

## Storage Battery Rectifier and Charger Saves Time and Money

Control Panel Which Can Be Made by Experimenter  
Described by Engineer Who Also Explains Tube,  
Vibrating Contact and Chemical Rectifiers

BY LESLIE G. BILES.

To obtain highest efficiency from a radio receiver all batteries must be kept in good operating condition. Partially discharged or worn out batteries are a sure source of trouble. Loss of volume, crackling noises and distortion are frequently caused by operating the receiver when batteries are partially discharged.

If dry cells are used, it is advisable to have a good combination meter, with scales reading from 0 to 34 amperes and 0 to 50 volts, to determine the condition of the batteries. A meter of this type is not very expensive and is really invaluable.

"A" cells should be discarded after they have fallen to about 18 amperes and the "B" batteries should not be used after

market, but they may be divided into three chief classes: "Tube" rectifiers, mechanical or "vibrating contact" rectifiers, and "chemical" rectifiers.

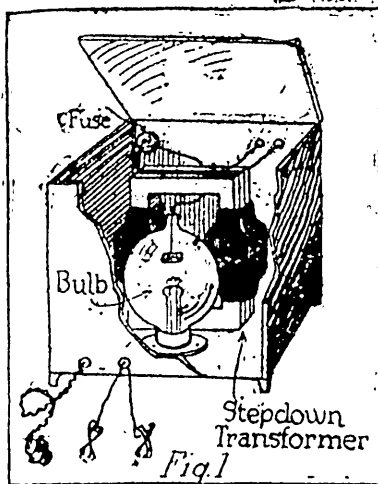
The bulb used in the rectifier shown in Fig. 1 is gas-filled and contains a hot and cold electrode. The cathode consists of a small spiral tungsten wire filament, while the anode is a graphite disc of relatively large cross section. See Fig. 3. The bulb is filled with argon gas, which facilitates the electron current flow.

Fig. 1A is the schematic diagram of this type of charger. It consists simply of a gas-filled tube, a fuse and an autotransformer which steps down the A. C. line voltage. A small portion of the transformer is tapped off and directly connected to the filament terminals of the tube, supplying the proper amount of current to heat the filament.

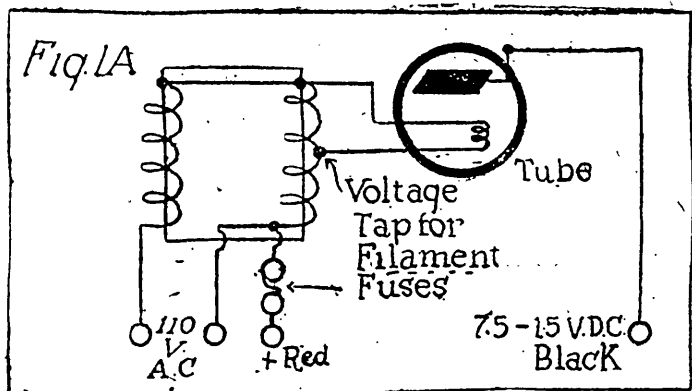
The theory of the bulb rectifier is somewhat similar to that of the vacuum tube. The filament is heated to incandescence and during the positive half of the cycle, the electrons emitted from the filament are attracted to the positively charged plate, thus causing current to flow, while on the other half of the cycle, when the plate is negative, any electrons that are emitted are repelled and driven back to the filament so that no current flows.

In other words, one half of the cycle is then and thus cut off, as shown in Fig. 5. The top curve is that of the A. C. wave as applied to the rectifier, while the lower curve in the same illustration is that of the pulsating direct current, after half-wave rectification. It will be noticed that only one-half of the cycle is used. Thus current, although pulsating, flows constantly in the same direction and is therefore entirely satisfactory for charging batteries.

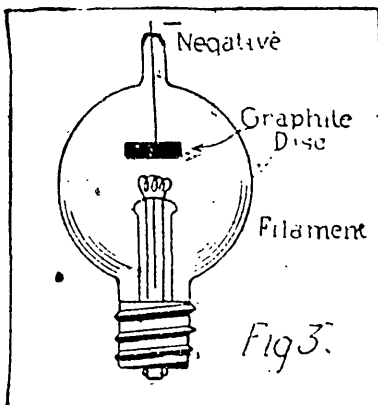
This type charger is a half-wave rectifier, in fact the half-wave rectifier is the type most commonly used. Half-wave



Tube Rectifier



Schematic Diagram of Tube Rectifier



Bulb-in Tube Rectifier

they show a depreciation of 20 per cent. from their original rating.

When storage batteries are used it is necessary to have some means of recharging the battery. It is mighty inconvenient, to say nothing of the cost involved, to have to send your battery out to have it charged. This, however, is necessary if you use a stronger battery and do not have a charger. Of course, to operate a charger your home must be wired for electricity.

If your home is wired for electric light service and the current supply is D. C. (direct current), it is a very simple matter to recharge the battery. In this case, all that is necessary is to supply the house current to the battery, having a high resistance (usually an ordinary electric light bulb) in series with the line, to cut down the charging current to the value designated by the battery maker.

Direct current, however, is usually only supplied to homes in the immediate vicinity of a power station. Alternating currents are used for transmission of power to distant points for purely economic reasons. Alternating currents (abbreviated to A. C.) may have the voltage stepped up or stepped down with comparative ease with the use of transformers.

It is not feasible to attempt this when using D. C. current. The important consideration in transporting electrical energy to a distance is the amount of power that is necessarily lost, which, for obvious reasons, should be kept at a minimum.

The power lost depends upon the resistance of the wire and the square of the current which flows. To decrease the resistance of the wire means a large carrying surface is necessary. This involves a great expenditure of money. To reduce the current, therefore, is the most logical procedure. But upon reducing the current the voltage must be increased, or otherwise the same amount of power could not be transported.

Alternating current is sent out by the power plant at a high potential but low current, and is then stepped down by means of transformers to the current voltage for individual use.

Alternating current cannot be used in places where a steady and uniform current is required, because each reversal of the current through the battery would cause a reversal of chemical reaction, which would prevent the battery from becoming recharged. It therefore becomes necessary to change the A. C. to D. C., and for this purpose we use what is known as a "rectifier," as it "rectifies" that is, changes the current.

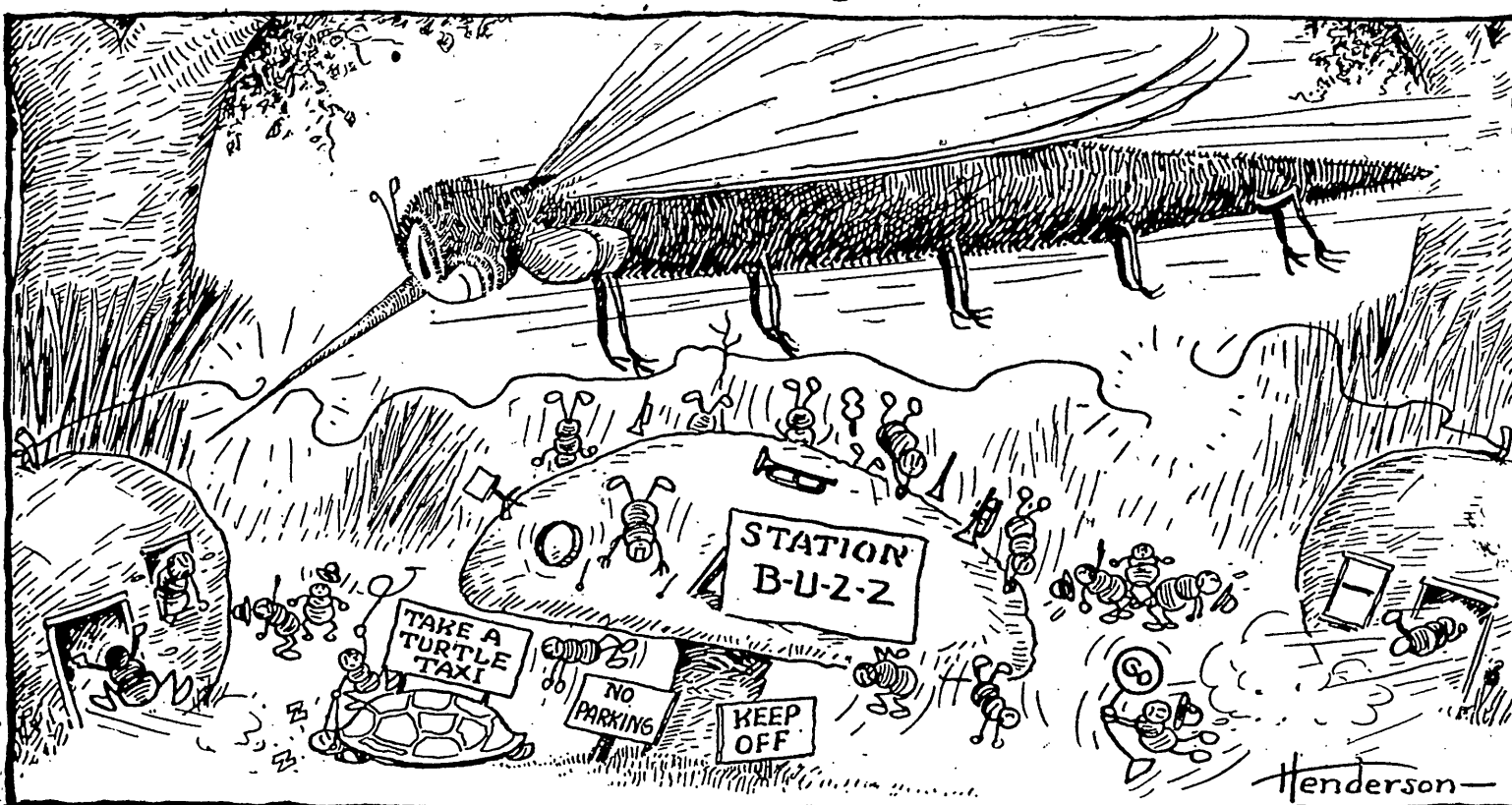
Various types of rectifiers are on the

rectification does not necessarily mean that the efficiency of the charger is low. On the half cycle, when no plate current is flowing, no energy is being drawn from the line other than that required to heat the filament and excite the transformer, which, in commercial charges, is very low.

