May 1, 1928. 1,668,418

P. L. PENDLETON

RADIO INSTRUMENT MOUNTING

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Fig. 1.

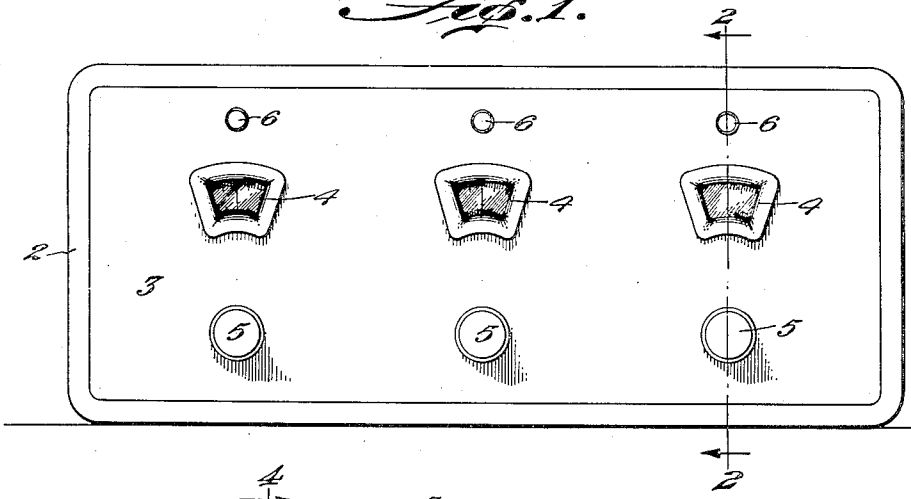
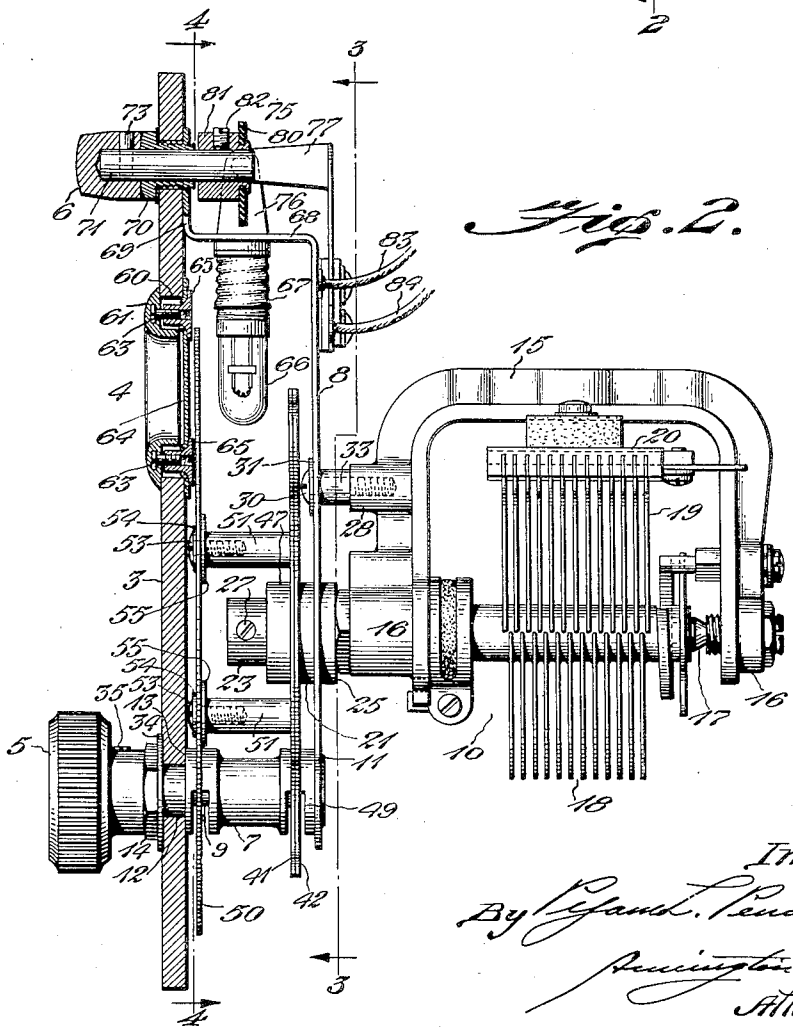


Fig. 2.



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RADIO INSTRUMENT MOUNTING

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Fig. 4.

