April 8, 1941. E. F. McDONALD, JR., ET AL. 2,237,886

RADIO CONSTRUCTION

Filed July 10, 1939

Fig. 1

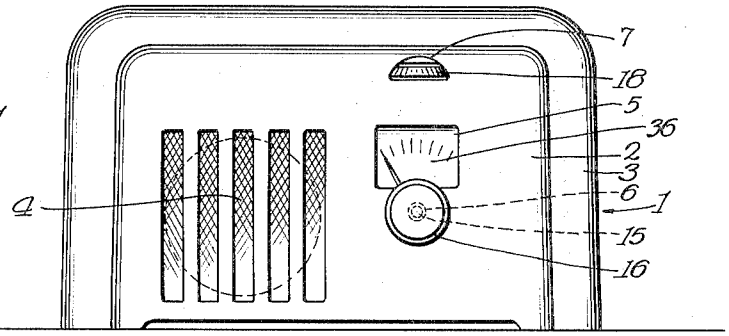


Fig. 2

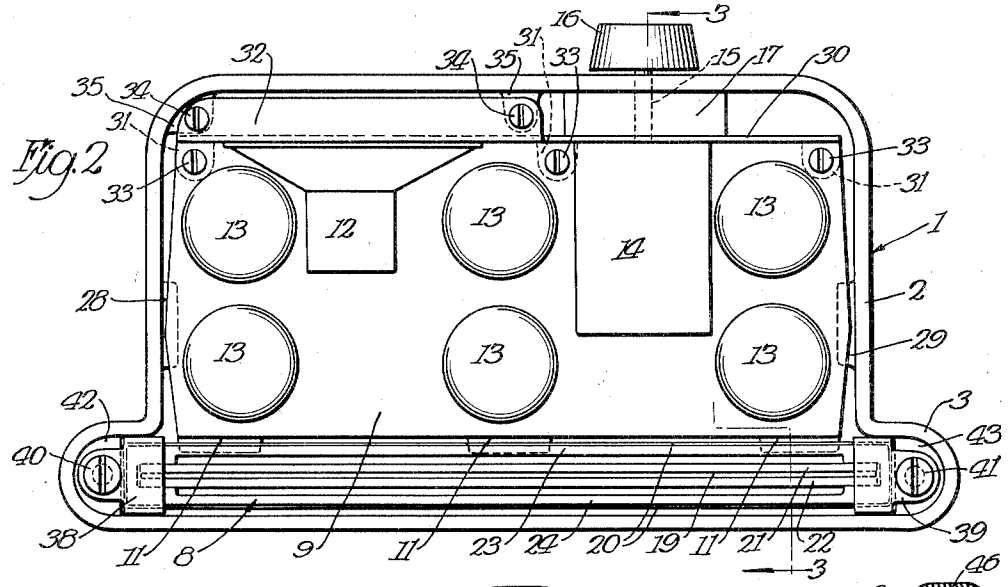


Fig. 3

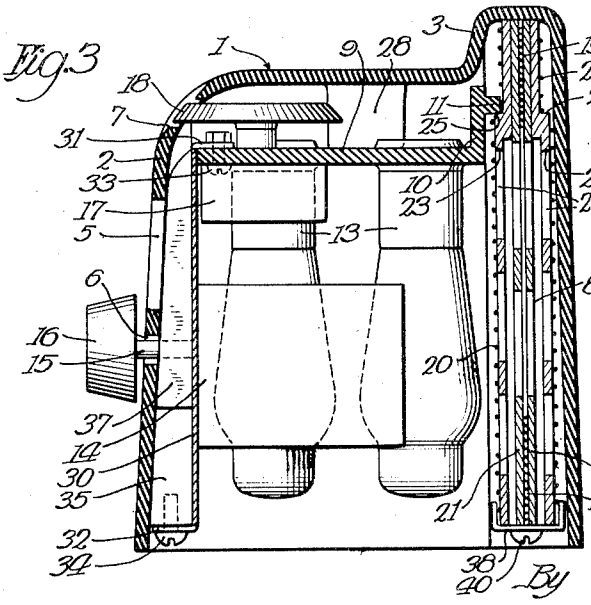
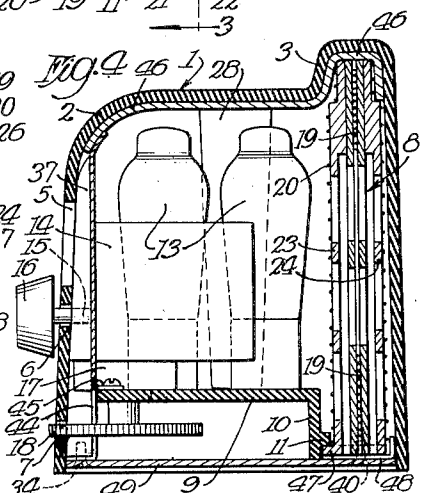


