

March 25, 1930.

W. A. READY

1,751,658

DIAL MECHANISM

Filed May 29, 1928

2 Sheets-Sheet 1

Fig. 1.

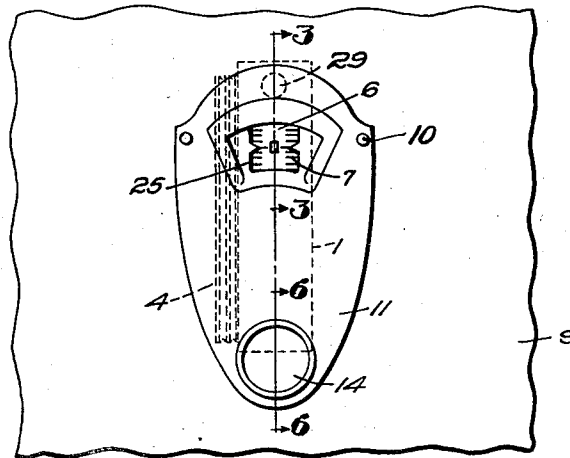


Fig. 2.

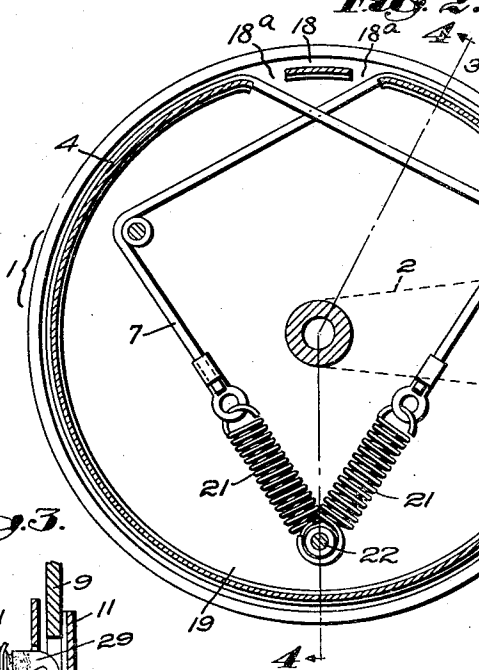


Fig. 4.

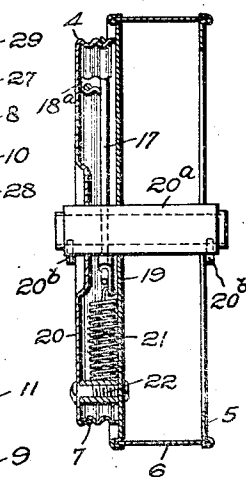
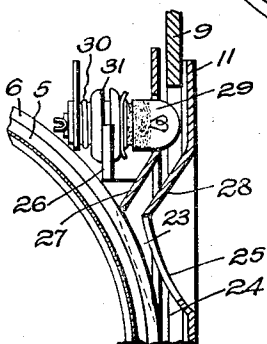


Fig. 3.



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Fig. 5.

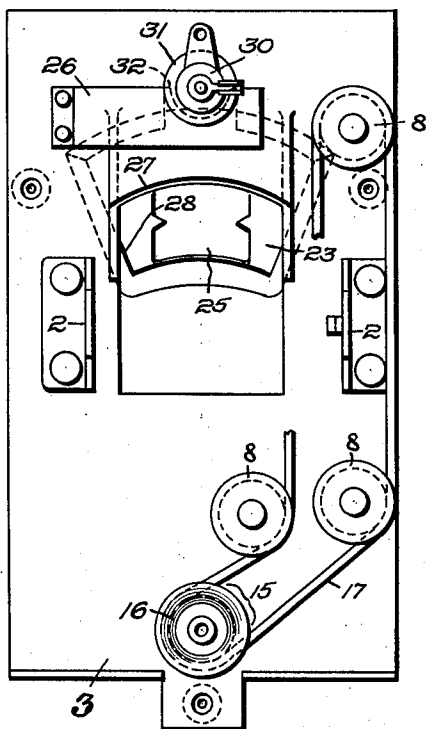


Fig. 6.

