

Radiola
REG. U. S. PAT. OFF.
Loud Speaker
Model 104



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Loud Speaker Model 104



Instructions 86992

Radio Corporation of America

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Radiola

Loud Speaker

Model 104

CAUTION

Do not attempt to make installations or changes in this Loud Speaker while the current is "on." The best procedure before opening the cabinet for any purpose is to disconnect the Power Supply Cable from the house lighting circuit. This Loud Speaker is equipped with electrical safety devices for your protection. Do not attempt to render them inoperative or to experiment with the apparatus inside the cabinet.

Do not connect Radiola Loud Speaker, Model 104, to any direct-current house lighting mains, or to any alternating-current mains other than those of the proper rating—105 to 125 volts, 60 cycles. Otherwise serious damage to the Loud Speaker or possible injury to yourself may result. If in doubt about the rating of your house lighting circuit, consult your Electric Light and Power Company.

First, read the instructions carefully so that each step is thoroughly understood. It is advisable to re-read them as each operation is being performed.

INTRODUCTION

Radiola Loud Speaker, Model 104, is a high-quality loud speaker operating with large sound volume. It comprises a loud speaker unit, and a Rectifier-Power-Amplifier unit which are housed inside the cabinet.

This loud speaker should be connected to an alternating-current house lighting circuit, rated at *105 to 125 volts, 60 cycles*. It will supply 45 to 90 volts (direct current) for the plate voltages of the radio receiver being used. In the cases of Radiola 25 Super-Heterodyne or Radiola 28 Super-Heterodyne, it will also supply current to light the Radiotron filaments and to provide proper grid bias, when used in connection with A.C. Packages for Radiola 25 or Radiola 28 Super-Heterodyne, Models UP-971 or UP-972, respectively. This makes possible the elimination of the usual "B" batteries from any radio receiver when used without the Accessories Packages, or the complete elimination of all batteries when using Radiola 25 or 28 with these accessories.

EQUIPMENT REQUIRED

The following apparatus is furnished with Radiola Loud Speaker, Model 104, in addition to the device as described:

- 1 Radiotron, Model UX-210
- 2 Rectrons, Model UX-216-B
- 1 Radiotron, Model UX-874
- 1 Radiotron, Model UV-876
- 1 30-foot Input Cable (attached to Loud Speaker)
- 1 8-foot Power Supply Cable (attached to Loud Speaker)

The user will also need a radio receiving set, and a power supply of proper rating (105 to 125 volts, 60 cycles alternating current).

The instructions for the installation of Radiola Loud Speaker, Model 104, are presented in two sections: the first, in brief pictorial form, the second, in detail.

SECTION I
(Brief Section)
INSTALLATION
To Prepare Radiola 104 for Assembly

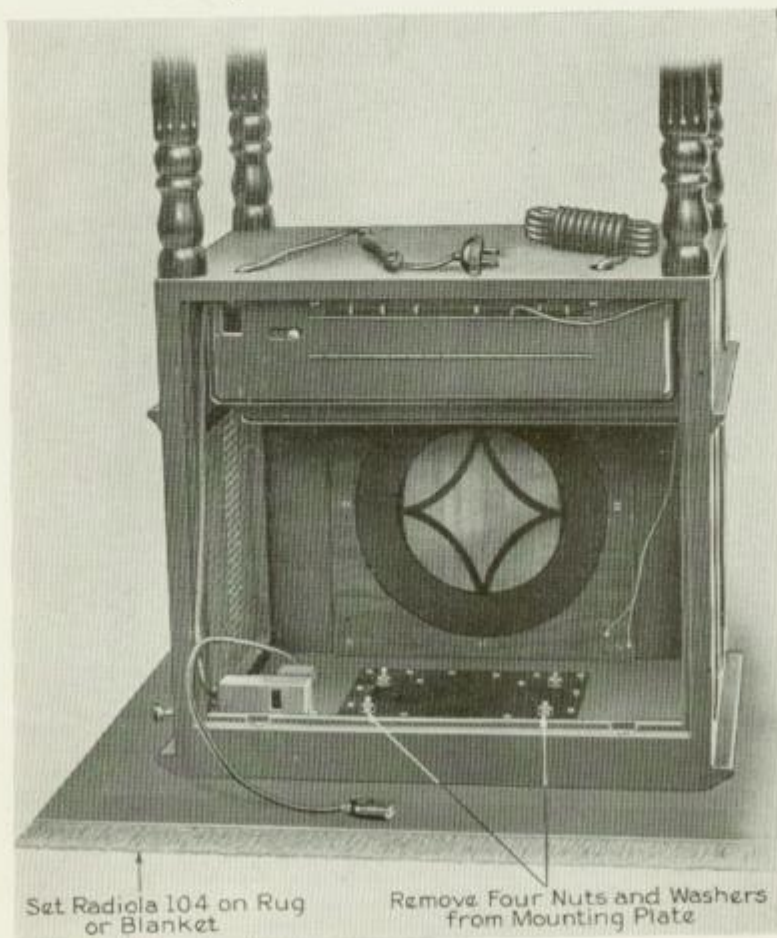


Fig. 2

Turn Radiola 104 upside down, setting it on a rug or blanket. Remove the four nuts and washers from the four bolts projecting through the plate fastened to inside of top.

