

Radiola Regenoflex

INTRODUCTION

The Radiola Regenoflex Receiver, using four WD-11 Radiotrons, is a complete radio receiving set with self-contained batteries mounted in an attractive mahogany cabinet and contains everything necessary for operation, except the loud speaker, antenna and ground connections and the necessary batteries. It is designed especially for broadcast reception and will tune to all frequencies between 1400 and 540 kilocycles (220 to 550 meters).

The circuit employed is the newly developed Regenoflex circuit, designed to eliminate radiation, that is, interference with a neighboring radio set, and also to give selectivity (the ability to select the station desired) unapproached by the usual antenna type of receiver.

The Radiola Regenoflex receiver embodies the following features:

1. Super selectivity.
2. Freedom from radiation.
3. Greater sensitivity so that distant stations may be heard.
4. Radio frequency amplification.
5. Sufficient amplification so that a loud speaker may be operated on signals from distant stations.
6. "Dual amplification" whereby one tube is made to amplify at both Radio and Audio frequencies.
7. Audio frequency amplification using the balanced or push-pull method with improved transformers, using a special alloy for the cores.
8. Regeneration.
9. Use of negative grid bias or "C" battery.
10. A lock to prevent unauthorized use of receiver.
11. All batteries self-contained.
12. The panel contains all necessary controls.

13. An unusually pleasing cabinet.
14. Dry cell operation, no storage battery required.
15. Improved quality of speech and musical reproduction (when a good loud speaker is used).
16. The panel may be tipped forward to give access to the Radiotrons or to adjust the antenna tap.

The appearance of the Radiola Regenoflex is such that it will be an article of furniture welcome in any living room and its capabilities as a musical instrument will prove it to be a never ending source of entertainment.

EQUIPMENT

The Radiola Regenoflex is supplied complete ready for operation with the exception of the loud speaker, antenna and batteries. Four WD-11 Radiotrons are required which, with reasonable care should last for approximately one year's use.

In addition there are required a suitable antenna, ground connection and "A", "B" and "C" batteries as follows:

(A) refers to Filament lighting or "A" battery.

(B) refers to Plate or "B" battery.

(C) refers to Negative grid bias or "C" battery.

(A) Six 1½ Volt Dry Cells, connected in Parallel, such as:

- 6 Burgess Radio "A" dry cells # 6 (2½ x 6) or,
- 6 Eveready dry cell radio "A" batteries # 7111 (without Fahnestock clips), (2½ x 6) or,
- 6 Manhattan Red Seal Dry Cells # 2445 (2½ x 6½) or,
- 6 Ray-O-Vac Radio "A" Dry Cells # 1211 (2½ x 6½) or,
- 6 Columbia Ignitor # 6 Dry Cells (2½ x 6½) or,
- 6 Ace Radio "A" Dry Cells # 61 (2½ x 6) or,

