March 25, 1930. S. A. SHAPIRO 1,751,560

ATTACHMENT FOR CONNECTING TUNING UNITS TO DIAL CONTROLS

Filed Dec. 20, 1926

Fig. 1.

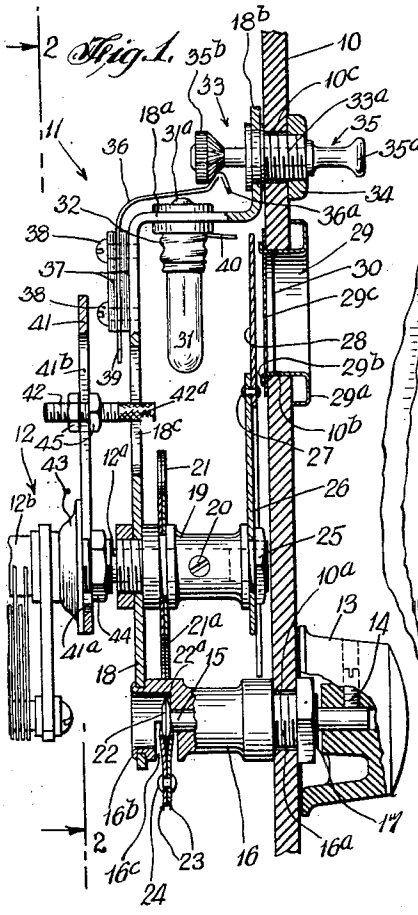


Fig. 2.

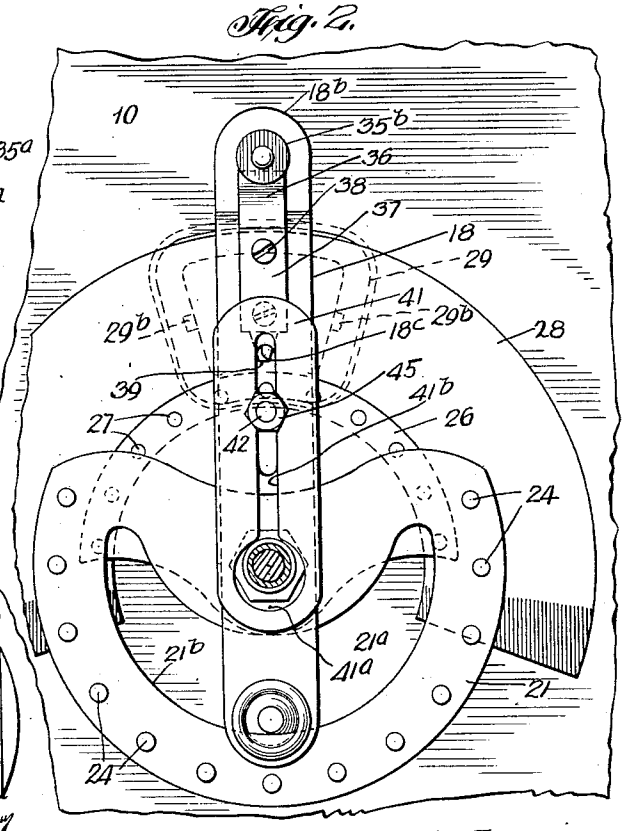


Fig. 3.

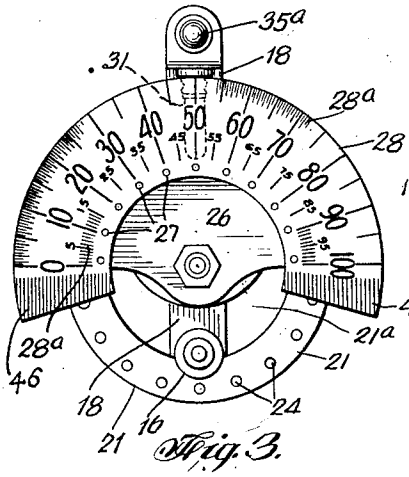


Fig. 4.