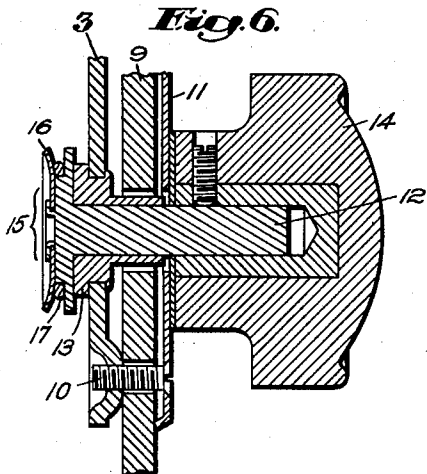
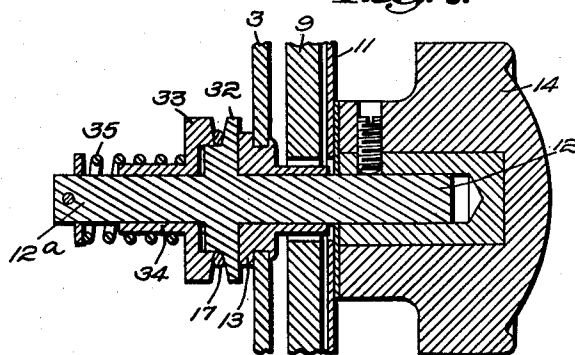


Fig. 7.



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DIAL MECHANISM

Application filed May 29, 1928. Serial No. 281,561.

My invention aims to provide improvements in dial mechanisms particularly, though not exclusively, adapted for operation of the rotary parts of radio devices.

In the drawings, which illustrate preferred embodiments of my invention:—

Figure 1 shows a front elevation of the dial mechanism as it appears when attached to the panel of a radio receiver;

Fig. 2 is a section taken through the panel and showing parts of the device in cross-section and parts in elevation;

Fig. 3 is a section taken on the line 3—3 of Fig. 1;

Fig. 4 is a section taken on the line 4—4 of Fig. 2 to show the drum type dial structure;

Fig. 5 is a rear view of the supporting plate, which fits against the inner face of the panel of the receiver, showing the device as it appears with the drum type dial removed and the belt broken;

Fig. 6 is a section taken on the line 6—6 of Fig. 1; and

Fig. 7 is a section similar to that shown in Fig. 6, but illustrating another form of the friction pulley device attached to the operating knob.

Referring to my invention, as illustrated by the drawings, I have shown a drum type dial mechanism for radio receivers. Many dials of the drum type have been manufactured heretofore, but there has been some trouble with slippage due to various defects occurring in the use of driving mechanisms. Therefore, one of the purposes of my invention is to increase driving torque by providing a driving mechanism which will eliminate all slippage and, at the same time, secure a fine adjustment of the device to which the dial is secured. The driving mechanism which I will describe is not limited in use to drum type dials, however, and, therefore, this description is merely for the purpose of clarification.

The device illustrated includes the drum type dial 1 (Figs. 1 and 2) supported on brackets 2 (Fig. 5) extending from a supporting part 3. The drum type dial 1 is provided with pulley means 4 and a ring 5 between which is held a part 6 upon which

graduations 7 are marked, as shown in Fig. 4.

The supporting part 3 (Figs. 2 and 5) is in the form of a plate to which are attached pulleys 8 (illustrated as three in number). This plate is adapted to be secured to a panel 9 of a radio receiver by means of screws 10.

If desirable, an escutcheon plate 11 may be secured to the outer face of the panel 9 by means of the screws 10. Thus, the panel 9 is located between the supporting part 3 and the escutcheon plate 11, as best illustrated in Fig. 2.

A shaft 12 (Fig. 6) is journaled in a bearing 13 secured to the supporting part 3 and extends through the panel 9 and escutcheon 11 (if used). At that end of the shaft, outside the panel 9, I have secured a knob 14 and at the other end I have secured a friction pulley means 15. This latter pulley means has the usual flanges but in this instance one flange 16 is in the form of a thin disc of yieldable material.

The driving connection between the friction pulley means 15 and the pulley means 4 is in the form of a belt 17 which may be made of any kind of flexible material such as metal, cord, leather or the like. The belt 17 passes around the pulleys 8 and friction pulley 15, between the flanges of which it is pinched, as shown in Fig. 5, and around the pulley means 4, as shown in Figs. 2 and 4. The ends of the belt pass around the grooves 18 and through slots 18^a in the pulley means 4 (Fig. 2) and are concealed between the partitions 19 and 20. The ends of the belt are attached to tension springs 21 which, in turn, are attached to one of the fastening elements 22. These fastening elements 22 hold the parts of the pulley means 4 together.