To Assemble Loud Speaker Unit

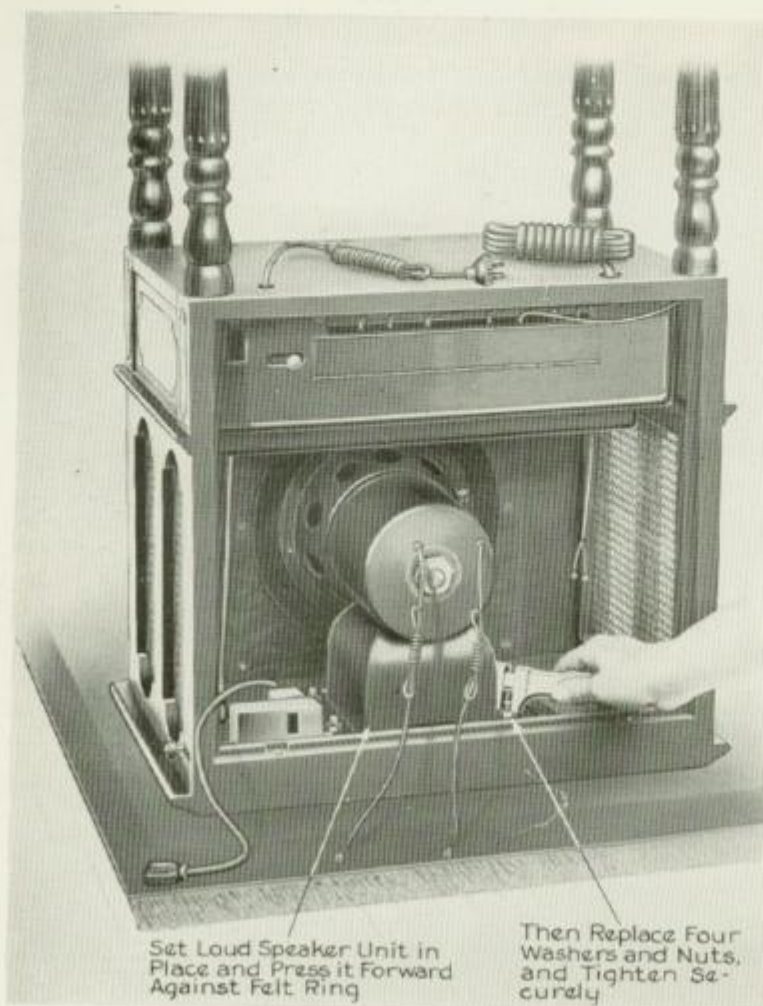


Fig. 3

Unpack Loud Speaker Unit from bottom of packing case, and set it in place over the four bolts. Replace the four washers and nuts just removed. Push the Loud Speaker Unit forward, so that its front end presses firmly against the felt ring in front, and tighten the four nuts securely.

