

Feb. 20, 1951

R. BRENTA

2,542,793

RADIO RECEIVING SET

Filed May 26, 1948

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FIG. 3.

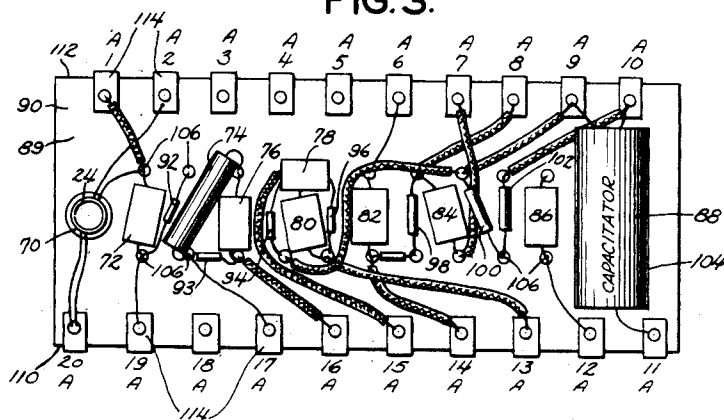


FIG. 4.

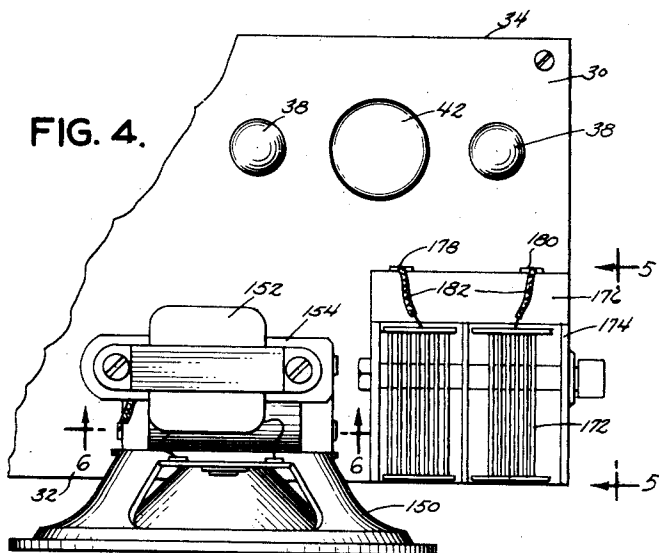
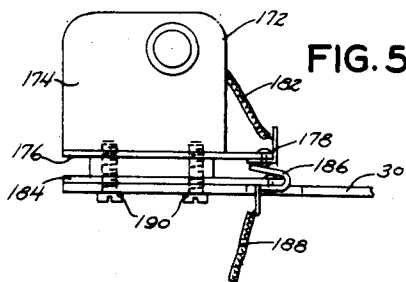


FIG. 5.



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FIG. 6.

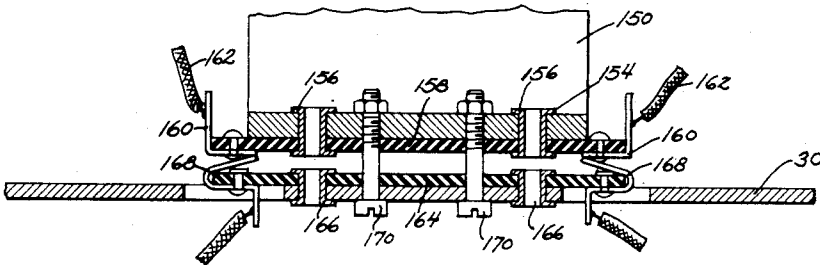


FIG. 7.