Fig. 4



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Patented Apr. 8, 1941

2,237,886

UNITED STATES PATENT OFFICE

2,237,886

RADIO CONSTRUCTION

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Application July 10, 1939, Serial No. 283,544

4 Claims. (Cl. 250—14)

This invention relates to radio construction, and more particularly concerns the construction of the casing for radio receiving apparatus, and the provisions for placing and supporting the parts of such apparatus within said casing.

The object of the invention is to provide an improved radio construction, comprising a chassis and a loop antenna enclosed in a casing of novel and artistic design, in which construction the chassis and loop antenna are inserted in the open bottom of the casing and are located and secured in their proper positions in a simple and practical manner to provide for their easy removal and replacement.

In the accompanying drawing,

Figure 1 is a front elevational view of a radio receiving set, constructed in accordance with our invention;

Fig. 2 is a bottom view of the device, illustrating the novel form of the casing, the compact and accessible arrangement of the radio apparatus, and the simplified method and means for placing and removably securing said apparatus in proper position in the casing;

Fig. 3 is a vertical sectional view, taken upon the line 3—3 of Fig. 2, further illustrating the features of the invention just mentioned in connection with Fig. 2; and

Fig. 4 is a view similar to Fig. 3, upon a reduced scale, illustrating a modified construction embodying the present invention.

A prominent novel feature of the construction of the casing herein shown comprises the enlarged rearward portion thereof, which, in addition to its ornamental value, provides a housing for the loop antenna and serves as a substantial structural reinforcement in the casing, while the novel construction and arrangement of the radio apparatus are designed to insure its proper installation within the casing, provide convenient access to the several elements thereof, and facilitate its easy removal from, and replacement in, position. These and other advantages will appear from the following description.

In the drawing, the casing 1 is shown as a one-piece shell, open at the bottom, having a substantially rectangular forward portion 2 for housing the major division of the radio receiving apparatus, a somewhat higher and wider rearward portion 3 for housing the loop antenna, and with the front wall provided with the usual loud-speaker opening or grille 4, dial aperture 5, and openings 6 and 7 for the tuning and volume adjusting means, respectively. The one-piece construction, the rectangular shape of the forward portion 2, and the particular location of the several openings 4, 5, 6 and 7 are illustrative only and may be varied as desired or as required by the shape of the enclosed apparatus and the arrangement of the parts thereof. It will be noted that the rearward portion 3 projects upwardly along the top and outwardly at each side of the forward portion 2, forming a stiffening flange for the entire casing and a pocket-like receptacle for the loop antenna unit 8. The chassis 9 comprises a flat table having a flange 10 extending along the rearward edge thereof, and this flange is provided with a plurality of abutments 11, three being shown in the drawing (Figure 2).

Preferably, though not necessarily, the casing 1 and the chassis 9 are formed as die-castings, thereby insuring exactness in the location and shape of all openings and in the placing of parts. A slight downward flare is given the upright walls of the casing to facilitate removal of the core and of the cast casing from the die or mold. The arrangement of some of the elements of the radio receiving apparatus upon the chassis 9 is illustrated more or less diagrammatically in Figures 2 and 3, where 12 indicates the loud-speaker, 13 the tubes, 14 the tuning condenser, 15 the tuning shaft, 16 the tuning knob, 17 the combined circuit switch and volume control unit, and 18 the knurled adjusting wheel therefor.