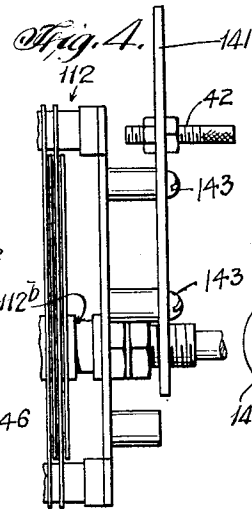
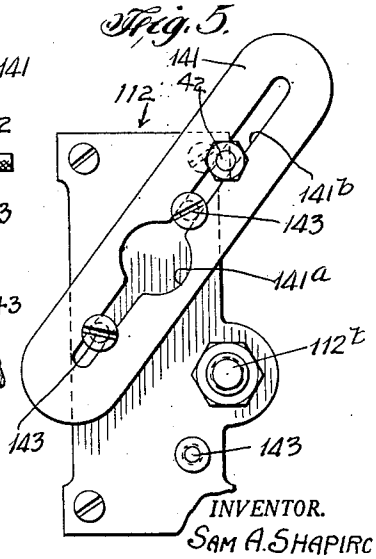


Fig. 5.



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1,751,560

UNITED STATES PATENT OFFICE

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ATTACHMENT FOR CONNECTING TUNING UNITS TO DIAL CONTROLS

Application filed December 20, 1926. Serial No. 155,968.

This invention relates to dial controls for radio apparatus.

An object of the invention is to provide an improved device of the character described including a novel form of attachment or coupling plate for connecting a tuning unit to a dial control.

Another object of the invention is to provide an improved attachment plate for connecting a tuning unit to a dial control which permits angular adjustment of the tuning unit relative to the control mounting and is adapted to be applied to units of various sizes and constructions.

A further object of the invention is to provide a device of the character described comprising few and simple parts, which shall be cheap to manufacture, and practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

In the accompanying drawing, in which is shown one of the various possible illustrative embodiments of this invention—

Fig. 1 is a side elevational view, partly broken away to show the construction, of an improved illuminated vernier dial control embodying the invention mounted on the rear side of a panel and connected with a "single-hole" type of adjustable condenser.

Fig. 2 is a rear view of the control as seen from a cut taken on line 2—2 in Fig. 1.

Fig. 3 is a front elevational view of the device dismounted from the panel.

Figs. 4 and 5 are side and front elevational views, respectively, showing a modified form of plate for adjustably interconnecting a condenser to the vernier control, the condenser having a plurality of mounting supports.

Referring in detail to the drawing, 10 denotes a front panel of a radio set which has mounted on the rear side thereof an illuminated dial control 11 embodying the invention adapted to operate a tuning device, such as an adjustable condenser 12. As here shown, the dial control 11 is electrically lighted and is of the vernier type, said control being mounted for turning the shaft 12^a of the condenser 12 at a comparatively slow speed relative to the speed of a manually operated knob 13.

The control knob 13 has a set screw 14 which secures it to the front end of a horizontally extending drive shaft 15 journaled in a sleeve bearing 16 which has its front threaded end 16^a extended through an opening 10^a provided in the front panel 10. Said threaded end 16^a has a clamping nut 17 for rigidly securing the sleeve bearing to the panel, and serves as the main mounting for the control.

Rigidly fastened to the outside of the sleeve bearing 16 adjacent the inner end 16^b and extending vertically upward, is an elongated frame bar 18. A mid-portion of said bar rotatably supports the rear end 19^a of a hollow shaft 19 so that the latter extends in parallel alignment with said bearing 16. Said shaft 19 is adapted to couple with the shaft end 12^a for turning the condenser rotor electrode 12^b to adjust the capacity of the condenser. The shaft end 12^a is secured so as to turn with the hollow shaft 19 by means of a set screw 20 threaded into the latter.

A frictional gear member 21 is secured to extend down from the hollow shaft 19 in front of the frame bar 18 and is adapted to engage with a drive wheel 22 mounted on the rear end of the shaft 15. The gear member 21 is preferably formed of a pair of discs 23 which are fastened together by means of rivets 24 spaced adjacent the periphery of said member as shown in Figs. 1 and 2. Said member 21 has an arcuately shaped opening 21^a extending through the mid-portion thereof, the outer rim edge 21^b of said opening being concentrically curved with respect to the axis of rotation of the mounting of said member 21 on the hollow shaft 19.