Bulb rectifiers are generally supplied in two sizes, the two-ampere and the five-ampere sizes. The ampere-hour capacity of the battery and the rate of discharge should determine the size charger to be used.

Continued on Page Two

## Radio Bugs



The Big Dirigible Passing Over Buggville Spoils the Evening Concert From Station BUZZ

## Vagrant Waves of Interest to Fans

A single coil set cannot cut out interference as does a two-circuit set.

A great many parts of your set may be bought cheaper than you can build them at home.

To get best results with a one-tube set, use a high and long aerial.

If you want to do good soldering, clean the parts thoroughly and don't use too much soldering compound.

A long crystal detector will not cover the distance an audion will.

Grid leaks are not used with crystal detector sets.

By connecting the grid return to the negative side of the "B" battery rather than to the negative terminal on the socket, the normal steady value of the grid potential is not zero, but is negative to the extent of the voltage drop.

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Will Keep Missions in Touch  
with Outside World

Seven Receivers Manufactured in  
United States Sent to Grenfell  
Outposts Where They Will Be Set  
Up by American Radio Relay  
League Official

After the experience of many months of dependence on dog sledges and small vessels to keep him in contact with the outside world, Wilfred T. Grenfell, the "Labrador doctor," whose work in behalf of the natives and fishermen has received worldwide recognition, will now have the opportunity of trying out the value of radio in the many hospitals scattered through Labrador and Newfoundland.

Dr. Grenfell is hopeful that all his missions will be equipped with the latest marvel of science, to bring to the dreary outposts the finest music and educational facilities.

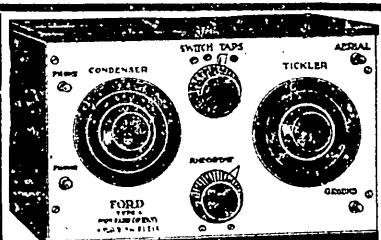
Seven complete receiving sets of the finest grade, entirely the product of American manufacturers, are to be installed in the Grenfell missions this fall by C. A. Service, assistant secretary of

the American Radio Relay League, who was assigned the work by the Grenfell Association.

Much of the inspiration in behalf of the project has been furnished by Eldon Macleod of Dorchester Centre, and associated for some time in the work of the New England Grenfell Association.

The assistance of the American Radio Relay League was requested for the purpose of selecting the equipment and allowing its assistant secretary the necessary leave of absence in which to undertake the installing of the sets. He will also investigate the power facilities of the missions in order to determine whether it will be possible to install amateur telegraph transmitters for intercommunication.

The need for a special radio service of this kind was made evident when, in the middle of winter, fire destroyed one of the hospitals, and the facilities were such that it was found impossible to get any word to the outside world for two months. The survivors were compelled to depend on dog teams to reach their ultimate destination, and the task forms one of the interesting annals of the Grenfell Association.



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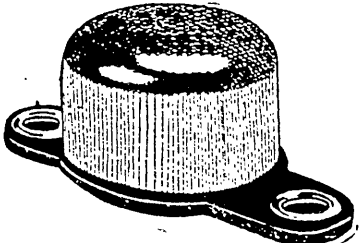
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## BATTERY CHARGER SAVES EXPENSE

Continued from Page One

selected. If the storage battery is a small one, about 60 ampere hours, the two-ampere charger will be sufficient. For larger batteries, and especially where multi-tube sets with their resulting high current drain are used, the larger size charger is preferable. The larger size will of course charge the battery in a much shorter period of time.

For example, let us assume that we have a battery of 100 ampere-hour capacity which is one-half discharged. A five-ampere charger will require about 11 hours to fully recharge the battery, while a two-ampere charger would require about 26 or 27 hours to recharge.

On the other hand, a battery of 100 ampere-hour capacity, used with three one-quarter-ampere tubes, would not be subject to a very high discharge rate, and in this case the smaller charger, if used once or twice a week, would be entirely satisfactory.

When charging the battery it is advisable to have some method of disconnecting the battery from the receiver. The reason for this is that one side of the A. C. line is generally "grounded" and one side of the "A" battery line to the receiver is also grounded. It may happen that a direct short circuit will occur, which would blow out the fuses in the A. C. line or may cause damage to the receiver or charger.

When the line current is shut off the battery, if used with a bulb charger, is automatically disconnected and cannot discharge through the charging apparatus. But if the vibrating charger is used it may be necessary to disconnect the charger from the battery.

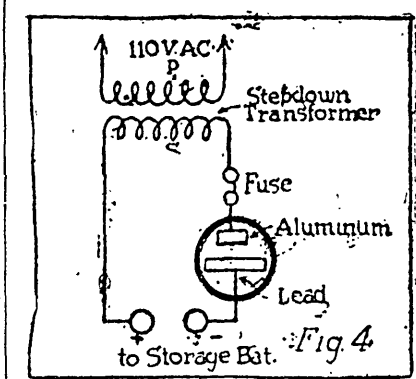
The mechanical or vibrating contact rectifier, shown in Figs. 2 and 2A, consists essentially of a step-down transformer with an electro-magnet, an adjustable carbon block contact, a vibrating armature with metallic contact of copper, silver, platinum or similar metal and an ammeter and a fuse.

The transformer reduces the A. C. line voltage to the value necessary to charge the battery. Most chargers of this type are so arranged that the contacts close on one half of the cycle and open on the other half. The charging circuit closes at the instant the A. C. voltage from the

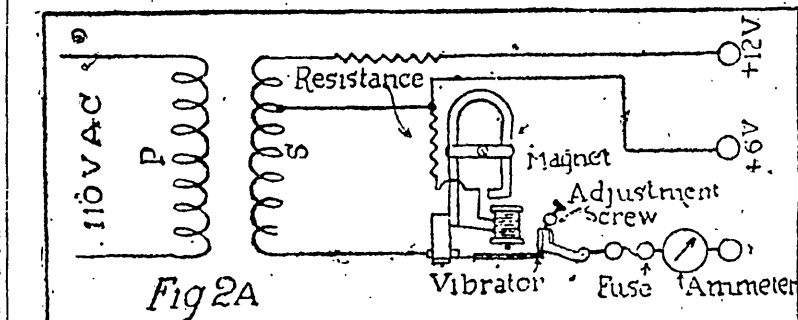
step-down transformer to reduce the A. C. line voltage, and a cell or number of cells containing two dissimilar metals immersed in a solution of aluminum phosphate, dilute sulphuric acid or saturated solution of borax.

The action of this rectifier depends on what is known as the "valve action" of metals like aluminum or tantalum, one of which is generally used as the positive electrode, with lead or a similar metal as the negative electrode. When aluminum or tantalum is immersed in an acidulated solution, as mentioned above, either exhibits a property somewhat similar to a crystal, that of unilateral conductivity, that is, it will pass current in one direction but not in the opposite direction.

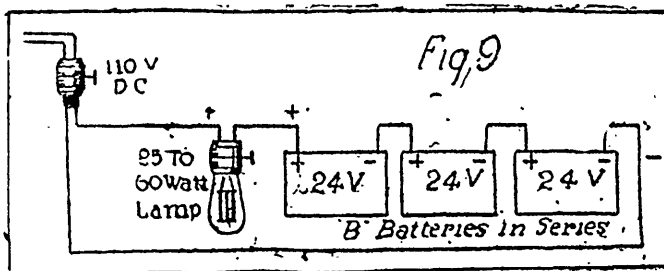
When the aluminum plate is positive a large number of small bubbles of oxygen gas form around the aluminum plate, which then acts as a valve, preventing the flow of electricity. When the lead elec-



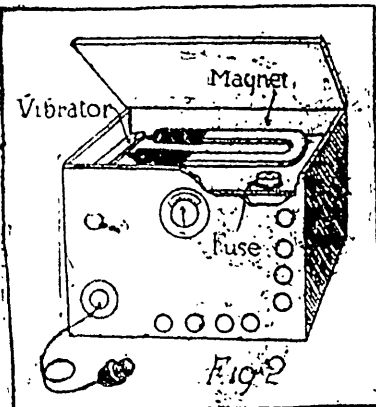
Chemical Rectifier



Schematic Diagram of Vibrating Rectifier



Charging From Direct Current



Vibrating Rectifier

transformer secondary rises to the value of the battery voltage. The circuit is also closed at the instant the charging voltage falls to the battery voltage during the same half-cycle.

If the position of the contacts is properly adjusted by the adjusting screws, the vibrating contacts are timed to synchronize (keep in step) with the frequency of the charging alternating current, and the battery will receive a pulsating direct current.

The alternating current supplied by nearly all power companies is 60 cycle A. C., that is, there are 60 complete alternations in the current each second of time, therefore, the contacts "make and break" 60 times per second.

Many of the vibrating rectifiers have the secondary of the transformer tapped so as to permit charging of various size A batteries, charging either two, four, six or 12-volt batteries. Some rectifiers utilize the complete winding of a large secondary coil and have a number of resistances connected in series to regulate the charging current flow, so that from one to four 24-volt B batteries in parallel may be charged. If one B battery is to be charged, three resistances are in series with the line; if four are to be charged, the resistances are cut out by means of a switch.

