illustrated in Figs. 1, 2 and 3, the inner face of the dial 22 will lie parallel to the outer face of the panel 21, whether or not the hollow shaft 26 is normal to the front face of the panel.

It will be seen that in the embodiment of my invention illustrated in Figures 1 and 2, the connecting member 9 forms, in operation and effect, when the parts are assembled, a portion of the shaft 7 and may be made integral therewith, as in Fig. 3, without departing from the spirit of my invention, the only object of having the connecting member 9 a separate piece from the shaft 7, but rigidly fastened thereto by the screw 10, is for convenience of manufacture and marketability, and for securing a desirable proportion of the parts.

The same is true of the connecting member 28 in the embodiment of my invention illustrated in Fig. 4.

It will also be understood that the sleeve 14 in that embodiment of my invention illustrated in Figures 1 and 2 is in effect a part of the dial 17 as it is rigidly fastened thereto, but said sleeve is made of a different piece of material for convenience of manufacture, for strength, and for wearing qualities, and the same is true of the sleeve 24 in the embodiment of my invention illustrated in Fig. 4, but as to operation and effect, the sleeve 14, or the sleeve 24, might be made integral with the dial without departing from the spirit of my invention, and the appended claims are to be read and understood as embodying either of these constructions.

I claim:

1. A rotary dial, a connecting member adapted to be fastened to one end of a shaft and provided with a slot extending longitudinally thereof, said connecting member being positioned in a recess provided in said dial and a connecting pin on said dial projecting into said slot and terminating at its inner end in a depression provided in the bottom of said slot.

2. A rotary dial, a connecting member adapted to be fastened to one end of a shaft and provided with a slot extending longitudinally thereof, said connecting member being positioned in a recess provided in said dial and terminating in a spherical shaped end fitting into a recess provided in said dial, and a connecting pin on said dial projecting into said slot and terminating at its inner end in a depression provided in the bottom of said slot.

3. A rotary dial, a knob on said dial, a connecting member adapted to be fastened

to one end of a shaft and provided with a slot extending longitudinally thereof, said connecting member being positioned in a recess provided in said dial and its knob, and a screw projecting through said knob transversely thereof and terminating at its inner end in a depression provided in the bottom of said slot.

4. A rotary dial, a knob on said dial, a connecting member adapted to be fastened to one end of a shaft and provided with a slot extending longitudinally thereof, said connecting member being positioned in a recess provided in said dial and its knob, and a screw projecting through said knob transversely thereof and terminating at its inner end in a depression provided in the bottom of said slot, the inner end of said screw terminating approximately in the axial line of said shaft.

5. A rotary dial, a connecting member adapted to be fastened to one end of a shaft and provided with a slot extending longitudinally thereof, said connecting member being positioned in a recess provided in said dial, and a projection on said dial projecting into said slot and terminating at its inner end in a depression provided in the bottom of said slot.

6. A rotary dial, a connecting member adapted to be fastened to one end of a shaft and provided with a slot extending longitudinally thereof, said connecting member being positioned in a recess provided in said dial and terminating in a spherical shaped end fitting into a recess provided in said dial, and a projection on said dial projecting into said slot and terminating at its inner end in a depression provided in the bottom of said slot.

7. A rotary dial provided with a recess, a sleeve, in said recess, a connecting member adapted to be fastened to one end of a shaft and provided with a slot extending longitudinally thereof, said member being positioned in said sleeve, and a connecting pin on said dial projecting into said slot and terminating at its inner end in a depression provided in the bottom of said slot.

8. In combination a rotary dial, a panel, a shaft rotatably mounted thereon and projecting therethrough, a connecting member fast to one end of said shaft and provided with a slot extending longitudinally thereof, said dial being provided with a recess into which said connecting member projects, and a connecting pin on said dial projecting into said slot and terminating at its inner end in a depression provided in the bottom of said slot.

9. In combination, a rotary dial, a panel, a shaft rotatably mounted thereon and projecting therethrough, a connecting member terminating in a spherical-shaped end fast to one end of said shaft and provided with a slot extending longitudinally thereof, said dial being provided with a recess into which said spherical-shaped end projects, and a connecting pin on said dial projecting into said slot and terminating at its inner end in a depression provided in the bottom of said slot.

10. In combination, a rotary dial, a rotary shaft, a panel through which said shaft projects, a connecting member fast to one end of said shaft and provided with a slot extending longitudinally thereof, said dial being provided with a recess into which said connecting member projects, a knob on said dial, and a screw projecting through said knob transversely thereof and terminating at its inner end in a depression provided in the bottom of said slot.

11. In combination, a rotary dial, a rotary shaft, a panel through which said shaft projects, a connecting member fast to one end of said shaft and provided with a slot extending longitudinally thereof, said dial being provided with a recess into which said connecting member projects, a knob on said dial, and a screw projecting through said knob transversely thereof and terminating at its inner end in a depression provided in the bottom of said slot, the inner end of said screw terminating approximately in the axial line of said shaft.

12. In combination, a rotary dial, a shaft adapted to be rotatably mounted on a stationary support, one end of said shaft being provided with a slot extending longitudinally thereof, said dial being provided with a recess into which said shaft projects, and a projection on said dial extending into said slot and terminating at its inner end in a depression provided in the bottom of said slot.

13. In combination, a rotary dial, a shaft adapted to be rotatably mounted on a stationary support, one end of said shaft being spherical shaped and provided with a slot extending longitudinally thereof, said dial being provided with a recess into which said spherical-shaped end projects, and a projection on said dial extending into said slot and terminating at its inner end in a depression provided in the the bottom of said slot.

14. In combination, a rotary dial, a panel, a shaft rotatably mounted thereon and projecting therethrough, a connecting member fast to one end of said shaft and provided with a slot extending longitudinally thereof, said dial being provided with a recess, a sleeve in said recess into which said connecting member projects, and a connecting pin on said dial projecting into said slot and terminating at its inner end in a depression provided in the bottom of said slot.

15. In combination, a rotary dial, a panel, a hollow shaft rotatably mounted thereon, a

shaft rotatably mounted in said hollow shaft, means to rotate said shaft, a connecting member fast to one end of said hollow shaft and provided with a slot extending longitudinally thereof, said dial being provided with a recess into which said connecting member projects and through which said shaft projects, and a connecting pin on said dial projecting into said slot and terminating at its inner end in a depression in the bottom of said slot.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM P. DE WITT.

Witnesses:

FRANKLIN E. LOW,

HAZEL F. BATES.