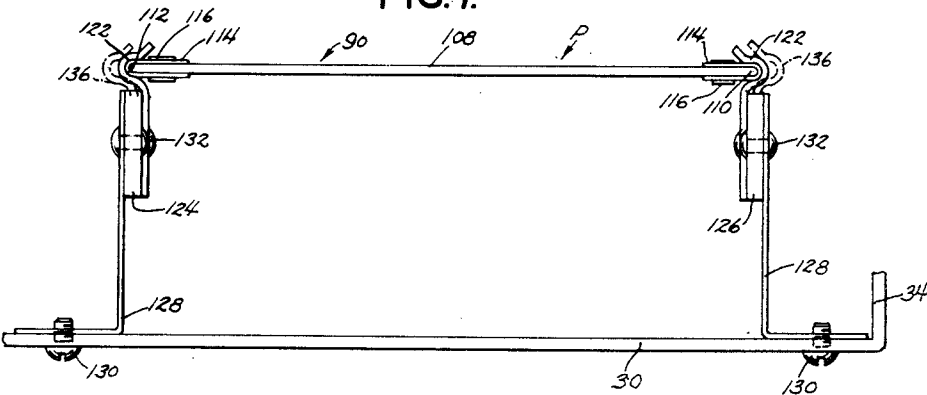
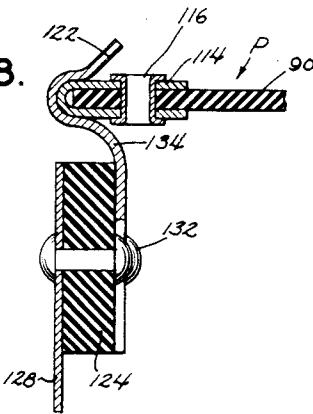


FIG. 8.



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RADIO RECEIVING SET

Roberto Brenta, New York, N. Y., assignor of fifty per cent to Jack Schneider and fifty per cent to Carmella Serraro Brenta, both of New York, N. Y.

Application May 26, 1948, Serial No. 29,242

3 Claims. (Cl. 250-16)

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This invention relates to the manufacture, construction and maintenance of radio receiving sets and the like.

An object of the invention is to provide an improved form of radio receiving set construction whereby certain pre-determined electrical components of the set are connected into their respective circuits by novel means so that said components are easily detachable for inspection or repair or replacement without breaking soldered connections and without the use of tools.

Another object of the invention is to provide an improved form of radio receiving set construction, in which a number of pre-determined electrical components of the set are all mounted upon a unitary frame, each component being connected to individual terminals of said frame, and the frame being adaptable for engagement with the chassis of the receiver to automatically interpose said electrical components into the electrical circuit thereof.

A further object of the invention is to provide a novel radio receiving set construction in which all the resistors and capacitors of the circuit thereof are mounted upon a panel and permanently connected to individual terminal clips on the panel, and in which mating terminal clips are mounted upon the receiver chassis and connected to the remaining circuit elements such as the tubes, power supply, loud speaker and the like, whereby the panel bearing the said resistors and capacitors may be quickly snapped into electrical engagement with said mating terminal clips to directly interpose said elements mounted on the panel into the receiver circuit, and whereby, for service, repair or replacement, the entire said panel may be readily unsnapped from said engagement for entire replacement, or for rapid service of individual resistors and capacitors mounted thereon.

Still another object of the invention is to provide a novel receiver construction in which circuit elements such as the loud speaker assembly and the variable condenser assembly are provided with unitary insulated panels upon which they are mounted, the circuit elements being permanently connected to electric terminals mounted on the panels, with corresponding mating terminals mounted on the receiver chassis for electrical engagement therewith, and including means for securing said panels to said chassis independently of said terminals.

A further object of the invention is to provide a novel form of receiver construction, as described, which is simple in design, inexpensive to

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manufacture, and which makes for rapid inspection and servicing of radio receivers at low cost, thereby encouraging users to have their receivers repaired rather than replacing the entire receiver due to the normally high cost of repair under prior art construction.

Other objects and advantages of the invention will become apparent from the following description of a preferred embodiment thereof as illustrated in the accompanying drawings, and in which,

Fig. 1 is a bottom plan view of a radio receiver chassis according to my invention,

Fig. 2 is a view similar to that of Fig. 1, but with my resistor-capacitor replacement panel dismounted therefrom,

Fig. 3 is a plan view of my novel resistor-capacitor replacement panel apart from the receiver chassis, and showing the opposite side thereof from that shown in Fig. 1,

Fig. 4 is a fragmentary top plan view of a radio receiver chassis according to my invention, illustrating particularly the invention with relation to easily replaceable loud speaker and variable condenser units,

Fig. 5 is a fragmentary right side elevation as viewed along line 5-5 of Fig. 4,

Fig. 6 is an enlarged sectional view taken substantially along the line 6-6 of Fig. 4,

Fig. 7 is an enlarged sectional view taken on line 7-7 of Fig. 1,

Fig. 8 is an enlarged detail sectional view taken on line 8-8 of Fig. 1, and

Fig. 9 is a schematic circuit diagram of a radio receiver embodying my invention.