The electrolyte or chemical rectifier is shown in Fig. 4.—Like the two preceding rectifiers, this type also makes use of a

mild acid known, is to be preferred to the sulphuric acid, because when the rectifier is not in use the sulphuric acid solution will attack the aluminum, while the other will not.

Rectifier cells of this type (used with a step-up instead of a step-down transformer) are commonly used by radio amateurs for obtaining high voltage direct current plate supply in a transmitting set.

Many of the objectionable features of home charging, that of having to disconnect the receiver from the battery or having to move the battery to another part of the house for connection to the charger can be eliminated by the use of a charging panel.

A charging panel may be a simple arrangement, or an elaborate and attractive instrument-board. The selection of the type panel to be used will, of course, depend upon the use to which it is to be put.

The panel discussed here not only serves as a handy method of switching either "A" or "B" storage batteries from the

receiver to the chargers, but also provides a means of keeping an accurate check on the battery condition, the charging rate of both batteries and the discharging rate of the "A" battery.

The materials necessary for a panel of this type are as follows:

One bakelite panel, 12 by 20 inches.  
Two unmounted DPST baby knife switches.  
One unmounted DPDT baby knife switch.  
One unmounted 4PDT baby knife switch.  
Two three-ampere automobile cartridge fuses, with mounting clips.  
One flush type push-button.  
Seven Eby binding-posts.  
One Hubbell flush receptacle.  
One Hubbell flush receptacle with plug and cap.

One D. C. voltmeter, scale 0 to 120 volts, flush type.  
One D. C. ammeter, zero centre, scale 5 to 0 to 5 amperes, flush type.  
One hot-wire ammeter, scale 0 to 1.0 amperes, flush type.  
One 100-watt electric light bulb.

If unable to obtain the four-pole double throw, two DPDT baby switches, unmounted, will answer the purpose. In this case it will be necessary to remove the handle from each switch, and then connect the two sets of blades together with a strip of bakelite.

In laying out the panel, the flush type lamp receptacle is placed in the top centre of the panel. Immediately below the receptacle are placed the two meters, the "A" battery ammeter at the left and the "B" battery ammeter at the right.

How Charging Panel is Wired

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A highly efficient condenser. 75c  
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with a space of 5 1/2 inches between centres of the meters.

Just below the ammeters and in line with the lamp receptacle is the correct location for the "B" battery voltmeter. The push button, used for closing the circuit to determine the "B" battery voltage, is placed 1 1/2 inches below the voltmeter.

The exact location for the switches will, of course, depend upon the size of the switches used, which should be as small as possible, but under no consideration should the small anti-capacity or jack switches, as used in radio receivers, be used. Use small but good quality baby knife switches.

The double-pole, double-throw switches are placed in the centre of the panel, with the "A" battery switch placed about two inches below the push-button.

To the left of the double-pole double-throw switches is placed the flush receptacle and plug for connecting the A. C. line and the A. C. line switches for connection to either "A" or "B" battery. The receiving set are placed at the right of the panel and in line with battery chargers.

The binding posts for connecting to the receiving set are to the right of the battery switches.

In order to avoid any errors, let us follow through the wiring, line for line. Connect a wire from the top terminal of the switch "charge A" to the top terminal of the "charge B" switch, and thence to one side of the flush receptacle. Connect together the remaining terminals of each switch and then to the other terminal of the receptacle.

From the "charge A" switch connect

to the "input" of the "A" battery rectifier. The negative side of the charger is connected to the top terminal of the DPDT switch, and the positive lead is connected to the bottom terminal.

The top centre terminal of the DPDT switch is connected to one side of the ammeter (5-0-5 ampere). A flexible lead

Continued on Page Three

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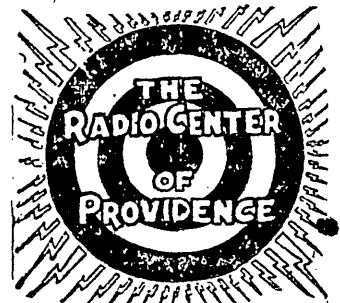
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Four-Tube Reflex. This Model is Entirely Self-Contained, with Built-In Speaker and Batteries. Complete \$161.20

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Great Advance Made with Advent  
of Wireless Telephone.

Constructing Apparatus and Maintaining Stations Requires Services of 250,000 People, According to Estimates—Trained Men Needed in Industry.

By E. L. DEGENER.

Only a few years ago a radio enthusiast was looked upon as some sort of a wizard. Radio sets were few and far between and the man on the street did not know anything about radio except that it was very wonderful.

The radio field was limited and only a small number were interested in radio communication. Learning the code was, of course, essential if one was to get any enjoyment out of the radio game, for at that time the transmission of the voice had not yet been perfected.

The wireless law of 1912 was a regulation that made it necessary for certain types of vessels to have wireless equipment. Men were needed for both ship and station. The position of operator on a ship was an attractive one and appealed to the spirit of adventure in the young men.

The ranks of the commercial operators have remained about the same in number for several years. The amateur ranks, however, increase yearly. Indeed, it takes a certain amount of time to learn the code and it is not surprising that a few years ago the radio enthusiasts numbered only 15,000.

It used to be that the manufacture and distribution of radio supplies was handled entirely by the radio manufacturers and commercial companies. Radio was then an infant industry and no doubt would have remained small had it not been for the advent of the radio telephone. The radio telephone came into prominence when it was found that vacuum tubes could be used as generators of high frequency currents. Other methods of telephony had been tried, but not successfully until the tubes were used.

It is one thing to have to learn the code to enjoy wireless communication and entirely another thing to listen to music. Any contrivance which would bring entertainment from the outside world into the home at a small cost was bound to sooner or later be popular. The demand for receiving sets today has made it possible for a great number of people to make their living from radio.

Today, it is estimated that there are 250,000 people actively engaged in radio work—making their living from it. There are thousands of radio dealers, who in the days of the radio amateur virtually all selling was done by mail. There must be to-day approximately 1000 concerns engaged in the manufacture of radio sets or parts of sets, while a few years ago there were only a small number. And to-day we have approximately 600 broadcasting stations, some of them costing as high as a quarter of a million dollars.

Taking into consideration the rapid expansion which the above figures reveal, naturally one is interested in knowing what class, sex and nationality of people are turning to radio as a career. While the radio boom first started with the inauguration of broadcasting through the first broadcasting station now so famous, the great majority of people whose interests were turned to radio as a means of making a living, average from 17 to 25 years of age.

During the past few years men of more mature age and judgment have become attracted to this field. Everyone knows that dozens upon dozens of electrical engineers have turned from electricity to radio, as a career—probably due to the fact that so many large electrical manufacturing concerns and electrical dealers took up radio work so promptly.

A large number of students around the ages of 30 to 40 are enrolling for radio course, which would certainly indicate that these men have come to the conclusion that radio is now a stable industry and, looking back through the past years they realize that although they may have overlooked the chance to get in on the ground floor of some of our other industries, such as the automobile, motion picture, etc.—they are not going to let this opportunity get away. In fact, some men as old as 72 have been enrolled. The average, however, is from 21 to 40.

Radio is no longer a children's game as it was one time thought to be. That period, of course, was during the early days of the radio amateur. With approximately \$100,000,000 being spent annually

## To-day's Hook-Up



His Mental State While Trying to Decide Which Hook-Up to Use

on radio equipment, one does not need a highly developed imagination to realize that there must be some excellent paying positions in radio—the new industry of this decade. About four years ago the only branch of employment was operating one board ship. To-day there are many other fields.

Constructing, operating and maintaining the broadcasting stations alone requires no small number of trained men. Hundreds of newspapers and magazines are maintaining radio sections which require trained men to conduct their technical columns. The manufacturing companies to-day engaged in radio employ a large number of technically trained radio men in various capacities, from the point of experimenting and developing new apparatus to that of testing the finished product prior to shipment.

Although the great radio audience of the United States estimated at approximately 15,000,000 people is becoming better and better educated in the science of radio through the information distributed by newspapers and magazines and many radio books now on the market, the leading radio dealers are seeing the advantage of having men in their employ who have specialized in radio—who understand all types of receiving apparatus and who are thoroughly versed in this new science in every respect.

Women, as yet have not turned to radio in any appreciable numbers. Less than one-half of 1 per cent. of our students are women.

To what extent radio will develop and expand in the next few years is a matter of conjecture, but it is safe to assume that developments and expansions will be as rapid as they have been during the past four years, unless new inventions revolutionize radio in a great deal—make radio sets simpler and easier to operate, lower in price but capable of bringing in long distance.

### RADIO CABINETS

Made to Order

Highest grade of cabinet and carpenter work. Specialty stock cut to dimensions—no order too small.

**GLEDHILL**

PATTERNS AND MODELS  
107 Friendship St.  
TEL. UNION 2202

### Stocks Sawed for Specials

### RADIO CABINETS

### TABLES TO ORDER

WOODWORK OF ALL KINDS  
PATTERN AND MODEL MAKING  
J. M. Baker Pattern Co.  
114 W. Exchange St. Union 5532  
Corner of Mathewson St.

**2-834**  
R.I. 1924

Auto Number Frames  
\$2.50 a Pair in R. I. and Mass.

### Radio Cabinets

Why not a genuine Mahogany, little difference in cost?  
Can make inexpensive or elaborate.

