

Dec. 21, 1926.

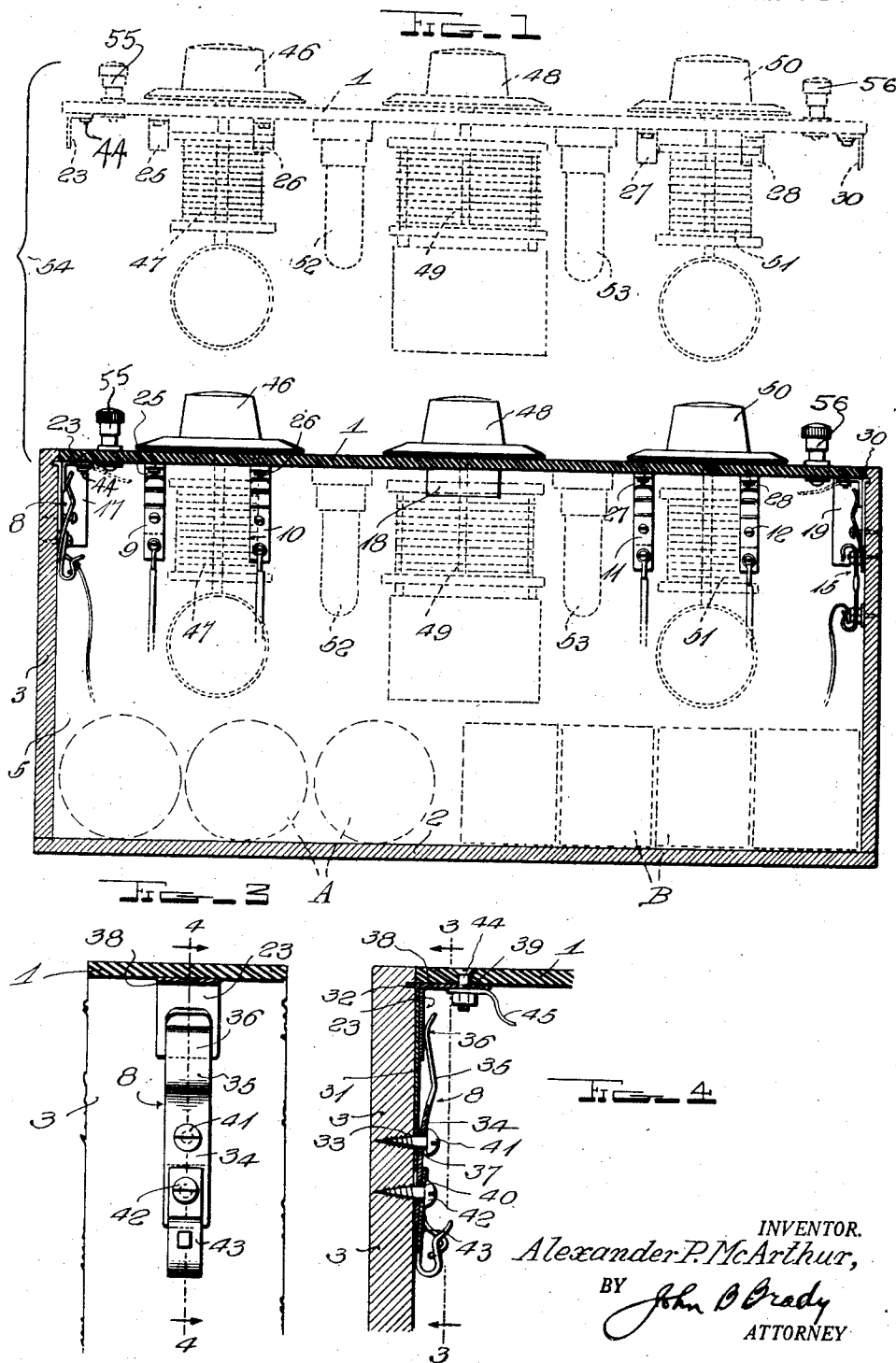
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RADIO RECEIVING APPARATUS