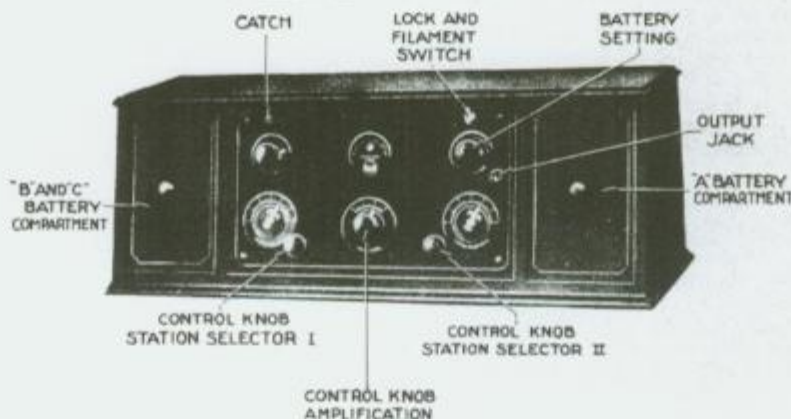


Fig. 1 Radiola Regenoflex

- 6 Du-al Radio "A" Dry Cells (General Duty) # 6 ($2\frac{1}{2} \times 6$), or equivalent.
- (B) **Four 22½ Volt Plate Batteries, connected in series, such as:**
 4 Burgess # 5156 Plate Batteries ($4\frac{1}{4} \times 2\frac{3}{8} \times 2\frac{3}{4}$) or,
 4 Eveready # 768 Plate Batteries ($4\frac{1}{8} \times 2\frac{3}{8} \times 2\frac{3}{4}$) or,
 4 French Ray-O-Vac # 5151 Plate Batteries ($4\frac{1}{4} \times 2\frac{3}{8} \times 2\frac{3}{4}$), or equivalent.
- (C) **One 4½ Volt Negative Grid Bias Battery, such as:**
 1 Eveready # 771 Negative Grid Bias Battery ($4 \times 3 \times 1\frac{3}{8}$) or,
 1 Ray-O-Vac # 231-R Negative Grid Bias Battery ($4 \times 3 \times 1\frac{3}{8}$) or,
 1 Burgess # 2370 Negative Grid Bias Battery ($4 \times 3 \times 1\frac{3}{8}$) or,
 1 Yale # 312 Negative Grid Bias Battery ($4 \times 3 \times 1\frac{3}{8}$) or,
 1 Bright Star B-34-17 Grid Bias Battery ($4 \times 3 \times 1\frac{3}{8}$) or,
 1 Novo # 288 Grid Bias Battery ($4 \times 3 \times 1\frac{3}{8}$), or equivalent.

INSTALLATION

Location—The Radiola Regenoflex should be placed as near as possible to the incoming lead from the aerial wire. A good ground such as a water pipe should be not far away.

If possible, place the Radiola Regenoflex in a fairly large room—one which does not have bare walls, as draperies, hangings, etc., will prevent accoustic reflections and help to make the entertainment more pleasing.

ANTENNA

Outdoor Type—In general, best results will be obtained with an outdoor antenna, from 75 to 150 feet long, including the lead-in wire and from 20 to 35 feet above the ground. If the suggested length and height cannot be secured, approach them as nearly as possible. So far as possible, it should be located in a space above the tops of surrounding buildings and trees. It should not be touched by any object except the antenna insulators. The same precautions apply to the lead-in wire which preferably should be a continuation of the antenna wire without any joints, and should run as directly as possible to the receiver. The antenna should be at right angles to all electric light, traction, power, telephone and telegraph wires and, if practicable, at least 15 feet distant from them.

Where an outdoor antenna is used, it should be protected from lightning by a suitable approved type of lightning arrester and the installation made in accordance with the National Electric Code Standards.

Outdoor aerials having a length up to 150 or 175 feet may be used since louder signals and greater distances can thus be covered. Proper volume control and selectivity will be obtained by adjustment of the "Volume Control" knob, regardless of the size of the antenna, provided the length does not exceed 175 feet (approximately).

Any normal antenna already installed may be used. If a new antenna is to be erected all necessary material and full directions will be found in the Radio Corporation of America Type AG-788 antenna package.

Indoor Type—For local reception, satisfactory results may be secured by using only 20 to 30 feet of ordinary double cotton covered bell wire (# 18 B & S) strung around the picture moulding. It may also be run the length of the attic.

Loop Type—A loop aerial connected across the antenna and ground binding posts can be used for nearby local reception.

Ground—A good ground is as necessary as a good antenna. Perhaps the best ground is a good electrical connection to a water pipe. If this is not convenient, a connection to the steam or hot water heating system will usually serve almost as well. Connections to gas pipes are not always successful and should be avoided. If nothing of this nature is available, a pipe or metal rod may be driven into the ground to a depth of several feet, preferably where the soil is moist.

The ground connection should be made with a ground clamp, the wire being soldered or held by clamping under a screw or nut. Be sure to scrape and clean the pipe thoroughly before attaching the ground clamp. Usually, connecting to more than one ground, for instance to both water and steam pipes, will improve reception.

CONNECTIONS

There are two binding posts at the bottom part of the cabinet near the middle of the back. One of these has a small plate with the letters "ANT". Connect the lead from the antenna side of the lightning arrester to the binding post. The other has a small plate with the letters "GND". Connect a wire from the ground clamp to this binding post. Make both leads as short as possible.

All batteries fit into compartments at either end of the cabinet. The compartment at the left is designed to hold the "B" and "C" batteries while the one at the right is intended to hold six dry cells. The little panels on the front of the cabinet may be easily removed by lifting upward and then pulling outward.