In the construction of radio receivers, it is customary to solder lead wires to interconnect the various circuit elements, permanently to those elements, all these elements being thus permanently interconnected by soldered joints except the receiver vacuum tubes themselves. As a result, those elements, such as resistors and capacitors, which, aside from the vacuum tubes themselves, are most frequently apt to give trouble, as well as the variable condensers and loud speaker, cannot be inspected or dismounted from the chassis frame without considerable difficulty and annoyance.

Consequently the cost of repair or even of inspection of a receiver to determine the location of the trouble has become quite high. By means of the present invention, it is possible to snap out of the receiver all the trouble-giving components, either for inspection, or for replacement of the

entire assembly, so as to eliminate the trouble, and make the receiver function immediately.

In order to understand clearly the nature of the invention, and the best means for carrying it out, reference may now be had to the drawings, in which like numerals denote similar parts throughout the several views.

As shown, the radio receiver includes a chassis base 30 made of steel, aluminum or other suitable sheet material, and having depending front and rear walls 32 and 34. Mounted with rivets or otherwise upon the underside of the platform or base 30, as seen best in Fig. 2, are a number of vacuum tube sockets 36, in alignment or registry with corresponding openings formed in the base 30 to permit insertion from above the base 30 of vacuum tubes 38 through the openings and into the tube sockets in the usual manner.

Coil sockets 40 are similarly secured to the underside of the chassis platform 30 in registry with openings formed therein, to permit insertion from above the base 30 of the contact prongs or plugs of hollow cans 42 containing tuning coils and trimmer condensers into said coil sockets. The cans 42 are well known in the art and hence will not be otherwise described in detail, except to mention that they form shields about the enclosed coils and trimmer condensers, and are employed for various purposes in the radio circuits, such as intermediate frequency transformers and the like. The tube sockets 36 and the coil sockets 40 are connected into the radio circuit by means of insulated wires 44 so that the various circuits are made continuous in the manner well known in the art.

Fig. 9 shows a typical superheterodyne radio receiver circuit including tubes and power supply adapted for connection to the electric power lines by means of wires 46 and 48. A combined line switch and potentiometer type volume control 50 is supported upon the front chassis wall 32 with its shaft 52 extending through an opening formed in the wall and is secured in position by means of a nut 54 threaded onto the outer end of the shaft bushing 56. The electrical connections of the switch and volume control 50 are shown in the schematic diagram of Fig. 9, at two locations marked 50, and it is connected into the circuit by means of insulated wires such as those shown at 58.

An antenna loop 60, comprising a number of turns of wire wound on a fibre form, is supported upon a loop bracket 62 secured to the rearward chassis wall 34 by means of screws 64, the loop being connected into the circuit by means of wires such as those shown at 66 and 68 in the manner shown in Fig. 9. From examination of the schematic circuit diagram in Fig. 9, it will be seen that there are numerous other circuit elements and components, such as oscillator coil 70, fixed capacitors 72, 74, 76, 78, 80, 82, 84, 86 and electrolytic capacitor 88. These are mounted upon one surface 89 of a removable plate or platform 90 formed of insulating sheet material.

Also mounted on the same surface of the removable plate 90 are other circuit elements, such as the fixed resistors 92, 94, 96, 98, 100 and 102. In view of its greater bulk, the dry type electrolytic condenser 88 is set into an opening 104 formed through the plate 90, so as to avoid undue extension thereof in either direction. A number of contact rivets 106 are permanently set into two longitudinal parallel rows of holders formed through the plate 90, and some of the circuit elements such as resistors and capacitors are con-

nected to these contact rivets 106 by means of wires, as shown in Fig. 3. In Fig. 1, the rivets 106 themselves are clearly visible upon the underside 108 of the removable plate 90.