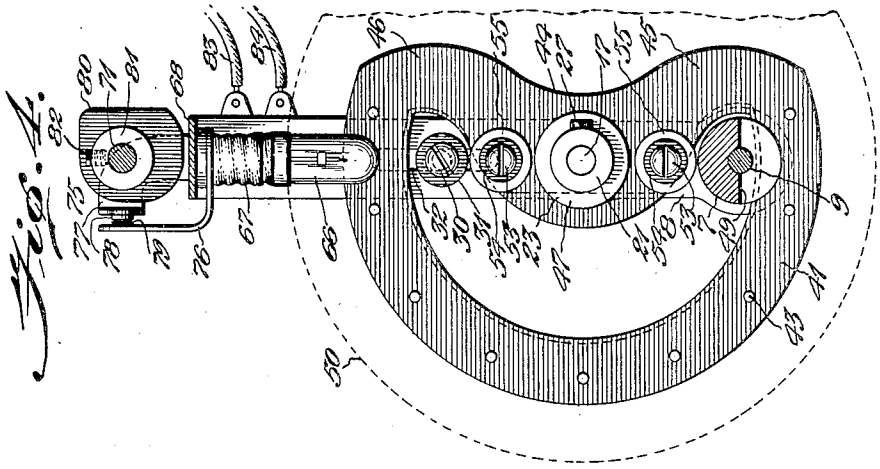
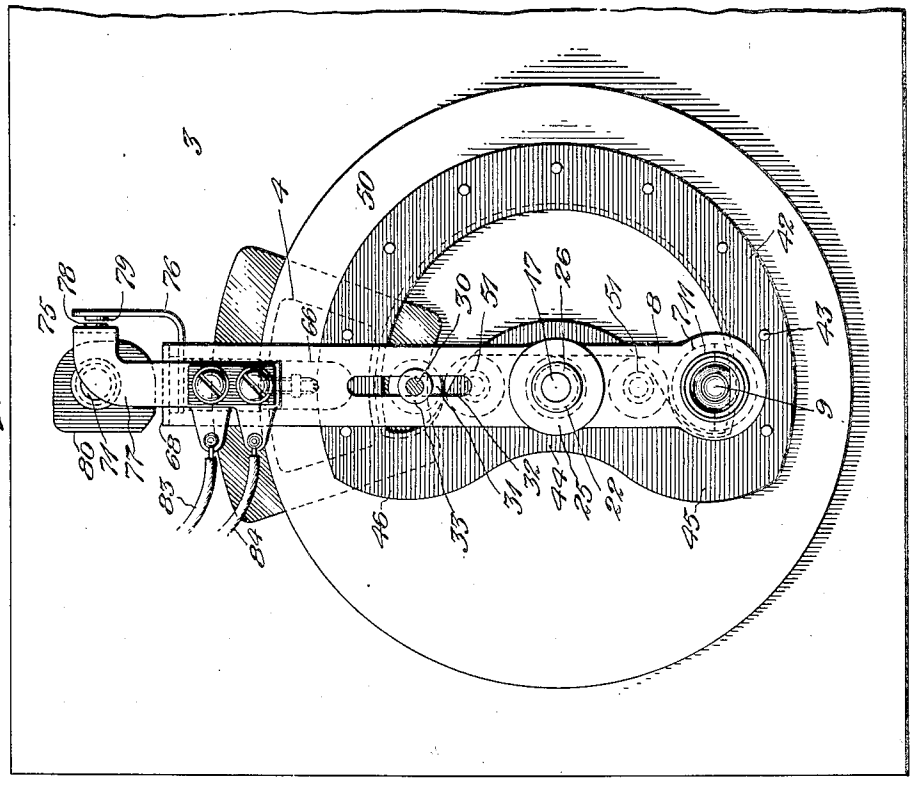


Fig. 5.



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May 1, 1928. 1,668,418

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RADIO INSTRUMENT MOUNTING

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Fig. 5.

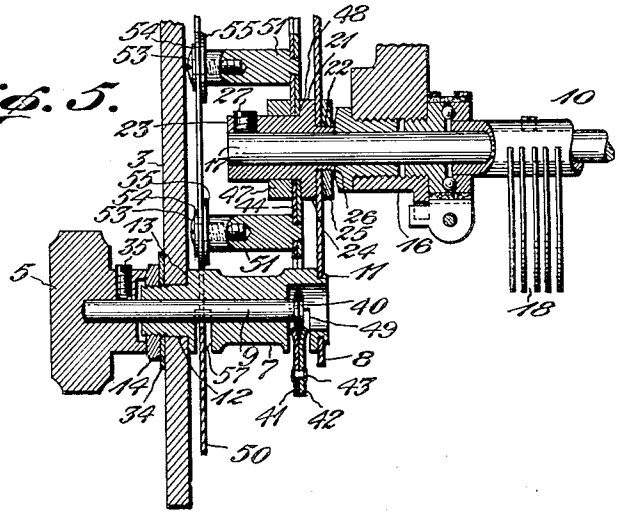


Fig. 6.

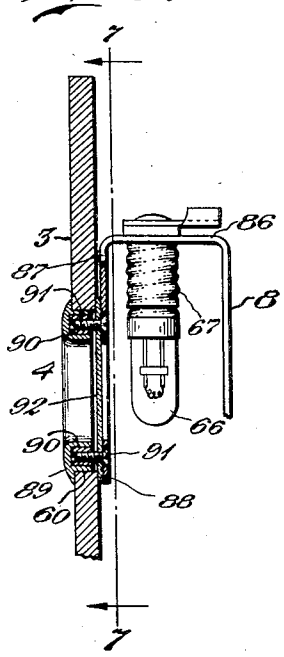
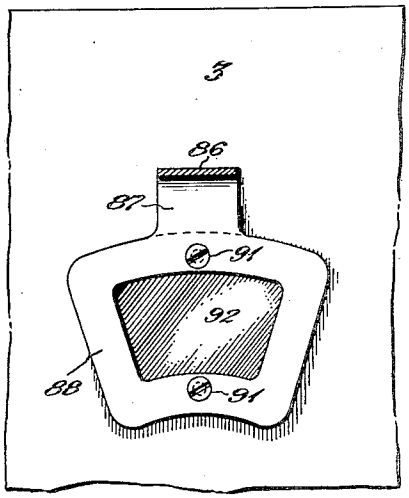


Fig. 7.