As the drum type dial 1 is mounted behind the panel 9, it is necessary to have an opening in the panel for observation of the graduations 7. Therefore, I have provided an opening 23 in the supporting means 3 and an opening 24 in the panel 9 for the purposes stated. If the escutcheon plate 11 is used it also has an opening 25 in line with the openings 23 and 24.

The dial mechanism which I have illustrated and described as being secured to a

panel 9 may be used to turn a rotatable shaft of an instrument of the radio receiver, as, for instance, the shaft of an air condenser. Assuming that the shaft of the device to be rotated or adjusted is entered from either side of the dial into the hollow hub means 20^a, which support the partitions 19 and 20 between the brackets 2, it may be held therein by means of one of the set screws 20^b. The operation of the device is substantially as follows:—Rotation of the knob 14, will turn the shaft 12 and friction pulley means 15. As the pulley means 15 grips the belt means 17 rotation thereof will move the belt means and cause the drum type dial 1 to be turned. The pulley means 4 of the drum type dial being relatively larger than the pulley means 15 there will be a reduced turning movement of the dial with relation to the turning of the knob 14. Thus, I am enabled to secure a fine adjustment of the shaft to which the drum type dial is connected. I may also observe the amount of rotation of the dial by means of the graduations on the dial which are visible from the outside of the radio receiver panel.

The mechanism which I have described is in the nature of an anti-back lash friction drive which gives positive operation of the dial when the knob 14 is turned in either a clockwise or a contra-clockwise direction. There can be no lost motion because the belt 17 is always maintained under tension by the springs 21 and the belt is always gripped by the pulley means 15.

Illumination of the dial may be had in any desired manner so that the dial graduations may be plainly visible in the darkness. However, I prefer to provide a quick, demountable incandescent lamp unit supported upon a suitable bracket 26 and adapted to cast light rays between hood portions 27 and 28 passed from the supporting part 3 and escutcheon 11, respectively, as best illustrated in Fig. 3. The lamp 29 extends through a hole in the supporting part 3 and in the panel. The hoods 27 and 28 are so arranged that light from the lamp will pass between them and be directed upon that portion of the part 6 of the dial 1 which is exposed through the panel so as to give full illumination thereof.

The quick, removable lamp unit has a socket 30 into which the lamp 29 is screwed.

Instead of rigidly securing the lamp socket 30 to the bracket 26, I provide a flexible grooved washer 31 surrounding the socket and fitted into a notch 32 (Fig. 5) in the bracket 26. Thus, it is only necessary to lift the flexible washer from the bracket to change the lamp. No tools are required because the resiliency of the washer 31, which is made of rubber or like material, holds the unit in place. The lamp is so constructed and arranged that the illuminated part thereof is

located entirely between the escutcheon and the supporting part 3.

In Fig. 7, I have illustrated another form of friction pulley means secured to the shaft 12. In this instance, I have shown a flange 32 of the pulley means secured directly to or formed integral with the shaft. The second flange 33 is provided by a part 34 which is slidably mounted upon an extension 12^a of the shaft 12 and is pressed toward the flange 32 by means of a spring 35. Thus, there is a gripping action on the belt means by the flanges 32 and 33 to provide for positive driving of the belt means 17 when the knob 14 is rotated.

The invention described is simple, positive of operation, inexpensive and easy to assemble and, therefore, provides a practicable, highly desirable device for use in connection with the fine adjustment of circuit tuning devices.

While I have illustrated and described my invention somewhat specifically, I do not wish to be limited thereby and reference is made to the following claims to indicate the scope of my invention.

Claims:

1. A dial mechanism for radio receivers comprising, in combination, a drum type dial adapted to be secured to an instrument shaft, panel means in front of said drum type dial parallel with the axis thereof, a knob exposed at the front of said panel means and having its axis at right angles to the axis of the drum type dial, driving connections between the knob and the drum type dial including pulleys secured to the dial and to the knob and connected by a flexible connecting element whereby when said knob is turned said drum type dial will be rotated and an opening in said panel means through which markings on the drum type dial are visible.

2. A dial mechanism for radio receivers comprising, in combination, a dial adapted to be secured to an instrument shaft and carrying a pulley of relatively large diameter, a knob, pulley means of substantially smaller diameter than said large pulley and connected to said knob and belt-like means connected between the pulley means and the dial and frictionally gripped between flanges of the pulley means whereby when said knob is turned said dial will be driven at a reduced ratio through the medium of said belt.