The "A" battery of six dry cells will fit into the compartment at the right as shown in figure 3. The cells should be placed in such a position that the outside or negative terminals form a vertical line. Remove all the thumb nuts. Find the black wire carrying the metal tag marked "-A" and with six lugs soldered to it. Place one lug over each of the outside binding posts, replace the thumb nuts on these posts and screw them down tightly. Then find the long yellow wire carrying the metal tag marked "+A" and with the six lugs soldered to it. Place one lug over each of the center binding posts beginning at the lower right cell and running up and over and down the left column as shown in figure 5. Replace the remaining thumb nuts and screw them down tightly. Replace the panel.

The "B" battery of four blocks is to be placed in the left compartment near the back. The blocks are to be laid on their sides in two rows as shown in figure 4. It will be necessary to make connections before the batteries are placed in the compartment. All four blocks are to be connected in series, that is, the positive of one to the negative of the next. Assuming that the intermediate size "B" batteries with lead and binding post are to be used, proceed as follows: Arrange four blocks as shown in figure 4. The one at the upper right we shall designate as #1. Among the leads coming from the center compartment

will be found one with a brown braid and carrying a metal tag marked "-B". Connect this to the negative or "-" terminal of block #1. Then connect the positive or "+" lead from block #1 to the negative terminal of block #2. To this same binding post connect the orange lead carrying a metal tag marked "+20 B". Then connect the positive lead from block #2 to the negative terminal of block #3 and the positive lead of block #3 to the negative terminal of block #4. Finally connect the red cable lead to the positive lead of block #4. Now place the blocks in the compartment. #3 goes at the bottom at the back with #4 on top of it, the blocks lying on their sides. The other two blocks go in front with #2 on the bottom and #1 on top. If the batteries used are not of the type described, use short pieces of insulated wire to make the connections between blocks. When the wire is clamped under terminals, see that the copper conductor is clean and bright. All connections must be clean and tight or there will be noises.

The "C" battery is to be placed directly in front of the "B" batteries in the compartment at the left. Find the black cable lead with the tag marked "+C" and connect it to the battery terminal marked "+". Then connect the green cable lead with tag marked "-C" to the terminal marked "-4-1/2".

To place the Radiotrons in the set, tip the operating panel forward. In the upper right corner of the panel is a combination lock and switch. This in the locked position opens the filament battery circuit and prevents the panel from being tipped forward. Insert the key and turn it to the right. In the upper left corner there is also a small catch with a gold knob. Turn this also to the right, and then pull. The panel will tip forward leaving a clear space of about three inches at the top. Remove four new WD-11 Radiotrons from their cartons and insert them in the sockets provided in the tube mounting board directly in back of the panel. The sockets are arranged so that the large pin in the base of the Radiotron will be toward the panel. Be sure that the control marked "Battery Setting" has been turned as far to the left as possible before the Radiotrons are inserted. Then while the panel is still in the forward position turn the "Battery Setting" to the right until the pointer reaches the mark diagonally upward to the right. Look down into each of the Radiotrons and make sure that the filaments of all four glow at a dull red color. Then tip the panel back into normal position and turn up the catch at the left.

A jack is provided at the extreme right of the panel a little above the center. The loud speaker must be equipped with a telephone plug which is to be inserted in the jack when the loud speaker is to be used. In a few instances, it may be desirable to use a telephone headset plugged into the same place, but ordinarily, the signals will be uncomfortably loud.

OPERATION

Controls

Volume Control—The control so marked serves to regulate the transfer of energy between the two tuning circuits. Thus it regulates the strength of the signal. It also governs the selectivity of the set, that is, the farther the "Volume Control" is turned toward the left, the more easily can various stations be separated.

Battery Setting—The control so marked serves to turn on and regulates the current to the filaments of the Radiotrons. When the set is not in use, either the lock directly above this control should be in the locked position with the key vertical, or else the pointer of the "Battery Setting" should be turned as far to the left as possible. When it is desired to operate the set, unlock it and then turn the "Battery Setting" pointer until it rests on the mark diagonally upward to the right. With new dry cells in the "A" battery, this adjustment will give the proper current through the filaments. As the cells become old, it will be necessary to turn the "Battery Setting" still further to the right. The filaments should always glow at a dull red color, and should never be burned brighter than necessary to obtain signals. They may be examined at any time by tipping the panel forward.