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RADIO INSTRUMENT MOUNTING

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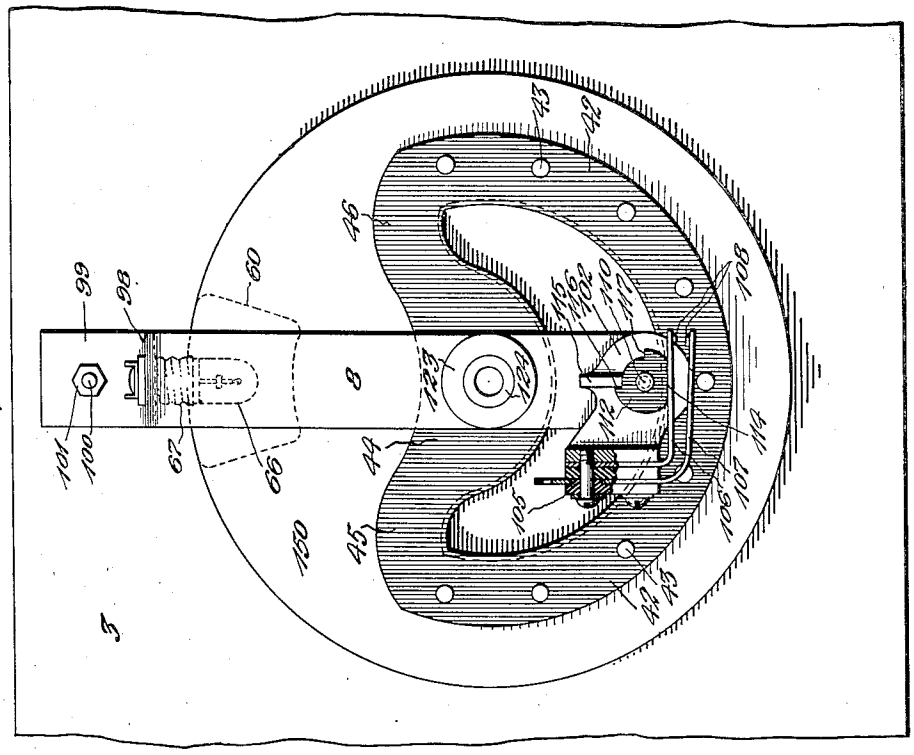

Fig. 9.

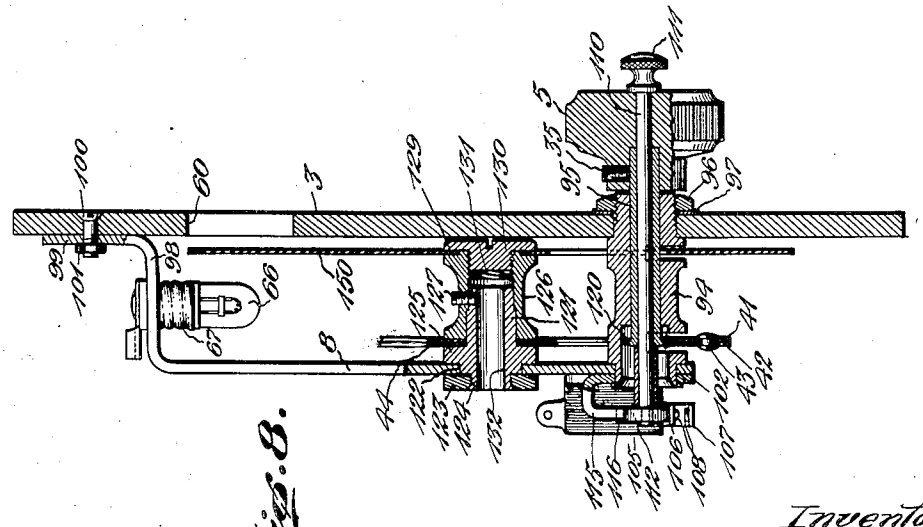

Fig. 8.

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Patented May 1, 1928. 1,668,418

UNITED STATES PATENT OFFICE.

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RADIO INSTRUMENT MOUNTING.

Application filed June 4, 1926. Serial No. 113,833.

This invention relates to radio apparatus and particularly to an improved fitment for mounting different types of radio instruments and their connected dials and operating-means.

One object of the invention is to provide means for mounting a radio instrument and its dial at the back of a panel, with means at the front of the panel for operating the instrument and turning the dial to render its indicia visible through a sight-opening in the panel.

Another object of the invention is to provide means for mounting the instrument and dial on the panel to support them in operative position without the use of brackets, braces or the like fastened to a sub-panel or base.

Another object of the invention is to provide a device of the type specified which is simple in structure and efficient in use for securely mounting the radio instrument, dial and operating-means on the panel with a minimum number of drilling operations.

Another object of the invention is to provide an instrument mounting and dial-operating means self-contained in a unitary structure adapted for attachment to the panel without other means of support.