To Install Radiotrons and Rectrons

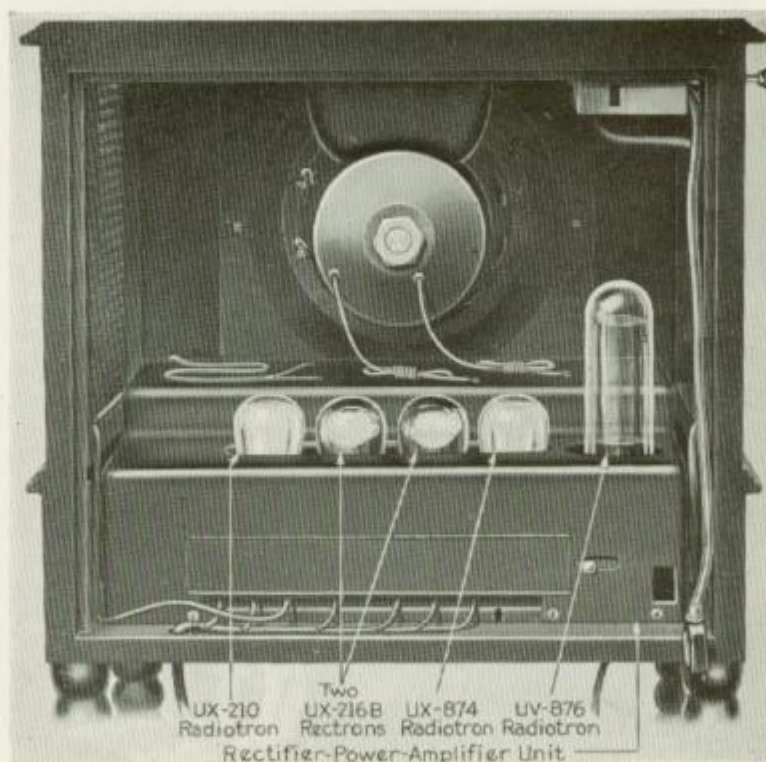


Fig. 4

Stand Radiola 104 on its legs. Unpack Radiotrons and Rectrons carefully and insert them (with bayonet pin facing toward front of cabinet) in following order:

UX-210 UX-216-B UX-216-B UX-874 UV-876

To Connect Loud Speaker Unit

Place ventilating stack over UV-876 Radiotron. Remove Safety Plug, and push Safety Knob to right. Then raise hinged door of Rectifier-Power-Amplifier Unit, Model AP-951. Connect (in either direction) the two wires in Output Cable on left side of the cabinet to two terminals on front housing of Loud Speaker. Connect two leads coming through bushings from rear end of Loud Speaker Unit to FIELD terminals of Rectifier-Power-Amplifier Unit, fastening them under cable clamps at top and along right-hand side of cabinet (looking from rear).

Examine the cables already fastened to the terminal board. See that each wire is connected as shown and is tight. See that the FILAMENT link is closed, that is, connecting between the fifth and sixth terminals from left.