As will be seen from Fig. 1, the drive wheel 22 has a peripheral portion 22^a of V-shaped cross section which is inserted between the

plates 23 at said rim edge 21^b and serves as a wedge to form a spring frictional internal gearing drive. The opening 21^a is shaped to accommodate the rear sleeve bearing end 16^b, the latter being slotted at 16^c to permit unobstructed cooperation between the drive wheel 22 with the gear member 21. The ends of the opening 21^a serve as stops for limiting the rotation of the member 21 and hollow shaft 19 preferably to half a revolution for permitting the adjustment of the condenser from maximum to minimum capacity in the well understood manner.

Extending upwardly from the front end of the hollow shaft 19 and firmly secured thereto by means of a clamping nut 25 is a carrier plate 26 to the peripheral portion of which is secured a semi-circular graduated dial 28 positioned adjacent the rear side of the panel 10. Said dial may be made of any translucent material, such as celluloid, glass or other suitable substance and may be attached to the carrier plate 26 in any suitable manner as by cementing or by means of rivets 27, as shown. For observing the dial from the front of the panel, an opening 10^b is provided in the panel 10. Said opening has fitted therein a window frame 29 which may be of any suitable construction, and may, for example, be made of stamped sheet metal formed with a frame portion 29^a which extends through and about the front rim of the opening 10^b and has rearwardly extending prongs 29^b for engaging a transparent sheet 29^c forming a closure for said opening, as is clearly shown in Fig. 1. A suitable marker in the form of a vertically extending cross wire 30 may be provided in the window to facilitate reading the dial setting.

For illuminating the dial from the rear side thereof, a miniature electric bulb 31 is dependingly carried in the shell socket 32 which is suitably insulated and mounted on a bent horizontally extending portion 18^a of the frame bar 18. Said socket 32 is connected to a suitable power source (not shown) and preferably has a suitable control switch 33 in circuit therewith. As here shown, said switch 33 may be of the "push and pull" type and comprises a threaded body portion 33^a which is firmly secured to the upper vertical end 18^b of the frame member 18^a and extends through an opening 10^c provided in the panel 10. Said threaded body portion 33^a has a nut 34 mounted on the front end thereof for clamping the panel 10 and anchoring the upper end of the frame bar 18 in position to the rear side of said panel. Said switch body portion carries a reciprocating plunger 35, the front end of which is provided with a finger-piece 35^a, the rear end thereof having a tapered insulating head 35^b. The latter cooperates with a projecting end 36^a of a spring blade 36 secured to the frame bar 18 on an insulating support 37 by means of screws 38, as is clearly shown in Fig. 1. For connecting the lamp and switch in circuit with the power source, terminal posts 39 and 40 are provided connecting with the spring blade 36 and the socket 32, respectively. It is apparent that when the switch parts are positioned as shown in Fig. 1, the lamp circuit is open and on pulling the switch plunger 35 forward the insulating head depresses the blade and brings the latter into contact with the center terminal 31^a of the lamp 31, thus closing the circuit for lighting the lamp.