Another object of the invention is to provide a transparent dial with means on the mounting for supplying illumination at the back of the dial to facilitate the reading of its graduations or indicia through the sight-opening.

Another object of the invention is to provide a contact switch embodied in the mounting for controlling the current to the illuminating lamp for the dial.

Further objects of the improvement are set forth in the following specification which describes a preferred form of construction of the invention and several modifications thereof as illustrated by the accompanying drawings. In the drawings:

Fig. 1 is a front elevation of a radio-receiving set showing the instrument panel and illustrating the general arrangement of the dials and controls thereon;

Fig. 2 is an enlarged sectional view taken on line 2—2 of Fig. 1 and illustrating the complete instrument- and dial-mounting with its operating-means, illuminating lamp and switch as embodied in a unitary fitment applied to the panel;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2, showing the rearward side of the dial, its operating-means, the instrument-mounting and the switch for the lamp;

Fig. 4 is a similar sectional view taken on line 4—4 of Fig. 2, looking in the opposite direction, and illustrating the same elements in detail;

Fig. 5 is a vertical sectional view taken on line 2—2 of Fig. 1 and illustrating the instrument- and dial-operating means more in detail;

Fig. 6 is a vertical sectional view taken through the sight-opening in the panel and showing the mounting fastened to the panel by means of a bezel secured in the opening;

Fig. 7 is a detailed view of the bezel frame, part-sectional on line 7—7 of Fig. 6;

Fig. 8 is a view similar to Fig. 2 showing a modification in the arrangement of the mounting for the instrument and dial and the operating-means therefor, as combined with a different form of switch for the illuminating lamp; and

Fig. 9 is a rearward view of the same.

In radio-receiving sets it is the usual practice to mount the variable-condenser, variometer, variocoupler and other instruments at the rear of the front panel of the cabinet and to connect them to be operated from dials rotatable on the front of the panel. In some cases the dials have been mounted at the rear of the panel to be read through sight-openings therein, but in the manufacture of units for use by amateurs in building radio apparatus this latter practice has not been feasible on account of the mechanical difficulties. With back-panel mountings it has been the common practice to support the instruments from the base of the cabinet or from a sub-panel arranged thereabove, so as not to mar the face of the panel with numerous screw-holes, but such a construction requires considerable drilling and fitting and extra brackets and supports which take up valuable space. In the present invention a particular object of the improvement is to eliminate the sub-panel, supports, brackets and like connections and to

provide means for mounting one or any number of instruments directly on the panel while rigidly supporting them therefrom without the use of other attaching means. It is also a purpose of the present invention to provide for attaching the instrument mounting to the panel at two separate points, one point of attachment being at the drilled hole where the operating-spindle projects through the panel, and the other at the sight-opening or adjacent thereto, the apertures mentioned being the only ones required and thus eliminating the drilling of a large number of holes in the panel.

Referring to Fig. 1 of the drawings, 2 designates the cabinet of a radio-receiving set and 3 is the vertical front panel having sight-openings 4 through which the dials for the various instruments are visible. The operating knobs for the instruments are shown at 5 and the buttons for the switches for controlling the lights which illuminate the dials are designated 6.

In one form of construction of the invention as illustrated in Figs. 1 to 5, the instrument mounting for attachment to the back of the panel 3 takes the form of a vertical framework or strut 8, projecting upwardly from a bearing-member 7 for the instrument operating-spindle 9 and attached to the panel at a point some distance thereabove, see particularly Fig. 2. In this view the instrument carried by the mounting is represented as a variable-condenser 10 of conventional type. As here shown the condenser 10 comprises a U-shaped frame 15 provided with bearings 16 for the spindle 17 which carries the rotor-plates 18, see also Fig. 5. The fixed plates 19 are held in an insulated member 20 projecting from the frame 15, and as the general construction of this type of instrument is well known to those versed in the art further description thereof is unnecessary. Suffice it to state that the spindle 17 of the condenser 10 is inserted through a bearing hub or sleeve 21 rotatably secured to the upright strut or framework 8 previously referred to.

As shown in detail in Fig. 5, the bearing hub 21 has a reduced portion 22 journalled in a hole in the vertical strut or framework 8, with a shouldered flange 24 arranged to abut the forward face of the strut. Abutting the opposite face of the strut 8 is a disk or collar 25 which is held fast on the reduced portion 22 of the hub 21 by swaging or riveting over the end of the latter at 26. At the opposite end of the hub 21 is a set-screw 27 which is set up against the spindle 17 to secure the hub rotatively herewith. It will thus be seen that the hub 21 which is held fast on the spindle 17 will turn therewith, being free to rotate in its bearing in the strut 8 and braced from the strut by the extended bearing faces of the shoulder 24 and collar 25 which abut the sides thereof. The condenser 10 is thus supported from the strut or mounting 8 by means of the hub 21, and preferably the frame of the instrument is braced from the strut at a point above the spindle. As shown in Fig. 2, a hub or boss 28 is usually provided on the frame 15 of the condenser 10 for attaching it to the panel of the radio cabinet and in the present construction this boss is used to brace the instrument from the strut or mounting 8. For this purpose a screw 30 carrying a washer 31 is inserted through a vertical slot 32 in the strut 8, see Fig. 3, and projecting through a hub or washer 33 is screwed into the boss 28 on the frame 15. By using washers 33 of different length or thickness the instrument frame may be properly spaced from the strut in accordance with the requirements of its bearings for the spindle 17. In mounting the condenser or other instrument in this manner on the strut 8 one or several screw-holes in the panel are eliminated, the number varying with the type of instrument used.

