

New Eight Tube Super-Heterodyne Series Conclusion; Care of Batteries, How Resistance Affects Your Selectivity; Most Complete Advance Programs

Radio Digest

EVERY WEEK **Illustrated** PROGRAMS **TEN CENTS**

REG. U. S. PAT. OFF. & DOM. OF CANADA

Vol. XI

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By Radio Digest Publishing Co.

SATURDAY, NOVEMBER 1, 1924

No. 4

COLOR PICTURES BY RADIO

MARCONI WILL OPEN THIRD ANNUAL SHOW

AMERICA WILL BROADCAST
GREETING TO INVENTOR

Two Miles of Exhibits at Monster New
York Exposition in Grand
Central Palace

NEW YORK.—Guglielmo Marconi, the "father of Radio," it is announced, will open the Third Annual National Radio exposition at Grand Central palace, New York, on the evening of November 3.

The famous inventor will be the central figure in a remarkable demonstration of international broadcasting. It will be followed by an exceptional program of entertainment and education given on a mammoth scale by the leading broadcasters and Radio manufacturers of the United States.

At an appointed moment on the opening day, Marconi, in his London laboratory, will touch the key of a special transmitting instrument, releasing by Radio a bolt of power that will be hurled across the ocean and instantaneously light a huge American flag outlined in electric lights at Grand Central palace

To Greet Marconi

Immediately thereafter, three of the most powerful stations in the United States, WJZ in New York, WRC in Washington and WGY in Schenectady, will be joined together to broadcast to Mr. Marconi a message of greeting from the Radiophans of America, direct from the exposition.

Many broadcasting stations both in the United States and on the other side of the

(Continued on page 2)



NEW MACHINE BROADCASTS PHOTOGRAPH

Natural Tints Are Kept

Capt. G. A. Taylor, of Australia,
Demonstrates Epochal Invention
for First Time in London

LONDON.—Colored pictures transmitted by Radio were shown here recently for the first time in Europe.

Captain George A. Taylor, president of the Association for Developing Wireless in Australia, New Zealand and Fiji, demonstrated his machine for transmitting them and explained the process.

The colored picture for transmission by Radio is photographed through screens on to metal plates in the ordinary way for printing in the three primary colors—yellow, red and blue. Each plate is printed in black ink and the print is enlarged so that when acid etched on a metal plate it will have deep etchings between the screen lines.

Sent in Dots and Dashes

The plate is then placed on a cylinder moving with a needle coming in contact with the metal parts untouched by the acid, and such contacts are transmitted by Radio over any distance in

(Continued on page 2)



Margaret Buckey, well-known soprano, who is familiar to the fans who tune in on Station KQV, Pittsburgh, is shown above. Left, Marian Hansen, who has broadcast her readings from WOAW, Omaha, several times. Right, Elizabeth Wottring, piano soloist, heard from WBAV, Columbus.

GIMBEL BROS. OPEN NEW YORK STATION

USE WESTERN ELECTRIC 1B TYPE TRANSMITTER

Use Storage Battery Power and Filter to Eliminate All Carrier Wave Noises

NEW YORK.—Because of the success Gimbel Brothers met with its broadcasting station, WIP, in the Philadelphia store, the New York store now also has its own broadcasting station. It opened its program on Sunday evening, October 26.

This new station has the call letters WGBS, and operates on a wave length of 316 meters (949 K. C.). Due to the experience gained from the Philadelphia station and by the recent developments of the Western Electric company on broadcast transmitters, WGBS promises to be one of the finest of its kind in the country.

The transmitter proper is the Western Electric type 1B, consisting of two 250-watt oscillator tubes and two modulator tubes of the same rating. The antenna consists of a four wire flat top supported by 137 feet above the roof by steel masts. A lead is brought from this directly to the transmitter on the eighth floor of the store.

Storage batteries furnish the power supply for the transmitter.

MARCONI OPENS SHOW

(Continued from page 1)

water, will offer the courtesy of "silence in the air" for the few moments that will be required to accomplish this feat. As atmospheric conditions also are usually favorable during this period of the year, the wizard of wireless will have little difficulty, it is expected, in hearing the voice of America transmitted across the Atlantic.

Race Against Time

Another thrilling demonstration, attempted for the first time in the history of Radio, will be a race against time. From a transmitting and receiving plant, to be installed at Grand Central palace for the week of the show, two Radio telegraphic signals will be released simultaneously and sent flashing around the world in opposite directions, to return after the messages have completely circumnavigated the globe. The famous letter "S," used by Marconi in his first historic achievements of spanning the ocean by Radio will be the signal used in the experiment by a group of leading Radio engineers.

A great world map to be hung on the mezzanine floor of the palace. As each signal is received at and relayed from country to country, a white and red light respectively will flash from those parts of the map, and a special loud speaker will repeat the acknowledgments from England, France, Germany, Norway, Poland, China, Japan, Honolulu, and the American west coast stations.

Demonstrate Teledynamics

A striking demonstration of Radio in the field of teledynamics will also be shown. A pan of flashlight powder in Grand Central palace will be touched off by Radio from a point across the Atlantic ocean. In the fraction of a second in which this blinding flash occurs, an automatic camera will click and take a group picture of the opening night throngs assembled at the exposition.

The vast scale upon which the exposition is to be held is best indicated by the fact that it will require a promenade of almost two miles for a complete inspection of all the exhibit.

S. L. Rothafel of the Capitol theater in New York will be in charge of a nightly entertainment program which will be broadcast by Station WEAJ direct from the exposition.

Will Give Big Frolic

On election night, November 4, the entire third floor of the Grand Central palace will be turned into a dance floor for the National Radio exposition frolic. It is expected that this will draw 10,000 people, who can be comfortably accommodated. Prominent figures of society, the opera, the stage and the screen are sponsoring the "frolic," the proceeds from which are to be equally divided between the Actors' Fund of America and the Wounded Veterans Radio fund. Vincent Lopez will direct a greatly augmented orchestra on the night of the dance.

Kalamazoo College Resumes Winter Broadcast Program

DETROIT.—WOAP, Kalamazoo college station, will be on the air again soon. Professor Leonard J. Ashby, whose voice so many Radiophans came to know last winter and spring, will have charge of the programs and has promised to broadcast a series of concerts that will make his listeners eager to tune in whenever he is on the air.

It is planned to begin broadcasting from the college the first week in November until next March.

AND THE INTERCITY FAILED TO APPEAR

WASHINGTON.—When Secretary Hoover denied a renewal of license to the Intercity Radio company on the assumption that they were interfering with broadcasting, the case was taken into court. Both the Supreme court of the District of Columbia and the District court of Appeals ruled against Hoover. He appealed to the United States Supreme court. There the case was dismissed. Something happened to the Intercity company and they had gone out of business.

Why Is a Berry and If it Is, How Many?

And WBZ Wonders What It's All About

SPRINGFIELD, Mass.—The fever which seizes the average Radiophan makes him unaccountable for many errors committed while he is wrapped in the mysteries of his receiving set.

They make many slips, but the prize "bone" arose out of a postcard of acknowledgment a local fan sent to the Westinghouse station, WBZ, at Springfield, Mass.

The fan wrote as follows: "You Westinghouse bunch are berries. Please confirm."

Bureau of Standards Warns Against Use of Its Name

WASHINGTON.—The attention of the bureau of standards has been called several times to the unauthorized use of its name in connection with the sale of dry batteries for Radio receiving sets. No test results of competing brands of batteries have been published.

Wandering Minstrel Entertains in Boston

Colwell, Tramping Artist, Travels 5,000 Miles in Six Months

BOSTON.—Nate Colwell, the real twentieth century edition of the wandering minstrel, arrived here recently and is now making his headquarters at the Edison Light company Station WEEI.

Colwell is one of the most interesting fellows on the air. During the past six months he has walked over 5,000 miles in his travels about the country. His story of these wanderings sounds like a Horatio Alger book. He came east from Chicago about three years ago to attend college. Here his health failed and he was ordered by physicians to live out in the air.

RADIO COLOR PICTURES

(Continued from page 1)

The simple "dot and dash" method, the "dot and dash" being easily picked up as in ordinary reception by Radio, and made to establish contact by means of an ink-marker on to a cylinder moving at the same speed as that at the transmitter.

The receiving cylinder, however, is covered with paper so that at the receiving station the picture is received in black as transmitted. It is then reduced to the original size and printed in color, the black print of which has been transmitted. The three pictures received at the receiving station are reduced and printed in the three primary colors—yellow, red and blue. This gives the effect as shown on the original colored picture at the transmitting station.

Predicts Wide Use

Captain Taylor, in showing the machine at work, explained that it opened the way for many possibilities. He predicted the early showing of happenings afar off in all their glory of color. He also explained a process by which drawings can be shown being made at a distance, and how colored pictures and cartoons will be broadcast during their actual making.

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Looking Ahead

Watch for the New and Improved Advance Program Department.—A distinct improvement in the method of giving the important stations' programs, will be initiated next issue. The change, it is believed, will be hailed with unanimous approval by all readers of Radio Digest.

Static Inter-Coupling Phenomena Are as the Sphinx to the average listener in who takes an interest in "what makes it go," but William W. Harper, in his next article, has a very lucid explanation of this phase of the underlying principles of selectivity.

Charge Your Batteries with a Homemade Charger if you like to make apparatus, but of course the manufactured ones are better. William Fenwick, in his next article of the series on the upkeep of batteries, will tell how to build an electrolytic charger.

Beginners Will Learn All about Grid Leaks and Biases from Thomas W. Benson in his next "Helpful Hints" article. He will tell the reason for the grid leak and other forms of biasing.

Coming Soon—KYW, KFNF and WSAI in Pictures, Interviews with Rosaline Green, Fiddlin' John Carson, Capt. Donald B. MacMillan, Ernie Rogers, Bert Davis and other Radio notables. Watch for them.

Newsstands Don't Always Have One Left

WHEN YOU WANT

Radio Digest

YOU WANT IT!

BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW

SEND IN THE BLANK TODAY

Publisher Radio Digest,
510 N. Dearborn St.,
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Please find enclosed check M. O. for Five Dollars (Six. Foreign) for One Year's Subscription to Radio Digest, Illustrated.

Name

Address

City.....State

Of Course It's a CROSLEY Better-Costs-Less Radio

For ease of tuning, selectivity and long distant reception, you can't beat a Crosley. Actual performances prove this day in and day out.

Here are what a few of the happy Crosley users say:

Apponag, Rhode Island. "I purchased my Crosley one tube No. 50 around the first of August and I think it is my duty to express my satisfaction of its performance during the warm spell. Have heard New York, Boston, Pittsburgh, Cincinnati, Chicago, Detroit, Ottawa, Canada, and many other stations."

Dallas, Texas. "The set, Model 51, has already surpassed my greatest expectations. On the night of September 13th, Oakland, California, was received with sufficient volume to be clearly heard throughout seven rooms. Kansas City, Chicago and many other stations were received with respectively greater volume."

Chicago, Illinois. "My Tridyn has done all that you claimed for it. The first silent night, Monday, September 22nd, using only two tubes, I pulled in twenty-eight stations. On the following night with most of the Chicago stations going full blast, using two tubes, I pulled in Memphis, Cincinnati, Dallas and Omaha."

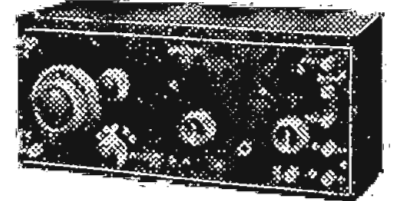
(Names upon request)

These are only a few of the thousands of unsolicited letters that come to us. You, too, can enjoy similar results with a Crosley. And the cost of any Crosley is remarkably low.

BEFORE YOU BUY—COMPARE YOUR CHOICE WILL BE A CROSLEY

Crosley Regenerative Receivers are licensed under Armstrong U. S. Patent 1,113,149. Prices West of the Rockies add 10 per cent

For Sale By Good Dealers Everywhere



Crosley Model 52, Price \$30.00 With three tubes and Crosley Head Phones, \$45.75

Write For Complete Catalog

The Crosley Radio Corporation

Powel Crosley, Jr., President

11491 Alfred Street Cincinnati, O.

Crosley Owns and Operates Broadcasting Station WLW

The kind of Letters Thordarson gets No. 4

NOTE—Copy of following letter was sent to Thordarson Electric Mfg. Co., Chicago. Next week we will print the letter Mr. Bond wrote us direct.

BRADSHAW & WEIL, Inc. INSURANCE 175 W. Jackson Blvd. Chicago

Radio Station WMC. Memphis Commercial Appeal, Memphis, Tenn.

Gentlemen: I have stood this just as long as possible and, as Mr. Nuvolini yelled at me as I fell down on his dance floor way back in pre-synthetic days, "enough is enough!" If you do not cut down the out-put of that globe-trotting, cross country galloping 10,000,000 kilowatt transmitter of yours, you will blow all the bottles out of my receiver.

As you know, we have some very fine local stations here, WDAP, WJAZ, KYW, WMAQ, etc., and I certainly would like to listen to them without you birds crashing through with more noises than Peter Tracy and Mike Conroy used to make when they got to arguing back in the days when you could get two for a quarter without losing any fillings or inlays. All foolishness aside, you are getting out wonderfully, and it is a pleasure to listen to your programs. Tell the boys if they want a real receiver that tunes, to junk their standards, reflexes and singles and build a Cockaday Four circuit, stick in two new type low ratio everything from lean back and Bynalla. It is the only medium priced receiver that, from Chicago, will tune out the Drake and KYW and pick up outside stations so they can be heard on the loud speaker. Less power to you for the sake of my ears and thanks for the excellent entertainment.

Yours very truly, (Signed) H. W. Bond. HWB:M

THORDARSON

Super AMPLIFYING TRANSFORMERS

Standard on the majority of quality sets

Audio Frequency: 2-1, \$5; 3 1/2-1, \$4; 6-1, \$4.50. Power Amplifying, pair \$13.

Write for some real bulletins!

DISMISS INJUNCTION MOTION OF A. T. & T.

McCULLOUGH LABORATORY
WINS COURT DECISION

Manufacture of Metal Covered "Heliotron" Tube to Be Continued—
Will Add New Line

PITTSBURGH.—When the United States District Court entered its order recently, dismissing the motion of the American Telegraph and Telephone company for a preliminary injunction against the F. S. McCullough laboratories of Wilkensburg, Pa., probably the first adverse decision among a score of favorable ones was entered on the records of the rapidly expiring DeForest three electrode patent.

The tube, for the manufacture of which the McCullough company is being sued, is known as the "heliotron," invented by him. It is a power tube having a metal envelope instead of the usual glass one.

This metal shell, which is really an external plate, serves as the anode of the tube. Inside the shell there is only the filament and grid. Leads are brought in through a special glass seal at the bottom of the shell. This seal was developed by Mr. McCullough.

Tube Contains Helium

The external plate of the tube can be readily cooled by air or water. The tube derives its name from the presence of a very perceptible quantity of helium contained within which materially increases the efficiency.

In addition to the manufacture of the heliotron, McCullough is also making B battery eliminator rectifier tubes and has developed a new type of 100 and 250-watt power tube which is expected on the market within a short time. Patent and pending applications cover all of these developments.

It is the contention of the A. T. and T. that McCullough has no right to manufacture tubes of any description.

WGY Players Present Broadway Show by Air

Radiophans Hear "First Night" of
New Crook Play

SCHENECTADY, N. Y.—By means of wires running between here and New York, the WGY Players have realized their ambition of every follower of the drama—a hearing on Broadway. WJZ, the New York station of the Radio Corporation of America rebroadcast the offerings of the Schenectady group during the month of October. Five plays were given.

The WGY Players are heard weekly by many New York Radiophans but a great majority find difficulty in picking up the General Electric's eastern station because of fading or interference. In a single performance the WGY Players, the oldest and foremost group offering drama to Radiophans, entertained listeners of two stations. One or two plays that have had their day on Broadway came back through the air. On October 3 Radiophans tuned to WGY or WJZ became real first-nighters for on that date "Silence," a crook drama by Max Marcin, presented by the WGY Players in advance of the play's opening in New York and while the play was in rehearsal by Selwyn & Company.

The WGY Players were first heard on the air in October 1922 in Eugene Walters' play "The Wolf." Since that time they have presented 83 plays.

Preliminary regulations regarding broadcasting have been completed by the Radio committee of Esthonia and are now subject to the approval of the minister of communications.

"HIRED HAND"—LONE STAR ACE



Finishing fourth in the Radio Digest first annual Gold Cup Award, the "Hired Hand," chief announcer and director of WBAP, Fort Worth Star-Telegram, ever remains a popular Radio figure. His original announcing is so typical of him that a recent communication from a listener suggested reprimanding him for having given one "wise crack" twice the same year.

Football Radiocasts

November 1

- Harvard-Boston, WBZ (337).
- Purdue-Chicago at Chicago, KYW (536), WMAQ (447.5).
- Iowa-Illinois at Illinois, WGN (370).
- West Point-Yale at New Haven, WEAF (492), WGY (380), WJZ (455).
- Wooster-Ohio at Columbus, WEO (294)

November 8

- Butler-Iowa at Iowa City, WHAA (484).
- Harvard-Princeton at Cambridge, WBZ (337), WEAF (492).
- Illinois-Chicago at Chicago, KYW (536), WMAQ (448).
- Indiana-Ohio at Columbus, WEO (294).
- Northwestern-Michigan at Ann Arbor, WWJ (517).
- Yale-Maryland at New Haven, WGY (380), WJZ (455).

Give Broadcasting Concession

WASHINGTON, D. C.—A ten year concession for exclusive broadcasting privileges has been granted by the government of Peru to the Peruvian Broadcasting company.

STAGE RADIO FIRE AT CELEBRATION

Fans Get Thrill as Sounds of
Imaginary Blaze and Fire-
Fighting Are Broadcast

KANSAS CITY.—All the thrills of sixteen fire companies speeding to an imaginary burning building, together with the official commands and sounds incident to a big fire, were broadcast by WDAF, at Kansas City, Mo., the night of the opening of Fire Prevention Week.

The entire equipment of the Kansas City, Mo., fire department was used in staging a performance especially for the Radio audience. The fire run was arranged by Elmer E. Scott, state fire marshal of Kansas, and John McNarrey, fire chief. Special microphones were placed in the fire headquarters and special lines carried the demonstration to The Star's transmitter.