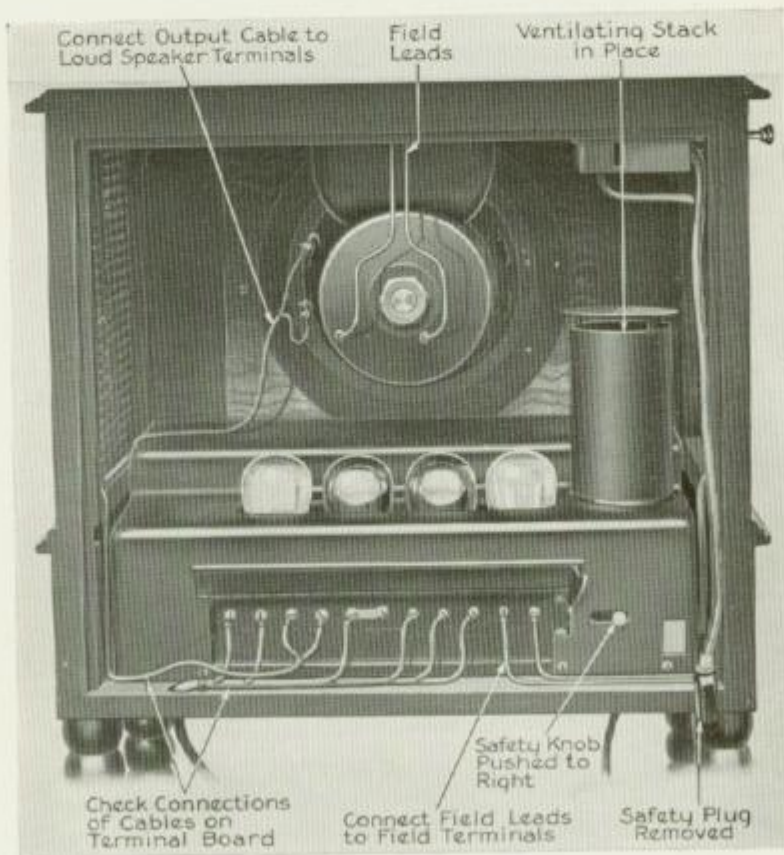


Fig. 5

To Close Rectifier-Power-Amplifier Unit

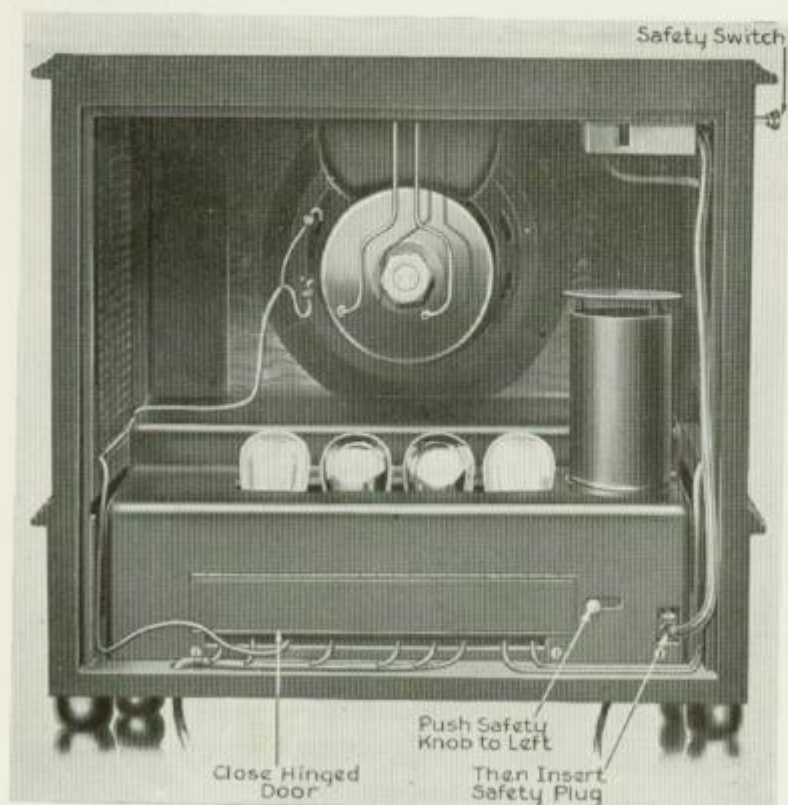


Fig. 6

Close hinged door of Rectifier-Power-Amplifier Unit. Push Safety Knob to left, locking door. Insert Safety Plug in socket.

To Close Cabinet

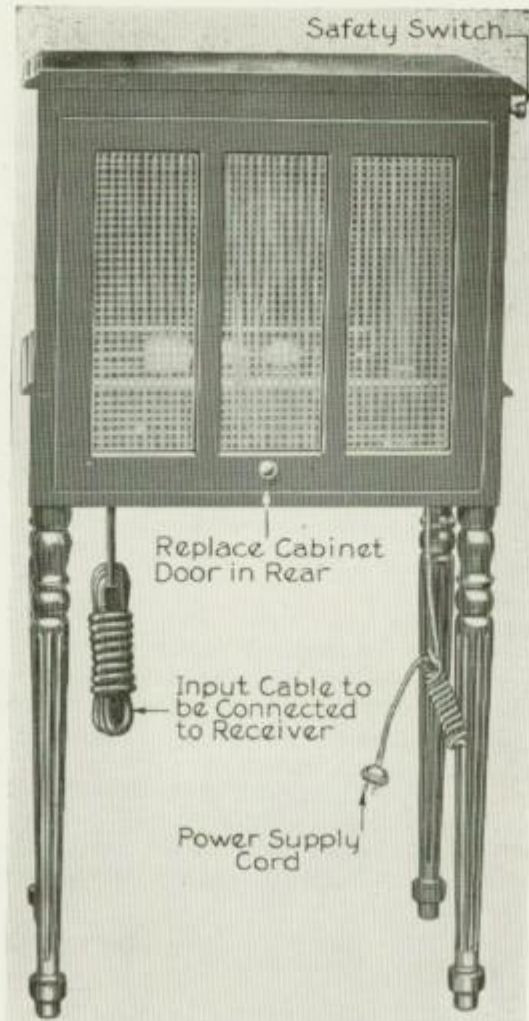


Fig. 7

Replace cabinet door, making sure bolt on door enters slot in Safety Switch. **DO NOT TURN ON CURRENT UNTIL RECEIVING SET HAS BEEN CONNECTED.** The connections of Radiola Loud Speaker Model 104, when supplying "B" battery voltage to Radiola 25 Super-Heterodyne, for Radiola 28 Super-Heterodyne, and for other types of receivers are shown in Fig. 8 (page 13), Fig. 9 (page 15) and Fig. 10 (page 17), respectively.

To Connect to Radiola 25 Super-Heterodyne

If the receiver used is Radiola 25, connect Input Cable as follows, and as shown on opposite page:

Drill a hole (of say $\frac{3}{4}$ " diameter) in back of cabinet. Remove cable from terminal board and fasten terminal board onto rear of cabinet above the "A" batteries. Reconnect leads as they were, making sure the leads are connected to the same terminals from which they were removed, as shown by the terminal board and tag markings.