As previously noted, the variable-condenser 10 or other instrument is operated from the spindle 9 which is journalled in the bearing-member or hub 7, see Figs. 2 and 5, and projects through the panel 3 with the finger-knob 5 at its outer end. The bearing-member or hub 7 may be secured to the lower end of the mounting or strut 8 by any suitable means, and as herein illustrated in its inner end is reduced in diameter at 11 and inserted through a hole in the strut and riveted over on the rearward side thereof. The forward end of the hub 7 is also reduced in diameter at 12 to adapt it to be inserted through a hole in the panel 3 with its shouldered portion 13 abutting the rearward side thereof. The reduced portion 12 of the sleeve 7 is screw-threaded at its end to adapt it to receive a nut 14 which screws against a suitable washer 34 to clamp the hub or bearing 7 snugly in place on the panel 3. The knob 5 is fastened to the forward end of the spindle 9 by any suitable means such as a set-screw 35.

The means for connecting the spindle 9 to operate the condenser 10 or other instrument may consist of suitable gearing and, as herein shown, this gearing is preferably of the friction type similar in construction and arrangement to the dial- and instrument-operating means disclosed in application for U. S. Letters Patent Serial No. 84,738, filed January 29, 1926. The spindle 9 carries a bevel-edge pinion 40 on its rearward end which may be formed integral therewith or suitably secured thereon. The beveled edges of the pinion 40 engage between the opposite edges of two overlapping annular plates or sectors 41 and 42, see Fig. 5. As shown more particularly in Figs. 3

and 4, the annular plates or sectors 41, 42 are concentric with the axis of the spindle 17 which operates the condenser 10 or other instrument and are secured fast therewith by means of the hub 21, previously described, carried on said spindle. The sectors or annuli 41, 42 are constructed from sheet-metal plates riveted together at 43 and may be in the form of a complete ring or annulus. Usually, however, it is only required to turn the operating-shaft or spindle 17 through 180 degrees so that in most cases the sectors 41, 42 extend through only slightly more than half a circumference as illustrated in Figs. 3 and 4. The plates or annuli 41, 42 are supported from the hub 21 by means of a cross-strip 44 made integral with and extending between the sides of their rims. This double strip 44, formed as a part of each of the overlying plates or sectors 41, 42, has curved arms 45, 46 merging with the circular rims of the plates. At the center of the strip 44 is a circular opening through which the reduced portion 23 of the hub 21 projects. A collar 47 is forced on to this reduced portion 23 of the hub 21 to clamp the cross-member 44 snugly against a shoulder 48 whereby the sectors 41, 42 will be held both axially of and rotatably with the hub and the spindle 17 carrying said hub. It will be noted from Fig. 5 of the drawings that with the beveled edge of the pinion 40 inserted between the rims of the sectors or annuli 41, 42 the latter will be sprung apart so that the inherent resiliency of the plates provides a frictional contact with the pinion. Thus, as explained in the prior patent application above referred to, the turning of the shaft 9 and its pinion 40 will act to rotate the plates or sectors 41, 42 to turn the condenser-spindle 17 at a reduced rate of speed. In this way the condenser or other instrument may be operated to secure a very fine vernier adjustment thereof. It will be noted from Fig. 5 that in order to provide clearance for the engagement of the pinion 40 with the inner edges of the annular plates or sectors 41, 42 the hub 7 is slotted at 49 to adapt the rim of the plates to pass therethrough.

Attached to and rotatable with the sectors or plates 41, 42 is a dial 50 which is arranged parallel with the panel 3 and spaced at a slight distance back from its rearward face. The dial 50 is preferably constructed of celluloid or other semi-transparent or translucent material and is attached to the plates or sectors 41, 42 by means of posts or studs 51 projecting forwardly therefrom. The posts 51 may have their rearward ends reduced in diameter and riveted through holes in the cross-member 44 of the plates 41, 42 as shown in Fig. 5. The dial 50 is fastened to their forward ends by means of screws 53 screwed into the posts to clamp the dial thereagainst; washers 54 and 55 being used on the opposite faces of the dial to more securely hold it in place. A portion of the dial 50 is cut away in conformation with the cut-out portions of the plates 41, 42 to accommodate the spindle 9 which projects through the front of the panel, the hub 7 being slotted at 57, see Fig. 5, to adapt the circular rim of the dial to pass therethrough.

It will be understood from the above that when the knob 5 is turned to rotate the spindle 9 and spindle 17 to adjust the condenser 10 or other instrument the dial 50 will be turned with the plates 41 and 42 to indicate the extent of movement of the spindle 17, or, in other words, the degree of adjustment of the instrument connected thereto.