Station Selector I—The control so marked serves to adjust the antenna tuning circuit so that it will respond to the desired wave length.

Amplification—The control so marked adjusts the regeneration, and thereby regulates the sensitivity and the selectivity of the set.

Station Selector II—The control so marked adjusts the secondary tuning circuit so that it will respond to the desired wave length.

Finding Signals

Turn the "Volume Control" until the pointer extends horizontally to the right.

Turn "Battery Setting" until the pointer rests on the mark previously described, which shows proper position when batteries are new.

Turn "Amplification" until a breathing sound is heard. This should occur when the pointer reaches "2.5" or a little before.

Turn both "Station Selector I" and "Station Selector II" from one end of the scale to the other keeping them at approximately the same reading all the time. GO SLOWLY and listen carefully. A squeal or whistle will be heard when the set is tuned to a station that is operating. When the whistle is heard, turn "Station Selector II" until the whistle assumes a very low pitch. Then turn "Station Selector I" until the whistle becomes loudest. Finally turn "Amplification" to the left just enough to stop the whistle when the speech or music should be heard clearly. A slight readjustment of "Station Selector II" may be necessary for best results. Of course, it may happen that a station is found between numbers of its program. Therefore, if nothing is heard at the conclusion of the above process, wait a minute or so. Do not wait too long before adjusting "Station Selector II". A whistle may also be produced by an improperly operated receiving set nearby but such a whistle seldom remains constant.

A little experience in making the adjustments will be necessary before stations can be found easily and quickly. This receiver is capable of receiving over great distances, and such operation will be secured if the controls are properly manipulated. Care in adjustment of "Station Selector II" and "Amplification" is particularly important.

It will be found that there is a definite relation between the two station selectors, for example, when "Station Selector II" is set on "3.0", "Station Selector I" should be nearly "3.0" when

both are tuned to the same wavelength. It may happen that this agreement will not be very good in which case "Station Selector I" will reach one end or the other of the scale before "Station Selector II" thus making it impossible to tune both selectors accurately over the whole wavelength range. To remedy this trouble, tip the panel forward. At the extreme left is a coil wound on a micarta tube. At the top of the tube are four socket contacts, in one of which is inserted a lead from the antenna. Remove this and attach it to one of the other binding posts. One can be found where the agreement between the two station selectors will be quite close. In short, this adjustment is a means for adjusting the receiver to fit any antenna closely.

It is often convenient to have a record of the adjustments for various stations. The setting of "Station Selector I" and "Station Selector II" should be recorded for each station heard. Then when it is desired to hear that particular station, set the "Station Selectors" at the right points, adjust the "Amplification" and the station should be heard if it is operating.

When receiving from nearby stations, it may happen that the volume will be greater than is desired. Do not attempt to decrease the volume by turning back the "Battery Setting" as that will spoil the quality. Turn back the "Volume Control" until the signal strength has been reduced as much as is desired. Selectivity or the ability to pick a desired station out of interference, depends to a degree upon the setting of "Volume Control". The receiver is much more selective when this control is turned to the left. It is often desirable to operate with this control almost to the left limit. Careful adjustment will give almost as loud signals as when the "Volume Control" is at the extreme right.

MAINTENANCE

Radiotrons—When not mistreated, the Radiotrons will last for many months. Occasionally one will become inoperative on account of a broken filament or otherwise. It should be replaced by a new one of the same type.

If it becomes necessary to operate with only three Radiotrons, it may be done by leaving the socket at the extreme right empty.

Filament or "A" Battery—When the dry cells used for this purpose become discharged to the point where they will no longer heat the filaments to the proper brilliancy, they should be replaced by new ones.

Plate or "B" Battery—The "B" battery should last for several months. When signals become weak with the filaments burning properly or operation becomes noisy, the "B" batteries should be replaced by new ones. If a voltmeter (preferably of the high resistance type) is available, the batteries may be tested. They should be discarded when the voltage has dropped to 17.

Bias or "C" Battery—It is difficult to tell when this battery is exhausted except by measurement of its voltage with a voltmeter. The safe plan is to renew it whenever the "B" battery is replaced.