**Robert P. O'Brien**

86 Calverly St.

Wood and Metal Patterns  
Cabinet Making, Carpenters'  
Joining

Brass, Bronze and Aluminum  
Castings

Stock Bronze or at a Few Hours  
Notice

Aluminum Pattern Plates

THE ORIGINAL LOW LOSS—GROUNDED ROTOR

## Cardwell Condenser

Is specified by  
**COCKADAY**

for use in his NEW

## FOUR CIRCUIT TUNER

which is described in detail in the October issue of

## POPULAR RADIO

Cardwell Condensers and Transformers are distributed in

New England by

**Hill-Smith Metal Goods Co.—Boston**

### DEALERS IN RHODE ISLAND

#### PROVIDENCE

Tilley Radio Corp.  
Marshall & Co.  
R. & H. Supply Co.

#### PAWTUCKET

Quality Radio Store  
Shepard Stores  
The Outlet Co.

#### SHARTEBURG & ROBINSON CO.

E. & A. Radio Co.  
Motor Cycle Supply Co.

## BATTERY CHARGER SAVES EXPENSE

Continued from Page Two

With a clip attached for connecting to the negative terminal of the "A" battery is connected to the other terminal of the ammeter.

A similar flexible lead is connected to the lower center terminal of the switch for connecting to the positive terminal of the battery. The remaining terminals of this switch are connected to the fuse mounting clips and then to the "A" battery binding post.

The wiring for the "B" battery is somewhat more complicated. Connect the top terminal of the "charge B" switch to one side of the lamp socket at the top of the panel, and from the other side of the socket to one side of the hot-wire ammeter.

Now connect the first and third terminals, at the right looking from the rear, of the 4PDT switch, and then connect the second and fourth terminals together. Connect from the remaining terminal of the ammeter to the connection between the first and third terminals of the "B" battery switch (4PDT).

The lower terminal of the "charge B" switch is connected to the lead terminal of the chemical rectifier, and the aluminum terminal of the rectifier is connected to the strap across the second and fourth terminals of the switch.

The top, left-hand terminal of the 4PDT switch is connected to the negative "B" binding post and to one side of the voltmeter. The middle terminals of the switch are strapped together and then connected to the 48 volts binding post.

The bottom terminal of the switch is connected to the 96 volts binding post and then to one side of the push-button. The opposite side of the push-button is connected to the plus terminal of the voltmeter.

The center terminals of the 4PDT switch are connected by means of flexible leads with clips attached to one end, to the various terminals of the "B" battery. The top-center terminal is connected to the negative terminal of the first bank of "B" batteries. The second terminal is connected to the 48-volt tap of the same bank. The 24-volt terminal of this bank is connected direct to the 24 volts binding post.

The negative terminal of the second bank is connected to the third center terminal of the switch, and the 48-volt tap of this bank is connected to the bottom terminal of the switch. The 24-volt terminal of the bank is connected to the 72-volts binding post.

The panel should be attached to a base-board large enough to hold the "A" and "B" battery rectifiers.

Now let us see how the panel works. The plug from the receptacle at the side

of the panel is inserted in the electric light socket. If the "A" battery is to be charged, we close the charge A switch and place the "A" battery switch (4PDT) in the charge position.

This automatically disconnects the battery from the receiver, and that is all that is necessary to place the battery "on charge." Simply throw two switches. The "B" battery is charged in the same manner, close the charge B switch and throw the 4PDT to the charge position.

When charging two banks of 48-volt storage "B" batteries, a 100-watt lamp is usually sufficient. If the meter shows a charging rate to be in excess of the rate specified by the manufacturer, of the battery reduce the size of the lamp.

When the batteries are connected to the receiving set (placed on discharge) the amount of current being drawn from the "A" battery will be registered by the ammeter.

Any one or all of the meters may be eliminated from the panel if the fan so desires, but their use is advisable, as they afford an accurate means of keeping the batteries in good operating condition at all times.

The method of charging three "B" batteries in series from 110 volts D. C., is shown in Fig. 9.

### The Inexpensive Crystal Set

As a crystal set means less financial outlay in the beginning and practically no upkeep, such as burned-out tubes and now "B" batteries, and because it is a better rectifier of radio energy than an audion, it is coming into wide use. Com-

### "Radio Broadcast"

for November gives complete description of our new set

### Second Harmonic Super-Heterodyne

See the set here.

Complete information

**Marshall & Co.**

Where They Know the Neutrodyne

94 DORRANCE ST.

Opposite Narragansett Hotel

PHONE UNION 5008

## 1549 CHAIRS WANTED to Reseat Before January 1st

In lots of not less than 1 or more than 100 from 1 place at 1 time. Hand and machine woven cane, cane and flat rattan. Round and split reeds, willow, splint, rush and Shaker seats. Repairing, cleaning and refinishing reed furniture. Best quality of materials. Work done by men who know how. Always glad to estimate.

**Providence Cane & Rattan Co.**  
283 DYER ST. UNION 5310

## Only Two Weeks More of Our OCTOBER RADIO SALE

THIS Sale thus far has been a source of satisfaction to our customers who appreciate the values we are offering in Radio Sets and Supplies. If you have not yet taken advantage of this opportunity to save, come in tomorrow or early this week and get what you need now, to enjoy the radio programmes this Fall and Winter.

We Are Featuring Well-Known Sets, Including

Federal 110—58—59

Ace 38—XJ

Radiola V. at \$39.50

Atwater-Kent 4 and 5 Tubes

Zenith R-4

McMillan, the Arctic Explorer, used a Zenith Set on His Recent Dash to the North Pole.

BATTERIES PHONES TUBES

**A.T. Scattergood CO.**  
(For 38 years the leading Credit Furniture House in Providence.)

101-105 NORTH MAIN ST.

You Can Always Do Better at the  
**Economy**  
AUTO SUPPLY CO. INC.

Auto Supply Store—30 W. Exchange Street  
RADIO Store—26 W. Exchange Street  
OPPOSITE FREIGHT STATION

## OUR 8TH ANNIVERSARY SALE EIGHT YEARS OF PRICE SLASHING

We surely have kept down the cost of AUTO ACCESSORIES and RADIO in this burg. There is no city in the U. S. A. that can boast of such prices. Look over the values offered in all sales in town and compare their values with what we offer.

Our first Blast clears the way for the Opening of the Fall and Winter Radio Season with a gigantic price-slaughtering event that lifts the Economy above competition. The very latest tested and approved Radio Sets, Parts and Supplies of the Highest Grade from nationally known manufacturers at Ferocious Cut Prices.

In addition we have engaged Mr. Earl D. Gorton, Expert Radio Man, former Radio Sergeant, U. S. A. Signal Corps, solely for the benefit of our large following among the Radio Fans that they may freely bring their problems for our Radio Expert to solve satisfactorily and economically.

## BLAST NO. 1!!!

**RADIO**  
Our Radio Store at 26 West Exchange Street

**"Airmast"**  
Guaranteed  
Loud  
Speaker  
List \$10.00.  
Sale Price  
**4.99**

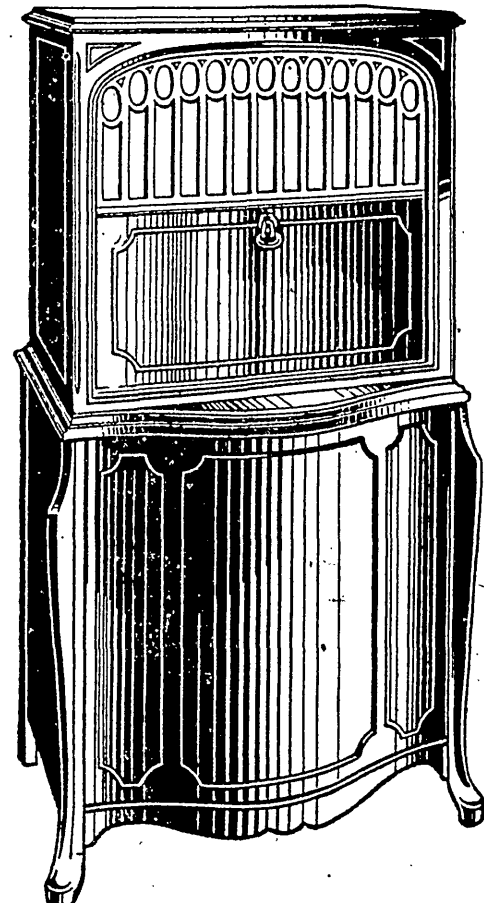
**AUTO**  
SUPPLIES  
AT OUR AUTO SUPPLY STORE,  
30 West Exchange St.  
Radiator Covers  
For Fords, each ..... 73c  
For Most Other  
Cars ..... \$2.43

Radiators  
FOR FORDS  
All brass and  
Guaranteed.  
**\$8.43**

## Outlet Radio Store—5th Floor WJAR Broadcasting Station

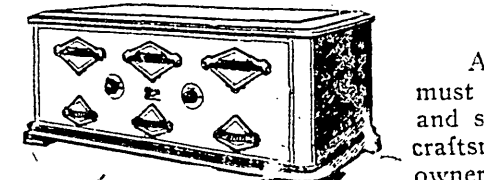
## Why You Should Own a Radiola Super-Heterodyne

The predominating requirement in present day broadcast Receivers is selectivity which enables the operator to pick his way through the great number of broadcasting stations, now in operation, and select the one desired.



### Radiola Super VIII.

Less battery equipment ..... **\$425**



Price **\$155**  
(Without Accessories)

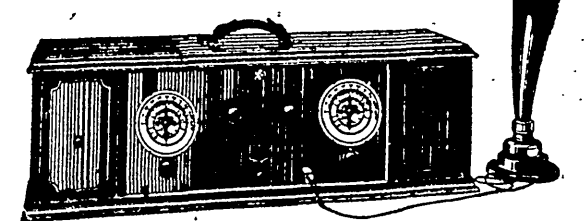
## The Radiola Super-Heterodyne Models

embody these technical applications which give the utmost selectivity that the art is capable of. You may listen to outside stations, without interference from local stations.