3. A dial mechanism for radio receivers comprising, in combination, a dial adapted to be secured to an instrument shaft and carrying a pulley of relatively large diameter, a knob, pulley means of substantially smaller diameter than said large pulley and connected to said knob, belt means connected between the pulley means and the pulley carried by the dial and frictionally gripped between flanges of the pulley means whereby when said knob is turned said dial will be

driven at a reduced ratio through the medium of said belt and spring means attached to said belt means to exert a tension thereon at all times.

openings through which said markings may be read, and a lamp mounted to cast rays of light between the plates and hood means so as to illuminate that portion of the dial visible through the said openings.

4. A dial mechanism for radio receivers comprising, in combination, a dial adapted to be secured to an instrument shaft and carrying a pulley of relatively large diameter, a knob, pulley means of substantially smaller diameter than said large pulley and connected to said knob and belt means connected between the pulley means and the pulley carried by the dial and frictionally gripped between flanges of the pulley means whereby when said knob is turned said dial will be driven at a reduced ratio through the medium of said belt, said belt means having both ends connected through spring means to said dial.

9. A dial mechanism for radio receivers comprising a dial adapted to be secured to a rotary instrument shaft and having pulley means 4 of relatively large diameter, a knob 14, secured to a shaft 12, friction pulley means 15 of substantially smaller diameter than the pulley means 4 and connected to said shaft 12 and a belt 17 passing over the pulley means 15 and 4 and pinched between flanges of the pulley means 15, whereby when said knob 14 is rotated said dial will be turned at a reduced ratio.

5. A single dial mechanism for radio receivers comprising, in combination, a drum type dial adapted to be secured to an instrument shaft, panel means in front of said drum type dial parallel with the axis thereof, a knob exposed at the front of said panel means and having its axis at right angles to the axis of the drum type dial, belt and pulley means connecting the knob and the drum type dial whereby when said knob is turned said drum type dial will be rotated and an opening in said panel means through which markings on the drum type dial are visible.

10. A dial mechanism for radio receivers comprising, in combination, a dial adapted to be secured to an instrument shaft and carrying a pulley of relatively large diameter, a knob, pulley means connected to said knob, a flexible member connecting the pulley means and the pulley carried by the dial, said pulley means having opposed flanges between which the flexible member is received and yieldable means forcing one of the flanges of the pulley means toward the other flange thereby to exert a gripping pressure upon the flexible member whereby when said knob is turned said flexible member will be driven without slippage due to the increased driving torque exerted upon said flexible member by said flanges.

6. In a dial mechanism for radio receivers, a drum type dial adapted to be mounted in back of a panel, supporting means adapted to be secured to the panel, a shaft, a knob secured to said shaft and exposed at the front of the panel, pulley means secured to said shaft and having one flange yieldably pressed toward the other, pulley means carried by said drum type dial and a belt connecting said pulley means, whereby when said knob is rotated said drum type dial will be rotated, said belt being gripped by the flanges of said first mentioned pulley means to provide a positive drive and prevent back-lash.

11. A dial mechanism for radio receivers comprising, in combination, a dial adapted to be secured to an instrument shaft and carrying a pulley of relatively large diameter, a knob, driving means connected to said knob, a flexible member connecting the driving means and the pulley carried by the dial, said driving means having opposed flanges operatively pressed against the sides of the flexible member whereby when said knob is turned said flexible member will be driven without slippage due to the increased driving torque exerted upon said flexible member by said flanges.

7. A dial mechanism for radio receivers comprising, in combination, a drum type dial adapted to be secured to an instrument shaft, panel means in front of said drum type dial parallel with the axis thereof, a knob exposed at the front of said panel means and having its axis at right angles to the axis of the drum type dial, a series of pulleys arranged between the knob and the drum type dial, one pulley being relatively large in diameter and another being substantially smaller in diameter, and a spring tensioned belt forming a driving connection guided by said pulleys, whereby when said knob is rotated said dial will be rotated at a reduced ratio.

In testimony whereof, I have signed my name to this specification.

WILLIAM A. READY.

8. A dial mechanism for radio receivers comprising a rotatable dial having markings to indicate the degree of rotation, means for rotating said dial, a pair of spaced plates, hood means presented by said plates having

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