It is believed that this is the first time in the history of Radio that such a demonstration has been put on the air.

RADIOCASTERS GIVE ELECTION RETURNS

GREAT INTEREST CREATED
BY BROADCAST TALKS

Will Begin Announcing Returns at
Closing of Polls and Continue
Until After Midnight

From reports and programs which have come to the attention of Radio Digest, probably every sizable Radiocaster in the country will announce the returns of the presidential election on November 4.

Stations in all sections report that correspondence from listeners in points out that never before has any single factor influenced political opinion as much as has Radio. This is especially true concerning women voters.

Influenced by the two party conventions broadcasts and by the numerous political addresses to which they have listened, they have formed definite opinions about the candidates. The names of candidates in the newspapers have become more to them than just names.

Obviates Husband Opinions

One woman wrote to Station WGY, "Thanks to Radio, we women do not have to depend on our husbands for our political opinions any longer."

Because of the nation wide scope of Radio it has become necessary for the speaker to make his appeal national in scope. Much has been done in breaking down the sentimental politics of triviality, sectionalism and religious difference, according to authorities. The same authorities believe it will be highly instrumental in bringing thousands to the polls who would otherwise neglect to go.

It is estimated that millions of people will listen in to hear the returns. Most stations will begin broadcasting at the closing of the polls and continue until after midnight.

WOMEN BUILDERS ENTER CONTESTS

Prizes Given for Best Sets Made
by Women at Montreal
Exhibition

MONTREAL.—"And I learned about Radio from her."

What with Radio contests of all descriptions being held in all parts of the world it has remained for this city to hold the first contest in which the ladies can exhibit their skill as set builders.

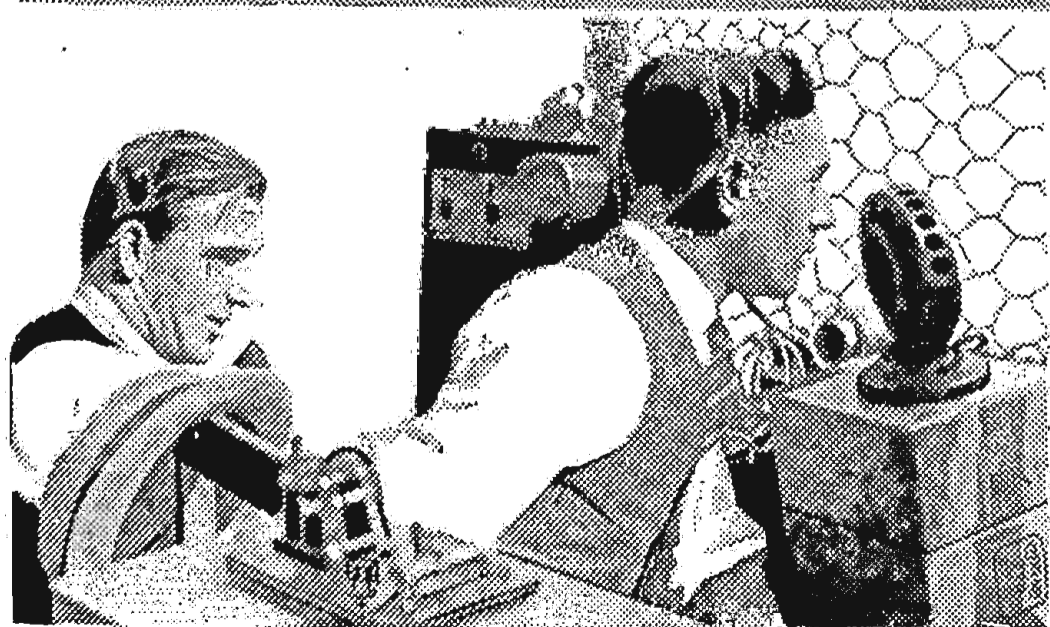
At the recent Montreal Radio show a score of women vied with each other for the honor of winning the prizes offered for the best sets made by them.

Mrs. Sturgess of Station 2CN, Canada's only woman amateur operator took charge of a complete amateur station in operation in one of the booths at the exposition. A "museum" showing all the Radio apparatus from the time of the science's inception up to the present set used by Marconi occupied another booth.

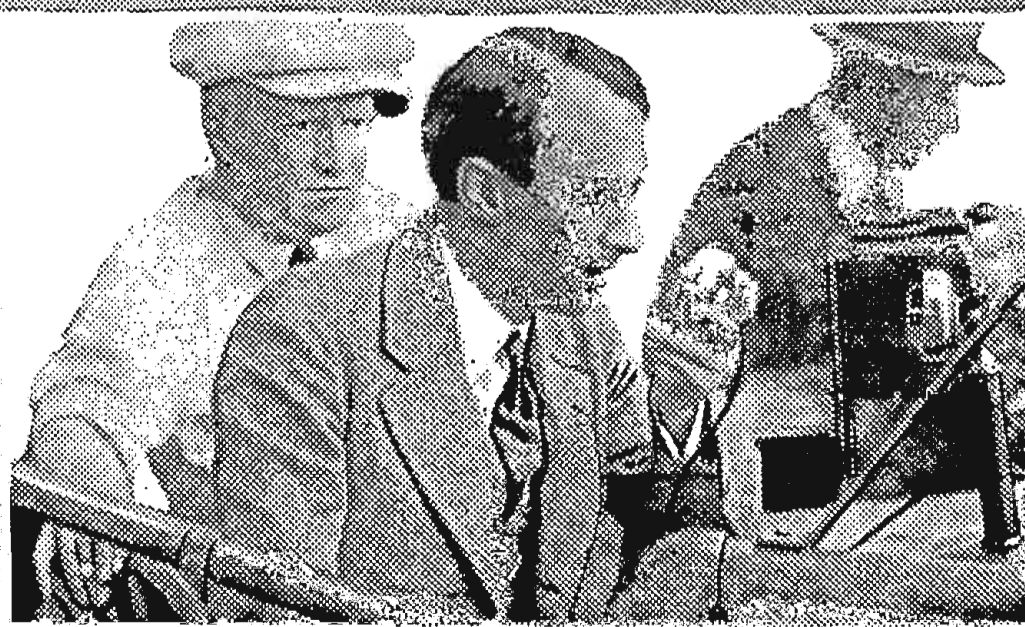
Station WJAG Starts Fund to Buy Sets for Shut-ins

NORFOLK, Nebraska.—Station WJAG of the Norfolk Daily News has requested that its listeners in stop sending in candy and cigars and instead dedicate their pennies and nickies to the "shut-in" fund.

This fund, already mounting above the thousand dollar mark will be used to buy Radio sets for the use of invalids and others who are confined indoors and are financially unable to buy sets. On each set a metal plate will be attached. It reads as follows: "From the listeners in of WJAG, World Series of 1924, dedicated to the 'shut-ins.' When you are through with the set please send it back and we will send it to some one else."



Albert Protzman, talking into the microphone, and his aide, George McElrath, who broadcast details of the world's series through eight stations, are shown on the left. Right is Graham McNamee and John P. McAvory, giving the fans a minute description, inning by inning, through Station WEAF.



New York's Street Railway Station—WEBJ

For Worker and Patron

By J. L. Newman

A STREET car ride and a Radio program for a nickel. That is what the Third Avenue Railway company of New York city, owner of Station WEBJ, is offering to the public. This station is distinguished in many ways. Designed and constructed in two months by W. J.

Although open only a few weeks, this station is giving some of the finest programs ever broadcast to the Radio public. Operating on a wave length of 273 meters and using 500 watts power, reports have reached the station indicating that they are being heard throughout the country.

Many noted Broadway celebrities are making their appearance before the microphone at WEBJ, among them Florence Johns who recently related to the Radiophone her reason for going on the stage.

It seems that this talk made quite a hit with the invisible female audience, for the next day the studio mail for Miss Johns was exceedingly heavy.



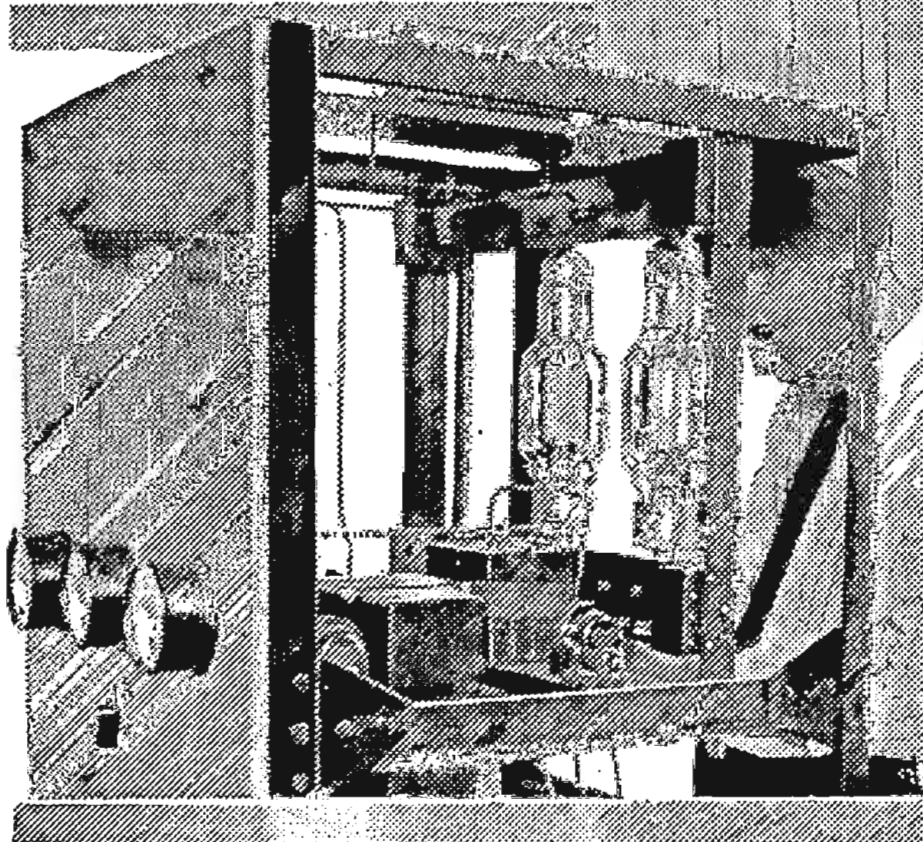
Richard E. Blythe and H. A. Bruno, former aviators, who now do the announcing at Station WEBJ. Mr. Blythe is chief announcer, while Mr. Bruno is second in command.



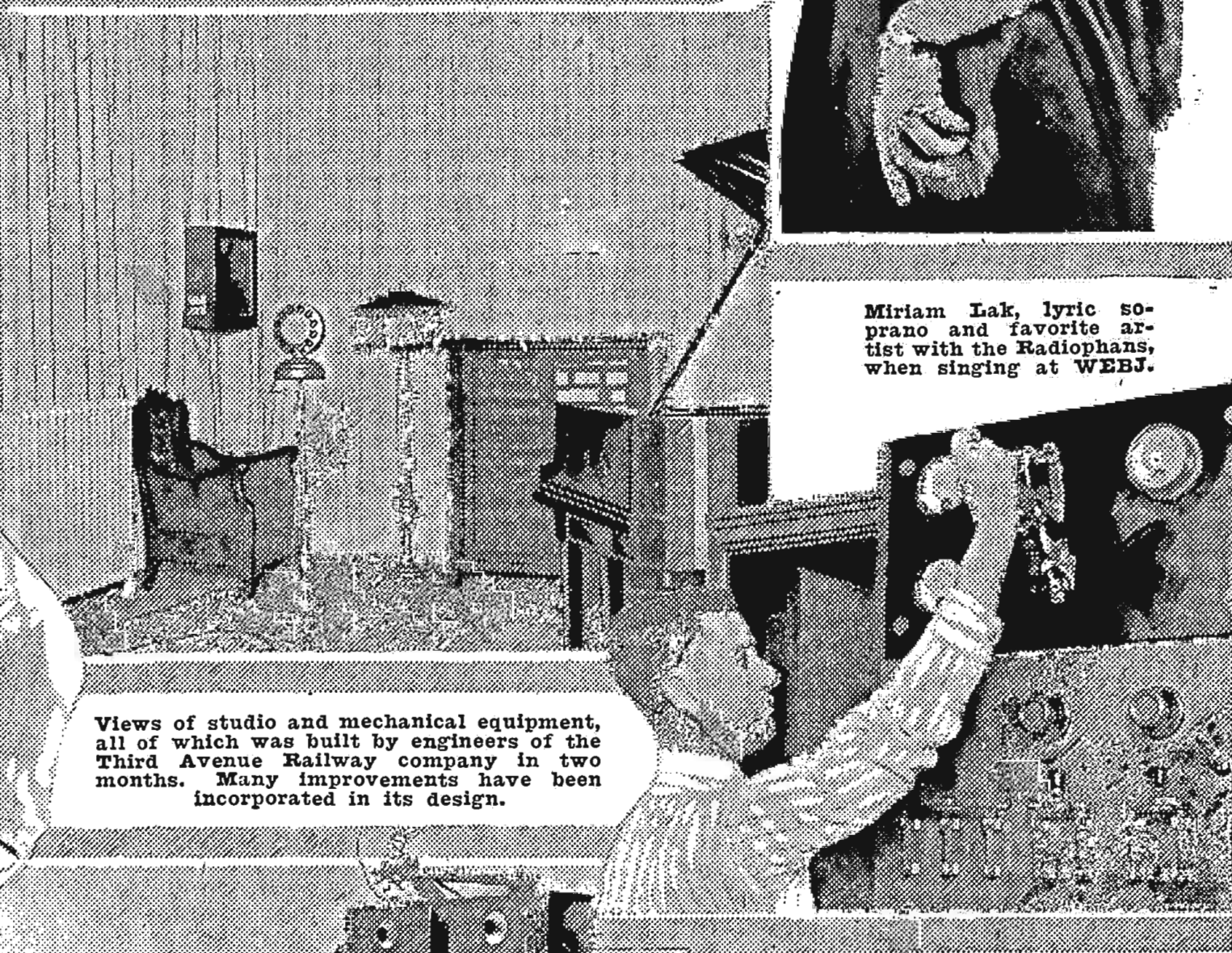
Florence Johns, well-known Broadway star frequently heard from this station.



Miriam Lak, lyric soprano and favorite artist with the Radiophans, when singing at WEBJ.



Views of studio and mechanical equipment, all of which was built by engineers of the Third Avenue Railway company in two months. Many improvements have been incorporated in its design.

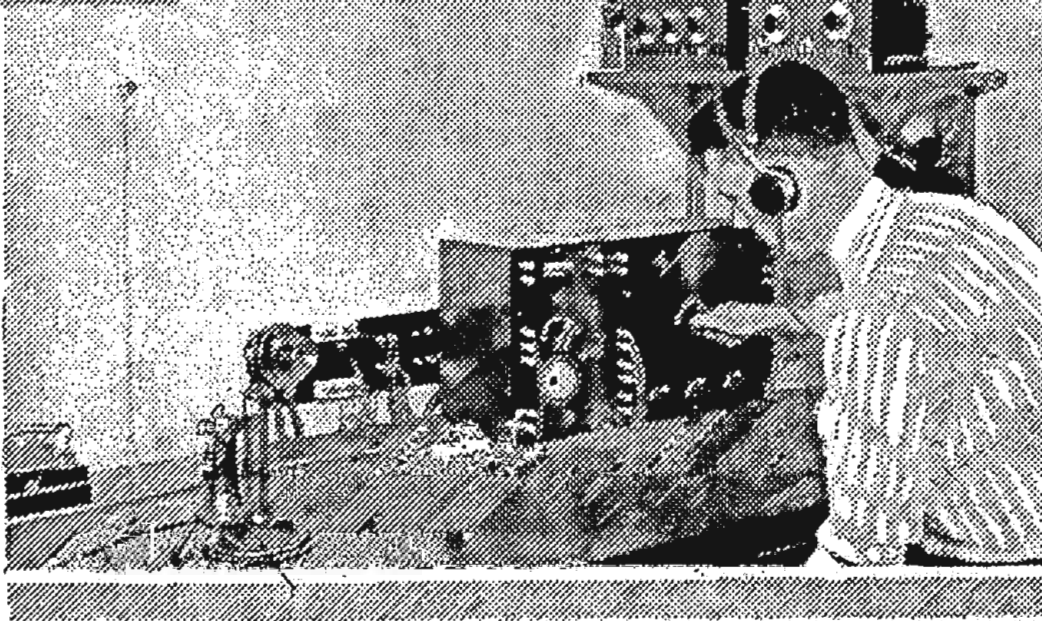


Quinn, electrical engineer, it is the first broadcast station owned and operated by a street railway company.

Colored posters announcing the programs are placed in each car. By using its 800 or more cars in this manner, it is estimated that more than 1,000,000 persons are made aware daily of the activities of the station.

Dual is the purpose of the station—to amuse and educate the public served by the company and to elevate the morale of its personnel. Leaders of community organizations are given the opportunity to tell of the achievements of their neighborhoods.

"Our broadcast station is like a house organ or magazine," said Garrow T. Geer, secretary of the company. "By means of it we are able to talk personally to our employees."



Another star performer is Miriam Lak, lyric soprano, who on numerous occasions has entertained the WEBJ fans. She is very popular, receiving the plaudits of the public whenever appearing on the program.

The men who handle the microphone end of the station are both aviators of national repute. Richard Blythe, formerly connected with the Royal Flying Corps, is chief announcer. His right hand man and second in command is H. A. Bruno, also an aviator with an enviable record.

Three years ago, Captain Bruno as he was then known, commanded the flying boat which established a world's distance flight. (Continued on page 9)

Peer of Sports Announcers — J. Andrew White

Enthralls Thousands

By John Galbraith

THEY'RE off!" A murmur that spreads over the throng swells with the volume of ejaculation. The "peer of sport announcers," Major J. Andrew White, is describing one of the greatest horse races in the history of the turf.

Perched high on a rail at the judge's stand, with a pair of binoculars in one hand and a microphone in the other, Major White is straining his eyes for a clear vision, as the restless horses kick the yellow dust high in the air.