This is an inherent feature of these two sets based upon great fundamental discoveries, contained exclusively in the Radiola Super-Heterodyne and Radiola Super VIII.

## The Radiola Super Heterodyne

With six UV-199 Tubes and  
Radiola Loud  
Speaker. Price... **\$269**



## GREBE SYNCHROPHASE

A Broadcast Receiver of the Antenna Type which must be heard to be appreciated. The ease of operation and selectivity of this set are but examples of Grebe craftsmanship, which has made ardent admirers of every owner. Ask your neighbor about Grebe Radio Receivers.

These sets have been tested by us and we recommend them to you.

**The Outlet Company**

Radio Store, 5th Floor



# RADIO PROGRAMMES

Politics again have a place on the air programmes for the week, the address of Secretary Charles E. Hughes at Infantry Hall on Wednesday being announced by WKBF. The following night Governor Ritchie of Maryland will be heard, his address being broadcast by WEAN. The usual Sunday evening concert from New York will be given by WJAR with varied numbers, including talks, recitals and studio programmes announced for the week. WSAD has a week of concerts, dance numbers and talks with its programme beginning to-morrow afternoon. The following programmes are given in Eastern standard time.

## WEAN, THE SHEPARD STORES (278 METRES.)

**TO-DAY**  
10:45 a. m.—Service broadcast from the First Baptist Church: Prelude, Marche Solennelle, Borowski; choir, sentence, prayer of thanksgiving, Kresner; invocation, Prayer of Thanksgiving; hymn, "If Thou But Suffer God to Guide Thee," Neumark; responsive reading, Psalm 43; anthem, "O Worship the Lord," Watson; Scripture lesson, Philippians 2:1-13; prayer the Lord's Prayer; offertory, "The Lord is My Light," Alliston; prayer; hymn, "Jerusalem the Golden," Ewing; sermon, "What is the Use of the Apostles' Creed," President Faunce; prayer, chant, benediction; postlude, "Jubilate Deo," Harrison, Fox, Arthur W. Cleaves, D. D., pastor; John H. Archer, organist and director; Miss Louise Tracy, soprano, Walter J. Morris, tenor; Mrs. George P. Miller, contralto; David A. Mitchell, bass. Music by quartet and chorus.

Afternoon programme relayed from Station WNAC, Boston.  
3:00 p. m.—The Troubadours—Oscar D. Knight, first tenor; D. P. Wilson, second tenor; William A. Nickerson, baritone; James S. Whyte, bass; Leroy E. Fuller, accompanist, assisted by Emory N. Leonard, violinist, Mrs. W. M. Leonard, accompanist; quartet, "Gipsy Life," Charles Scott; violin solo, "Christmas Carol," Grainger; quartet, "Secrets," Smith; tenor solo, "Afton Water," Scotch; D. P. Wilson, violin obligato, Emory N. Leonard; quartet, "Holea in Heaven," arr. J. A. Crowley; quartet, "Oh, This You," Charles Scott; violin solo, "Christmas Carol," Grainger; quartet, "Old Folks at Home," Foster; quartet, "In Absence," Buck; bass solo, "The Skipper," Jude; quartet, (a) "The Burnie," arr. Crowley, (b) "Evening's Twilight," Hutton.

**MONDAY**  
11:55 a. m.—Time signals.  
12:00 m.—Classical selections by the Shepard Colonial Concert Orchestra, Harold Sheffers directing, playing in the Colonial restaurant.  
12:10 p. m.—Weather report.  
12:15 p. m.—Continuation of musical programme.  
4:00 p. m.—Dance music by The Shepard Colonial Dance Orchestra.  
4:15 p. m.—Selections on the Mehlin Welle Mignon reproducing piano.  
4:30 p. m.—Weather report.  
4:35 p. m.—Shepard Colonial Dance Orchestra.  
6:30 p. m.—WEAN dinner concert, broadcast from Hotel Dreyfus.  
8:10 p. m.—"Sitting Pretty," to be relayed from Station WNAC, Boston.

**TUESDAY**  
10:00 a. m.—The Bluebird's Message to Housewives, by Gladys J. L. Peckham, Home Service Department, Providence Gas Company.  
11:55 a. m.—Time signals.  
12:00 m.—Classical selections by the Shepard Colonial Concert Orchestra.  
12:10 p. m.—Weather report.  
12:15 p. m.—Continuation of musical programme.  
4:00 p. m.—Shepard Colonial Dance Orchestra.  
4:10 p. m.—Incidental music by Emory Theatre, concert orchestra, William J. Faucher, director, broadcast from the Emory Theatre.  
4:30 p. m.—Weather report.  
4:35 p. m.—Shepard Colonial Dance Orchestra.  
8:00 p. m.—Programme to be announced.  
10:45 p. m.—Jimmie Lyon's Midnight Frolic, broadcast from Emory Theatre; Edward Benedict, organist and assisting artists.

**WEDNESDAY**  
10:00 a. m.—The Bluebird's Message to Housewives, by Gladys J. L. Peckham, Home Service Department, Providence Gas Company.  
11:55 a. m.—Time signals.  
12:00 m.—Classical selections by the Shepard Colonial Concert Orchestra.  
12:10 p. m.—Weather report.  
12:15 p. m.—Continuation of musical programme.  
4:00 p. m.—Organ recital by Edward Benedict, broadcast from Emory Theatre.  
4:30 p. m.—Weather report.  
4:35 p. m.—Shepard Colonial Dance Orchestra.  
8:00 p. m.—Programme to be announced.  
10:45 p. m.—Jimmie Lyon's Midnight Frolic, broadcast from Emory Theatre; Edward Benedict, organist and assisting artists.

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12:00 m.—Classical selections by the Shepard Colonial Concert Orchestra.  
12:10 p. m.—Weather report.  
12:15 p. m.—Continuation of musical programme.  
4:00 p. m.—Organ recital by Edward Benedict, broadcast from Emory Theatre.  
4:30 p. m.—Weather report.  
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8:00 p. m.—Programme to be announced.  
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**FRIDAY**  
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12:00 m.—Classical selections by the Shepard Colonial Concert Orchestra.  
12:10 p. m.—Weather report.  
12:15 p. m.—Continuation of musical programme.  
4:00 p. m.—Organ recital by Edward Benedict, broadcast from Emory Theatre.  
4:30 p. m.—Weather report.  
4:35 p. m.—Shepard Colonial Dance Orchestra.  
8:00 p. m.—Programme to be announced.  
10:45 p. m.—Jimmie Lyon's Midnight Frolic, broadcast from Emory Theatre; Edward Benedict, organist and assisting artists.

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12:00 m.—Classical selections by the Shepard Colonial Concert Orchestra.  
12:10 p. m.—Weather report.  
12:15 p. m.—Continuation of musical programme.  
4:00 p. m.—Organ recital by Edward Benedict, broadcast from Emory Theatre.  
4:30 p. m.—Weather report.  
4:35 p. m.—Shepard Colonial Dance Orchestra.  
8:00 p. m.—Programme to be announced.  
10:45 p. m.—Jimmie Lyon's Midnight Frolic, broadcast from Emory Theatre; Edward Benedict, organist and assisting artists.

**SUNDAY**  
10:00 a. m.—The Bluebird's Message to Housewives, by Gladys J. L. Peckham, Home Service Department, Providence Gas Company.  
11:55 a. m.—Time signals.  
12:00 m.—Classical selections by the Shepard Colonial Concert Orchestra.  
12:10 p. m.—Weather report.  
12:15 p. m.—Continuation of musical programme.  
4:00 p. m.—Organ recital by Edward Benedict, broadcast from Emory Theatre.  
4:30 p. m.—Weather report.  
4:35 p. m.—Shepard Colonial Dance Orchestra.  
8:00 p. m.—Programme to be announced.  
10:45 p. m.—Jimmie Lyon's Midnight Frolic, broadcast from Emory Theatre; Edward Benedict, organist and assisting artists.

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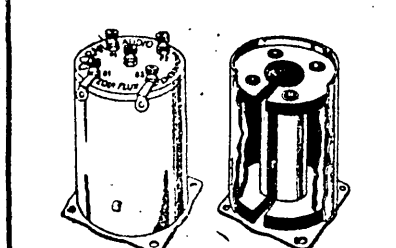
12:00 m.—Classical selections by Colonial Concert Orchestra.  
12:10 p. m.—Weather report.  
12:15 p. m.—Continuation of musical programme.  
4:00 m.—Dance music by Colonial Dance Orchestra.  
4:30 p. m.—Weather report.  
4:35 p. m.—Colonial Dance Orchestra.  
4:45 p. m.—Recital by Edward Benedict.  
8:00 p. m.—Musical programme by the Kalua Hawaiian String Quartet.  
9:15 p. m.—Dance music to be relayed from Station WNAC, Boston.  
10:00 p. m.—Dance music by Ed D'Alphonso and his Hotel Dreyfus Orchestra.

## WJAR, THE OUTLET COMPANY (350 METRES.)

**TO-DAY**  
7:20-9:15 p. m.—Musical programme by "Roxy and His Gang" direct from the Capitol Theatre, New York city, by courtesy of the Capitol Theatre management and Mr. S. L. Rathbun (Roxy). The first part of the programme will be taken direct from the stage of the theatre and will consist of music by the featured artists and the Capitol Grand Orchestra. The second part of the programme will consist of a special presentation by Mr. Rathbun of vocal and instrumental artists direct from the broadcasting studio in the theatre.  
9:15-10:15 p. m.—Organ recital direct from the studio of the Skinner Organ Company, New York city.

**MONDAY**  
10:00 a. m.—Housewives' Radio Exchange. A department conducted by Mrs. Wood on matters of household interest.  
10:45 a. m.—McCall style talk.  
1:05 p. m.—Studio programme.  
8:00 p. m.—Frederick W. Bliss of the Rhode Island Electrical League will speak on "Light Provision."