Filed Jan. 4, 1926

2 Sheets-Sheet 1



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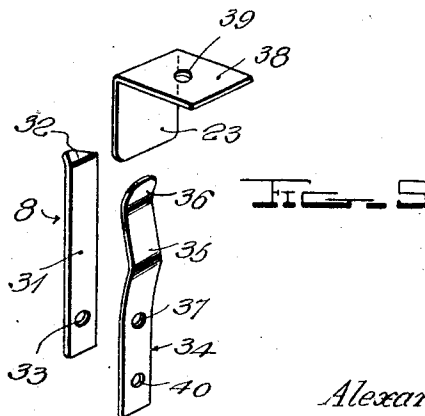
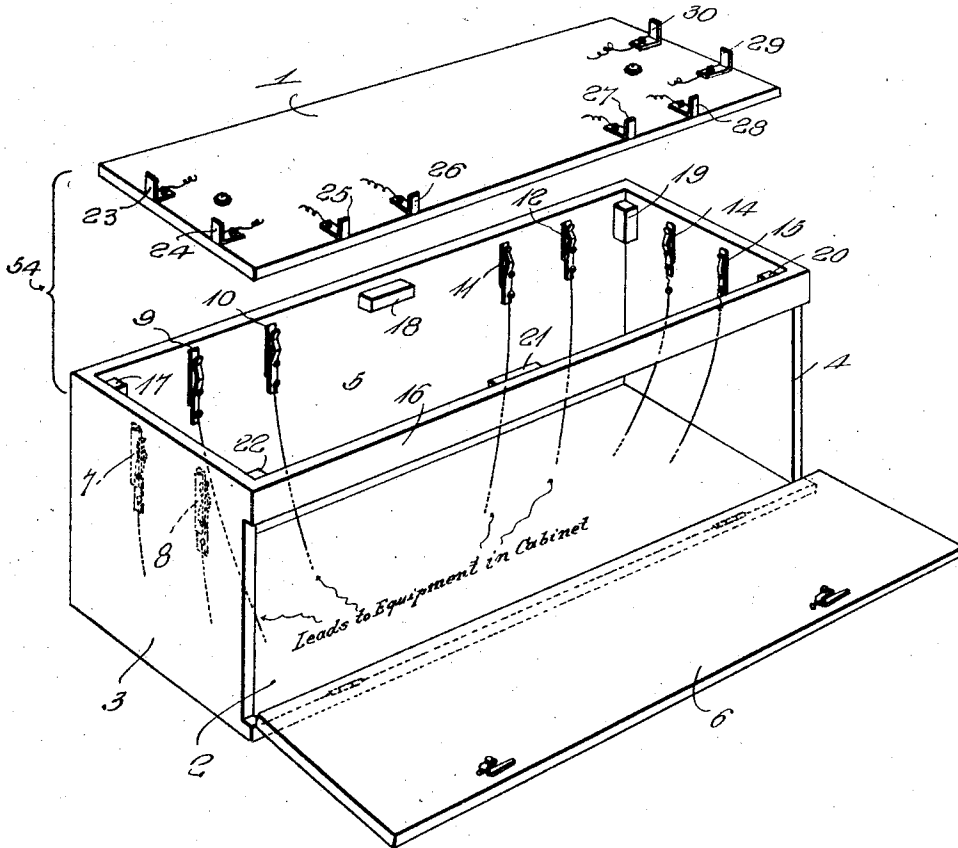
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FIG. 2



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UNITED STATES PATENT OFFICE.

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RADIO RECEIVING APPARATUS.

Application filed January 4, 1923. Serial No. 79,244.

My invention relates broadly to radio receiving apparatus and more particularly to the construction of a broadcast receiver for operation in the home in the reception of radio news, music, lectures, concerts and other entertainment.

One of the objects of my invention is to provide a construction of radio receiver in which the receiving apparatus is mounted upon a panel which has all connections established thereon and with which external connections may be established to the power supply by means of quick detachable connectors positioned interiorly of the cabinet structure which houses the receiving apparatus, the connectors being arranged to cooperate with contact members carried by the panel on which the apparatus is mounted.

Another object of my invention is to provide a construction of radio receiving apparatus in which the apparatus may be readily removed from the cabinet for the replacement of electron tubes or the repair of the circuits or inspection thereof without disturbing electrical connection to the antenna, ground or radio frequency energy collecting circuit, or connections to the battery supply system for the filament and plate circuits of the receiver.

Still another object of my invention is to provide a construction of cabinet for housing radio receiving apparatus in which the interior side walls of the cabinet are provided with contact terminals for the gripping of contact blades which extend from the interior of a panel on which the receiving apparatus is mounted.

Still another object of my invention is to provide a cabinet construction for a radio receiver wherein a panel carrying all of the receiving apparatus may be readily inserted or removed from the cabinet simultaneously with the completion or disconnection of electrical circuits with power equipment or other circuits established within the cabinet to afford a means for ready access to the receiving apparatus.