Whenever a championship contest is scheduled, either boxing, horse racing, baseball or football, Major White is the man usually picked to describe it. He received a letter recently from a prominent business man in Fall River, Mass., relating a humorous story of how his set brought in a big fight.

It seems that this man had been attending a meeting on the evening of the Lynch-Goldstein bout. His wife was entertaining a number of women. On his return he found a note in his wife's handwriting under the lamp on the library table.

It read, "Goldstein won. The score was Goldstein 8, Lynch, 3, tie 4."

Knowing nothing of the fight, in the morning, he inquired of his wife what it was all about. She informed him with a very superior air that SHE had followed the fight by Radio.

Transmitting to listeners the thrill of the game is the particular trick which has made this sports announcer the leader of them all. During the broadcasting of a football game, he was asked how it was done.

"I play the game myself, emotionally," he said. "I am 'in' every play and I let myself go, vocally, with all the intenceness that I would use if I was actually carrying the ball."

The distinctive character of the description given by this specialist in sports broadcasting lies in the fact that he does not speak in the past tense, but describes each play at the exact instant that it is made. He follows the milling mass of players, intent upon the game, while the howling spectators about him go wild.

Major White's gift of observation makes his word pictures of the scene so vivid that listeners feel they are actually present at the contest.

One of his favorite, and much admired, stunts is picking out some small incident, relating perhaps to but a single individual or group, which tells a story, tragic or humorous, and typifies the complexities of emotion which sway a football, race or fight crowd.

For many years Major White has worked the microphone end of various broadcasting station.

His glowing descriptions of a "stride-by-stride" horse race has won him numerous friends who have never seen him in person. But, even away from the microphone, he is the same unassuming gentleman that he is when talking to the invisible audience.

And here he is, the man all Radio sports fans listen to, as he appears when at his best—in action.



Major J. Andrew White, announcing the results of a prize fight, is shown above. Rated among critics as one of the most versatile announcers, he has the knack of "carrying" his audience through the entire program spellbound. Below he is shown describing a football match, following the players with binoculars while he tells of their various plays.



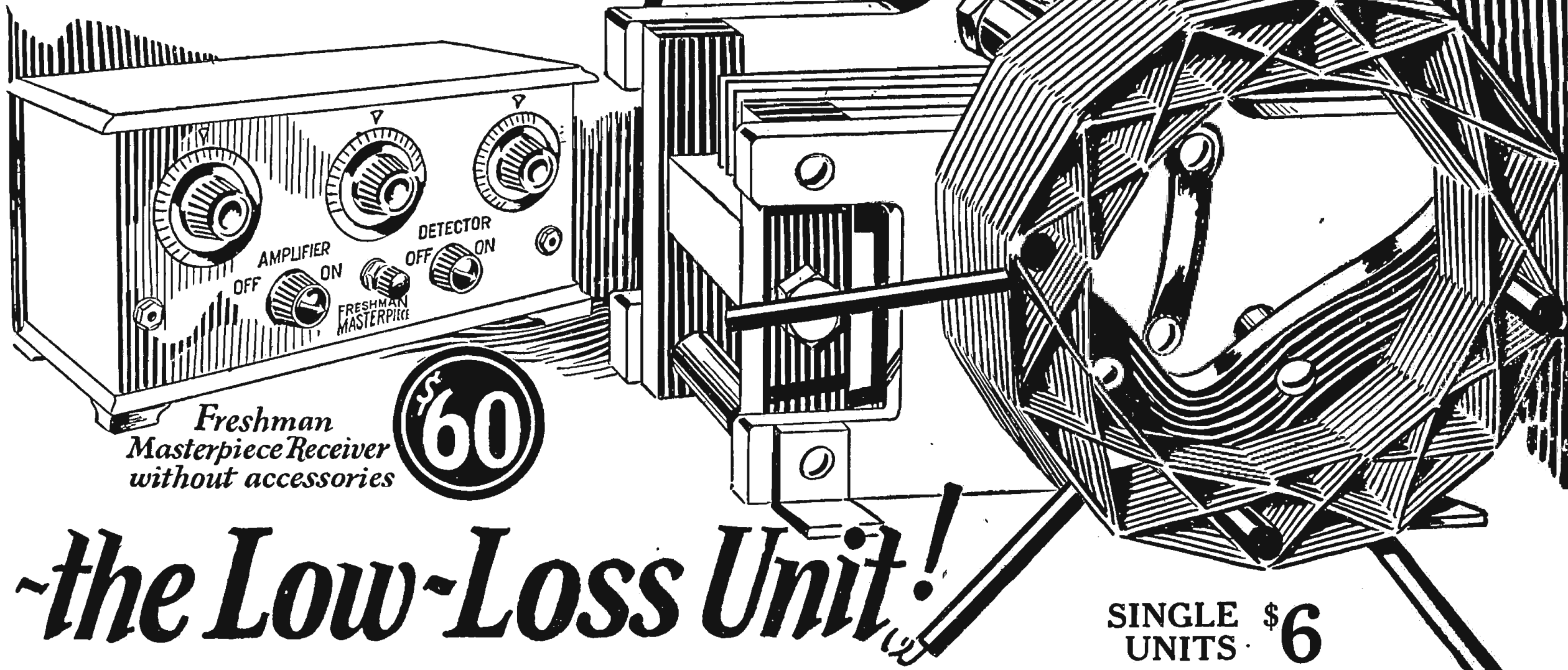
There is only one way to describe a football game, and that is to play the game emotionally. This is Major White's secret of announcing which ranks him as the foremost sports announcer in the world today.



Never in the history of broadcasting has an announcer held his audience as Major White did when he "covered" the horse race in which Epinard, the French ace, lost to an American horse.

FRESHMAN MASTERPIECE

The Secret of the Success of the Masterpiece



-the Low-Loss Unit!

It's Easy to Build

A Five Tube Radio Frequency Receiver When You Use the FRESHMAN MASTERPIECE KIT

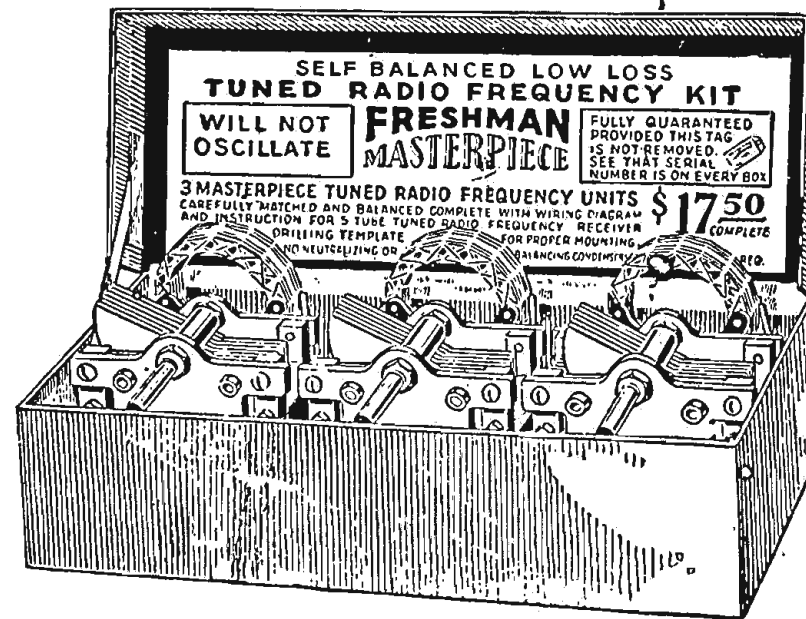
NO NEUTRALIZING OR BALANCING CONDENSERS REQUIRED

When you build with the Masterpiece Kit which produces a tuned Radio Frequency Receiver that will bring in even the most distant stations with the volume and clarity of locals. So selective that stations can be brought in day after day at the same dial settings. A set that will be the equal, if not the superior, of any 5 tube receiver on the market, and what's more, it's the easiest set in the world to operate.

Each and every Freshman Masterpiece Coil bears a serial number and trade mark—our guarantee of electrical and mechanical perfection. Every genuine Coil is made of specially insulated wire to prevent short-circuiting, so often caused by inferior coils. For your protection demand only the genuine.

For Reflex and Other Circuits
MASTERPIECE TUNED RADIO FREQUENCY KIT COMPLETE

with 3 MASTERPIECE UNITS carefully matched and balanced. Complete with wiring diagrams and instructions for building any 5 tube Tuned Radio Frequency Receiver and drilling template for proper mounting. **\$17⁵⁰**



At your dealer's, otherwise send purchase price and you will be supplied without further charge.

Chas. Freshman Co. Inc.

Radio & Condenser Products
106 Seventh Ave. New York, U.S.A.

BROADCASTING PAYS THIS TEAM



Britt (right) and Finch (left) are making a big hit at various broadcast stations throughout the country. The acknowledgment card shown at the right, and their advance itinerary, is sent all Radiophans who hear them and applaud.



ADDY Britt and Dick Finch of the famous team of Britt & Finch, are making a hit with their 45-week tour of all the broadcasting stations in the principal cities of the United States, Canada, Mexico and Cuba. Their booking, arranged by the National Association of Broadcasters and Henry Watterson, music publisher, is doing much to prove that broadcasting does help the music composer, publisher and dealer.

The team has a special acknowledgment postcard which is used to reply to all Radiophan letters, telegrams and postcards—and incidentally, lets the fans know just what songs they are "plug-

ging." The reverse side of the card lists the compositions, published by Henry Watterson, that the team has written.

The winning personalities of the two singers is creating a great deal of good will for them and their songs. Their itinerary for the next few weeks will be:

Two weeks ending November 9, WTAM, Willard company, Cleveland.

Two weeks beginning November 10, St. Louis stations.

Two weeks beginning November 24, WSB, Atlanta Journal, Atlanta, Ga.

Week beginning December 8, WMC, Commercial Appeal, Memphis, Tenn.

WHEREIN ANDY RIDES AIR WITH NITE CAPS

I WEAR NO MAN'S COLLAR HE TELLS RADIOPHANS

Deserts Caboose Porch for Radio— Expects to Occupy White House in Early Spring

CLEVELAND.—With a more than lively appreciation of the value of Radio as an aid in his presidential campaign, Andy Gump, palladium of the peoples' rights, champion of liberty and defender of the faithful, has forsaken the proscenium arch of the caboose and completed his tour of the country via Radio with "The Nite Caps on Lake Erie."

Mr. Gump, who wears no man's collar, visited the principal and unprincipled cities of the country as guest of the Cleveland News-Leader and the Euclid Music company, who jointly arranged the itinerary of the "Nite Caps" cruise from the twentieth floor of the Union Trust company's building.

Gives Interview

Mr. Gump, when interviewed, said, "It's safer up here. They can't get at me as easily as they can on the back porch of the caboose."

"I have traveled the country over on freight trains," said Mr. Gump, "and I find public sentiment strong in its offerings of unsolicited and unexpected tributes. If I am a target for votes as I am for other things," he continued, "I feel that Min and I will be running this country of ours next March."

"It is partly on this account that I finished my triumphal tour by Radio. Mr. Frew of the Euclid Music company asked me to do so on behalf of the Radiophans of the United States, and I could not well refuse. As the Radiophans go, so goes the country."

Danes Open Station

WASHINGTON, D. C.—Operation of the new broadcasting station of the Danish Radio club was recently begun. The station cost about 75,000 kroner. The Danish Meteorological institute is broadcasting weather reports three times a day for the benefit of farmers.

OPERATOR LAUDS SHORT WAVE SET

Small Transmitter on Giant Dirigible Highly Successful in Tests

FORT WORTH.—"We have proven the efficiency of the short wave length sending and receiving set."

This was the first statement of Gunner G. W. Almour, one of the Radio experts aboard the great dirigible Shenandoah, when it landed here on its way to the west coast.

Almour stated that for the first 850 miles of the trip into the west they were constantly in touch with NKF, the United States government Radio laboratory at Bellvue, using the short wave entirely. The talk by Admiral Moffett from Station WBAP was received perfectly.

Over a hundred amateurs helped the tests, answering from as far as Chicago and Minneapolis.

When the huge gas bag nosed in to make fast to the mooring tower near the helium plant it was necessary to signal with lights to have Station WBAP stop broadcasting because of the interference with the ship's outfit.

Water-Bug Stops Show While Ball Fans Howl

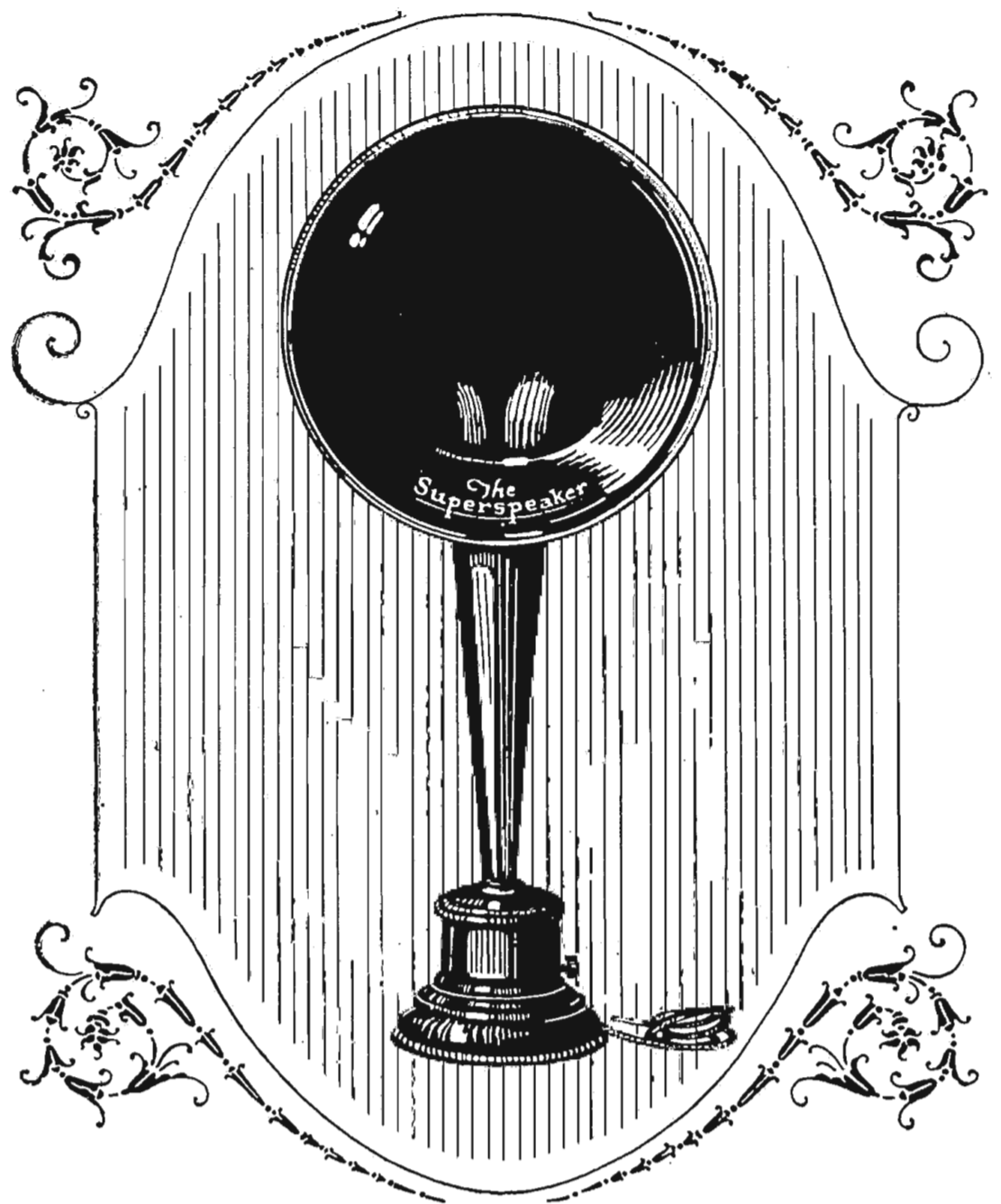
Shorts Condenser Plates Attempting to Get First Reports

WASHINGTON.—This is about a real "Radio bug."

During the operation of the Washington Star Radio score board in one of the world's series games, the receiver suddenly became silent and the fans became noisy.

A crystal set proved that Station WCAP was broadcasting. The receiver was hastily torn apart and between the plates of a variable condenser a common office building variety of water-bug was found. It is believed in his great interest to get the returns at first hand he crawled in and shorted the set.

He was removed and the announcements of the game continued.



Take No Chances

In the whole field of Amplified Reception, there is absolutely no adequate substitute for THE JEWETT SUPERSPEAKER.

The Superspeaker is the one instrument used and recommended by experts everywhere—the one standard by which all others are rated—the despair of imitators—the delight of users—the pride of conscientious radio merchants.

Don't cheat yourself or your set with anything cheap, doubtful or untried.

Install a Superspeaker and sweep the ether, with absolute confidence that your set is performing up to its full limit to receive.

No extra batteries or coils—adjustable by positive metallic cam, to increase the volume of distant stations or to modify local reception as desired—a big, beautiful musical instrument, standing 26 inches high, weighing more than five pounds and finished in permanent ebony gloss.

WARNING TO DEALERS

Holiday Superspeaker demand will surely be beyond our ability to supply, so fortify now with an ample stock

JEWETT RADIO & PHONOGRAPH COMPANY
5670 Twelfth Street
DETROIT, MICH.

The
Superspeaker,

Tower's

The Biggest

Tower's Scientific

\$2.95



Every set tested and approved by government licensed radio operators

Radio Value

TOWER'S Scientifics are used by MILLIONS, being approved by all newspapers, magazines and technical laboratories wherever submitted.

Tower's *Scientific* Headsets are guaranteed to be made of the best materials money can buy--- highest test enamel, insulated magnet wire, best grade five-foot tinsel cord, unbreakable caps, polished aluminum cases, using the famous scientific head-band constructed for maximum comfort.

If your dealer cannot supply you, order direct by post card, and we will ship immediately Parcel Post, C. O. D., plus a few cents postage.

THE TOWER MFG. CORP. 98 BROOKLINE AVE. Dept. W BOSTON, MASS.