These mutually insulated rivets 106 thus serve to support firmly, many of the circuit elements the leads of which are soldered thereto, in the manner of Fig. 3. As shown best in Figs. 1, 3, 7 and 8, the removable plate 90 is also provided along its edges 110 and 112, with a number of U-shaped spring contact lugs 114, which are secured to the plate by means of rivets 116 in the manner best shown in Figs. 7 and 8, so as to hold the contact lugs 114 securely in position.

The contact lugs 114 may be conveniently numbered as shown in Fig. 3, from 1 to 20 where 20 such lugs are used. It will be seen, from Fig. 3, that some of the circuit elements, such as the oscillator coil 70 and the electrolytic condenser 88 have one or more of their terminals soldered or otherwise connected directly to certain of the marginal contact lugs 114 which thus serve to provide direct support for them on the plate 90.

As shown best in Fig. 1, it will be seen that further interconnection between any selected contact rivets 106 and/or any selected marginal lugs 114, may be made by means of wires 120 on the reverse side of the plate 90. In this manner, any desired degree of circuit element interconnection may be accomplished.

The contact lugs 114 on the plate 90 are adapted by location along the margins of the plate 90, for conductive engagement with flexible spring clips or sockets 122 which correspond in number and position to the contact lugs 114. However, the stationary spring clips 122 are carried upon two parallel strips 124 and 126 of insulating material extending almost the full length from left to right of the chassis 30 as seen in Figs. 1 and 2 to underlie the marginal edges of the removable plate 90. Each of these insulating strips 124 and 126 is secured to the underside of the chassis platform 30 by means of L-shaped brackets 128 secured to the parts by means of screws or rivets 130 and 132. From Figs. 1 and 2, 7 and 8, it will be seen that the brackets 128 are only secured to the insulating strips 124 and 126 at their ends, so there is no direct connection through this means between the chassis 30 and any of the spring socket clips 122.

The brackets 128 may be of steel, whereas the shanks 134 of the spring socket clips 122 are of resilient material such as spring steel or brass or copper alloy, so as to yield readily to their dotted line positions shown at 136 in Fig. 7, when the plate lugs 114 are snapped into position as shown, each opposite pair of plate lugs 114 being thus snapped into engagement with the corresponding pair of opposite socket clips 122, so that the plate 90 is securely held in position.

In this manner, not only is the plate 90 supported firmly as illustrated, but each plate lug 114 on the plate 90 is in electrical connection with its mating socket clip 122 on the insulating strips 124 and 126. Since the stationary socket clips 122 are connected by means of wires such as those shown at 140 in Fig. 2, to various of the radio circuit elements in accordance with the circuit diagram of Fig. 9, it is obvious that quick connection and disconnection of the circuit components mounted on the plate 90 with the other circuit components mounted on the chassis is easily effected by merely snapping the movable plate 90 into position or unsnapping it from engagement with the stationary socket clips 122.

By this simple means, therefore, it is apparent that those circuit elements usually most prone to trouble, that is, the resistors, capacitors and oscillator coil, are all mounted on a single insulated plate for removal at any time for inspection. And this may be accomplished without use of any tools or the like, and without breaking any soldered connections. Similarly, if trouble exists, the entire plate 90 with the elements mounted thereon, may be replaced to cure the trouble, at low cost, it being sometimes cheaper to replace the entire plate 90 than to test individual elements of a conventional type set to determine the trouble.

According to the invention, other main circuit components may also be replaced without trouble. Such elements may be the loudspeaker assembly including the loudspeaker 150 and matching transformer 152, shown in Figs. 4 and 6. The magnetic yoke frame 154 of the loudspeaker has secured to its underside by means of rivets 156, an insulating terminal strip or plate 158 having lugs 160 secured thereto and mutually insulated. The terminals of the matching transformer and the voice coil of the loudspeaker are connected by wires 162 to these lugs 160.

A similar insulating strip or plate 164 is secured by rivets 166 to the chassis platform 30 as seen in Fig. 6, and has mounted thereon four stationary socket spring clips 168 by means of rivets or the like, in positions corresponding to the movable lugs 160 on the other plate when placed against each other, so as to make contact with the mating lugs and clips to complete the circuits to the loudspeaker. To hold the fixed and movable insulating plates 158 and 164 in mating engagement with their corresponding electrical contacts interconnected, I prefer to employ one or more screws or bolts 170 extending through aligned openings in the insulating plates and/or the abutting metal parts, as in Fig. 6.