A further object of my invention is to provide a panel construction for a radio receiving apparatus in which the tuning and amplification apparatus is mounted on the rear of a panel and contact members extended from the sides of the panel for establishing connection with corresponding contacts when the panel is inserted into a

cabinet construction for completing connections with other circuits within the cabinet.

A still further object of my invention is to provide a construction of radio receiving apparatus which is adapted for the mounting of electron tubes in a vertically downward position in such manner that the filament electrodes of the tubes are in such position that there is no tendency for the filament to sag and short circuit with the grid electrode in each of the tubes which is often the case in receiving apparatus of constructions heretofore available.

My invention will be more clearly understood from the specification hereinafter following by reference to the accompanying drawings, in which:

Figure 1 is a longitudinal cross-sectional view through a radio receiver showing the panel and cabinet construction of my invention where the panel has been inserted in the cabinet and where the panel is in a position removed from the cabinet for the inspection, repair or shipment of the receiving apparatus; Fig. 2 is a perspective view showing the panel and cabinet construction where the panel has been inverted to disclose more clearly the contact blades which cooperate with contact members positioned on the interior walls of the cabinet; Fig. 3 is a fragmentary view of one portion of the interior walls of the cabinet showing the arrangement of the depending contact on the operating panel and the corresponding contact on the interior wall of the receiving apparatus; Fig. 4 is a cross-sectional view through the contact mechanism of Fig. 3 taken on line 4—4 of Fig. 3; and Fig. 5 is a perspective view illustrating the elements which make up the contact mechanism for the panel and cabinet.

Referring to the drawings in more detail, reference character 1 designates the panel on which the radio receiving apparatus is mounted. Reference character 2 designates the rear of the cabinet structure in which a power equipment is housed having end portions 3 and 4 with sides 5 and 6. The side 6 of the cabinet is hingedly mounted and forms a closure with the longitudinally extending portion 16 of the cabinet affording ready access to the inside of the cabinet when the hingedly mounted side portion 6 is opened outwardly as represented in the perspective view in Fig. 2. Mounted around

the interior walls 3, 4 and 5 I provide contact members 7, 8, 9, 10, 11, 12, 14 and 15 which lead to connections to apparatus contained within the cabinet structure. Block members 17, 18, 19, 20, 21 and 22 are mounted on the inside walls of the cabinet immediately below the upper edges thereof to serve as a support for the panel 1 carrying the radio equipment. The panel 1 is provided around its periphery with depending contact members 23, 24, 25, 26, 27, 28, 29, and 30 which cooperate with the contact members on the interior walls of the cabinet structure.

The elements which make up each of the contact members positioned on the interior walls of the cabinet structure are shown more clearly in Fig. 5. A strip member 31 apertured at one end at 33 and provided with a biting angularly disposed tooth portion 32 at the opposite end is mounted directly adjacent the wall of the cabinet with the toothed portion 32 projecting into the material of the cabinet at a point below the upper edge of the cabinet depending upon the thickness of the panel 1. Directly adjacent the strip member 31 I provide a resilient strip 34 having a spring portion 35 and a contact portion 36 which normally bears against the face of the strip member 31. The member 34 is apertured at 37 and 40 to receive retaining screws 41 and 42 as shown more clearly in Figs. 3 and 4 for securing the contact strips to the wall 3 of the cabinet structure and providing a terminal for the contact unit as represented at 43. The depending contact member 23 is bent at right angles as represented at 38 and is secured to the rear of panel 1 by means of a screw device 44 which serves as a binding post for a conductor 45 which connects with the receiving apparatus carried by the panel 1. The face 23 of the contact member carried by the panel tends to wipe against the face of the strip 31 and bear against the resilient face 36 of the strip 34. The depending portion 23 of the contact is gripped between the resilient contact 36 and the strip 31 insuring a good electrical connection between the apparatus on the panel 1 and the equipment within the cabinet structure. The angularly disposed portion 38 of the contact member 23 bears directly against the rear face of the panel structure 1 and is apertured at 39 to be secured to the panel. I have described the structure of one of the contact units but it will be understood that the other contact units are similarly arranged and provide good electrical connection between the apparatus on the panel 1 and the equipment within the cabinet. I have represented batteries A and battery unit B in the cabinet structure which are connected to the contact members on the side walls of the cabinet for establishing connection to the contacts on the

panel structure with the apparatus carried by the panel 1. I have shown a complete electron tube radio receiving apparatus mounted on panel 1 where there are control dials 46, 48 and 50 arranged for adjustment of the tuning units 47, 49, and 51 respectively. I have represented the electron tubes at 52 and 53 depending downwardly from sockets carried by the panel structure 1. The arrangement of the cabinet structure and panel construction is particularly adapted for the vertical mounting of electron tubes in such manner that the filament electrodes are disposed in a vertical direction and there is no tendency for the filament to sag against the grid electrode and cause short circuits with ultimate failure in the operation of the receiving circuit.