Scientific

INJUNCTION MOTION DENIED PUBLISHERS

COPYRIGHT NOT INFRINGED FEDERAL COURT RULES

Important Decision Handed Down by Judge Knox Acclaimed by National Broadcasters' Association

NEW YORK.—The motion of the American Society of Composers, Authors and Publishers, made in the name of the Jerome H. Remick company, to enjoin the General Electric company from broadcasting the music of the society under the authorization of its members by the orchestra at an Albany hotel, was denied by Judge Knox of the United States District court here.

The publishers' suit was started to restrain broadcasters from using for radio-casting purposes their copyrighted composition.

Resume of Decision

In short the decision states: That whether or not broadcasting of musical compositions can under any circumstances be a public performance for profit, it is not an infringement where the playing of the musical composition, which is being broadcast, is itself authorized by the owner of the copyright or by anyone representing him. In other words, it is no infringement for a broadcasting station to broadcast performances of musical compositions by orchestras in hotels or elsewhere when the playing of the piece by the orchestra is itself authorized.

This decision, rated as one of the most important in the history of broadcasting, overrules the claim constantly made by the American society that broadcasting was a performance in itself, distinct and separate from the performance which was being broadcast.

This upholds present conditions—complete freedom to the public—and obviates the necessity of finding a way to make Radiophans pay for the entertainment. According to authorities it will also prevent any further misinterpretation of the copyright law.

Not only is the big station of Rome (IDO) now working on 100 to 120 meter waves, but two other amateurs, IHT and IMT, have entered the lists, and are reported with great intensity.

YOUR CHOICE FREE



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You receive 52 issues with your subscription and 13 issues in each bound volume. Bound volumes 5, 8, 9 and 10 ready for shipment. Volumes No. 1, 2, 3, 4, 6, and 7 are out of print. This offer good only in the United States and Canada. This offer good only for subscriptions coming to us direct with full amount of remittance. Not good through dealers or subscription agencies.

Great collection of Radio Information. Lessons for the beginner. Instruction on how to build and operate the standard reliable sets. Valuable Question and Answer department.

TODAY IS YOUR RADIO DAY

In addition to these features the current issues give you all the live news in Radio. Advance Broadcasting Station programs. Correct and authoritative list of all Broadcasting stations. The first and last word in Radio.

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510 N. Dearborn St., Chicago.

One year's subscription and choice of one volume. Send Vol. No. Enclose, \$5.00. (Additional Bound Volumes at \$2.00 each.)

Name.....

Address.....

City.....State.....

11-1-24

VOICE OPINIONS OF HOOVER MEET

WASHINGTON, D. C.—Leading Radio authorities attending the conference just closed here, were well pleased by the manner in which the meeting was held. Asked for their interpretation of the results of the conference, they gave the following messages to readers of Radio Digest:

SECRETARY HOOVER: "To my mind, the outstanding feature of the conference was the fine spirit manifested by the representatives of the listeners, broadcasters, manufacturers and all others of the Radio family. It was because of this that we were able to accomplish so much for the betterment of Radio.

"I am sure that as soon as the recommendations can be put in effect, the listeners can enjoy Radio with much greater satisfaction. There will be lessened interference between stations, and elimination of code interference which is now so troublesome in the broadcasting band.

"The refusal to lay down any super power program and limiting it to a purely experimental basis seems a happy solution of a difficult subject."

DR. FRANK W. ELLIOTT: "The conference has demonstrated the value of self government. Guiding the course of

an agency which bids fair to prove its worthiness as the greatest means of intelligent transmission the world has ever seen. The findings of the conference will in no way hinder progress in Radio development. It was a splendid achievement."

POWELL CROSLY, JR.: "The masterly ability of Herbert Hoover in the direction and handling of Radio broadcasting has been demonstrated. It would have been a mistake to have limited the amount of power that can be used. The development of broadcasting would suffer a serious set-back if it had been applied."

CAPT. P. P. ECKERSLEY: "As chief engineer of the British Broadcasting company under His Majesty's Postmaster General, I was extremely fortunate to be present at the conference. What impressed me chiefly was the manner in which the difficulties were discussed and solved.

"Americans are interested in distance. Englishmen in the quality of his limited stations. Nevertheless, the policy of increased power and experimental super power indicates a trend towards strong signals and simple receivers as in England."

SELECT SITE OF NEW SUPER POWER PLANT

Engineers Select Harrison, Ohio, for 5-kw. Crosley Station

CINCINNATI.—Radio engineers and surveyors have selected Harrison, Ohio, as the ideal place for the new powerful Radio broadcasting station of the Crosley Radio corporation.

Locating the powerful new five-kilowatt WLW station twenty-five miles from the studios in Cincinnati and away from thickly populated districts will lessen interference.

NEW RADIOCAST WEBJ

(Continued from page 4)

When the Navy balloonists were reported lost last summer in the region of the Great Lakes, Captain Bruno flew to their assistance. His crew found the drifting balloon and were the first to report that the balloonists had been drowned.

When asked her reactions before the microphone, Miss Johns, noted Broadway star, said, "I feel as if I talk to myself—it is worse than stage fright." Then looking in startled fashion at the microphone, she bowed in answer to inaudible applause and left the studio.



FADA NEUTROCEIVER

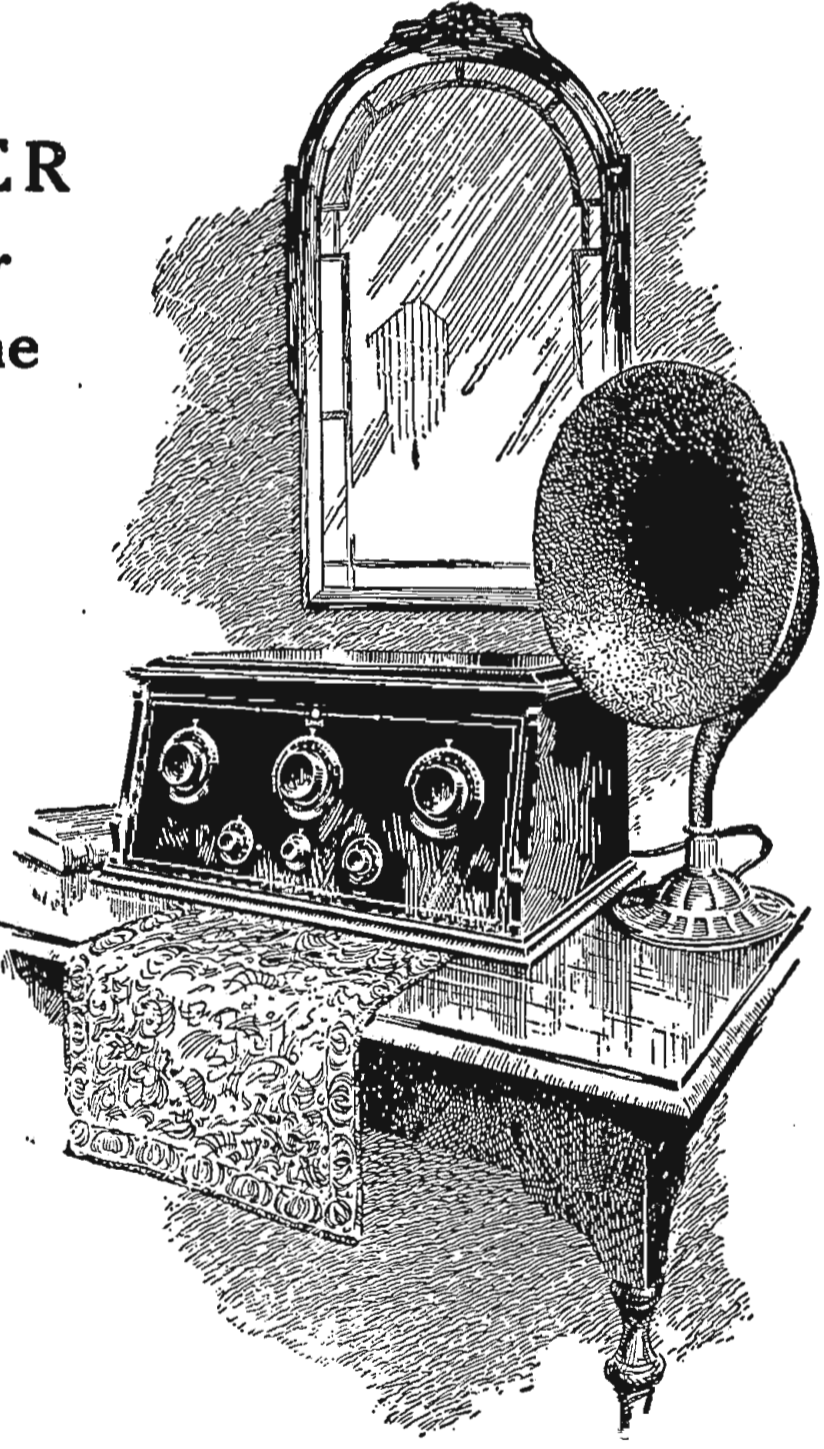
—a new and better five-tube Neutrodyne

THE better you become acquainted with this FADA improved five-tube Neutrodyne, the more you will wonder at its amazing performance. There's nothing else like it. In appearance, too, the Neutroceiver is in a class by itself. The cabinet is a beautifully designed and proportioned piece of art furniture. The panel is perfectly balanced and inclines at a gentle slope to facilitate easy tuning.

Try the FADA Neutroceiver. You have a treat in store. Volume as loud as you want it. Selectivity to an unusual degree. Easy to tune. Tone—as clear and sweet and true as the music or voice itself. Distant stations at your command as locals. Designed to use powerful tubes and guaranteed to give powerful results. Operates satisfactorily on both outdoor and simple indoor aerials. Price (less tubes, batteries, etc.) \$160.

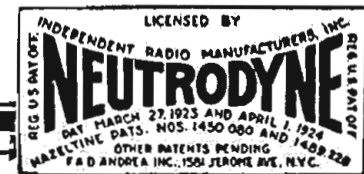
Other FADA three, four and five tube Neutrodyne receivers at your dealer's.

F. A. D. ANDREA, INC. 1581 JEROME AVE., NEW YORK



FADA Neutroceiver No. 175-A Mahogany cabinet. Inclined panel and roomy battery shelf. 5 tubes. Price (less tubes, batteries, etc.) \$160.

FADA Radio





Trade Mark
Reg. U. S. Pat. Off.



GREBE

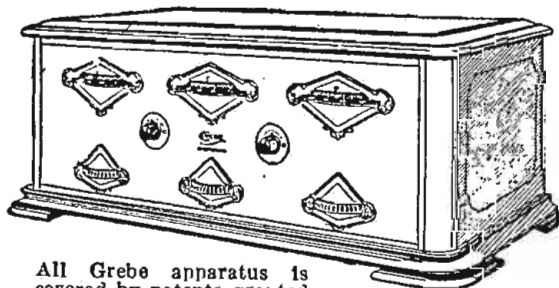
SYNCHROPHASE
(Trade Mark)

A BROADCAST Receiver that marks another long step forward in radio design and establishes a new set of standards in craftsmanship.

"Of what use is cleverness of speech?"
—Confucius

Words even though selected and phrased with the greatest deliberation, cannot do full justice to the Grebe Synchrophase—and its performance.

Doctor Wm.



All Grebe apparatus is covered by patents granted and pending.

Ask your quality dealer for a demonstration of the Grebe Synchrophase or write us for literature.

A. H. GREBE & CO., Inc.

Van Wyck Blvd.

Richmond Hill, N. Y.

Western Branch: 443 South San Pedro St., Los Angeles, Calif.

NEW MODELS
Bristol Radio Receivers.

*Incorporating the Patented
Grimes Inverse Duplex System*

Watch for further announcements in all leading radio publications.

Improved Bristol Audiophone Loud Speakers—gives greater volume, is more sensitive and still maintains its round, full tone and its distinctive freedom from distortion.

Ask for Bulletin No. AY-3017

Manufactured by

THE BRISTOL COMPANY

Waterbury, Connecticut

GRIMES SYSTEM INSURES NATURAL TONE QUALITY



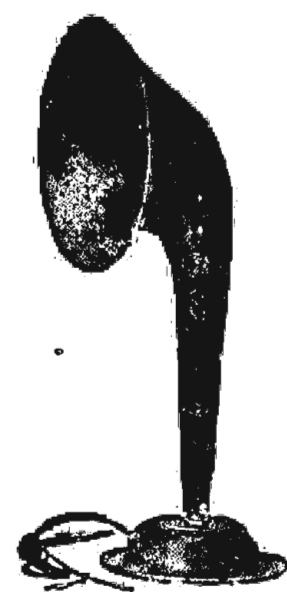
Senior Audiophone
15-inch Bell

Price.....\$30.00



Junior Audiophone
11-inch Bell

Price.....\$22.50



Baby Audiophone
With Fibre Horn

Price.....\$12.50

Why it is Better

"MASTER of Every Note in the Orchestral Range" is the proven claim of the Federal No. 65 Audio Frequency Transformer!—Volume without distortion is the basis for the beauty of Federal Tone.

From its oversize locking nuts to its heavy brass mounting feet the Federal No. 65 Transformer incorporates the same engineering skill that has made Federal the recognized leader in electrical communication apparatus since 1890.

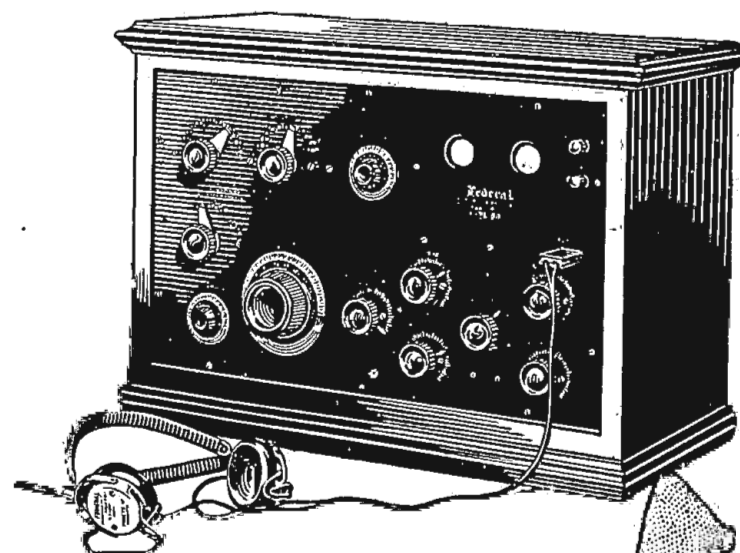
Insist upon Federal parts for your "pet" hook-up. There are over 130 standard parts bearing the Federal iron-clad performance guarantee.

FEDERAL TELEPHONE & TELEGRAPH COMPANY
BUFFALO, N. Y.

Boston New York Philadelphia Pittsburgh Chicago
San Francisco Bridgeburg, Canada



Federal
Standard RADIO Products



Oversize locking nuts, slotted for screw driver, eliminating use of pliers to tighten

Large laminated silicon steel shell type core.

In general the larger the core the better the transformer—Federal No. 65 weighs exactly 1½ pounds—guaranteeing a tonal quality and modulation pre-eminent among transformers

Primary and secondary fed thru hollow screws and dip-soldered making complete protection against breakage or shorts

Only highest grade genuine varnished cambric tubing used.

Black enameled shield completely surrounding windings

Heavy nickel plated brass mounting feet—2 screw slots and 2 screw holes for mounting.

Look for this sign



OPERATING AND TROUBLE SHOOTING

For the Owner of a Freed - Eisemann NR5 Neutrodyne

PLACE the receiver on the table or other piece of furniture on which it is to be permanently located. Keep the set at least 1 foot from the wall and away from heavy metal objects, such as radiators, etc. Connect two 45-volt B batteries or four 22½-volt B batteries "in series." These connections are to be made in accordance with the drawing on the back of the receiver. Do not put any tubes into the receiver until the set is completely wired.

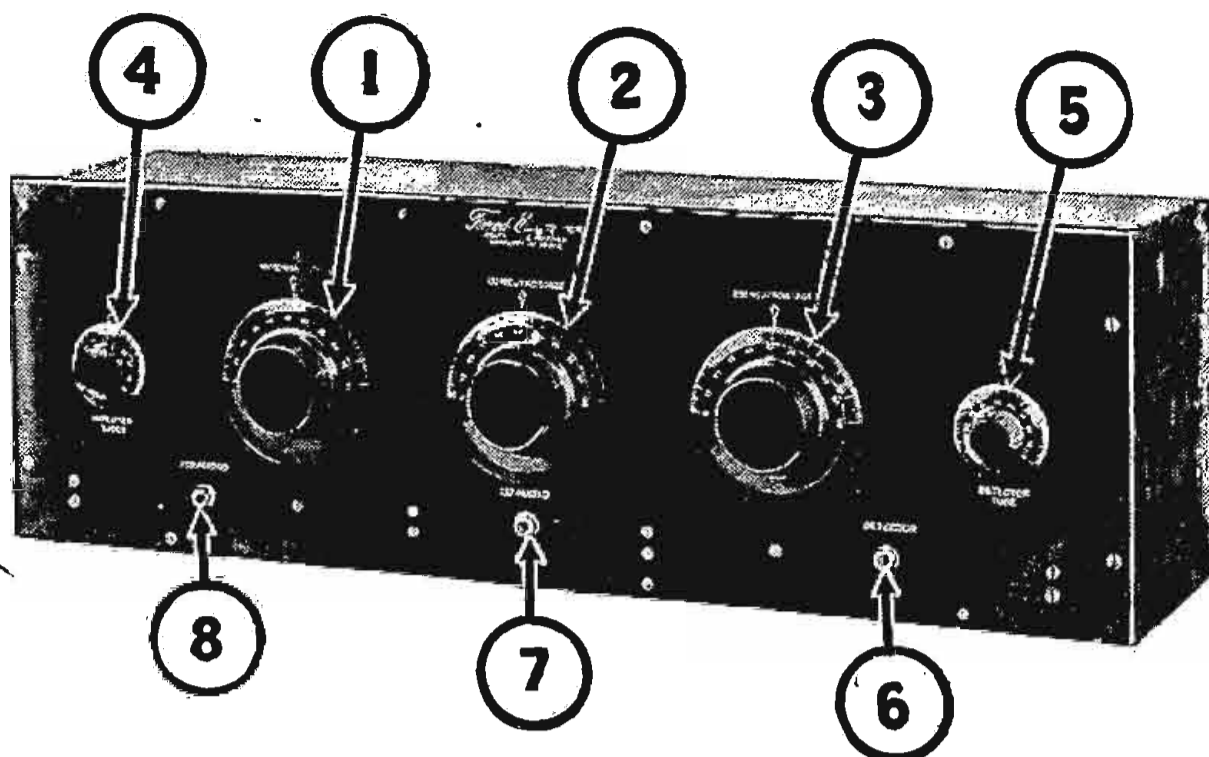
Turn the two small dials at the extreme left hand, Number 4, and the right hand, Number 5, of the receiver to 0. Connect the dry batteries and the storage battery to the receiver, following the drawing on the back of the set very carefully. Connect the antenna and ground connection to the appropriate binding posts, on the rear of the set. Two antenna binding posts are provided, one for a short antenna, say 50 feet, more or less, in length, and one for a long antenna, 50 feet or longer.