In the embodiment of the invention as illustrated in Figs. 1 to 5 of the present drawings the rim of the dial 50 is graduated and marked with indicia which are exposed to view through the sight-opening 4 arranged above the operating knob 5 and toward the top of the panel 3. The sight-opening is formed by an aperture 60 cut through the panel 3 in segmental shape and preferably framed with a bezel 61 to give it a more finished and ornamental appearance. As shown in Fig. 2, the bezel comprises an outer marginal frame adapted to fit within the aperture 60 in overlapping relation with its edges. This outer frame of the bezel 61 may be constructed of metal, vulcanized rubber, bakelite, or other composition, and is provided with two or more screws 63 arranged on its opposite sides with their heads embedded therein. A flat strip 64 of transparent material such as celluloid is placed at the back of the aperture 60 overlapping its edges and provided with suitable holes for receiving flanged sleeve-nuts 65 which screw on to the screws 63. In this way the bezel 61 and its transparent window 64 are clamped against opposite sides of the panel 3 to hold them in place in the aperture 60. The window 64 is marked or scored with a hair line with which the graduation-marks on the dial register.

The upper rim of the dial 50 is preferably illuminated from the rear by means of a small lamp 66 held in a socket 67 carried on the main strut or brace 8 of the mounting. It has been previously noted that the strut or brace 8, besides being supported from the hub 7, is attached to the panel 3 at another point and the location of this point may be varied somewhat in different adaptations of the invention. As illustrated in Fig. 2, the upper portion of the strut or brace 8 extends forwardly at right-angles to its vertical portion in a leg 68 which is bent upwardly again at 69 to adapt it to abut the rearward face of the panel 3. The

upwardly-extending portion 69 of the strut 8 is provided with a threaded bore for receiving the shank of a stud 70 which is inserted through a suitable hole drilled through the panel 3. The stud 70 is of hollow construction to adapt it to receive a spindle or shaft 71 which carries the finger-knob or button 6 held fast on its forward end by a cross-pin 73. The button 6 serves as a means for operating a switch 75, see Figs. 3 and 4, for controlling the current to the lamp 66. The socket 67 for the lamp 66 is mounted on the bent-over leg 68 of the strut 8, and extending upwardly therefrom is a right-angled contact-arm 76. A second contact-arm 77 projects upwardly from the back of the strut 8, see Fig. 3, and reaches out to one side with a contact 78 at its end adapted to be sprung against a similar contact 79 on the arm 76. A suitable cam 80, held fast on the end of the shaft 71 by means of a hub 81 and set-screw 82, is arranged with its eccentric rim adapted to engage the back of the contact-arm 77 to spring the latter over to bring the contacts 78 and 79 into engagement. As shown in Figs. 2, 3 and 4, suitable conductor wires 83, 84 extend from the switch to the battery or other source of current, not herein illustrated, one of them being grounded in the strut 8 and the other connected to the arm 77: it being understood that the arm 77 is suitably insulated from the strut 8. By turning the knob or button 6 the switch is closed to supply current to the lamp 66 whereby the latter will be lighted to illuminate the dial 50 from the rear so that its graduations and indicia will be more clearly visible through the sight-opening 4.

As another preferred form of construction for attaching the upper end of the strut 8, or in other words the whole mounting, to the panel 3 I may adapt it to be fastened to the bezel which is inserted in the sight-opening 4, see Figs. 6 and 7. In this simplified form of construction the strut or brace 8 is bent forward at right-angles in the leg 86 which has its forward end bent downwardly at 87 to overlap the edge of the aperture 60 in the panel 3. This extension 87 of the strut 8 is formed at its lower end with a frame 88, see Fig. 7, shaped to the confirmation of the aperture 60 and overlying its marginal edge on the back of the panel 3. The front bezel frame 89 fits within the edge of the aperture 60 and is provided with metal sleeves 90 embedded in its sides. The sleeves 90 are interiorly threaded to receive screws 91 which are inserted through the back of the frame member 88 on the arm 87. Inserted between the frame 88 and the rearward side of the panel 3 is a transparent window 92 of celluloid or glass, and the screws 91 reach therethrough and clamp the parts against the panel, not only holding the bezel in place in the aperture 60 but also securely attaching the upper end of the strut 8 to the panel.

Figures 8 and 9 illustrate still another embodiment of the invention in which the parts are simplified to a further extent and the switch for the lamp embodied in the adjusting knob 5. In this form of construction the hub 94 which serves as a bearing-member for the operating-spindle 95 is attached to the panel 3 by means of the nut and washer 96 and 97 in substantially the same manner as previously explained. The strut or brace 8 is supported at the rearward end of the hub 94 and is bent forwardly at the top in the leg 98 and then extended upwardly in an arm 99 which abuts the rearward face of the panel 3, being secured thereto by means of the bolt 100 and nut 101. With this method of supporting the mounting or fitment on the back of the panel 3 the latter is drilled with only one additional hole to accommodate the bolt 100, the hole for the hub or bearing-member 94 being required in all instances to accommodate the operating-shaft. The strut 8 is attached to the rearward end of the hub 94 and abutting its rearward face is an arm 102 which serves as a means for supporting the switch for the illuminating lamp 66 whose socket 67 is held on the leg 98 of the strut 8. The strut 8 and the arms 102 are secured fixedly in place on the reduced end of the hub 94 by riveting over the end of the latter.