**DORAN**  
**EQUI-FLUX**  
THE NEW AUDIO TRANSFORMER  
GREATER VOLUME AND CLARITY  
EVERY TONE TRUE AND NATURAL  
ENTIRELY FREE FROM DISTORTION



Sectional view shows our new system of lamination, which distributes the magnetic flux equally. The laminated discs at top and bottom guide the flux radially, in its natural path, to the outer laminated shell.  
Positively no leakage of magnetic flux, thus preventing howls and squeals in adjoining wires and parts of the set.  
The secondary coil receives all the magnetic energy, so that it delivers the output at almost 100% efficiency. Occupies minimum space, and can be placed at any location desired.  
The Equi-flux permits three or even four stages of audio frequency, producing amazing results with loud speakers.  
Two ratios, 4 to 1 and 8 to 1.  
Price \$5.00



**Doran Double Contact Socket**  
Positive connections, as spring contacts press on both the side and the end of each peg. Contact is spring arms riveted in, not bolted; thus, they can not loosen under terminal wire above. You will agree that this is the best socket you ever used. Price ..... 50c.

**Doran Binding Posts**  
Index Heads Non-removable.  
Everybody appreciates clearly marked binding posts. But expensive errors result if heads fall off, and become transposed. Insist on getting Doran Binding Posts that always indicate correctly.  
Only 10c. Each.  
Doran Radio Parts are sold by all dealers on a money back guarantee, with five days trial, return pending on all these improvements.  
Sold and Recommended by B. & H. Supply Co., J. A. Foster Co., Little Rhody Radio Store, R. I. Electrical Equipment Co., Richmond Radio Supply Co.

**James C. Doran & Sons**  
PROVIDENCE, R. I.

8:10 p. m.—Brown University Dance Team.  
**TUESDAY**  
1:05 p. m.—Providence Biltmore Hotel Orchestra direct from the hotel.  
7:00 p. m.—Earl Shean and his orchestra.  
7:30 p. m.—Assa G. Randall of the Stammers' Club will speak in behalf of the Providence Safety Council.  
8:00 p. m.—Mrs. Gertrude Wilcox Harrow will give one of a series of talks on "Hygiene," speaking under the auspices of the American Red Cross, Providence Chapter.  
9:00 p. m.—The Eveready Entertainers direct from our New York studios.

**WEDNESDAY**  
10:00 a. m.—Housewives' Radio Exchange. A department conducted by Mrs. Wood on matters of household interest.  
10:45 a. m.—McCall style talk.  
1:05 p. m.—Studio programme.  
7:30 p. m.—This programme will come direct from our New York studio. Effin Rosanoff, 'cellist, accompanied by Winifred T. Barr.  
7:50 p. m.—"Some Things Consumers May Do to Reduce Their Food Costs," by Alexis L. Clark, chief of Bureau of Markets of New Jersey Department of Agriculture, speaking under the auspices of American Agriculturist.  
8:00 p. m.—Effin Rosanoff, 'cellist.  
8:10 p. m.—Louise Stallings, mezzo-soprano, and May Laird Brown in continuation of lecture-recital. Programme: "Nuages," Bouval; "Ma poupee Cherie," De Severac; "J'ai pleure en rêve," Hue.  
9:15-10:30 p. m.—Robert Yap's Hawaiian Guitar Ensemble.

**THURSDAY**  
1:05 p. m.—Studio programme.  
Silent night.  
**FRIDAY**  
10:00 a. m.—Housewives' Radio Exchange. A department conducted by Mrs. Wood on matters of household interest.  
10:45 a. m.—McCall style talk.  
1:05 p. m.—Twin Elm Orchestra, under the direction of Martin J. Casey.  
7:45 p. m.—Mt. St. Mary Choral Club of Fall River.  
8:30 p. m.—Talk by Mr. Grinnell of the Morris Plan Co.  
11:00 p. m.—Providence Biltmore Hotel Dance Orchestra, direct from the hotel.

**SATURDAY**  
1:05 p. m.—Studio programme.  
7:05 p. m.—Musical programme.

**WKBF, DUTEE W. FLINT, Inc.**  
(286 METRES.)

**TO-DAY**  
8:00 p. m.—Orpheus Trio. Chester W.

**POLITICAL ADVERTISEMENT**

**REPUBLICAN RALLY**  
AT THE AUBURN THEATRE  
MONDAY, OCTOBER 20th, 1924  
AT 8 P. M.  
SPEAKERS:  
JESSE H. METCALF  
IRA LETTS CHARLES WALSH  
AND OTHERS  
MUSIC—ALL WELCOME

**STOP—THINK**  
Are YOU Going to Waste Your Evenings  
THIS COMING WINTER

The R. I. Radio School trains men in Wireless for positions as Radio Officers of ships, land stations and as Operators of broadcasting stations. Men are placed in positions with the Independent Wireless Telegraph Co., who control 85% of the ship stations under the American flag upon completion of training. The following men completed training obtaining Government licenses this past week and will be placed in the I. W. T. Co. service:  
Leo Paul, 111 Lincoln Avenue, Central Falls, R. I. Lic. No. 5441  
James Laurence, 122 Elmwood Ave., Providence, R. I. Lic. No. 12215  
Leon Deschamps, 820 South Main St., Warren, R. I. Lic. No. 12214

**WHY NOT YOU**  
Sixth Year of School  
Evening Course Mon., Wed., and Fri. Eve.  
Determine NOW To Improve Your Position by Study This Winter.  
School Office Open Daily 9 a. m. to 5 p. m. and Mon., Wed. and Fri. Evenings 7 p. m. to 10 p. m.

**R. I. RADIO SCHOOL**  
INDEPENDENT WIRELESS TELEGRAPH CO., Inc.  
J. FRANK SULLIVAN, N. E. Div. Supt.  
2nd Floor, Butler Exchange  
Providence, R. I.

We Are Wholesale Distributors  
Of the New  
**APCO RECTODYNE**  
This New Apco  
Product Will Appeal  
To Live Dealers  
Serving An Up-To-  
The-Minute Clientele.

**UNION ELECTRIC SUPPLY CO.**  
Wholesale Only 60 Pine St., Providence  
Gaspee 6523-6528—Connecting All Departments

**M. STEINERT & SONS**  
HAS A RADIO FOR EVERY  
PURSE AND EVERY NEED  
\$25 to \$500  
Convenient Terms if Desired

The selection of a radio is a perplexing problem to the uninitiated. Let us show you what real friendly co-operation is.

**NEARLY EVERY POPULAR MAKE OF SET IN STOCK**

**M. STEINERT & SONS**  
STEINERT BUILDING 495 WESTMINSTER STREET

de lune," Debussy; "Mandoline," Faure.  
8:30 p. m.—Phonix Male Quartet, consisting of R. T. Crafts, first tenor; Thomas F. Betts, second tenor; C. B. W. Anderson, baritone, and A. R. McAdams, bass.  
8:50 p. m.—Louise Stallings, mezzo-soprano, and May Laird Brown in continuation of lecture-recital. Programme: "Nuages," Bouval; "Ma poupee Cherie," De Severac; "J'ai pleure en rêve," Hue.  
9:15-10:30 p. m.—Robert Yap's Hawaiian Guitar Ensemble.

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**FRIDAY**  
10:00 a. m.—Housewives' Radio Exchange. A department conducted by Mrs. Wood on matters of household interest.  
10:45 a. m.—McCall style talk.  
1:05 p. m.—Twin Elm Orchestra, under the direction of Martin J. Casey.  
7:45 p. m.—Mt. St. Mary Choral Club of Fall River.  
8:30 p. m.—Talk by Mr. Grinnell of the Morris Plan Co.  
11:00 p. m.—Providence Biltmore Hotel Dance Orchestra, direct from the hotel.

**SATURDAY**  
1:05 p. m.—Studio programme.  
7:05 p. m.—Musical programme.

**WKBF, DUTEE W. FLINT, Inc.**  
(286 METRES.)

**TO-DAY**  
8:00 p. m.—Orpheus Trio. Chester W.

**POLITICAL ADVERTISEMENT**

**REPUBLICAN RALLY**  
AT THE AUBURN THEATRE  
MONDAY, OCTOBER 20th, 1924  
AT 8 P. M.  
SPEAKERS:  
JESSE H. METCALF  
IRA LETTS CHARLES WALSH  
AND OTHERS  
MUSIC—ALL WELCOME

**STOP—THINK**  
Are YOU Going to Waste Your Evenings  
THIS COMING WINTER

The R. I. Radio School trains men in Wireless for positions as Radio Officers of ships, land stations and as Operators of broadcasting stations. Men are placed in positions with the Independent Wireless Telegraph Co., who control 85% of the ship stations under the American flag upon completion of training. The following men completed training obtaining Government licenses this past week and will be placed in the I. W. T. Co. service:  
Leo Paul, 111 Lincoln Avenue, Central Falls, R. I. Lic. No. 5441  
James Laurence, 122 Elmwood Ave., Providence, R. I. Lic. No. 12215  
Leon Deschamps, 820 South Main St., Warren, R. I. Lic. No. 12214

**WHY NOT YOU**  
Sixth Year of School  
Evening Course Mon., Wed., and Fri. Eve.  
Determine NOW To Improve Your Position by Study This Winter.  
School Office Open Daily 9 a. m. to 5 p. m. and Mon., Wed. and Fri. Evenings 7 p. m. to 10 p. m.

**R. I. RADIO SCHOOL**  
INDEPENDENT WIRELESS TELEGRAPH CO., Inc.  
J. FRANK SULLIVAN, N. E. Div. Supt.  
2nd Floor, Butler Exchange  
Providence, R. I.