Then insert one vacuum tube into the socket at the extreme right hand side of the set and turn the extreme right hand dial, Number 5, to about 75 to be sure that your batteries are properly hooked up. Then insert one vacuum tube in the extreme left hand socket and insert the telephone plug in the jacks and turn the extreme left hand dial, Number 4, to about 75 to be sure that all filament circuits are complete.

Operating

Turn both these dials, Numbers 4 and 5, back to zero; then insert the remaining tubes into the set. The receiver is now ready for operation.

Turn "Detector Tube" dial, Number 5, till the index mark points to about 75



on the dial. Then turn "Amplifier Tubes" dial, Number 4, till its index mark also points to about 75 on the dial. Insert plug of telephones or loud speaker into the jack, Number 8, marked "Second

Audio." All five vacuum tubes are now lighted and the receiver is ready to be "tuned-in."

Set the "Second Neutrostage" dial, Number 3, at, say 70, and the "First

Neutrostage" dial, Number 2, at 70. (This setting is approximately correct for receiving broadcasting on 492 meters.) Move "Antenna Tuning" dial, Number 1, slowly from about 0 to 90. If there is any broadcasting on 492 meters, it will be heard at some setting of the "Antenna Tuning" dial.

If no broadcasting is heard, set each of the "Neutrostage" dials at 68, and readjust "Antenna Tuning" dial, Number 1. Continue this tuning operation, always commencing by setting the two "Neutrostage" dials at the same setting and then rotating the "Antenna Tuning" dial.

Because of the sharpness of tuning of this receiver and the complete absence of "beat notes" new settings of the "Neutrostage" dials should be only about 2 apart when "picking up" a station. Thus, if no broadcasting is heard with the "Neutrostage" dials at 68, reset these dials to 66, then 64, then 62, etc., till a station is received. Then move each dial separately either up or down the scale, slightly, till the broadcast music or speech is loudest.

The "Detector Tube" and "Amplifier Tubes" dials, Numbers 4 and 5, should be readjusted till broadcast reception sounds clearest and loudest. This adjustment is not essential and need only be made once during a receiving period. (Continued on page 28)

ASK TO SEE

The Most Logical Vernier Condenser Ever Designed



"SCIENTIFIC"

Low-Loss Condensers (Plain and Vernier)

Bakelite Condensers (Plain and Vernier)

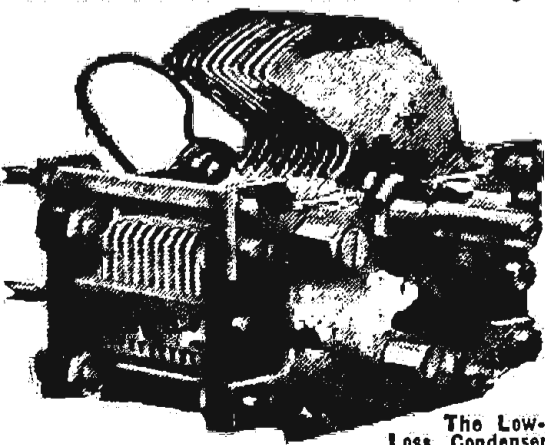
RHEOSTATS POTENTIOMETERS (All Sizes)

Are Leaders in the Industry

SCIENTIFIC PRODUCTS ARE RECOGNIZED AS STANDARD BY SET MANUFACTURERS

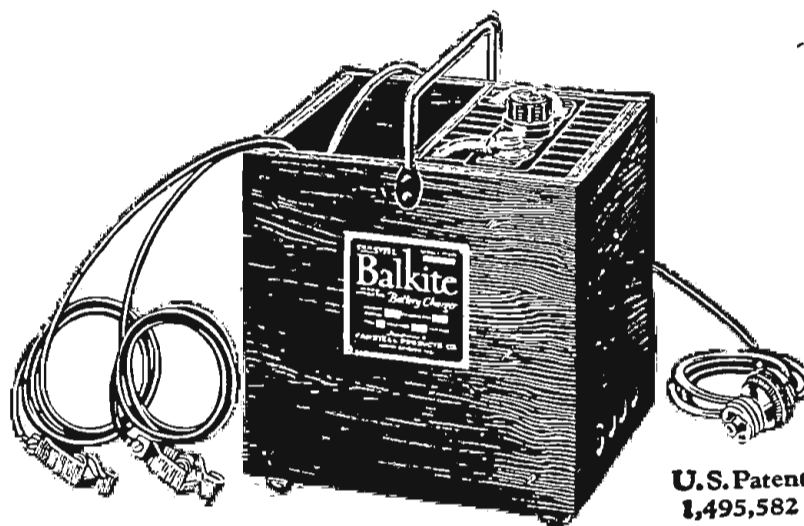
Send for descriptive literature and price list

The United Scien. Lab., Inc. 92 E. 10th St. New York City



The Low-Loss Condenser

TESTED AND LISTED AS STANDARD BY UNDERWRITERS' LABORATORIES



A noiseless battery charger without bulbs, vibrators, or moving parts

The Balkite Battery Charger is today universally known and accepted as one of the most efficient and trouble-free methods of charging radio batteries. It is based on a new principle, the use of Balkite, a rare metal developed for this purpose. This metal changes the AC current commonly used for lighting to the DC current necessary for charging batteries, without the use of fragile bulbs or noisy vibrators.

1. The Balkite Battery Charger is entirely noiseless.
2. It cannot deteriorate through use or disuse.
3. It has no contact points, bulbs, vibrators, or moving parts.
4. It has nothing to adjust, break, or get out of order.
5. It cannot discharge or short circuit the battery.
6. It requires no attention other than an occasional filling with distilled water.
7. It delivers a taper charge, and cannot damage the battery by overcharging.
8. It cannot fail to operate when properly connected to the battery and line current.
9. It is unaffected by temperature or fluctuations in line current.
10. It will charge a completely discharged battery.
11. Its operation does not create disturbances in either your set or your neighbor's.
12. It is simple, efficient, and indestructible except through abuse.
13. Designed primarily for charging "A" batteries, it will also charge "B" batteries of the lead type without added attachments.
14. It can be used while the radio set is in use, without affecting the set or its operation, and without disturbing noises.

The Balkite Battery Charger will charge the ordinary 6-volt radio "A" or automobile battery at 3 amperes, from 110-120 AC, 60 cycle current. Special model for 50 cycles. For sale by all leading radio dealers. If your dealer cannot supply you, sent direct, prepaid, on receipt of price.

Manufactured by FANSTEEL PRODUCTS COMPANY, Inc., North Chicago, Illinois

DEALERS: Order through your jobber. JOBBERS: Write to our factory representatives. Where we are not represented, write to us.

Factory Representatives: Ekko Company, 111 W. Monroe St., Chicago. J. P. Rainbault, 50 Church St., New York City. Wood & Lane, 915 Olive St., St. Louis. Chas. F. Saenger & Co., 919 Huron Road, Cleveland. Detroit Electric Co., 113 E. Jefferson St., Detroit. The Hoy Company, 719 McKnight Bldg., Minneapolis. A. S. Lindstrom, 111 New Montgomery St., San Francisco. Burndep of Canada, Ltd., 172 King St. West, Toronto, Ont. Sparling-Markle, Ltd., 276 Smith St., Winnipeg, Man.

FANSTEEL
Balkite Battery Charger
Price \$19⁵⁰
West of the Rockies \$20 • In Canada \$27⁰⁰

AN EVENING AT HOME WITH THE LISTENER IN
(SEE INSTRUCTIONS FOR USE BELOW)

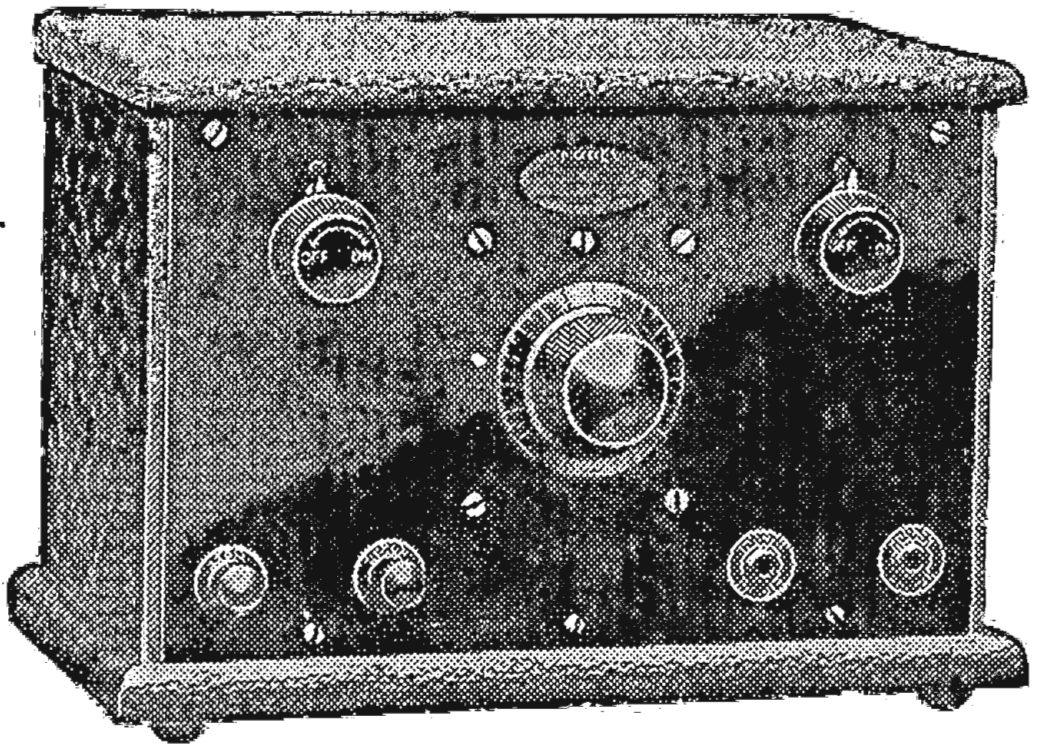
Table with columns: Station and City, Met., Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday. Lists various radio stations and their broadcast times.

Instructions for Use.—All the hours above are given in Central Standard Time. If your city uses Eastern Time, add one hour to each of the periods stated; if your city uses Mountain Time, subtract one hour; if your city uses Pacific Time, subtract two hours. This table includes only the evening Radiocasts, and, on Sunday, the late afternoon program.

STATIONS IN ORDER OF WAVE LENGTHS USED

Table with columns: Meters, Call, Meters, Call, Meters, Call, Meters, Call, Meters, Call, Meters, Call. Lists stations grouped by wavelength.

Save the Battery
Never connect large and small B batteries in series. By doing so they will run down very fast. This also applies to new and old B batteries, as the amperage of the new one is greater than the old, therefore, the old one will draw from the new.



\$18.00

Model C-12 Two-tube Receiver. A great distance getter; puts local stations on the horn; single dial tuning.

KODEL

for Every purpose
in Any purse

\$5 to \$32.50

RADIO'S latest triumph—the wonderful KODEL Circuit, brilliant discovery of an independent experimenter. So simple it can be sold at amazingly low prices, so effective that it gives as good or better results than receivers costing much more. Single dial tuning except in the 3 and 4 tube models, which have only two dials.

Powerful, compact, great for distance, works perfectly without an outdoor antenna, all at prices anyone can afford. Cabinets finished in handsome black leatherette. You may use either storage battery or dry battery tubes.

See the KODEL line at your dealer's. If he does not carry these marvelous sets, send us his name and address and we will mail you the interesting KODEL catalog, from which you can order direct. Money returned if any KODEL set does not more than satisfy you.

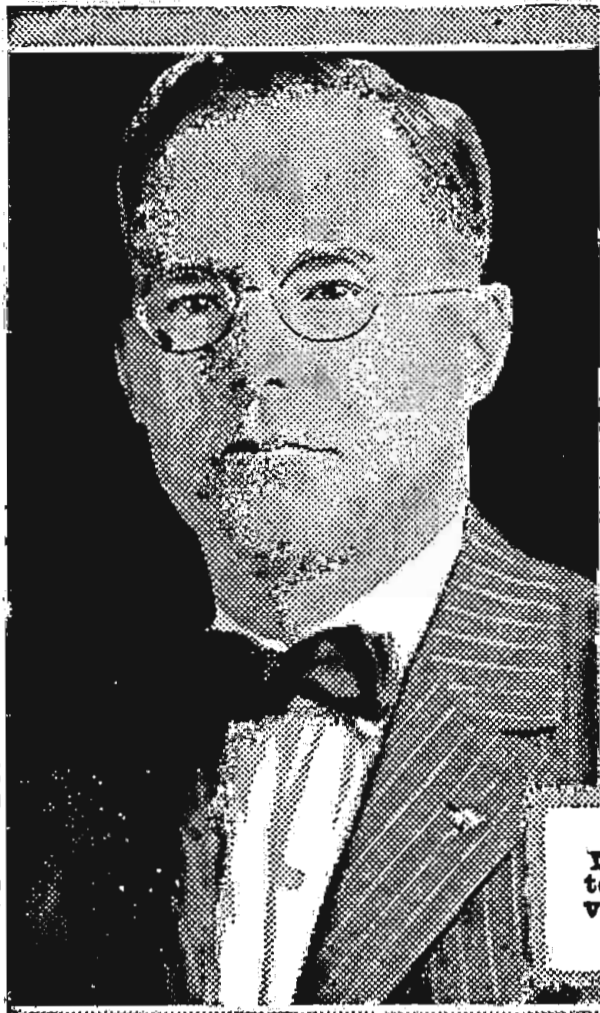
DEALERS: The KODEL is a sensation wherever introduced. Write for terms.

KODEL MANUFACTURING CO.

Under the same management that made the HOMCHARGER famous
215 West Third Street, Cincinnati, Ohio

FREE! Write for instructive KODEL catalog, entitled "Radio for Every Purpose and Any Purse." FREE!

RADIO ELECTION RETURNS TUESDAY



F. Stanley Perry is the tenor who is such a favorite at WWJ, Detroit.

Headliners of the Week

THE NEW organ at the Scottish Rite Cathedral, St. Louis, will be heard for the first time Wednesday, when M. Corbein, the famous Belgian organist will send the first notes forth from KSD. But it is Wampus night again at KFI, and anyone who knows what Wampus means will surely travel westward after KSD signs off.

Once more the fragrant sounds of the Frontenac breweries will be heard in many earphones. Sad to tell only Quebecers will receive the prize awards. Americans should not tune in for CKAC Thursday for fear revenue officers misled by familiar evidence may confiscate their Radio sets. It would be better to learn to appreciate the Russian operas which puzzle opera lovers every season. Fullerton L. Waldo will explain the

Russian music, assisted by Piotr Wizla at WFI.

CNRT has produced a musical composer of note, Fraser Allan. Friday he will direct the production of his own opera "The Prince of Mah Jong."

Andy Gump, the friend of the people gives his last campaign speech at WJAX, Saturday night. If you have never heard this world famous politician, tune in at midnight for the meeting of the Nite Caps and hear his last appeal for votes.

Is your disposition sweet? If not, listen in to the University of Pittsburgh lecture, "Developing a Pleasing Personality," Monday. This is also, by the way, KDKA's fourth birthday.

Tuesday for the first time election returns may be heard in every home. All the stations are broadcasting the results of the presidential election.



Waldine Johnson, violinist, at WLW, Cincinnati, will appear on the program again Tuesday, November 4.