Carried on the arm 102 is a conventional form of switch 105 comprising two spring-arms 106 and 107 having contacts 108 at their ends. The operating-shaft 95 is made tubular, as shown in Fig. 8, and rotatable therein is a rod or spindle 110 which projects through the finger-knob 5 and carries a knurled button 111 at its outer end. On the inner end of the spindle 110 is a disk-shaped cam 112 having one of its sides flattened off at 114. When the arm 106 of the switch 105 engages this flattened face 114 of the cam 112 it will be positioned away from the arm 107 so that the contacts 108 at the ends of the arms will be separated as shown in Fig. 9. When, however, the cam 112 is rotated its cylindrical portion will ride against the arm 106 to spring it towards the arm 107 to engage the contacts 108 to close the circuit. The turning movement of the arm 112 is limited by a stop 115 on the arm 102 which is engaged by detent shoulders 116 and 117 formed in the edge of the cam. It will be understood, of course, that the switch 105 is suitably wired to the socket of the lamp 66 and connected to the battery or other source of current, these wiring connections not being shown in the drawings as they may be of the usual arrangement.

The hollow or tubular operating-shaft 95 has a beveled pinion 120 at its rearward end

which engages between the overlapping edges of the plates 41 and 42 in the same manner as previously explained in connection with Figs. 1 to 5 of the drawings. In the construction shown in Figs. 8 and 9, however, the annular plates or sectors 41 and 42 are attached to a different form of hub-member 121 and this hub also mounts the rotatable dial 150. The hub 121 has a reduced portion 122 which turns in a bearing in the strut 8 and is held in place by a washer 123 fitting its further reduced end 124 and riveted thereon. The plates 41 and 42 fit over the opposite reduced end of the hub 121 abutting a shoulder 125, against which they are held by means of a spool-shaped sleeve 126. The sleeve 126 is forced onto the hub 121 and a set-screw 127 projects through the sleeve and hub to secure these parts rotatively with the spindle of the instrument to be operated therefrom.

The dial 150 fits over the reduced outer end of the sleeve 126 and is clamped in place against a shoulder 129 by means of a screw 130 screwed into the threaded bore 131 of the sleeve. The main hub 121 is provided with an axial bore 132 for receiving the end of the spindle or operating shaft of the condenser or other instrument to which the dial and the adjusting-means are to be attached, it being understood that the hub 121 is held fast on the spindle of the instrument by means of the set-screw 127. In this last described embodiment of the invention the parts are made simpler and lighter in weight by mounting the dial directly on the hub 121 which connects the operating mechanism to the instrument to be adjusted; and the switch mechanism for the lamp is compacted and rendered more convenient to operate by combining it with the operating-shaft 95 and knob 5. In the arrangement of the device as last described the method of operation is substantially the same as before explained, the button 111 being turned to close the switch 105 to light the lamp 66 and the instrument being adjusted and the dial 150 rotated to show the degree of adjustment by turning the knob 5.

With any of the forms of construction as herein shown and described my invention provides an extremely simple and compact fitment for mounting various instruments and their operating-means at the back of the panel. The device also provides for mounting the dial to rotate at the back of the panel with means for illuminating it to make its indicia more clearly visible through the sight-opening in the panel. The whole device with its operating-means and dial for the instrument are self contained in a single mounting or fitment which may be attached to the panel with a minimum of drilling operations and fitting and which, when once assembled thereon, provides a rigid and secure mounting without the use of extra brackets and supports attached to a base or sub-panel. Furthermore, and most important, the number of screw-holes in the panel is reduced to an absolute minimum. The mounting or fitment may also embody the lamp for illuminating the dial and the switch for controlling the current to the lamp, and in this complete form the device makes a particularly convenient and efficient unit for use by amateurs in building or assembling radio-receiving sets. Moreover, the improved construction may be used in factory built sets and for this purpose will conserve space and make for more economical cost of manufacture due to the simplicity of its construction and the relatively small number of parts employed. At the same time, the construction and arrangement of the device is such that an extremely sensitive and accurate adjustment may be secured for the instrument connected with the operating-mechanism, and the apparatus is therefore highly efficient for the purpose intended.

It is obvious that other modifications besides those herein illustrated may be made in the construction and arrangement of the parts of the device without departing from the spirit and scope of the invention. Therefore, without limiting myself to the exact embodiment of the invention as herein shown and described, I claim:

1. In a fitment for radio apparatus, the combination of a bearing-member for insertion through an opening in the panel of a radio set, means for securing the bearing-member to the panel, a framework supported from said bearing-member and adapted to serve as the sole support for a radio instrument, an operating-shaft journalled in the bearing-member, means for attaching the instrument to the framework, and gearing between the operating-shaft and the instrument shaft and on the same side of the panel as the said instrument for effecting fine adjustment of the instrument.

2. In a fitment for radio apparatus, the combination of a bearing-member for insertion through an opening in the panel of a radio set, means for securing the bearing member to the panel, an operating-shaft journalled in said bearing-member, a framework supported from said bearing-member and adapted for attachment at another point on the panel to brace the bearing-member therefrom, means rotatable on the framework and adapted for connection with the spindle of a radio instrument to adjust the latter, and gearing connecting the operating-shaft to operate said adjusting-means.

3. In a fitment for radio apparatus, the combination of a bearing-member for insertion through an opening in the panel of a radio set, means for fixedly securing the

bearing-member to the panel, an operating-shaft journalled in said bearing-member and projecting through the panel, a knob on said shaft, a framework supported from the bearing-member at the rear of the panel, means on the framework for attaching it to the panel, a hub rotatable on the framework and adapted for connection with the spindle of a radio instrument to adjust the latter, and gearing connecting the operating-shaft to rotate the hub.