Disconnect leads from right-hand (extra large) 45-volt "B" battery, and connect leads tagged "-" (yellow with red tracer), and "+45" (black) to terminals marked "-B+A," and "+45," respectively. Disconnect leads from left-hand (extra large) 45-volt "B" battery, and connect leads tagged "-" (black) and "+ 45" (black) to terminals marked "+45" and "+90," respectively.

Disconnect the $22\frac{1}{2}$ -volt "C" battery from the cable, and tape the unused "- $22\frac{1}{2}$ C" lead (black with green tracer).

Disconnect the leads from the two large $22\frac{1}{2}$ -volt "B" batteries and tape the terminals separately.

Remove the unused batteries from the receiver and replace the $4\frac{1}{2}$ -volt "C" battery, connected as it was.

Connect the Branch Telephone Cable to a telephone plug, and insert plug in first-stage telephone jack (left-hand jack, reference H in Radiola 25 Instruction Book). Remove Radiotron UX-120 from socket 6.

The terminal marked "-A" on the terminal board is unused. Leave the "A" batteries as they were and the "C" battery as described.

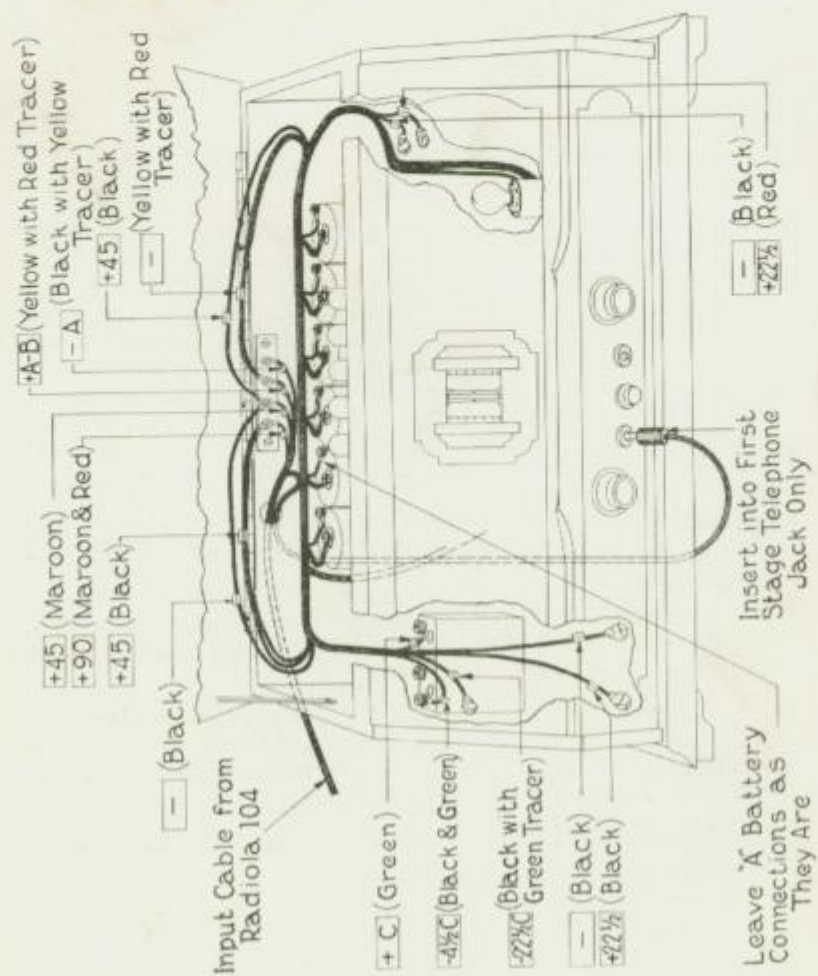


Fig. 8

To Connect to Radiola 28 Super-Heterodyne

If the receiver used is Radiola 28, connect Input Cable as follows, and as shown on opposite page:

Disconnect all leads from the two $22\frac{1}{2}$ -volt "B" batteries, and tape the terminals separately.

Disconnect the leads from the two (extra large) 45-volt "B" batteries. Drill a hole in the wooden bottom of the battery compartment (of say $\frac{3}{4}$ " diameter) and remove from terminal board cable of Radiola 104. Fasten the terminal board to the bottom. Insert the four leads from the bottom and reconnect them as they were, making sure each lead is connected to same terminal from which it was removed, as shown by the terminal board and tag markings. Connect the leads marked "-" (yellow with red tracer) and "+ 45" (black) for the right-hand battery to the terminals marked "-B" and "+ 45," respectively. Connect the leads marked "-" (black) and "+ 45" (maroon and red) for the left-hand battery to the terminals marked "+ 45" and "+ 90," respectively.