We Are Wholesale Distributors  
Of the New  
**APCO RECTODYNE**  
This New Apco  
Product Will Appeal  
To Live Dealers  
Serving An Up-To-  
The-Minute Clientele.

**UNION ELECTRIC SUPPLY CO.**  
Wholesale Only 60 Pine St., Providence  
Gaspee 6523-6528—Connecting All Departments

**M. STEINERT & SONS**  
HAS A RADIO FOR EVERY  
PURSE AND EVERY NEED  
\$25 to \$500  
Convenient Terms if Desired

The selection of a radio is a perplexing problem to the uninitiated. Let us show you what real friendly co-operation is.

**NEARLY EVERY POPULAR MAKE OF SET IN STOCK**

**M. STEINERT & SONS**  
STEINERT BUILDING 495 WESTMINSTER STREET

Miller, baritone; John J. Fitzpatrick, organist.  
**TUESDAY**  
8:30 p. m.—Vincent Lopez Arcadia Orchestra.  
**WEDNESDAY**  
8:00 p. m.—Secretary Charles E. Hughes, address at Infantry Hall.  
**THURSDAY**  
8:30 p. m.—"Congressmen's Night."  
WNAC, BOSTON, MASS.  
(278 METRES.)

**TO-DAY**  
11:00 a. m.—Entire service, Cathedral Church of St. Paul: Hymn, Processional 288, "Praise, My Soul, the King of Heaven;" Recessional 287, "Sing, My Soul, His Wondrous Love;" anthem, "To Whom Then Will Ye Liken God," Parker; communion hymn 333, "And Now, O Father, Mindful of the Love," sermon, "Why Do Men Pray," preacher, Dean Roumanoff.  
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# APCO Rectodyne

## *The Newest and Greatest Radio Achievement*

### "B" Radio Power — direct from the lamp socket!

"SOME DAY IT WILL COME" thousands have prophesied. "Simply plug into a lamp socket and get 'B' battery power direct from your house current." That day is here, thanks to the APCO research engineer. The Apco Rectodyne, enclosed in a beautiful mahogany cabinet, smaller in size than a "B" battery outfit is the answer. With the Apco Rectodyne you get "B" battery voltage that is just right for your set at all times.

#### What the APCO Rectodyne is

##### If You're Not Technical

The Apco Rectodyne is a self-contained unit in a small mahogany cabinet, one end of which has terminals properly marked leading to connections on the set. Its purpose is to do away with the necessity for "B" batteries on your detecting and amplifying tubes, giving you a constant and steady supply of electrical energy from your house current. The Apco Rectodyne is always ready for use by simply turning on the current at the lamp socket. It may be regulated, or "tuned in" by the turning of a knob, giving you any plate voltage required by your set from 0 to 120, with sufficient current output for any size set from the smallest to the largest super-heterodyne.

There is nothing about this device to get out of order. It is not complicated. Its use requires no electrical knowledge and costs so little to operate that it can scarcely be measured—about one-tenth of a cent per hour.

It is ready to use instantly. No delay. No wait. Snap on the switch and tune in.

##### If You're Technical

The Apco Rectodyne employs both sides of the wave. The current is stepped up thru a transformer equal to "B" plate voltage and stepped down for the tube filament to the same voltage as the 6V. battery. After the A. C. Current is rectified thru the two rectifying tubes, the energy is stored up in condensers and gradually fed thru choke coils which smooth out the pulsating current into a non-pulsating direct current. This again is used to charge condensers from which current is drawn to the set, as if drawn from storage batteries. The current supply is transformed to give the same voltage as the "A" battery current to the tube. It is rectified in the tube to give same direct current as the "B" battery. From there it flows into condensers, where it is stored between cycles, giving a non-fluctuating output. From the condensers, it is filtered thru choke coils and made to flow into another set of condensers, ready to use on the amplifier and detector circuits. The Apco Rectodyne uses two special two-element Apco tubes. Any standard 201A type will do, tho the two-element tube is more satisfactory, and may be obtained from Apco distributors.

The average life of tubes in the Rectodyne is from 1200 to 1500 hours or about two years in use. Replacement cost is low, hence the operating cost of an Apco Rectodyne is negligible.

The Apco design with two tubes not only uses the two sides of the A. C. cycle, but gives a large safety margin, greatly prolonging the life of the tubes. Should one tube burn out, the other will continue receiving the program, tho with not quite the same volume. If used with a small set of two or three tubes, it is only necessary to use one tube.

##### —for Convenience

Wouldn't you like to substitute a compact, beautifully finished mahogany cabinet—an object in perfect harmony with the fine appearance of your radio set, in place of the unattractive multiplicity of wet or dry, "B" batteries you now use?

With the Apco Rectodyne, you merely plug into a lamp socket or floor receptacle to obtain an unlimited supply of electric current in exactly the right amount to operate at the highest efficiency point, irrespective of the kind of set or the number of tubes. Wouldn't the greatest possible degree of Radio Enjoyment and Satisfaction be yours?

##### —for Economy

Replacement and charging of "B" batteries is done away with. Your operating cost becomes less than one-tenth of a cent per hour. Your set reception is always fine and dependable. When you consider the cost of a device that does all this is less than a set of wet "B" batteries and a Charger, wouldn't you buy it?

Such a device as the Apco Rectodyne—a scientific development of a highly efficient sturdy rectifier to eliminate "B" batteries, enabling you to obtain necessary plate current direct from the lamp socket with no more trouble nor complication than turning on an electric bulb.

*The Clearest Possible Reception Assured  
—with No Noise or Hum*

**APCO Manufacturing Co.**

1200 Eddy St. Providence

Makers of the Famous Apco Radio Products

For Direct  
Current Users

**APCO D. C. Type  
Rectodyne**

To those who live in the Direct Current sections of the city there is an Apco Rectodyne available, also. It operates in the same way as the A. C. Rectodyne, but as the Rectifying tubes and condensers are unnecessary, the price is proportionately less—

**\$32.50**

**\$50.**  
complete  
with tubes

*Shown about 1/2  
Actual Size*

# The Dream of Every Radio Owner Realized



## RADIO PROGRAMMES

Continued from Page Four.

Prize on George F. Root's hymn, "Shining Shore." Barnes; finale, "Pomp and Circumstance," John Herman Loud; anthem, "I Am Alpha and Omega," Stainer, Park Place Quartet; offertory, "Cantata in F major, March," Scriabin, prelude, Dr. Gurnea; "What Is It That the Sabbath Day Brings to Us?" Dr. Gurnea; "Can a person speak the whole truth and not his friends? Will the plan of compulsory arbitration to outlaw war be defeated by Japan? Should children be required to attend church? How far should parents undertake to control their children's vocations?" Tenor solo, Arthur F. Tucker; sermon, "Crowded Congregations and Baffled Delegates," Dr. Conrad.

### WSAD, FOSTER'S (241 METRES.)

**MONDAY.**  
2:00-4:00 p. m.—Concert.  
6:00 p. m.—Foster's Story Lady.  
6:15 p. m.—Fifteen minutes of music.  
**TUESDAY.**  
2:30-4:00 p. m.—Concert.  
6:00 p. m.—Foster's Story Lady.  
6:15 p. m.—Dance music.  
7:30 p. m.—Hill of series of 12 lessons in modern dancing prepared by Arthur Murray, America's foremost dancing instructor.  
7:35 p. m.—Continuation of dance programme.

**WEDNESDAY.**  
2:30-4:00 p. m.—Concert.  
6:00 p. m.—Foster's Story Lady.  
6:15 p. m.—Musical programme to be announced.

**THURSDAY.**  
2:30-4:00 p. m.—Concert.  
6:00 p. m.—Musical evening by Sayles Finishing Plants band.

**FRIDAY.**  
6:00 p. m.—Foster's Story Lady.  
6:15-7:15 p. m.—Concert by the Rathskeller Trio.

**SATURDAY.**  
2:30-4:00 p. m.—Concert.  
6:00 p. m.—Foster's Story Lady.  
6:15-8:00 p. m.—Dance music by Lar Potter's Orchestra.

### WGY, SCHENECTADY, N. Y. (380 METRES.)

**(TO-DAY)**  
10:30 a. m.—Service of Bellevue Reformed Church, Schenectady, N. Y.; Organ prelude, "Autumn," Chaminade, Mrs. Katherine Chamberlayne; duet, "Come Into Me and Rest," Campanella, Maurice May, tenor; Sidney Cromie, baritone; sermonette to children, "The Man Like a Tree," offertory, "Cantata Domino," Buck, Mrs. Anderson, soprano; Margaret Barrie, contralto; Maurice May, tenor; Sidney Cromie, baritone; sermon, "The Parents Debt to the Child," Rev. J. A. Thurston, D. D., pastor; organ postlude, "Grand Chorus."

3:45 p. m.—Programme by WGY Symphony Orchestra, Leo Kilven, conductor; Isabelle Franklin, soprano, soloist. Selection, overture, "Carmen," Rostini, WGY Symphony Orchestra, Leo Kilven, conductor; soprano solo, "Louise," Charpentier, Isabelle Franklin, Ollie G. Yettru, accompanist; selection from the opera, "Samson and Delilah," Saint-Saens, orchestra; soprano solos, (a) "Violets," Wright, (b) "The Cuckoo," Liza Lehmann, Isabelle Franklin; selections, (a)

"Menuetto," Elgar, (b) "March of the Mogul Emperors," from the suite, "The Crown of India," Elgar, orchestra; soprano solo, "Spring's Awakening," Sanderson, Isabelle Franklin; selection, "Allergo Molto Vivace," from the "Symphony Pathétique," Tschalkowsky, orchestra.  
7:30 p. m.—Service of Bellevue Reformed Church, Schenectady, N. Y. Organ prelude, improvisation on a familiar hymn, Chamberlayne, Mrs. Katherine Chamberlayne; anthem, "Evening and Morning," Onkelley; Mrs. Anderson, soprano; Margaret Barrie, contralto; Maurice May, tenor; Sidney Cromie, baritone; offertory, "The Lord Is My Light," quartet; sermon, "The Rule of Great Men," Rev. J. A. Thurston, D. D., pastor; organ postlude, "Pilgrim's Chorus," Wagner.