In a similar manner, as shown best in Figs. 4 and 5, the variable tuning condensers 172 may also be mounted for ready removal from the circuit. Thus, the frames 174 of the condensers have secured to their undersides by rivets or otherwise, insulating plates 176 carrying terminals 178 and 180 connected to the condensers by wires 182. Matching insulating plates 184 are secured to the upper surface of the chassis platform 30 by rivets or otherwise, and have socket clips 186 carried thereon and interconnected with the receiver circuit by means of wires 188. Grounding is effected by direct connection to the chassis by means of the screws 190 extending between the chassis platform and the condenser frame, and holding the condenser in position, with its contacts 178 and 180 in electrical connection with the corresponding mating stationary contacts on the plate 184.

In this manner, both the loudspeaker and the variable condensers may be readily connected or disconnected without breaking any soldered connections, either for inspection and repair, or for replacement.

It is thus apparent that I have devised a type of radio receiver construction which is quite simple for both connection and disconnection of the more important circuit elements. Hence servicing of the radio receiver is possible at low cost and without delay.

Although I have described a preferred embodiment of my invention in specific terms, it is to be understood that various changes may be made in size, shape, materials and arrangement without

departing from the spirit and scope of the invention.

I claim:

1. A radio receiver comprising a plurality of radio circuit elements, a chassis, some of said radio circuit elements being mounted on said chassis, a secondary support plate, means for supporting said secondary support plate upon said chassis so as to be readily engageable and disengageable therewith, some other of said radio circuit elements being mounted on said secondary support plate, means carried jointly by said chassis and said secondary support plate for effecting ready electrical connection and disconnection of the circuit elements carried on said plate with the rest of the circuit, said secondary support plate being adapted to overlie a portion of the receiver chassis, a plurality of fixed main contact lugs secured to said secondary support plate and interconnected individually with selected numbers of said circuit elements carried on said secondary support plate, a plurality of mating contact sockets carried by and insulated from said chassis, and adapted to engage with said corresponding main contact lugs to effect electrical interconnection therewith, said mating contact sockets being electrically interconnected with the circuit elements on said chassis according to the schematic hookup of the particular radio receiver, whereby quick and easy connection and disconnection of the circuit elements on the plate may be effected.

2. The construction according to claim 1, characterized further in that said chassis carries secured thereto a plurality of insulated strips, said mating contact sockets being secured to said insulated strips and interconnected with said electrical circuit of the radio receiver, and said fixed main contact lugs on the said plate are constructed and arranged for good electrical connection with their said mating contact sockets.

3. A radio receiver comprising a plurality of radio circuit elements, a chassis, some of said radio circuit elements being mounted on said chassis, a secondary support plate, means for supporting said secondary support plate upon said chassis so as to be readily engageable and disengageable therewith, some other of said radio circuit elements being mounted on said secondary support plate, and means carried jointly by said chassis and said secondary support plate for effecting ready electrical connection and disconnection of the circuit elements carried on said plate with the rest of the circuit, said secondary support plate being adapted to overlie a portion of the receiver chassis, a plurality of fixed main contact lugs secured to said secondary support plate and interconnected individually with selected members of said circuit elements carried on said secondary support plate, a plurality of mating contact sockets carried by and insulated from said chassis, and adapted to engage with said corresponding main contact lugs to effect electrical interconnection therewith, said mating contact sockets being electrically interconnected with the circuit elements on said chassis according to the schematic hookup of the particular radio receiver, whereby quick and easy connection and disconnection of the circuit elements on the plate may be effected, said chassis having secured thereto a plurality of brackets, at least one insulating strip secured to at least one of said brackets, a plurality of mating contact sockets secured to each of said insulating strips and in position to mate with one of said main contact lugs on the

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said secondary support plate to effect electrical connection therewith, whereby said secondary support plate may be quickly and easily engaged with and disengaged from the said receiver chassis, and simultaneously effecting electrical engagement or disengagement of the electric circuit components carried by said secondary support plate from and with the radio receiver elements carried by said chassis.

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The following references are of record in the file of this patent:

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