Remove and tape the lead marked "- $22\frac{1}{2}$ C" (black with green tracer) from the "C" battery. Leave other battery connections as they were.

Connect the Branch Telephone Cable to a telephone plug and insert the plug in the first stage telephone jack (left-hand jack, reference T in Radiola 28 Instruction Book). Remove Radiotron UX-120 from socket 8.

The terminal marked "-A" on the terminal board is unused.

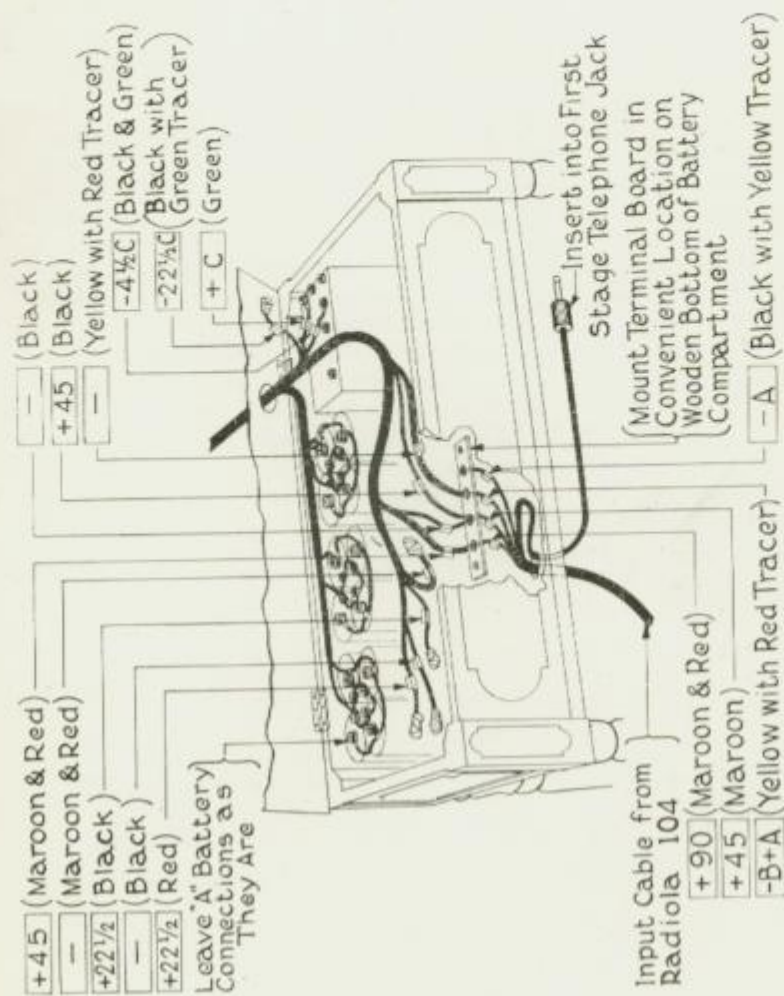


Fig. 9

To Connect Other Receivers

For other receivers connect the Input Cable as follows, and as shown on opposite page.

Disconnect from the receiver all "B" batteries up to 90 volts. Connect the three leads tagged "-B+A" (yellow with red tracer), "+45" (maroon), and "+90" (maroon and red) to the corresponding terminals or leads on the receiver. These connections may be made, (1) by connecting the cable leads directly to binding posts, if the receiver is so equipped, or (2) by installing the terminal board in the receiver, and connecting cable leads and receiver leads to the proper points, if the receiver is equipped with a cable. This provides "B" battery voltage up to 90 volts. Leave the "A" and "C" batteries as they were.

Connect the two leads in the Telephone Branch Cable to the output of the *first audio stage*, either through a telephone plug or directly to binding post terminals, if provided.

The "-A" (black with yellow tracer) is *not* connected to any part of the set. This lead and any other leads unconnected in the receiver, should be taped to prevent short circuits. Remove Radiotron from second audio stage of receiver.