Wednesday, October 29

Silent night for: CKAC, KGO, WFAA, WGY, WJY, WMC, WOAW, WRC, WSAI.
CFCA, Toronto, Can. (Eastern, 400), 7 p. m., results of British elections.
CHYC, Montreal, Can. (Eastern, 341), 7:45-11 p. m., Salvation Army, Silver band.
CKAC, Montreal, Can. (Eastern, 425), 1:45 p. m., Mount Royal hotel luncheon concert.
KDKA, E. Pittsburgh, Pa. (Eastern, 326), 7:30 p. m., exercises, Y. M. C. A.; 9:45, stock reports, markets; 11:55, time; 12 m., weather, markets; 12:15, Daugherty's orchestra; 8:30, dinner concert, Pittsburgh Athletic association, Gregorio Scalzo's orchestra; 7:15, Kindergarten Good-Night circle; 7:30, late news; 7:40, stocks, markets; 8:15, "The Role of Chemistry in Everyday Life," Dr. Alexander Low; 8:30, KDKA String quartet; Dr. Bryan Moorehead, soprano; 9:55, weather.
KFAE, Pullman, Wash. (Pacific, 330), 7:30 p. m., Vincent Hiden, cellist, saxophonist; Harry Isaacs, baritone; "Poultry Management in November," W. D. Buchanan; "Results of State College Leaf Hopper Experiments," A. Spuler; readings.
KFI, Los Angeles, Calif. (Pacific, 469), 5:30-6 p. m., talk, Dr. Ralph L. Power; 6:45-7:30, detective stories, Nick B. Harris; orchestra concert; 7:30-8, Harry Baxter recital; 8-9, Evening Herald concert; 9-10, Examiner studio recital, Wampus program; 10-11, special dramatic program featuring Harry James and Georgia McCrone Field; 11-12, Ambassador Hotel Cocanut Grove orchestra.
KFKB, Milford, Kans. (Central, 286), 8 p. m., Abe Martin's band; 9, lecture, Dr. Osborn, male quartette; 10-11, lecture, Dr. Brinley, jubilee boys' orchestra.
KFNF, Shenandoah, Va. (Central, 266), 7:30 p. m., concert, Clearmont Oil company.
KFOA, Seattle, Wash. (Pacific, 455), 12:30-1:30 p. m., Monday luncheon program, Seattle Rotary club; 8:30, 116th Medical Regiment band, Willis A. Cadler, leader; address, Col. J. B. W. Corey; 20 minutes of Hawaiian and popular music, Michael P. Bell and Allen Hinton, Seattle guitarists.
KFSG, Los Angeles, Calif. (Pacific, 278), 2:30-4:30 p. m., auditorium healing service sermon, Aimee Semple McPherson; the ladies revival chorus; Florence Glauser, soprano; Ruth Frances Thomas, pianist; Esther Fricke Green organist; 6:30-7:30, Gray studio children's program, featuring Mrs. Edward Hughes and daughters, Mary Elizabeth and Helen in nature study program.
KGO, Oakland, Calif. (Pacific, 312), 1:30 p. m., stock; 1:40, S. F. stocks; 1:45, weather; 3, musical program; and Cora L. Williams Institute speaker; 4:50-5:30, concert orchestra, Hotel St. Francis; 6:55, S. F. stocks; 7, conductor; 8:45, N. Y. stocks; 8:55, S. F. stocks; 7:30, weather; 7:55, S. F. produce news; 7:10 baseball scores; 7:15, news.
KGO, Portland, Ore. (Pacific, 492), 11:30 a. m., weather; 12:30 p. m., Bill Darby's orchestra; 5, children's program, story, Mrs. Edward Gulver; 7:15, markets, weather, news, police reports; 8, concert, Hanna Davis; 10, dance music George Olsen's Metropolitan orchestra.
KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:30 p. m., concert; garden address, Fred C. McNabb, Aggeler and Musser Seed company; 2:30-3:30, musical appreciation talk, Carolyn Pearson; 6:30-8, Art Hick-appreciation talk, Edward Fitzpatrick, director; 6:30-7:30, children's hour, "American History," Prof. Walter Sylvester Hertzog; Dick Winslow, screen juvenile and reporter; baby Muriel MacCormac, screen juvenile; bedtime story Uncle John; 7:30-8, concert, University of Southern California; 8-10, lecture, Dr. Mars F. Baumgardt; the Gaylord trio, Lorena Wade; 10-11, Art Hickman's dance orchestra, Earl Burnett, director.
KLX, Oakland, Calif. (Pacific, 509), 8-10:20 p. m., opera in three acts, "La Traviata," Gregorio Artieda, director; Violetta Valery, soprano, Terecina Artieda, mezzo soprano, Grace Gilbert; Annina, soprano, Beatrice L. Sherwood; Alfredo Germont, tenor, Gregorio Artieda; Giorgio Germont, baritone, Marlon Vecky; Gaston, tenor, Dixon A. Ervin; Baron Douphol, baritone, E. Arnold; Marquis D. Obigny, bass, C. Alibertina; Doctor Grenvil, bass, L. Lehbach; Augustus Berantend, pianist; American Theater orchestra; 10:10, Clement Barker, organist.
KOB, State College, N. M. (Mountain, 360), 7:30-8:30 p. m., "Conditions Affecting Farm Profits in New Mexico," L. H. Hauter; "Food Value of Milk," Prof. O. C. Cunningham; College male chorus, quartets.
KPD, San Francisco, Calif. (Pacific, 423), 1-2 p. m., Selger's Fairmont hotel orchestra; 2:30-3:30, Ampiana of the Cabrila cafe; 4:30-5:30, Rudy Selger's Fairmont hotel orchestra; 5:30-6:30, Rudy Selger's Fairmont hotel orchestra; 7-7:30, Rudy Selger's Fairmont hotel orchestra; 8-11:20, E. Max Bradford's Versatile band; "Vocational Education for Your Boy and Mine," William T. Elzinga; Yvonne Farr, soprano; conversational French course lesson; male quartet, S. E. Police quartet.
KSO, St. Louis, Mo. (Central, 546), 8 p. m., M. Corbein, Belgian organist, will open the new organ at the Scottish Rite cathedral.
KYW, Chicago, Ill. (Central, 536), 6:30 a. m., morning exercises, Y. M. C. A.; 9:30, news, markets; 11:35, table talk, Mrs. Anna J. Peterson; 6:02-6:15 p. m., late news, markets; 6:35-7, children's bedtime story, Uncle Bob; 7-7:30, dinner concert, Congress hotel; 7:30-8, program, Duncan Sister Music Publishing company;



The Happiness Boys, Ernest Hare, Jerry Biero, Billy Jones, all set to distribute joy at WFAF, Friday.

8-8:30, Tony Prince, accordionist; Evans Lloyd, haritone; Charlotte Simmons, soprano; Dorothy Wilkins, mezzo soprano; Thora Martens contralto; Florence Boydston, contralto; 9:30-8:45, around the town with KYW in Chicago; 8:45-9:05, musical program; 9:05-9:15, "Good Roads," Chicago Motor club; 9:15, "Hygeia," Dr. Dodson; 9:15-11:30, midnight revue; 1:30 a. m., American feature, Coon-Sanders Original nightbirds; W. Remington Welch, organist.
WBAP, Fort Worth, Tex. (Central, 476), 7:30-8:30 p. m., dance music; 9:30-10:45, Texas hotel orchestra.
WBAY, Columbus, Ohio (Eastern, 423), 12 m., Ila Lorbach Owens, pianist.
WBZ, Springfield, Mass. (Eastern, 337), 11 a. m., weather, time, markets; 6 p. m., dinner concert, Westinghouse Philharmonic trio; 7, markets dept. of agriculture; 7:10, civil service examinations information; 7:30, bedtime story for the kiddies; 7:40, Westinghouse Philharmonic trio; Mrs. Carl Rommel, pianist; 8:15, special Jewish program, Y. M. H. A.; 9:55, time; 10, Charles Bradford Beach, baritone; Stanley Usher, accompanist; 11, Leo Reisman and his Hotel Brunswick orchestra; 11:30, songs, Bill Coty, Jack Armstrong; 11:45, Leo Reisman and his Hotel Brunswick orchestra.
WCAE, Pittsburgh, Pa. (Eastern, 462), 12:30 p. m., news, weather; 3, Fred Rosenfeld, pianist; 3:30, news; 4:30, stocks; 6:30, dinner concert, William Penn hotel; 7:30, Sunshine girl; 7:45, special feature; 8:15, special feature; 8:30, Mrs. E. C. Sheets, contralto; Frances Victor, entertainer.
WCAL, Northfield, Minn. (Central, 360), 9:45 a. m., St. Olaf College chapel services.
WCAP, Washington, D. C. (Eastern, 469), 7:30-7:45 p. m., music; 7:45-8, address, Hon. Lerton R. Ginn; 8-8:20, musicale; 8:20-10, New York Philharmonic orchestra, from WFAE.
WCAY, Milwaukee, Wis. (Central, 266), 6:30 p. m., Boston Store night; Olympians band; Tony Wuchterl, reader; Lucille Snyderworth, soprano.
WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 6, dinner concert; 8:30, musical program, direction of George H. Carr; Glenn Nichol's orchestra.
WDAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's string trio; 6-7, school of the air; piano solo; address speaker, Meat Council of Greater Kansas City; address, auspices, Health Conservation association; the Tell-Me-a-Story lady; music, Hotel Muehlebach Trianon ensemble; 8-9:15, program by string pupils of Anton Seuffert; 11:45-1 a. m., night-hawk frolic, the "Merry Old Chief" and the Plantation players.
WDAR, Philadelphia, Pa. (Eastern, 395), 11:15 a. m., daily almanac; 12:02 p. m., organ recital, Stanley theater; 12:30, services, direction Philadelphia Federation of churches; Arcadia cafe concert orchestra; Feri Sarkozil, director; 2, Arcadia cafe concert orchestra; "Caré of the Children," Mrs. Louis Love; 7:30, Dream Daddy's bedtime stories; 8, "Conversation

Corner," Arnold Abbott; 8:15, Green Hills Farms orchestra; 10, Arcadia cafe dance orchestra; Arthur Murray's dancing lessons.
WEAO, New York, N. Y. (Eastern, 492), 11-12 a. m., young mother's program; 12-12:30 p. m., chapel services, Columbia university; 4-4:30, Jeanette Uhle String quartette; 4:30-5, stories for children; 6-7, dinner music, Waldorf-Astoria hotel; 7-7:30, services United Synagogue of America; 7:30-8, Alfred Urner, tenor and William Lieblich, baritone, 8-8:15, O. S. Rogers, flutist; 8:15-10, concert, New York Philharmonic society, Willem Van Hoogstraten, director; 10-10:30, Grace Fisher, soprano.
WEAO, Columbus, Ohio (Eastern, 294), 9 a. m., music Marguerite Manley Siedel School of Music talent; 11, music, Siedel artists; 1:30 p. m., music, Siedel artists.
WEEI, Boston, Mass. (Eastern, 303), 6 p. m., Maxwell Melody boys, dance music; 7, Radio rally conducted by James M. Curley, Mayor of Boston; 7:10, Boston Edison Big Brother club; 7:45, talk, Dorothy H. Goodwin; 8, Boston police night.
WFI, Philadelphia, Pa. (Eastern, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 3, closing prices, Chicago grain market; 3:05, recital, Roman Niteski, violin, Madeline Reifsynder Budd, soprano; 6:30, Meyer Davis Bellevue Stratford concert orchestra; 7, Sunny Jim, the kiddies' pal.
WGBS, New York, N. Y. (Eastern, 316), 10 a. m., daily shopping talk; 10:10, Ludmilla Vojackova Wetche, pianist and composer, Czecho Slovakian folk songs; 10:20, first of series of mothers talks, Mary G. Armstrong of the United Parents association; 10:30, Mme. Ludmilla Vojackova Wetche, pianist; 10:50, Priscilla Bayne, soprano; 1:30 p. m., recital, Carl Sacks, Hotel Empire concert trio; 2-2:30, Ruth Bowman, mezzo soprano; 3, interview, Terese Rose Nagel with Emmanie Sachs, author of "Talk"; 3:10, Crystal Water, songs; 3:20, talk, Mrs. Clarence M. Smith; 3:30, Crystal Waters, songs; 3:40, students' period; 3:50, Carrie Hirsch, mezzo soprano; 6-6:30, Uncle Geebee; 6:30, Vera Robbins Brown, mezzo soprano; 6:45, Bernard Mann, pianist; 7, Uncle Robert, talking to the family; 7:15, Bernard Mann, pianist.
WGN, Chicago, Ill. (Central, 370), 1:40 p. m., Drake concert ensemble and Blackstone string quintet; 2:30, recital from Lyon and Healy concert hall; 3, rocking chair time; 5:30, Skeezix time; 6, Lyon and Healy organ recital; 6:30, Drake concert ensemble and Blackstone string quintet; 8, the classic hour; vocal, instrumental music; 10, Jack Chapman's dance orchestra and latest popular songs.
WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1 p. m., George Albert Bouchard, organist; 2:30-4:30, Buffalo Courier and Enquirer musical program; 6:30, dinner music; 8, address, "Buffalo Harbors and Canals," Cornish Stalley; 8:15-9, Malle and Little, Carco record artists; 9-11, recital, featuring Isabelle Wheaton Stranahan, soprano, accompanied by Ethel McMullen; 10-11, mixed program, Eleanor Taft and W. H. F.

Tenny; 11, supper-dance music, Vincent Lopez Hotel Statler dance orchestra, Harold Gieser, director.
WHA, Madison, Wis. (Central, 275), 7:45 p. m., University School of Music; "Voting and Elections," Prof. Ford H. MacGregor, assistant professor of political science.
WHAA, Iowa City, Ia. (Central, 484), 9-9:30 a. m., high school assembly program; 2:30-1 p. m., "Capital Punishment as a Preventive of Crime," T. M. D. Koder.
WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., Alamo theater orchestra; weather; "Just Among Home Folks"; readings, Courier-Journal Louisville Times; 7:30-9, Keith Kannard and his Kentucky Ramblers, Keith Kannard director.
WHB, Kansas City, Mo. (Central, 411), 2-3 p. m., ladies' hour program, Sweeney Radio trio; 7-8, "Mausoleums and Tombs—Ancient and Modern," C. L. Van Nostrand; music, Sweeney Radio trio.
WHN, New York, N. Y. (Eastern, 360), 2:15 p. m., Jimmy Clarke and his entertainers; 2:35, Ben Jacobs, tenor; 2:45, Original Runnin' Wild orchestra; 3:45, Betty Ross "Peeps at Celebrities"; 4, Samuel Shankman, pianist; 4:15, Arcady Borkenholz, violinist; 4:30, Edwin Preble, tenor; 4:45, "Americanism," May M. Gooderson; 5, John DeDroit and his New Orleans orchestra; 5:30-7, Houston Ray's Alamo quartet; 7-7:20, Houston Ray's Alamo orchestra; 7:20-7:30, "Personal Chats of the Stage and Screen," E. S. Colling; 7:30, "Life Story of Emily"; 7:45, Florence Hynes, child soprano; Orry Parado, pianist; 8, Vincent D. Daniels, pianist; 8:10, "The Bible as a Guide for Life," Rabbi J. A. Dolgemas; 8:20, Cantor M. M. Hillman; 8:30, Alfred Dulin, pianist; 8:45, Margaret Pallonius, violinist; Hazel Gruppe, accompanist; 9, Kiwanis Club Boys' period, William J. Stuart; 9:15, Johnston-Davidson Society orchestra; 9:30-9:37, news; 9:37-9:45, Johnston-Davidson Society orchestra; 9:45-10, Leo Wood's Air troopers; 10-11, Clover Gardens dance orchestra.
WHO, Des Moines, Ia. (Central, 526), 7:30-9 p. m., Bankers Life Radio orchestra, W. L. Marsh, director; Virginia Groomer Maurrine, Leone Martindale, Pauline Payton vocal soloists; Gladys M. Stribling, accompanist; Kathryn Mason, pianist; movie chats, Dorothy Day.
WHP, Philadelphia, Pa. (Eastern, 509), 1 p. m., Gimble's tea room orchestra, Ray Steem, director; 3, Marlon Werner, soprano; Anna Basse, Cheney, pianist; William H. Cornog, baritone; Flora Alpka, accompanist; 6:05, Art Coogan and his Club Madrid orchestra; 7, Uncle Wip's bedtime stories.
WJAR, Providence, R. I. (Eastern, 360), 10 a. m., household hints, Mrs. Wood; 10:45, style talk, McCall; 1:05 p. m., studio program; 7:30, program from WFAE.
WJZ, New York, N. Y. (Eastern, 455), 10 a. m., housewives learn menu, Mrs. Julian Heath; 10:20, "Household Equipment," Ethel R. Fayer; 10:30, "Keeping the Baby Well," Henry St. Visting Nurse service; 10:40, Tribune Institute, Bertha Baldwin; 10:50, Eleanor Gunn's fashion talk; 1:15 p. m., Orlando's Hotel Roosevelt orchestra; 4, Leonard D. Ornauer, baritone; Keith McLeod, accompanist; 4:30, Hotel Belmont Tea orchestra; 5:30, state and federal agricultural reports, farm and home reports; stocks, foreign exchange quotations, news; 7, Cafe Boulevard orchestra; 8, Wall Street Journal review; 8:10, NYU, air college, "Economics," Prof. Reid L. McClung; 8:30, Helen Davis, banjoist; 8:45, Military Aviation, General Patrick; 9:05, Helen Davis, banjoist; 9:20, Miriam Hoffman, violinist; Phillip Swigals, accompanist; 9:45, talk, auspices, Democratic National committee; 10, Hock and Jerome, popular songsters; 10:15, Frieda Williams, soprano; Keith McLeod, accompanist; 10:30, Billy Wynne's Greenwich Village Inn orchestra.
WLS, Chicago, Ill. (Central, 345), 9 a. m., livestock markets, weather; 11, livestock, dairy, fruit, vegetable markets; 12-1, noon-day farm program; "Book Farmer Series," E. Biggar; "Putting Up Farm Machinery for the Winter," J. C. Bohmker; music numbers, Nakutin studio; 1:30 p. m., livestock, fruit, vegetable markets; 3, final grain markets; 3:45-4:45, home-makers hour, home dressmaking hints, Margaret O'Rourke; home dressmaking question box, Ellen Rose Dickey; games and music for the home, Mrs. H. A. McKeene; daily recipe; 6, market summary and farm news bulletins; 6:30, organ, Ralph Emerson; 6:45, Hutter School of Music; 6:50, organ, Ralph Emerson; 7, lullaby time, Glenn Powell, Ford Rusb; 7:20, Hutter School of Music; 7:30, Isham Jones and his College Inn orchestra; 7:45, Hutter School of Music; 8-9, farm program; weekly wool market summary; "Farm Flickerings," E. B. Heaton; "Co-operative Live Stock Marketing," C. A. Stewart; talk, J. C. Bohmker; 9, Saddler feature, poem period, requests; 9:20, Donnis sisters; 10, Isham Jones and his College Inn orchestra; 10:15, Car Craven; 10:40, Ford and Glenn time.
WLW, Cincinnati, Ohio (Central, 423), 4 p. m., Ilo lesson, Fred Smith, instructor; 8, Virginia entertainers; 9, Formica band and orchestra; 11:30 Lange-McKay orchestra.
WMAQ, Chicago, Ill. (Central, 447.5), 1 p. m., speeches from the weekly luncheon of the association of commerce; 4, child life stories for children; 4:30, musical program; 6, Chicago theater organ recital; 6:30, stories for children, Georgene Faulker, the story lady; 8, weekly lecture, Northwestern university; 8:30, WMAQ "Play night"; 9:15, Leo Sowerby, pianist; 9:45 talk, one of the Chicago charities.
WMM, Cincinnati, Ohio (Central, 309), 8 p. m., Goodrich Silverton orchestra; 9, talk, "Bits of Cincinnati History," George W. Platt; piano solos, Eddie Scholwer; Law instrumental trio; 10, Auburn orchestra, Lawrence Archolz, director; 12, midnight session, Royal Order Peacocks, orchestra concert.
(Continued on page 14)

Where to Hear Dramas

Central Standard Time

DRAMAS, humorous, serious, musical comedies and even operettas are broadcast during the week. Below are the stations and dates.