4. In a fitment for radio apparatus, the combination of a bearing-member adapted for insertion through the panel of a radio set, means for fixedly securing the bearing-member to the panel, an operating-shaft journalled in said member, a strut for bracing the bearing-member from the panel, means rotatable on the strut and adapted for connection with the spindle of a radio instrument to adjust the latter, and gearing for rotating said adjusting-means from the operating-shaft.

5. In a fitment for radio apparatus, the combination of a bearing-member adapted for insertion through an opening in the panel of a radio set, means for fixedly securing the bearing-member to the panel, an operating-shaft journalled in said bearing-member, a strut supported from said bearing-member and adapted for attachment to the panel at a point removed from said member, a hub rotatable on the strut and adapted for connection with the spindle of a radio instrument, a dial carried by said hub at the rear of the panel, and gearing connecting the operating-shaft to rotate the hub to adjust the instrument and turn the dial.

6. In a fitment for radio apparatus, the combination of a bearing-member adapted for insertion through an opening in the panel of a radio set, means for clamping said bearing-member to the panel, an operating shaft journalled in said bearing-member, a framework extending from the bearing-member at the rear of the panel, means on the framework for fastening it to the panel, adjusting-means rotatable on the framework and adapted for connection with the spindle of a radio instrument to support the latter therefrom, means for clamping the instrument to the framework, and gearing connecting the operating-shaft to rotate the adjusting-means.

7. In a fitment for radio apparatus, the combination of a bearing-member adapted for insertion through an opening in the panel of a radio set, means to attach the bearing member to said panel, an operating-shaft journalled in said bearing-member, a strut supported from said bearing-member, means on the strut for attaching it to the back of the panel, a hub rotatable on the strut and adapted for connection with the spindle of a radio instrument, means for clamping the instrument to the strut, a dial rotatable with the hub at the rear of the panel, gearing connecting the operating-shaft to rotate the hub and dial, and a lamp mounted on the strut at the back of the dial in position to illuminate the latter.

8. In a fitment for radio apparatus, the combination of a bearing-member adapted for insertion through an opening in the panel of a radio set, means for clamping the bearing-member to the panel, an operating-shaft journalled in said bearing-member to adapt it to project through the panel, a strut supported from the bearing-member, means for attaching the strut to the panel at a point removed from the bearing-member, means rotatable on the strut and adapted for attachment to the spindle of a radio instrument to adjust the latter, means for rotating said adjusting-means from the operating-shaft, a dial rotatable therewith at the rear of the panel, a lamp mounted on the strut in position to illuminate the dial, and a switch operable from the front of the panel to control the current to the lamp.

9. In a fitment for radio apparatus, the combination of a bearing-member adapted for insertion through an opening in the panel of a radio set, an operating-shaft journalled in said bearing-member, a mounting for a radio instrument supported on said bearing-member and adapted for attachment to the panel at a point removed from the bearing-member, adjusting-means rotatable on said mounting and adapted for connection with the spindle of the radio instrument, means connecting the operating-shaft to rotate said adjusting-means, a dial rotatable with said adjusting-means at the back of the panel to exhibit its indicia through a sight-opening in the panel, a bezel adapted to fit the sight-opening in the panel, and means for attaching the mounting to the bezel to secure the parts to the panel.

10. In a fitment for radio apparatus, the combination of a bearing-member adapted for insertion through an opening in the panel of a radio set, an operating-shaft journalled in said bearing-member, a mounting for a radio instrument supported on said bearing-member and adapted for attachment to the panel at a point removed from the bearing-member, adjusting-means rotatable on said mounting and adapted for connection with the spindle of the radio instrument, means connecting the operating-shaft to rotate said adjusting-means, a dial rotatable with said adjusting-means at the back of the panel to exhibit its indicia through a sight-opening in the panel, a bezel adapted to fit the sight-opening, means for attaching the mounting to the bezel to secure the parts to the panel, a lamp support-

ed on the mounting at the rear of the dial, and a switch for controlling the current to the lamp.

11. In a fitment for radio-receiving sets, the combination of a bearing-member adapted for insertion through an opening in the panel of the set, a mounting for a radio instrument supported from said bearing-member, means rotatable on the mounting for connection with the spindle of a radio instrument to adjust the latter, an operating-shaft journalled in the bearing-member, a friction member on said shaft, and a friction annulus rotatable with the adjusting-means and adapted to be engaged by the friction member to turn the instrument spindle.

12. In a fitment for radio-receiving sets, the combination of a bearing-member adapted for insertion through an opening in the panel of a radio set, a mounting supported on said bearing-member and attachable at another point to the rear of the panel, adjusting-means rotatable on the mounting and adapted for connection with the spindle of a radio instrument, a dial rotatable with said adjusting-means at the rear of the panel, an operating-shaft journalled in the bearing-member, means connecting the operating-shaft to rotate the adjusting-means and dial, a lamp carried on the mounting at the rear of the dial, a rod extending axially of the operating-shaft to project through the panel, and a switch operable from said rod to control the current for the lamp.

In testimony whereof I affix my signature.

PYAM L. PENDLETON.