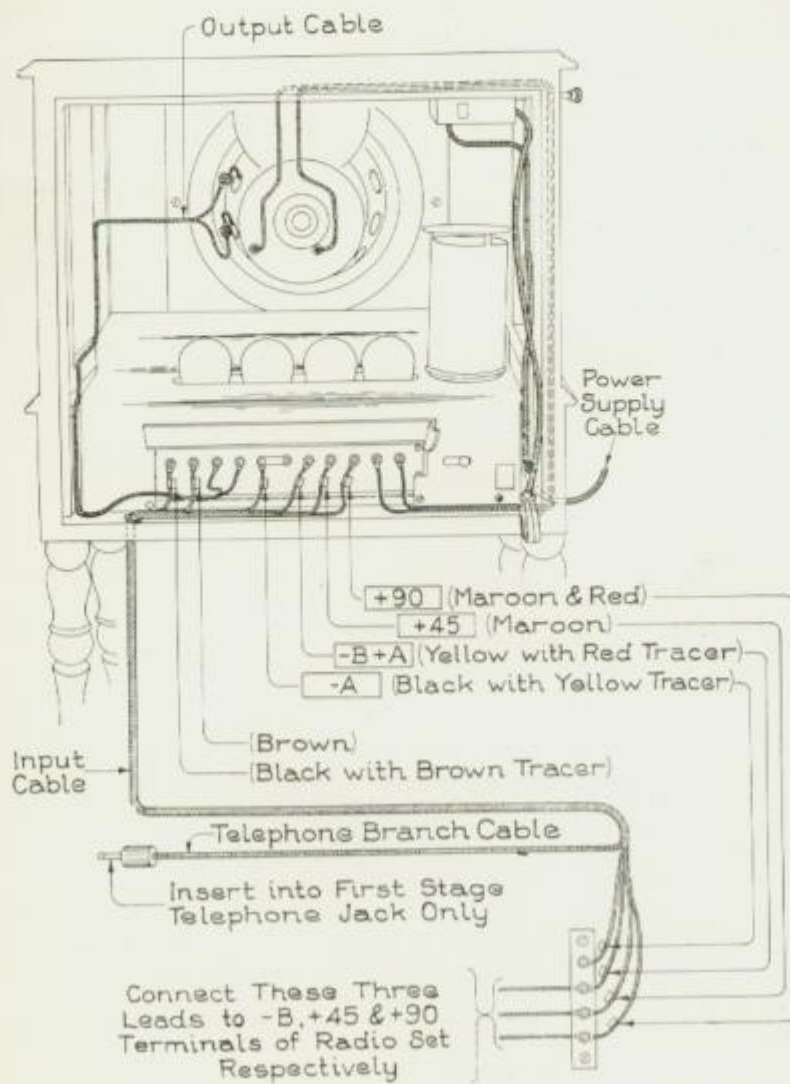


Fig. 10

OPERATION

It is desirable from the listener's viewpoint to locate Radiola 104 at a distance from the receiver, the Input Cable interconnecting the two units.

After all receiver connections have been made, push the attaching plug on the end of the Power Supply Cable (Fig. 7) into a lighting socket of proper rating—(105 to 125 volts, 60 cycles alternating current only).

Operate by pulling out the Safety Switch on the left rear corner (looking from front), and by operating the radio receiver in the normal manner. The telephone plug should always be connected in the first audio stage only, and the Radiotron in the second audio stage should be removed.

When finished with the set, push in both the Safety Switch on Radiola Loud Speaker, Model 104, and the Filament Switch on the receiver.

SECTION II

(Detailed Section)

INSTALLATION

Assembling Loud Speaker Unit. The first step in preparing Radiola Loud Speaker, Model 104, for operation is the assembly of the Loud Speaker Unit which comes clamped to the bottom of the packing case. Turn the cabinet upside down, taking care to prevent damage to the finish by setting it upon a rug, or carpet, or by spreading a blanket upon the floor. Fastened to the inside top of the cabinet will be found a mounting plate, from which project four bolts. Remove the nuts and the washers from these bolts.

Unpack the Loud Speaker Unit, and remove the wrapping paper carefully, preventing any dirt or other foreign matter from settling upon or entering the unit. In handling this unit, be careful not to damage the paper diaphragm.

Locate the unit in place as shown in Fig. 3, entering the four bolts into the holes in the base. Replace the four lock washers and nuts. Then push the unit forward, making a firm pressure between the front of the unit and the felt ring, and tighten the nuts.

Stand the cabinet on its legs, avoiding damage to the finish.

Inserting Radiotrons and Rectrons. All the Radiotrons and Rectrons should be handled with due care. Unpack and insert them in the following order, starting with the left-hand socket: One Radiotron UX-210, two Rectrons UX-216-B, one Radiotron UX-874 and one Radiotron UV-876. Radiotron UV-876 is screwed in place in the last socket. The other Radiotrons and Rectrons are pushed in place. It will be noticed that there is a bayonet pin on the side of the base. This bayonet pin should be pointed toward the front of the cabinet. Place the ventilating stack over the UV-876 Radiotron.