- Wednesday:** 8:30, WMAQ, "play-night"; 10, KLX, "La Traviata," Gregorio Artieda, director.
- Thursday:** 7:20, WLS, comic opera, "Prince of Pilsen," Robert W. Stevens, director.
- Friday:** 7, CNRT, "The Prince of Mah Jong," Fraser Allan, director; 9, WLS, "The Monkey's Paw."
- Saturday:** 9:05, WFI, Radio play, Starlight players.

ADDITIONAL PROGRAMS, RECEIVED TOO LATE FOR CLASSIFICATION, WILL BE FOUND ON PAGE EIGHTEEN

FAR EAST TALK SATURDAY AT WMAQ

Friday, October 31

(Continued from page 14)

KSD, St. Louis, Mo. (Central, 546), 8 p. m., Sixth U. S. Infantry band.

KYW, Chicago, Ill. (Central, 536), 6:30 a. m., morning exercises, Y. M. C. A.; 9:30, news, markets; 11:35, table talk, Mrs. Anna J. Peterson; 12:30 p. m., "The Progress of the World," Review of Reviews; 6-6:30 news, markets; 6:35-7, children's bedtime story, Uncle Bob; 7-7:30, dinner concert, Congress hotel; 7:30-8, program, Duncan Sisters Music Publishing company; 8:20-8:45, American Farm Bureau federation; "Farm Juniors at the International Live Stock Exposition," B. H. Helde; "What the Illinois Farm Bureau Are Doing," H. C. Butcher; 9-10, midnight revue; 11-2:30 a. m., midnight revue, Coon-Sanders Original night-hawks; W. Remington Welch, organist.

WBAP, Fort Worth, Tex. (Central, 476) 7:30-8:30 p. m., musical program, Mrs. E. E. Nash, director; 9:30-10:45, Walter Collins' fiddlers of Cleburne, Texas.

WBAV, Columbus, Ohio (Eastern, 423), 12 m., Ila Lorbach Owens, pianist; 9 p. m., concert, talent from Ohio Wesleyan university, Delaware, Ohio.

WBZ Springfield, Mass. (Eastern, 357), 11:55 a. m., time, weather, markets; 6 p. m., dinner concert, Westinghouse Philharmonic trio; 7, markets; 7:10, current book review, Court Square Book store; 7:30, bedtime story for the kiddies; 9:55, time; 10, Reba Harrington, cellist; Catherine Hogan, violinist; Beatrice Haynes, pianist; 10:30, Alden E. Davis, tenor; Jessie Fleming Voss, accompanist; 11:30, McEnelly's singing orchestra.

WCAE, Pittsburgh, Pa. (Eastern, 462), 12:30 p. m., news; 3:30, news; 4:30, Sunshine girl, stocks; 6:30, dinner concert, William Penn hotel; 7:30, Uncle Kay-bee; 8, special feature; 8:15, special feature; 8:30, musicale.

WCAL, Northfield, Minn. (Central, 360), 9:45 a. m., St. Olaf college chapel service; book talk, "Marbacka," an autobiography of Selma Lagerlof.

WCAP, Washington, D. C. (Eastern, 469), 8-9 p. m., United States Navy band orchestra, Charles Benter, leader; 9-10, program from WEA; 10-12, Halloween dance program, Irving Boernstein's Wardman Park hotel orchestra.

"Fall Fashions from Paris," Amy Hogeboom; 10:30, Stella Goldberger, pianist; 10:40, "What of Marriage?" Ruth Mason Rice; 10:50, Lillabelle Barton, soprano; 1:30-2:30 p. m., "Why Women Can Fill Big Positions," Terese Rose Nagel; 3:10, Lou Oip, pianist and monologist; 3:40, students' period, "Boy Scout Movement in Public Schools"; 3:50, Rose Wieninger, soprano; 6-6:30, Uncle Geebe; 6:30, Clifford Lodge orchestra, Mr. Reddick, conductor.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1 p. m., George Albert Bouchard, organist; 2:30-4:30, Buffalo Enquirer and Courier musical program; 6:30, dinner music; 8:40, readings, John Dodsworth; 9-10:30, recital, James W. Duncan and assisting artists; 10:30-11:30, musical program, Buffalo Trust company, direction of Cecile Kertz; 11:30, supper-dance music, Vincent Lopez Hotel Statler dance orchestra, Harold Gieser, director.

WGN, Chicago, Ill. (Central, 370), 1:40 p. m., Drake concert ensemble and Blackstone string quintet; 2:30, recital from Lyon and Healy concert hall; 3, rocking chair time; 5:30, Skeerix time; 8, Lyon and Healy organ recital; 6:30, Drake concert ensemble and Blackstone string quintet; 8, the classic hour, vocal and instrumental music; 10, Jack Chapman's dance orchestra and latest popular songs.

WGY, Schenectady, N. Y. (Eastern, 380), 11:55 a. m., time; 12:30, markets; 12:40 p. m., produce market; 12:45, weather; 2, "The Citizenship of Women," Mrs. Florence E. Tabor; 6, produce and stock, news; 6:30, stories for children; 7, Sunday school lesson; 7:45,

talk, auspices Democratic National committee; 8:30, program, French line, music, S. S. De Grasse orchestra; 9:30, "Income Taxes," Frank Shevitz; 9:40, Max Kalfus, tenor; 10, Loosleaf current topics, Dr. William H. Allen; 10:15, Leopold Busch, violinist.

WJZ, New York, N. Y. (Eastern, 455), 10 a. m., housewives league menu, Mrs. Julian O'Neil; 10:20, Review of Reviews; 10:30, "Be Your Own Decorator," Amy Mall Hicks; 10:40, "Shoppers Guide," Mrs. Pauline Peck; 10:50, fashion talk, Eleanor Gunn; 1 p. m., Henry Vander Zanden's Hotel Ambassador trio; 4, Hotel Astor organ recital, Leo Riggs, director; 5, Hazel Franking Bailey, soprano; 5:30, agricultural reports, farm and home reports; stocks; news; 7, Savarin ensemble, Nathan Franko, director; 8, Wall Street Journal review; 8:10, N. Y. U. Air college, "Economics," Prof. Reid L. McClung; 8:30, Norma Gradstein, pianist; 8:45, V. L. Reynolds, candidate for vice president of Socialist Labor party; 9, Norma Gradstein, pianist; 9:15, Wright and Bessinger, the two Radio Franks; 9:30, Pavlova ballet music, Manhattan Opera house; 10:30, Duke Yellman's Irene Castle orchestra.

WLS, Chicago, Ill. (Central, 345), 9 a. m., live stock markets, weather; 11, live stock, dairy, fruit, vegetable markets; 12-1 p. m., noon-day farm program; music, Four Harmony aces; "The Care of Gasoline Engines," B. F. Watson; "Book Farmer" series, G. C. Biggar; 1:30, live stock, fruit, vegetable markets; 3, final grain markets; 3:45-4:45, homemakers hour; "Beauty Hints, Wrinkles, Question Box," Ellen Rose Dickey; "Simplifying Cooking at Home," Mrs. H. A. Keene;

WOR, New York, N. Y. (Eastern, 405), 2:30 p. m., Helen Felch Gregory, soprano; 2:45, Rev. Harris, tenor; John A. Scott, pianist; 6:15, Ruth Forbes, contralto; 6:30-6:45, man in the moon stories; 7, Ruth Forbes, contralto; 7:15, sports, Jolly Bill Sienke.

WQL, Chicago, Ill. (Central, 448), 11 a. m.-12 m., Fred Mann and his Sunday dinner menu; 3-4 p. m., "Answers to Questions," Helen Harrington Downing; 7-8 concert by Ralph Williams and his Rainbo Garden orchestra; Dorothy Schubert, Jugo slav soprano, Fred Jacobson, monologues; Arthur Ward, tenor; Harry Geise, pianist; 10-2 a. m., Ralph Williams and his Rainbo Skylarks; Langdon Bros., steel guitar duets; Paul Lougher, tenor; Nubs Allen, contralto; Ziegler sisters; O'Flannigan and O'Hara, the Frenchmen.

WRC, Washington, D. C. (Eastern, 469), 3 p. m., Fashion developments of the moment, women's wear; 3:10, Arthur McCormick, baritone; 3:20, "Beauty and Personality," Elsie Pierce; 3:25, current topics, editor of the Review of Reviews; 3:35, piano recital; 3:50 the Magazine of Wall street; 4, songs, stories for children, Peggy Albion.

WTAS, Elgin, Ill. (Central, 286), 6-8 p. m., Tlp Top Inn string sextette; 8-12, dance program, Terrace Garden orchestra, Fred Hamm, director; Terrace Garden entertainers.

WTAY, Oak Park, Ill. (Central, 283), 6:45-7:45 p. m., Glenn Bruce, reader; Sandy Meek, baritone; Black Cat orchestra; 9-9:45, 10:15-11:15, Guyon's Paradise ballroom orchestra.

WWJ, Detroit, Mich. (Eastern, 517), 8 a. m., setting-up exercises, R. J. Horton; 9:30, talk, women's editor, Detroit News; 12 m., musical program; 3 p. m., Detroit News orchestra; 7, Detroit News orchestra; Cyril Wezemael, baritone; male quartet.

Saturday, November 1

Silent night for: CKAC, KFAE, KFOA, KLX, WBAP, WCAP, WCX, WDAE, WEEL, WGR, WHB, WHO, WJY, WJZ, WOO, WWJ.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 9:45 a. m., stocks, markets; 11:55, time; 12 m., stocks, markets; 1:30 p. m., Daugherty's orchestra; 2:30, Pitt-Syracuse football game; 6:30, dinner concert, Westinghouse band, T. J. Vastine, director; 7:15, "Wimble the Wanderer"; 7:30, sport review, James J. Long; 7:45, address, representative of the American Red Cross; 8, "Inside Movie Gossip," Sam Comley; 8:15, feature; 8:30, Westinghouse band; T. J. Vastine, conductor; Alice Smith, soprano; F. Robert Coe, baritone; P. Zahner, violinist; 9:55, time, weather.

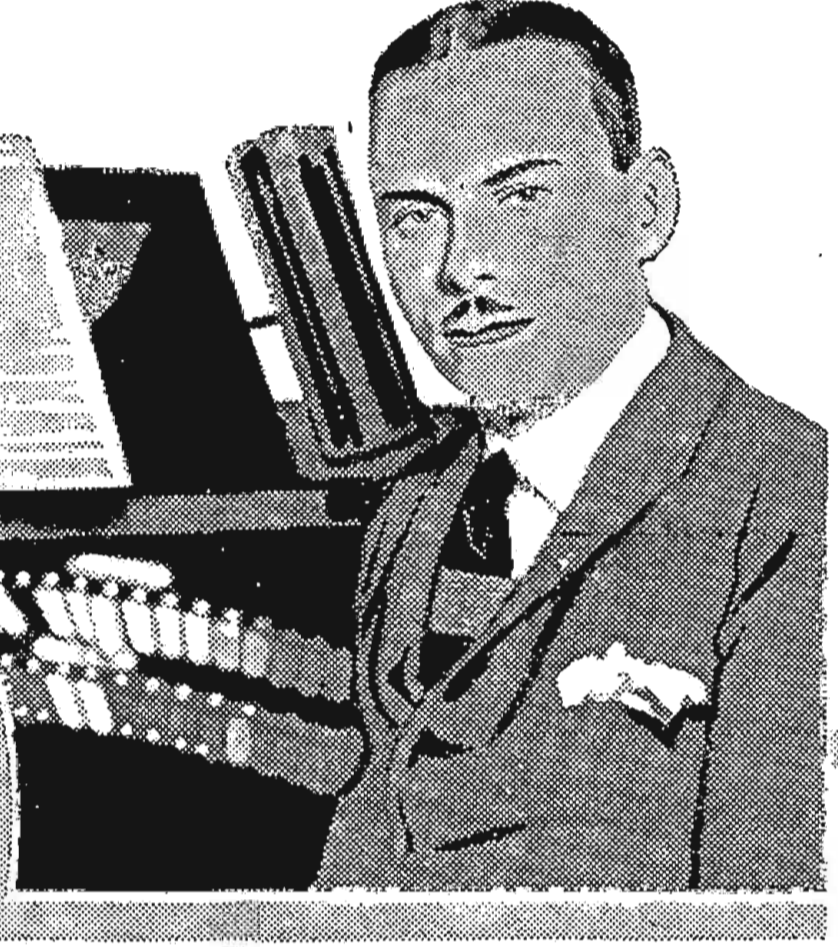
KFI, Los Angeles, Calif. (Pacific, 469), 5:30-6 p. m., Anita Ariss; 6:45-8, dance orchestra; 8-9, special recital; 9-10, Examiner studio concert; 10-11, Packard Radio club recital; 11-12, Ambassador Hotel Cocoanut Grove orchestra.

KFKB, Milford, Kans. (Central, 286), 8 p. m., concert, Abe Martin's band; lecture, Dr. Osborn, male quartet; 10-11, lecture, Dr. Brinkley, Jubilee Boys' orchestra.

KFNH, Shenandoah, Iowa. (Central, 266), 7:30 p. m., Scotch program, Scottish concert trio of Omaha, E. S. Dodds, director; 10:30, midnight frolic, Seehouse bunch.

KFOA, Seattle, Wash. (Pacific, 455), 2:30 p. m., football game, U. of Washington-U. of Oregon.

KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m., children's service and program featuring talented



Helen Wilkom, soprano, is popular in Cleveland and outside of it. She is one of the stars of WJAX. Here is Carlos Meier (above) in a new pose before the Capitol theater organ, which he plays every Monday evening at midnight. The kiddies will like this picture of the Tell Me a Story Lady (right) of WDAF, Kansas City. No need to tell what hours she is heard.



WCAY, Milwaukee Wis. (Central, 266), 8 p. m., Oswald Jaeger night; Tune Tinkers; Margie Mackin, soprano; Franz Lindl, zitherist; Helen Loeffler, mezzo soprano.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 8, dinner concert; 8:30, musical program, direction of Mrs. Theodore Miller.

WDAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's string trio; 8-7 school of the air, piano tuning-in number on the Duo-Art; address, auspices Kansas City Children's bureau; the Tell-Me-a-Story lady; music, Hotel Muehlebach Trio ensemble; 8-9:30, popular program, the Star's Radio orchestra and the WDAF minstrels; Frank O. Kohn, harmonica player; Fields Jones, baritone; 11:45-1 a. m., nighthawk frolic, the "Merry Old Chief" and the Plantation players.

WDAE, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., daily almanac; 12:02 p. m., organ recital, Stanley theater; Arcadia cafe concert orchestra; Feri Sarkozl, director; 2, Arcadia cafe concert orchestra; playlet, members National School of Oratory and Elocution; 4:30, King Pin Six dance orchestra; 7:30, Dream Daddy's bedtime stories; 8, book review, Arnold Abbott; band concert, "Songs of Scotland," "T. O. H.," "Bambalina," "Eileen," and "Blue Paradise," Atlantic City Railroad band; 10, Arcadia cafe dance orchestra; "Morning Glory Club," program songs, "On My Euketele," Zocherns and Herscher.

WEAF, New York, N. Y. (Eastern, 492), 11-11:30 a. m., health talk, New York Speakers service; 11:30-12, organ recital, Capitol theater; 4-5 p. m., club program for women and Arthur Stone, blind pianist; 6-7, dinner music, Waldorf-Astoria hotel; 7-7:30, children's stories, G. R. Kinney Shoe company; 7:30-7:45, Marie Nicholson, soprano; 7:45-8, Happiness boys—Billy Jones and Ernest Hare; 9-9:30, G. Schirmer's half hour of newly published music; 9:30-10, B. Flescher and company Astor Coffee orchestra; 10-10:30, Vant's Collette's orchestra.

WEAD, Columbus, Ohio (Eastern, 294), 9 a. m., music, Marguerite Manley Siedel School of Music talent; 11, music, Siedel artists; 1:30 p. m., music, Siedel artists.

WEBI, New York, N. Y. (Eastern, 273), 7-7:15 p. m., Blyburn's Review of new plays on Broadway; 7:15-7:30, Ida M. Tacaparro, pianist; 7:30-8, "Evidence," short story written and presented by Murray Leinster; 8:15-8:30, Edith Grusenberry, songs; 8:30-9, College club orchestra, Bob Krub, leader.

WEEL, Boston, Mass. (Eastern, 303), 6 p. m., dance music, Sam Blum and his Famac Inn orchestra; 7, Radio rally conducted by James H. Curley, Mayor of Boston; 7:10, Boston Edison Big Brother club; 7:45, talk on Child Labor Amendment by Citizen's committee to protect our homes and children; 8:30, musicale; 9-10:30, program from WEAF; 11-11:30, dance music, Dok-Efaen and his Sinfonians.

WFAA, Dallas, Tex. (Central, 476), 8:30 p. m., Harris choral club.

WFI, Philadelphia, Pa. (Eastern, 395), 1 p. m., Meyer Davia Bellevue Stratford concert orchestra; 3, Caroline Hoffman, pianist; closing prices, Chicago grain market; 6:30, Meyer Davia Bellevue Stratford concert orchestra; 7, Sunny Jim, the kiddies' pal.

WGBS, New York, N. Y. (Eastern, 316), 10 a. m., shopping talk; 10:10, Stella Goldberger, pianist; 10:20,

health talk; 7:50, harvest program, Josh Quinby and his wife, S'mantha, give a Huskin' Bee; "All Hands Around," Village orchestra; "I Wonder How the Old Folks Are at Home," Cowbell four; "Sea Farming," William Flrth Wells; "Uncle Josh's Huskin' Dance," orchestra; "Juanita," Cowbell four; reading, "Pleasure Exertion," S'mantha; "Rubenesque," orchestra; "The Old Sexton," Snowball; "Farm Yard Medley," Cowbell four; "Cocoanut Dance," orchestra; 10:30, "Cavalleria Rusticana," WGY orchestra; "La Belle aux Cheveux de Lin," Ollie G. Yettru; "Shimame o Mine," Harry Taylor, bass; "Floradora Waltz," orchestra; "In a Boat," Edward A. Rice, violinist; "The Sentinel Am I," Harry Taylor, bass; "Intermezzo," orchestra; "The Wonder," Peter Schmdt, clarinetist; "I Am a Pirate King," Harry Taylor; "Serenade," orchestra.