Brace 54 in Figs. 1 and 2 represents the removable feature of the panel structure and cabinet by which the receiving apparatus may be removed from the cabinet for repair or exchange of tubes or for inspection without disarrangement of the wiring or the requirement of flexible connectors dragging out of the cabinet to part of the receiving apparatus on the panel. By reason of my construction there is no danger of wrong connection such as the placing of the B battery across the filament lighting circuit of the electron tubes. The connections are all established on the panel of the receiving apparatus and the panel will only fit in the cabinet in one position to complete the connections properly. No binding posts become necessary and there are no wires from the set to the power supply system or the antenna or ground or radio frequency energy collecting circuit to be attached or detached. In shipping the apparatus for repair the panel may be removed from the cabinet and packed for shipment without the necessity of returning the complete cabinet structure which saves considerable transportation expense. A number of cabinet designs may be provided for the same type of panel and in this way manufacturing difficulties are considerably reduced. The opposed relationship of contacts 7-14 and 8-15 insures a good electrical connection by reason of the inherent tendency of the spring members to be subjected to tension and thereby increase the contact pressure and the electrical conductivity between the contacts on the panel and the contacts on the interior walls of the cabinet structure.

The members 55 and 56 which protrude from the face of the panel 1 serve as handles to permit the ready handling of the apparatus panel from the front in inserting the panel into the cabinet or removing the panel therefrom. These members 55 and 56 extend at right angles from the front of the panel.

I have described my invention in certain preferred embodiments, but I desire that it

be understood that modifications may be made and that no limitations upon the invention are intended other than those imposed by the scope of the appended claims.

5 What I claim and desire to secure by Letters Patent of the United States is as follows:

1. Radio receiving apparatus comprising in combination, a panel structure, a cabinet structure in which said panel structure is arranged to be mounted, receiving apparatus carried by said panel structure, electrical connections from said receiving apparatus terminating in contact members at the periphery of the outer edge of said panel, contact members carried by said cabinet structure in positions corresponding to the positions of the contact members carried by said panel whereby when said panel is mounted in said cabinet said contact members on said panel engage said contact members on said cabinet for establishing electrical connections therewith.

2. Radio receiving apparatus comprising in combination a cabinet structure for housing batteries, a panel structure for carrying radio receiving apparatus including electron tubes thereon, a plurality of contacts mounted adjacent the periphery of said panel structure and connected with said radio receiving apparatus on said panel structure, a plurality of corresponding contacts mounted on the interior walls of said cabinet structure and connected with said batteries, said panel structure being arranged to be moved into or removed from said cabinet structure for the engagement of said contacts on said panel structure with the contacts within said cabinet structure for completing or breaking the electrical connections between said receiving apparatus and said batteries when said re-

ceiving apparatus is removed from said cabinet structure.

3. Radio receiving apparatus comprising in combination a panel structure, radio receiving apparatus carried by said panel structure, a cabinet structure, a plurality of electrical contact members positioned around the interior walls of said cabinet structure, said contact members each having a pair of opposed faces and said panel structure having a plurality of depending contact members thereon correspondingly positioned to said first mentioned contact members for establishing electrical connection between power equipment within said cabinet structure and said receiving apparatus carried by said panel structure.

4. Radio receiving apparatus comprising in combination a panel structure, radio receiving apparatus carried by said panel structure, a cabinet structure, a plurality of strip members positioned around the interior walls of said cabinet structure, said strip members each comprising a pair of adjacent strips, one of said adjacent strips being arranged in resilient engagement with the other of said adjacent strips, said panel structure having a set of contact members comprising angularly disposed strip devices depending downwardly from said panel structure and arranged to enter between said aforementioned strips, with said resilient strip tending to force the face of each of said contact members into engagement with the other of said aforementioned adjacent strips for establishing electrical connection between power equipment within said cabinet structure and the receiving apparatus carried by said panel structure.

In testimony whereof I affix my signature.

ALEXANDER P. McARTHUR.