SPECIFICATIONS

Cabinet—The cabinet is finely made of solid mahogany. It is finished in dark brown mahogany and given a high polish.

Panel—The panel is moulded from a phenolic condensation product. The divisions and lettering are filled with a gold-colored material.

Variable Condensers—The variable condensers are especially smooth running. They are driven by a friction disc giving a slower motion to permit accurate tuning.

Fixed Condensers—The fixed condensers are of two types both specially designed for their uses.

Antenna Circuit Coils—The antenna circuit coils are wound on micarta tubing and are carefully impregnated and baked. They will retain their high efficiency indefinitely.

Secondary Circuit Coils—The secondary circuit coils are of an improved design which is so arranged as to require only very small space.

Radiotron Sockets—The Radiotron sockets are of the well-known sliding contact type that insure a positive connection to the Radiotrons. The Radiotron board is flexibly mounted on rubber to eliminate mechanical noises.

Transformers—The audio transformers use a special alloy material for the cores. This produces much better amplification at low frequencies than has been had in any previously used transformers.

Jack—The jack is of special design to keep all metallic parts from the front of the panel.

Radiotrons—The radiotrons are type WD-11. They have been redesigned with small bulbs and moulded bases to occupy less space, but their operating characteristics are identical with former types.

Circuit—The circuit employed is the newly developed "REGENOFLEX" circuit which eliminates radiation and gives excellent selectivity.

The REGENOFLEX circuit combines radio frequency amplification, regeneration, dual amplification and freedom from radiation. Also the last stage of audio amplification is of the balanced, or push-pull type, which improves the quality of reproduction and permits the use of greater loudness of signals.

A total of four Radiotrons are used therefore, which are equivalent in performance to the usual five tube set.

All Radiotrons are properly biased by the use of suitable grid or "C" Battery, which is an essential to good quality reproduction and which greatly increases the life of Radiotrons and plate batteries.

The stage of radio frequency amplification is balanced so that it can not oscillate and therefore this set can not radiate and cause interference to other nearby receivers. Radio frequency amplification and regeneration make this set especially sensitive while the two tuned circuits plus regeneration make it selective.