As herein shown, the loop antenna unit 8 comprises a flat spiral coil of insulated wire, the upper and lower turns of which are indicated at 19 (Figure 3). The coil or loop 19 is supported in any preferred manner within a substantially rectangular framework, upon and around which is wound the spaced horizontal turns of a grounded wire shield, indicated at 20. The exact construction of the framework is immaterial, but, in the particular form herein shown, the loop is held between open spacer-frames 21 and 22 of cardboard, and the outer frame-members 23 and 24 are secured along their upper and side edge-parts to the spacer-frames 21 and 22. The frame-members 23 and 24 may also be of cardboard, but are of sufficient thickness to form substantial shoulders along their upper horizontal edges, as at 25 and 26. Preferably, the frame-members 23 and 24 are provided with a number of openings 27 to afford ventilation and avoid warping or twisting, and for other purposes not necessary to mention, and the entire unit is surrounded from top to bottom by the windings of the shield 20, which may be cemented or otherwise securely held in proper spaced arrangement upon the frame-members.

Upon the inside of the end walls of the forward portion 2, the casing is provided with corresponding abutments 28 and 29. In the arrangement illustrated in Figures 1 to 3, these abutments, which serve as upper positioning stops for the chassis 9, extend downwardly from the top a comparatively short distance, since the chassis is arranged near the top of the casing in what may be termed inverted position, while, in the arrangement illustrated in Figure 4, wherein the chassis is shown in the customary position near the bottom of the casing, the aforesaid abutments extend downwardly a considerable distance further in order to serve the same purpose as upper positioning stops for the chassis in that position.

Referring, first, to the arrangement shown in Figures 1 to 3, a vertically extending front plate is illustrated at 30, having a plurality of rearwardly turned ears 31 at its upper horizontal edge and a forwardly turned flange 32 along a substantial portion of its lower edge. Ears 31 are secured, as by screw-bolts 33, to the forward edge-part of chassis 9, and flange 32 is secured by screws 34 to abutments 35, which project inwardly near the bottom of the front wall of casing 1. Plate 30, besides thus serving as the support for the forward part of chassis 9, also carries the loud-speaker 12 and the tuning condenser 14, and constitutes a backing-plate for the tuning dial 36 (Figure 1). Flanges, such as the one shown at 37 (Figure 3), are struck up from the plate, one at each side of the tuning dial and, while serving as dial-light shields, also act as stiffening flanges for the plate-support and bear against the front wall of the casing as front positioning stops for the chassis. The rearward part of chassis 9 is supported by the abutments 11 on flange 10, which rest upon the shoulder 25 of the loop antenna unit 8, and the loop antenna unit is in turn supported within the rearward portion 3 of the casing by a pair of shoe-clips 38 and 39. Said shoe-clips box the lower corner portions of the unit 8 and are secured by screws 40 and 41 to respective abutments 42 and 43, which abutments may extend as solid end walls of the pocket-like rearward portion 3, terminating a short distance above the bottom of the casing.

When the radio apparatus is to be inserted and secured in position, the casing is turned bottom upwards, and the chassis is lowered within the casing to rest upon abutments 28 and 29 and is then moved forwardly until the flanges 37 contact the front wall, at which position the tuning shaft 15 and adjusting wheel 18 will have been projected the proper distance through their respective openings 6 and 7, and the loud-speaker 12 and tuning dial 36 will be in their proper positions with respect to the grille 4 and dial aperture 5, respectively. The loop antenna 8 is then lowered into the pocket-like receptacle formed by the rearward portion 3 of the casing until the shoulder 25 rests upon the abutments 11 on flange 10 of the chassis 9. Screws 34 are then inserted and the flange 32 thereby secured to abutments 35, and shoe-clips 38 and 39 are applied over the corner portions of the loop antenna unit 8 and screwed down upon abutments 42 and 43 by the respective screws 40 and 41. Upon connecting the wiring leads (not shown) of the loop and shield and placing and securing tuning knob 16 upon the outer end of tuning shaft 15, the installation of the apparatus in the casing is complete. It will be observed that the top and shoulder 26 of the loop antenna unit 8 engage, respectively, the top and back of the pocket-like receptacle, and that the engagement of abutments 11 of the chassis 9 with shoulder 25 is such that the chassis is held locked thereby upwardly against abutments 28 and 29 and forwardly to hold the flanges 37 against the front wall of the casing. Endwise displacement is prevented, of course, by the screws 34, 40 and 41.