The frame or stator of the condenser 12 is secured against rotation by an interconnecting attachment or coupling plate 41 which carries an adjustable pin 42 whereof a forwardly projecting end 42^a engages in an elongated slot 18^c provided in the frame bar 18. Where the condenser 12 is constructed for "one-hole" mounting and is provided with a supporting disc 43 on the bearing 12^b with which are mounted the stator plates of the condenser and within which is journaled the shaft 12^a of the rotor electrode, as shown in Fig. 1, said plate has one end portion thereof firmly clamped against the disc 43 by means of a nut 44 and is provided with a clearance opening 41^a through which the rotor shaft 12^a freely passes. The opening 41^a may be made sufficiently large to accommodate the various commercial sizes of condenser shafts. Said plate 41 also has an elongated slot 41^b extending centrally therethrough which is adapted to permit adjustment of the pin 42 therein, the latter being mounted on the plate 41 in any suitable manner, as by means of the lock nuts 45. The construction described above including the plate 41 permits the anchoring of the stator of the condenser 12 in any angular position and prevents rotation of the bearing 12^b carrying the stator plates with the rotor shaft which is journaled within it. By adjusting the pin 42 between the slots 41^b and 18^c of the plate 41 and the member 18, respectively, the anchoring means may be adjusted for use with condensers of various sizes. To prevent possible loose engagement between the pin end 42^a in the slot 18^c, the outer surface of said pin end may be knurled with raised surface projections to afford a simple forced fit of the pin end 42^a in the slot 18^c. It should be noted that the interconnecting means between the relatively fixed parts of the condenser and the dial control through the plate 41 is of a very simple construction and is effective to a high degree in forming a rigid structure which may be adjusted for coupling the stator of standard "one-hole" mounting condensers in any desired angular position relative to said dial control.

The operation of the device will now be clear. The control is installed and connected in circuit with the parts disposed as shown in the drawing, and the bulb 31 is lighted for

illuminating the dial 28 by pulling the plunger 35 forward. The dial graduations 28^a which occupy a semicircular section may be observed through the transparent window closure 29^c. The condenser 12 may be adjusted by turning the knob 13 for rotating the wheel 22 which engages with the frictional gear 21, the latter being effective to turn the hollow shaft 19 together with the condenser rotor 12^a secured to rotate therewith. The rotation of the hollow shaft carries the dial past the window so that any setting of the condenser may be determined by noting the graduation 28^a at the cross-wire or marker 30 in the usual manner. Terminating each end of the graduations 28^a on the dial, there may be provided an indicia 46 preferably of a color contrasting with that of the dial background and the graduations so as to indicate the maximum and minimum range of the device. For example, where the dial is white and the graduation black, said indicia 46 may be red.

In Figs. 4 and 5 there is shown a modified form of connecting plate 141 which is suitable for securing a stator 112^b of condensers 112 having a plurality of mounting means 143 instead of having a "one-hole" mounting as in the condenser 12 described above. Said plate 141 is preferably longer than the plate 41 used in connection with the condenser 13 and is provided with an elongated slot 141^b extending lengthwise thereof, said slot being of sufficient length to extend across two of said mounting means 143 and to permit interconnecting said plate 141 by means of the pin 42 with the slot 18^c of the frame member 18. In addition, the plate 141 may be provided with an opening 141^a so that said plate may be of universal use, that is, adapted to serve either for condensers of "one-hole" mounting or condensers having multiple mounting means.

While the coupling plate or attachment has been described herein as applied to the particular form of control mechanism shown in the drawing, it will be understood, of course, that such plate may be employed with any standard type of control mechanism and tuning unit, the latter specifically forming no part of this invention.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

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

1. In an apparatus of the character described, having an adjusting device comprising a stator and a rotor, means cooperating with the rotor of the adjusting device for adjusting the same, common means to mount the adjusting device and the adjusting means upon a panel, a plate adjustably fixed with the stator of the adjusting device, a slot in the plate, a slot in the mounting means, and a pin adjustably fixed in one of the slots extending into the other slot, whereby the stator of the adjusting device is prevented from rotating with the rotor thereof.

2. In an apparatus of the character described, having an adjusting device comprising a stator and a rotor, a sleeve bearing fixed with a panel upon which the device is to be mounted, a frame fixed at one end to said sleeve bearing and at its other end to the panel, means to mount the rotor of the adjusting device upon said frame, a shaft journaled in said sleeve bearing and adapted for manual rotation, means connecting said shaft with the rotor of the adjusting device to adjust the latter, a plate adjustably fixed with the stator of the adjusting device, a slot in the plate, a slot in the frame, and a pin adjustably fixed in one of the slots and extending into the other slot, whereby the stator of the adjusting device is prevented from rotating with the rotor thereof.

In testimony whereof I affix my signature.

SAM A. SHAPIRO.