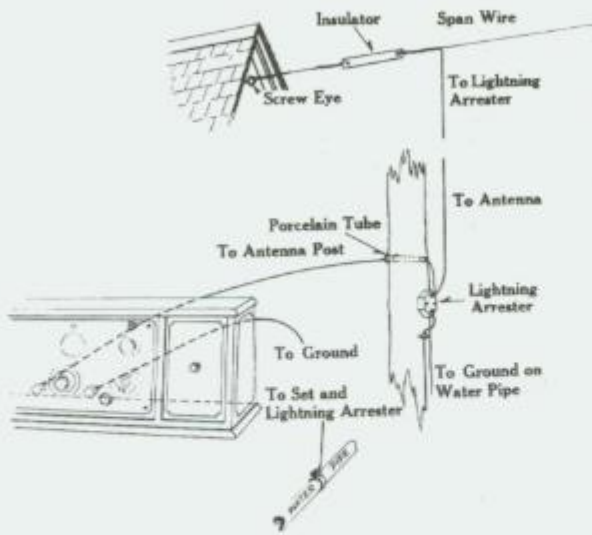


Fig. 2—Showing Connections to Antenna, Ground and Lightning Arrester

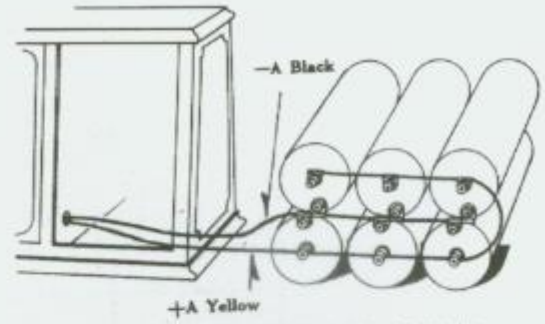


Fig. 3—Showing Method of Connecting A Batteries

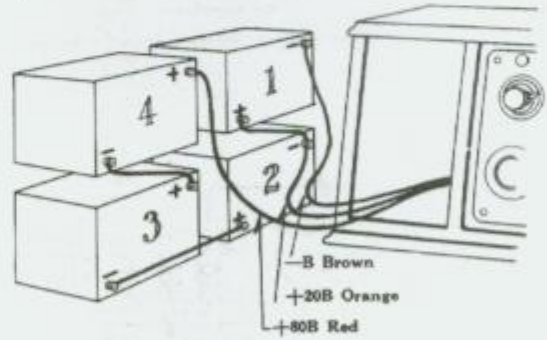


Fig. 4—Showing Method of Connecting B Batteries

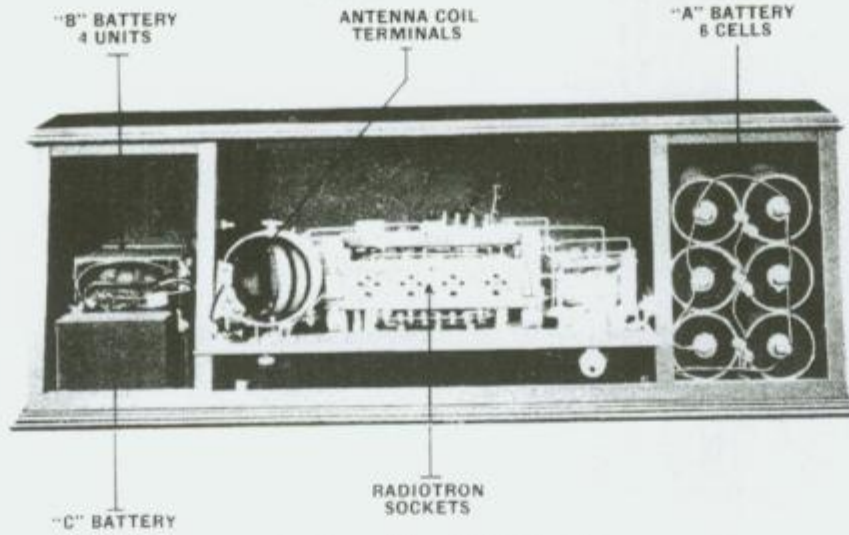
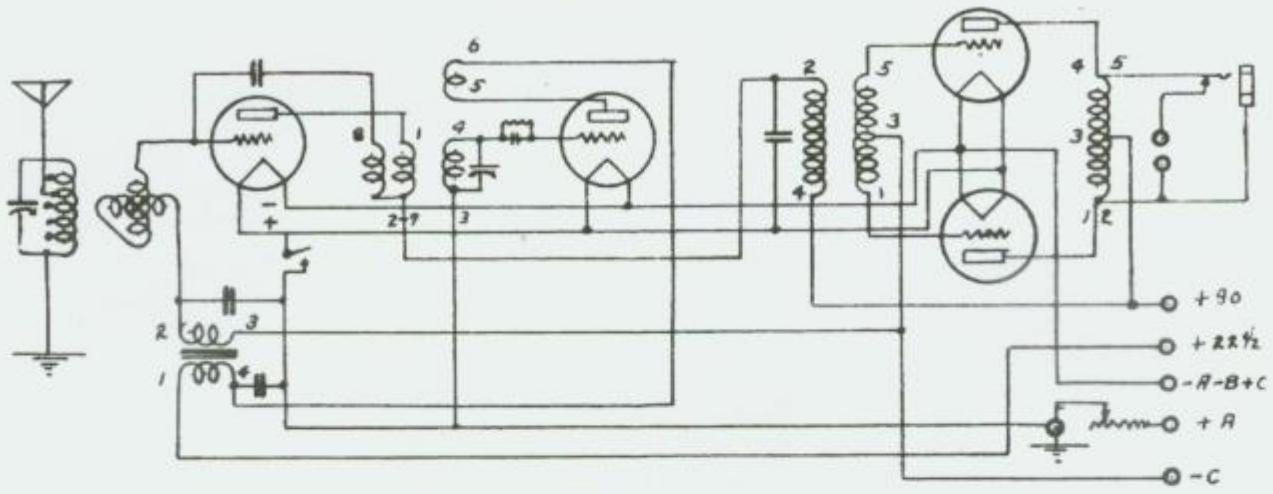
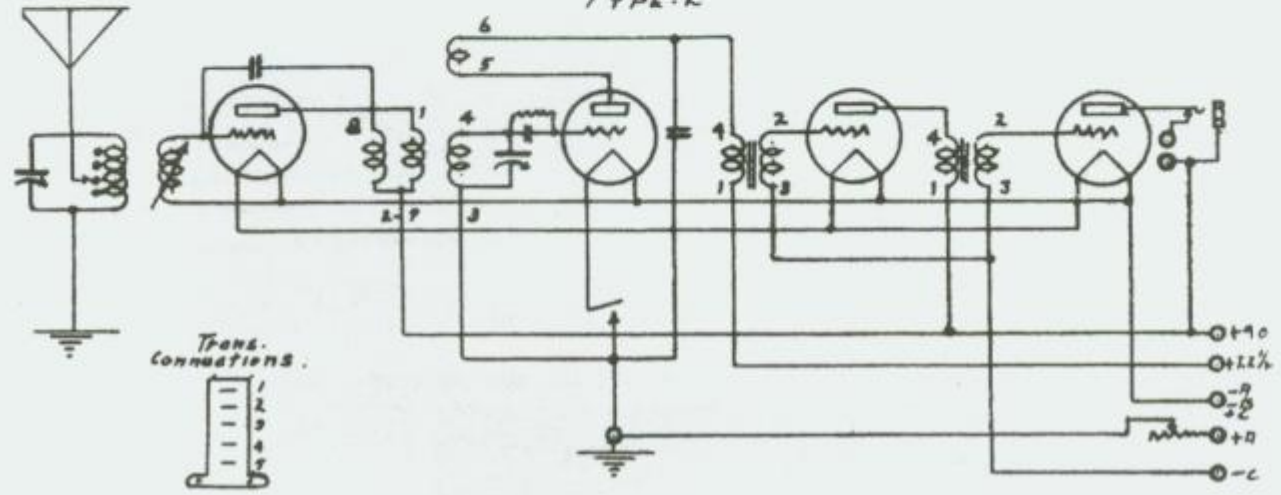