Referring, now, to the arrangement shown in Figure 4, it will be seen that the construction of the casing 1 is substantially the same as shown in Figures 1 to 3, differing therefrom only in the location of the opening 7 in the front wall to correspond with the different location of the knurled adjusting wheel 18, and in the downward extension of the abutments 28 and 29, as previously mentioned, to act as upper positioning stops for the chassis 9, here shown arranged near the bottom of the casing, instead of near the top thereof as in Figure 3. The vertically extending front plate 44 serves the same purposes as the plate 30 of the previously described construction, but the rearwardly turned ears 45, which are secured to the forward edge-part of chassis 9, are here located near the bottom of the plate, and the upper horizontal edge-part of the plate engages the forward edge-part of a protective shield 46, preferably of asbestos or other heat-resisting material, the rearward part of which is shown tucked into the upper pocket of the rearward portion 3 of the casing and engaged by the upper part of the loop antenna unit 8, serving as a cushion therefor.

In this lower arrangement of the chassis 9, the abutments 11 on the flange 10 rest upon a lip-flange 47 provided along the bottom edge-part of the loop antenna unit 8. This lip-flange may be the extending edge of a bottom plate of unit 8, as indicated in dotted lines, or it may be formed upon the bottom edge-part of the inner frame-member 23, as shown in full lines, and shoe-clips 48 are of slightly different form, since, in this arrangement, the chassis prevents forward displacement of the lower part of the loop antenna unit.

The placing and securing of the radio apparatus in the casing is substantially the same in the arrangement of Figure 4 as has been described in connection with the arrangement of Figures 1 to 3. The casing 1 is turned bottom upwards, and the chassis is lowered into the forward portion 2 to rest upon abutments 28 and 29 and is then moved forwardly to project the tuning shaft 15 and adjusting wheel 18 through their respective openings 6 and 7 until the flanges 37 contact the front wall, and the loop antenna unit is then lowered into the pocket-like rearward portion 3 of the casing until the lip-flange 47 rests upon abutments 11 of the flange 10 of the chassis. Shoe-clips 48 are then applied to the bottom corner portions of the unit 8 and the screws 34, 40 and 41 are inserted and screwed down to hold the parts clamped thereby to their respective abutments, as previously described. Thus, when the casing is turned right side up, chassis 9 is held upwardly against abutments 28 and 29 and forwardly with flanges 37 contacting the front wall by the engagement of abutments 11 with lip-flange 47, and loop antenna unit 8 is supported and secured in position by the shoe-clips 48, with its upper horizontal edge-part held in the cushion formed in the upper pocket of the rearward portion 3 by the shield 46.

In the arrangement of the radio apparatus

as shown in Figure 4, the circuit wiring and other elements (not shown) below the chassis-table would be exposed, so a bottom cover-plate 49 is applied and held in position by the screws 34, 40 and 41, while, in the inverted arrangement of the apparatus shown in Figures 1 to 3, said circuit wiring and other elements would be protected by the top of the casing.

We claim:

1. Radio construction comprising a chassis, radio apparatus carried by said chassis, a loop antenna unit, and an open bottom casing; said casing having a forward portion housing said chassis and said radio apparatus, and a rearward portion extending above and at each side beyond said forward portion engaging and housing said loop antenna unit, said chassis and said loop antenna unit being inserted in said casing through the open bottom thereof, and means located within said casing near the bottom thereof removably and individually securing said chassis and said loop antenna unit to said casing.

2. Radio construction comprising a chassis, a loop antenna unit, and a casing; means comprised in said chassis and said loop antenna unit cooperating in the unattached support of one by the other thereof, and means comprised in said casing to which said chassis and said loop antenna unit are each removably secured.

3. Radio construction comprising a chassis, a loop antenna unit, and a casing; said casing having a forward portion housing said chassis and provided with abutments to which said chassis is removably secured, and a rearward portion extending above and at each side beyond said forward portion housing said loop antenna unit and provided with abutments to which said unit is removably secured, and abutments upon said chassis and said loop antenna unit cooperating through their unattached engagement with each other in the positioning and support of said chassis and said unit.

4. Radio construction comprising a chassis, a loop antenna unit, and a casing, said casing having a forward portion housing said chassis and a rearward portion housing said loop antenna unit, means supporting the forward portion of said chassis upon said casing, means supporting said loop antenna unit upon said casing, and means supporting the rearward portion of said chassis upon said loop antenna unit.

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