Connecting Rectifier-Power-Amplifier Unit. Open the hinged door of the Rectifier-Power-Amplifier Unit, Model AP-951, by removing the Safety Plug from the right-hand end of the unit, and pushing the Safety Knob to the right. This door cannot be opened until the two operations mentioned above are performed in order. (Nor can the Safety Plug be reinserted until the door is closed and the knob pushed to left.)

The Output Cable will be found inside the cabinet to the left, and connected on one end to the OUTPUT terminals of the terminal board. Connect the two wires on the other end of this cable to the terminals near the front of the Loud Speaker Unit. Two leads will be found coming out of the rear end of the Loud Speaker Unit. Connect these to the two terminals marked FIELD. Both of these pairs may be connected without regard to polarity. Make and keep all connections tight.

Now examine the other connections made at the terminal board, the two wires on the Output Cable, and the six on the Input cable. The proper connections are shown in Fig. 5. See that the leads are in their proper places and tight. Examine the FILAMENT link to see that it spans the fifth and sixth terminals (counting from the left), and that the binding screws are tight.

Closing Cabinet. After all the equipment has been installed, the hinged door of the Rectifier-Power-Amplifier should be closed. The Safety Knob is then pushed to the left, and the Safety Plug inserted in the opening thereby made.

The cabinet door is now replaced, making the bolt on the upper right corner enter the slot in the Safety Switch. The door is replaced by pushing the pins in the top up into the holes provided for them, and then snapping the door shut at the bottom. **DO NOT CONNECT THE POWER SUPPLY CABLE TO THE HOUSE LIGHTING CIRCUIT UNTIL RADIOLA 104 IS CONNECTED TO THE RECEIVER.**

Connection to the Receiver. There are two general methods of operating the Loud Speaker.

(1) When Radiola Loud Speaker supplies "B" battery voltage to the radio receiver, the former being operated from alternating current.

(2) When the receiver (either Radiola 25 or 28 Super-Heterodyne) and the Loud Speaker are operated entirely from alternating current.

The second condition is covered by the instructions accompanying the respective A.C. Packages, Models UP-971 and UP-972.

The method of making the connections for the first conditions depends upon the type of receiver. There are three types of connections, (a) for Radiola 25 Super-Heterodyne, (b) for Radiola 28 Super-Heterodyne, and (c) for other receivers, which are described on pages 12, 14, and 16, respectively.

In each of the latter conditions the Branch Telephone Cable is connected to the output of the first stage telephone jack by the most convenient method. If binding posts are installed, connect directly. If telephone jacks are installed, connect the cord to a telephone plug. Insert the plug in the first stage telephone jack, if two are used, or in the common jack, if one is used, in conjunction with a switch. Then set the switch for the first stage. This method of connection provides only "B" battery voltage.

OPERATION

The operation of Radiola Loud Speaker, Model 104, involves only the operation of the Safety Switch, as described on page 18.

POSSIBLE DIFFICULTIES

If the installation has been properly made, no trouble should be found in the operation. Should Radiola 104 become inoperative, examine for the following troubles:

(1) Look (but do not do otherwise) through the cane side of the cabinet to see if all five Radiotrons and Rectrons are lighted. Replace any which are unlighted.

(2) Disconnect the Power Supply Cable from the mains. Remove the Radiotron and Rectrons from their sockets. Examine them for dirty or poor contacts. Replace them in the Loud Speaker.

Should the trouble appear to be other than above, do not attempt further to locate it, but call in the dealer from whom the Loud Speaker was purchased.

NOTICE

The apparatus and devices which, or the use of which, are covered by patents, are sold only under certain specified licenses set forth in a notice attached permanently to the said apparatus and devices or if this is impracticable on account of size, then on tags or wrappers attached to the said apparatus and devices or on the cartons containing the same. This license notice is as follows:

"In connection with devices it sells, Radio Corporation of America has rights under patents, having claims: (a) on the devices themselves and (b) on combinations of the devices with other devices or elements, as, for example, in various circuits and hook-ups.

"The sale of this device carries a license under the patent claims of (a), but only for (1) talking machine uses, (2) radio amateur uses, (3) radio experimental uses and (4) radio broadcast reception; and only where no business features are involved.

"The sale does not carry a license under patent claims of (b) except only (1) for legitimate renewals and repairs in apparatus and systems already licensed for use under such patent claims on combinations, (2) for assembling by amateurs and experimenters, and not by others, with other licensed parts or devices, or with parts or devices made by themselves, but only for their own amateur and experimental radio uses where no business features are involved, and not for sale to or for use by others, and (3) for use with licensed talking machines and licensed radio broadcast receiving devices; and only where no business features are involved."

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