### WGB, BUFFALO, N. Y. (310 METRES.)

**TO-DAY**  
10:45 a. m.—Weather forecast as issued by the U. S. Weather Bureau for marine and aviation interests; special report for Buffalo and Oswego, N. Y.  
3 p. m.—Vesper services. Rev. Wallace Thompson, St. Paul's Episcopal Church. Musical direction of Prof. D. C. Garretson.  
7:15 p. m.—Pre-service organ recital, William Avall Whiddell, organist, playing "Praeludium," Jarneloff, "Serenade," Rachmaninoff, "Largo," Handel.  
7:30 p. m.—Evening service, Central Church, Buffalo, N. Y. Processional hymn, "He Leadeth Me," Bradbury, choir and congregation. Invocation; anthem, "As the Earth Brings Forth Her Bud," Harris; Scripture lesson; quartet, "Ere Another Sabbath's Close," Bowles, Mrs. Hedrich, Miss Reid, Mr. Bates, Mr. Knauer; prayer; duet, "Whispering Hope," Hawthorne, Mrs. Hedrich and Miss Reid; offertory anthem, "For All the Saints," Terry; sermon, "Feeling the Mark," Rev. Robert J. McAlpine, D. D., hymn, "My Country 'Tis of Thee," Carey; benediction; organ postlude, "Le Bonheur," Hyde, quartet and choir of 50 voices.

### WJZ, NEW YORK CITY (435 METRES.)

**TO-DAY.**  
9:00 a. m.—Children's hour. Original stories by authors, music by the composers, comic stories by the originators of famous comedies.  
11:00 a. m.—West End Presbyterian Church service direct; sermon by Dr. A. E. Klegwin.

2:20 p. m.—Radio Bible class, under the auspices of the Greater Federation of Churches; Church Community Chorus, under direction of Clarence W. Allen; X. L. Male Quartet.  
3:30 p. m.—Practical Religion, Rev. Dr. Harry Emerson Fosdick.  
4:30 p. m.—Rev. Edmond Hains, cornetist; John A. Scott, pianist.  
7:00 p. m.—Nathan Abba's Hotel Pennsylvania Orchestra.  
8:00 p. m.—Evelyn Schiff, soprano; Keith McLeod, accompanist.  
8:15 p. m.—Howard and Dettborn, Hawaiian guitars.  
8:35 p. m.—Evelyn Schiff, soprano.  
8:50 p. m.—Violin recital by Godfrey Ludlow, direct from Aeolian Hall.

### WJY, NEW YORK CITY (405 METRES.)

**TO-DAY.**  
8:15 p. m.—Bernhard Levitow's Hotel Commodore Orchestra.  
10:00 p. m.—Anne Tyndall, soprano; Keith McLeod, accompanist.

### WEAF, NEW YORK CITY (402 METRES.)

**TO-DAY.**  
2:00 p. m.—"Sunday Hymn Sing," under the auspices of the Greater New York Federation of Churches. William B. Miller, general secretary, presiding.  
2:45 p. m.—Interdenominational services under the auspices of the Greater New York Federation of Churches. William B. Miller presiding. Address by Rev. Henry Edward Tralle, A. M., Th. D., specialist in religious education, New York. Music by the Federation Radio Choir with Arthur Billings Hunt, baritone and musical director; Novella Burns, soprano; Emma Reeves, contralto; Carlos Abba, harpist; Frank D. Penney, violinist, and George Vause, pianist. Harp and violin prelude, "Largo" (Handel); hymns, "The Son of God Goes Forth to War" (Cutler), and "I Love to Tell the Story" (Fischer), by the Federation Radio Choir; Scripture; harp recital by Carlos Abba; prayer; solo by Novella Burns, "I Heard the Voice of Jesus" (Rathbun); address by Rev. Henry Edward Tralle; hymn, "My Jesus I Love Thee" (Gordon), by the Federation Radio Choir; benediction; vespers hymn, "Jesus Saviour, Pilot Me" (Gould), by the Federation Radio Choir.  
3:45 p. m. to 5:30 p. m.—Regular Sunday men's conference in the Bedford Branch, Y. M. C. A., Brooklyn, with address by Dr. S. Barnes Cadman, musical secretary, Hammond, leader of the conference. Music by Gloria Trumpeters; tubular chimes played by George Betts; song leader, H. W. Millsap; accompanist, Mrs. Howard Wade Kinsey. Gloria Trumpeters, devotional exercises. Gloria Trumpeters, Dr. S. Barnes Cadman, answers to questions by Dr.

Cadman, prayer and benediction.  
7:20 p. m.—Same as WJAR.  
8:15 p. m.—Same as WJAR.

### WHN, NEW YORK CITY (360 METRES.)

**TO-DAY**  
3:00-4:00 p. m.—Queens County Christian Endeavor Union represented by the Rev. James Mayne, B. D., of the St. Alban's Presbyterian Church.  
10:00-10:07 p. m.—Evening bulletin current news.  
10:10 p. m.—Capt. Charles H. Longbottom, swinging harp.  
10:25 p. m.—Joseph C. Wolfe, baritone.  
10:40 p. m.—Anthony Reale, violinist.  
11:00 p. m.—Evangelina Evelyn Harris, lyric soprano, accompanied by Lydia Mason at the piano, singing "Just a Song at Twilight," "Rose of Allendale," "On the Banks of the Wabash."  
11:15 p. m.—Orchestra music.

### KGO, OAKLAND, CAL. (312 METRES.)

**TO-DAY**  
2:00 a. m.—Church service.  
3:30 p. m.—Concert by the KGO Little Symphony Orchestra. Carl Rhodeame, conducting; assisted by soloists and speaker.  
10:30 p. m.—Church services.

### WFAA, DALLAS, TEX. (476 METRES.)

**TO-DAY.**  
7:00 p. m.—Radio Bible class, Dr. William M. Anderson, pastor First Presbyterian Church, teacher; Bible study and gospel song.  
10:00—Sacred song recital by choristers from Oak Cliff Presbyterian Church, the Rev. Thomas F. Gallaher, pastor; Miss Alice Knox Fergusson, organist.

### WEEL, BOSTON (303 METRES.)

**TO-DAY**  
7:20-10:00 p. m.—Musical programme direct from the Mark Strand Theatre, Broadway and Forty-eighth street, New York city, by courtesy of Moe Mark.

### KYW, CHICAGO, ILL. (536 METRES.)

**TO-DAY**  
12:00 noon—Central Church service will be broadcast from Orchestra Hall, Chicago. Dr. F. F. Shannon, pastor. Musical programme will be given under the direction of Daniel Protheroe.  
3:30 p. m.—Studio chapel service will be broadcast from the Commonwealth Edison building, Chicago. The Chicago Church Federation will conduct this service.  
8:00 p. m.—Chicago Sunday Evening Club service will be broadcast from Or-

chestra Hall, Chicago. Special musical programme under the direction of Edgar Nelson.

### KDKA, EAST PITTSBURGH, PA. (326 METRES.)

**TO-DAY**  
11:00 a. m.—Services of the Smithfield Methodist Episcopal Church, Rev. W. L. Hogg, minister.

2:45 p. m.—Concert arranged by A. Douglas Cullum, tenor, of Clarksburg, W. Va., presenting Ruby Gail Marshall, soprano; Katherine Ernest, pianist; J. Ranciel Romine, baritone.  
4:45 p. m.—Vesper services of the Shady Side Presbyterian Church, Pittsburgh, Pa., Rev. Hugh Thomson Kerr, minister.  
6:30 p. m.—Dinner concert by Gegerio Scalzo's Orchestra playing at the Pitts-

burgh Athletic Association, Pittsburgh, Pa.  
7:45 p. m.—Services of the Calvary Episcopal Church, Pittsburgh, Pa., Rev. E. J. VanEtten, minister.

### WBZ, SPRINGFIELD, MASS. (337 METRES.)

**TO-DAY.**  
7:30 p. m.—Opening meeting of Ford Hall Forum, 1924-1925 season.



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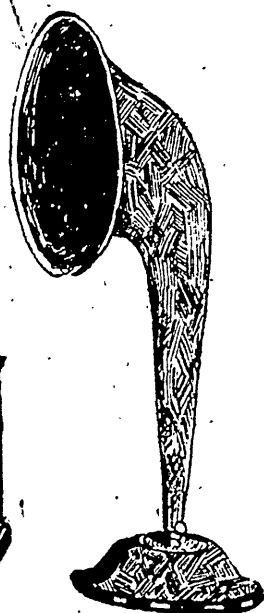
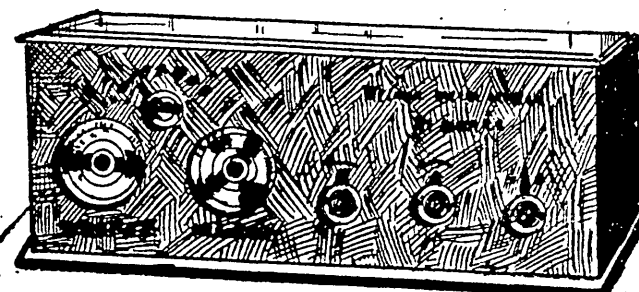
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