Fig. 5 Internal View of Radiola Regentflex

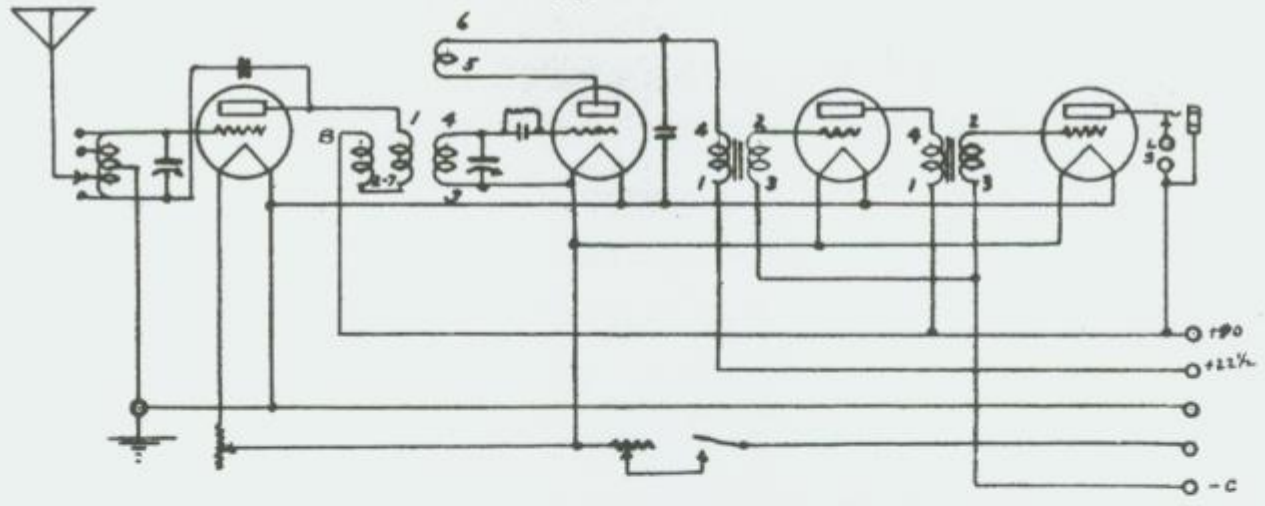
TYPE-1



TYPE-2



TYPE-3



SCHEMATIC DIAGRAMS FOR R-X AND REGENOFLEX