WHA, Madison, Wis. (Central, 275), 7:45 p. m., "The Government Work in Animal Husbandry," Prof. L. J. Cole, professor of Genetics.

WHAA, Iowa City, Ia. (Central, 464), 12:30-1 p. m., "What Interests People in Newspapers," George H. Gallup.

WHAS, Louisville, Ky. (Central, 400) 4-5 p. m., Alamo theater orchestra, Harry S. Currie, conductor; "Just Among Home Folks"; readings, Courier-Journal, Louisville Times editorials; 7:30-9, Jake Seligman's Kentucky Night Owls; Phil Coady, baritone.

WHB, Kansas City, Mo. (Central, 411), 2-3 p. m., ladies' hour program, Sweeney Radio trio; 7-8, music, Sweeney Radio trio; weekly W. C. T. U. talk, Mrs. Fannie L. Taylor.

WHN, New York, N. Y. (Eastern, 360), 2:15 p. m., Richard Hitter's Romance orchestra; 2:45, Judith Roth, Al Wilson; 3, Billy Burke, tenor; Matty Levine, pianist; 3:45, Uncle Robert's chat to children; 4, Mabel Livingston, children's poet; 4:15, Joseph C. Wolfe, baritone; 4:30, Kathryn R. Behnke, contralto; 4:45, serial story, William J. Stuart; 5, Alja and his orchestra; 6:30-7, Huston Ray's Almacae quartet; 7-7:30, Huston Ray's Almacae orchestra; 8:30-9:37, news; 9:37, Dan Gregory's Crystal Palace orchestra; 10, Prof. La Fontaine, ukulele soloist; 10:10, Melody Four male quartet; 10:30, Fletcher Henderson's Roseland dance orchestra; 11, Rody O'Flynn, tenor; 11:10, Lou Fordon, Leo Jacobs; 11:20, James A. Kennis, tenor; 11:30, Sam Wooding's Club Alabama orchestra; 12-12:30 a. m., Ted Lewis and his Symphonic clowns.

WHO, Des Moines, Ia. (Central, 526), 7:30-9 p. m., musical program, Dean Raymond Carr, director; Vernon Sheffield, pianist; Stewart Watson, baritone; Williams brothers guitar, banjo, mandolin artists.

WIP, Philadelphia, Pa. (Eastern, 509), 1 p. m., Gim-bel's tea room orchestra, Ray Steen, director; 3, Caroline Wagner Green, soprano; Elsie W. Wagner, pianist; 3:30, University orchestra, direction William Heinemann; 6:05, Jordan-Lewis dance orchestra; 7, Uncle Wip's bedtime stories.

WJAR, Providence, R. I. (Eastern, 360), 10 a. m., household hints, Mrs. Wood; 10:45, McCall's style talk; 1:05 p. m., Twin Elm orchestra, Martin J. Casey, director; 8, musical program; 10:45, Providence Biltmore hotel orchestra.

WJY, New York, N. Y. (Eastern, 405), 7:30 p. m., Billy Wynne's Greenwich Village Inn orchestra; 8:15,

daily recipe; 6, market summary and faru news; 6:30, organ, Ralph Emerson; 6:45, tenor, Sam Madia; 6:50, organ, Ralph Emerson; 7, lullaby time, Glenn Rowell, Ford Rush; 7:20, Sam Madia, tenor; 7:30, Isham Jones and his College Inn orchestra; 7:45, Sam Madia, tenor; 8-9, farm program; weekly dairy products review; "Principle of Co-operative Dairy Marketing," E. B. Heaton; "The World's Three Great Dairy Cows," Edward Horst; "John Turnipseed," farm philosopher of the "Prairie Farmer"; B. The Monkey's Paw; Saddler feature; 9:35, Dennis sisters; 9:45, George D. Horne, baritone; 10, Isham Jones and his College Inn orchestra; 10:15, George D. Horne, baritone; 10:40, Ford and Glenn time.

WLW, Cincinnati, Ohio (Central, 423), 4 p. m., French lesson, Madame Teimpids.

WMAQ, Chicago, Ill. (Central, 447.5), 4 p. m., "English as Sho I Spoke," Alexandra Carlisle Jenkins; 4:30, program, Bush conservatory of music; 6, Chicago theater organ recital; 6:30, Hotel LaSalle orchestra; 8, weekly Wide-Awake club program, Mrs. Frances M. Ford, program director; 8:30, musical geography, Marx Oberndorfer, Mrs. Marx E. Oberndorfer; 9, Hilda Butler Farr, pianist; Flora Walikes, soprano.

WMC, Memphis, Tenn. (Central, 500), 8:30 p. m., Brittlings' Novelty orchestra; 11 midnight frolic.

WNJ, Newark, N. J. (Eastern, 233), 10:30-12:30 p. m., Frank Daily and his Meadow Brook orchestra.

WOAW, Omaha, Nebr. (Central, 526), 6 p. m., "Uncle Ross" story hour, Doris Claire Secord; 6:20, Normal uale chole and college band of Concordia Teachers' college; St. John's Lutheran choir, Prof. Karl Haase; "The Broadcaster," "The Elves," "In a Rose Garden," band; "Send, O God, a Gentle Shower," "Psalm No. 46," Normal choir; "Rigoletto," Martin Renken; "Seward Concordia Teachers' College and Our Christian Day School," Prof. Henry Koenig; "O, Great Is the Depth of Riches and Wisdom and Knowledge of the Father," choir; selection from Mozart, F. Rutenbergs, pianist; "Jehova, Let Me Now Adore Thee," "Jerusalem, Thou City Fair and High," choir; "Celestial Overture," "The Twilight Hour," "Choral Overture," college band; 9, "A Mighty Fortress Is Our God," band; "The City of God," St. John's Lutheran choir and Normal male choir, Mrs. C. H. Riggert, soprano; Prof. Henry Koenig, baritone; Mrs. C. D. Zimmerman, accompanist.

WOC, Davenport, Ia. (Central, 484), 10 a. m., markets; 10:05, household hints; 10:55, time; 11, weather, river forecast; 11:05, market; 12 m., chimes; 12:15, weather; 2 p. m., stocks, markets; 6:45, sports, weather; 7, sandman's visit, Val McLaughlin; 7:20, "The Growing of Apples," C. F. L. Clemons; 8 Hawaiian music, Fred Sutterlin, ukulele soloist; Jesse Clinton, guitarist; Edward Brown, guitarist; artists from Orlon.

WOO, Philadelphia, Pa. (Eastern, 509), 11 a. m., organ recital, Mary E. Vogt; 12:02 p. m., Wanamaker crystal tea room orchestra, Robert E. Golden, director; 5:05, Mary E. Vogt, organist; 7:30, A. Candolori and his French room orchestra from Hotel Adelphi; 8:30, Erno Rapee's intimate concert from Fox theater; 9:30, organ recital, Mary E. Vogt; 10:30, Vincent Rizzo and his Hotel Sylvania dance orchestra.

tots from child's church; 7:30-9:30, auditorium service, "Bible Teaching on Divine Healing," Almee Semple McPherson; altar call; temple choir; Marlon McGlashen Muller, Salvation Army soprano.

KGO Oakland, Calif. (Pacific, 312), 12:30 p. m., N. Y. stocks; 12:30, S. F. stocks; 12:45, weather; 4-5:30, concert orchestra, Hotel St. Francis, Vinton La Ferrara, conductor; 8, studio program, Yerba Buena Minstrels and Olio minstrels; end men, Richard H. Glissman, Ernest W. Stenberg, Lloyd D. Barzee, A. E. Evers, Sydney H. Hansen, Harry Roach; interlocutor, George W. Ludlow; soloists, Carl Anderson, Clarence H. Oliver, R. J. Bishop A. H. Arneson, E. C. Dowdle, A. C. Kroeger, Chris Hampton, Willard B. Zimmerman; Olio; J. E. Whitehead, pianist; comic songs, Charles W. Reynolds; A. L. Bangle, clarinetist; monologues, A. E. Evers; Sydney T. Maar, violinist; George W. Ludlow, reader; Charles T. Besserer, organist; Newton Deprez, bass; Howard Tremble, pianist; monologues, Anson Bilger; Wiley R. Martin, saxophonist; piano duet, Mr. and Mrs. William W. Caruth; 10-1 a. m., Henry Halstead's orchestra.

KGW, Portland, Ore. (Pacific, 492), 11:30 a. m., weather; 10 p. m., dance music, George Olsen's Metropolitan orchestra; weather, news.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:30 p. m., concert; 2:30-3:30, matinee musicale; 6-6:30, Art Hickman's concert orchestra, Edward Fitzpatrick, director; 6:30-7:30, children's program, "American History," Prof. Walter Sylvester Horton; Helene Pierle screen juvenile; bedtime story, Uncle John; 8-10, special de luxe program; 10-11, Art Hickman's dance orchestra.

KLX, Oakland, Calif. (Pacific, 509), 2:30 p. m., football, U. of California-U. of Southern California.

KPO, San Francisco, Calif. (Pacific, 423), 12 m., time; readings from the Scripture; 1-2 p. m., Rudy Seigor's Fairmont hotel orchestra; 3:30-5:30, E. Max Brad-gel's Versatile band; 8-12, Art Weidner's dance orchestra; May Clarke Burns, soprano.

(Continued on page 16)

SONIC ORGAN AT KSD WEDNESDAY

Alice Graze, soprano, is a regular feature of WWJ, Detroit. These two youngsters, the Williamson Brothers of Des Moines, are perhaps two of the most popular youthful artists heard over any microphone. They will play at WHO this Friday, October 31. Ray Stilwell (right) is the director of the orchestra bearing his name, and is at the present time pleasing not only the patrons of Rainbow room at the Hotel Winton in Cleveland, but also the invisible audience of WHK.



Where to Hear Talks Central Standard Time

TALKS, instructive, serious, humorous and even frivolous, are Radiocast daily and below are listed the stations.

Wednesday, October 29th: 6, WDAF; 7, WDAF, WHB, WSAC; 7:15, KDKA; 7:45, WHA; 8, WLS, WAMQ, WPM; 8:30, KOB, KYW; 9, KFKE; 9:15, KYW; 9:30, KFAE; 9:45, WMAQ; 10:30, KFOA.

Thursday, October 30th: 6, WRC; 6:45, CKAC, WEA, WGY; 7, WDAF, WIP, WRC; 7:15, WBZ; 7:30, WHAS; 8, KYW, WAAW, WMAQ; 8:30, WFI; 8:45, WMAQ; 9, KFKE, WFI, WMAQ; 9:15, WRC.

Friday, October 31st: 7, CNRM, CNRT, KDKA; 7:15, KDKA; 7:30, WDAF, WHAS; 7:45, WHA; 8, WLS;

8:20, KYW; 8:30, KOB; 9, KFKE; 9:30, KFAE; 10, KGW.

Saturday, November 1st: 6:45, KDKA, WRC; 7, KDKA, WFI, WIP; 7:15, WBZ; 7:30, WDAF; 7:40, WMAQ, WRZ; 9, KFKE; 12, KGW.

Sunday, November 2nd: 6:30, WDAF, 8, KFKE.

Monday, November 3rd: 7, WEA; 7:15, KDKA; 8, WDAF; 9, KFKE; 9:30, KFAE; 10, KGW.

Tuesday, November 4th: 7, WIP; 7:30, WFI; 8, WHAA, WMAQ; 8:20, WMAQ; 8:40, WMAQ; 9, KFKE.

WOR, New York, N. Y. (Eastern, 405), 9 p. m., dancing lessons, Arthur Murray; 9:15, Carolinians; 9:30, Joseph Del Puerto, baritone; Hayward Hedden, pianist; 10:30-11, Peerless trio.

WQJ, Chicago, Ill. (Central, 448), 11-12 m., "Linen and their Manufacture," Marcia Meadows; "Bakery Products and the Home," Dr. Fred P. Siebal; "Wholesome Foods Easily Prepared," Agnes M. Olson; 3-4 p. m., "Ways of Serving Fish," Helen Harrington Downing; book review, Rev. Fred Harrison.

WRC, Washington, D. C. (Eastern, 469), 3 p. m., fashion development of the moment, Women's Wear; 3:10, songs; 3:25, current topics, Editor of The Outlook; 3:55, piano recital; 4, songs; 4:10, book review, auspices of The League of American Penwomen; 6, stories for children, Peggy Albion.

WSAI, Cincinnati, Ohio (Central, 309), 10 p. m., popular songs, Hughes & Axman; Royal Garden orchestra.

WTAM, Cleveland, Ohio (Eastern 390), 8 p. m., Ben Tindolph, tenor; Arthur Parry, baritone; Florence Wasson, soprano; Dorothy Smith Lenz, contralto; Mr. and Mrs. Otis C. Arnold, the old-time fiddler; WTAM Symphony orchestra.

WWJ, Detroit, Mich. (Eastern, 517), 8 a. m., setting-up exercises, R. J. Horton; 9:30, talk, women's editor, Detroit News; 12 m., music; 3 p. m., Detroit News orchestra; 8:30 Detroit News orchestra.

Tuesday, November 4

Silent night for: KFAE, WCAP, WGR, WMH, WNJ, WOO, WOR.

CKAC, Montreal, Can. (Eastern, 425), 4 p. m., weather and stock market reports; 7, kiddies' stories, in French and English; 7:30, Rex Battle and his Mount Royal Hotel concert orchestra; 8:30, Canadian Industrial Coal entertainers; 10:30, Joseph C. Smith and his Mount Royal hotel dance orchestra.

KOKA, E. Pittsburgh, Pa. (Eastern, 326), 9:45 a. m., stocks, markets; 11:55, time; 12 m., weather, markets; 12:15, Scalzo's orchestra; 6:30 p. m., Albert F. Taylor, organist; 7:15, Radio Godmother; 7:30 election returns.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-8 p. m., Aeolian organ recital; 8-9, Hotel Ambassador Cocoon Grovo orchestra; 9-10, Examiner studio concert; 10-11, popular ballad hour.

KFKB, Milford, Kans. (Central, 286), 8 p. m., Abe Martin's band, concert; 9, lecture, Dr. Osborn, male quartet; 10-11, lecture, Dr. Brinkley, Jubilee Boys' orchestra.

KFNF, Shenandoah, Ia. (Central, 266), 7:30 p. m., concert from Fairfax, Ralph Phillips, director.

KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m., organ "gems," Esther Fricks Green, organist; vocal selections by assisting artists; 6:30-7:30, "Cousin Jim," children's friend in song, music and story for Radio-land children; Eugene Lamb, pianist.

KGO, Oakland, Calif. (Pacific, 312), 1:30 p. m., N. Y. stocks; 1:40, S. F. stocks; 1:45, weather; 3:45-1, presidential election returns.

KGW, Portland, Ore. (Pacific, 492), 11:30 a. m., weather; 12:30 p. m., concert; 5, children's program; story, Jean Adams; 7:15, markets, news, weather, police reports; 8, election returns.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:30 p. m., concert, the Rendezvous ballroom orchestra; 2:30-3:30, musical appreciation talk, Carolyn Pearson; 6-6:30, Art Hickman's concert orchestra, Edward Fitzpatrick, director; 6:30-7:30, children's hour, "American History," Prof. Walter Sylvester Hertzig; the visit of the Sandman and Queen Titania; bedtime story, Uncle John; 8-10, concert, courtes, Barker Brothers; 10-11, Art Hickman's dance orchestra, Earl Burnett, director.

KPD, San Francisco, Calif. (Pacific, 423), 12 m., time, reading of the Scripture; 1-2 p. m., Rudy Selger's Fairmont Hotel orchestra; 4:30-5:30, Rudy Selger's Fairmont Hotel orchestra; 5:30-6:30, children's hour stories; 7-7:30, Rudy Selger's Fairmont Hotel orchestra; 8-10, election returns; program, Paul Corbel, director; 10-11, E. Max Bradford's Versaille band.

KSD, St. Louis, Mo. (Central, 546), 7 p. m., election returns; music, Vin James and company; Al Walsh, tenor.

WEAF, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., musicale, Baptist Theological seminary, Frank Cheek, director; 9:30-10:45, program, E. Clyde Whitlock, violinist.

WBAV, Columbus, Ohio (Eastern 423), 12 m., Ila Lorbach Owens, pianist; 8 p. m., WBAV orchestra, Frances Handlauer, director.

WCAL, Northfield, Minn. (Central, 360), 9:45 a. m., St. Olaf college chapel services.

WDX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 8 dinner, concert; 10, Red Apple club.

WDAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's string trio; 5-5:30, weekly child talent program, pupils of the Gertrude Conannon School of Music; 6-7, school of the air; piano tuning-in number on the Duo-Art; fourth of a series of Radio piano lessons, Maudell Littlefield, the Tell-Me-A-Story Lady; music, Hotel Muehlebach Trianon ensemble; 11:45-1 a. m., Nighthawk frolic, the "Merry Old Chief" and the Plantation players.

WDAF, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., recital, Arcadia cafe concert orchestra, Ferl Sarkozl, director; 2, Arcadia cafe concert orchestra; 3:30, Edna Finestone, pianist; 7:30, Dream Daddy's bedtime stories; "Both Sides of the Footlights," Arnold Abbott.

WEAF, New York, N. Y. (Eastern 492), 2:30-4 p. m., Government club, Hotel Astor; 4:15-5, Columbia university, Institute of Art and Sciences; 6-7, dinner music, Waldorf-Astoria hotel; 8-8:10, Mears and company; 8:30-8:45, Harriet Youngs, soprano; 9-10, A. & P. Gypsies.

WEAO, Columbus, Ohio (Eastern, 294), 9 a. m., music, Marguerite Manley Siedel School of Music talent; 11 a. m., music, Siedel artists; 1:30 p. m., music, Siedel artists.

WEBJ, New York, N. Y. (Eastern 273), 7-7:15, p. m., Blybrun's Review of now plays on Broadway; 7:15-8, Dan Gregory and his Crystal Palace orchestra; 8:15-9, Rivoli ensemble, under personal direction of Hugo Rosenfeld.

WEAO, Dallas, Texas (Central, 476), 12:30-1 p. m., music, Red head girl; 11-12, Palace theater, Dwight Brown, orchestra.

Monday, November 3

Silent night for: CKAC, KFNF, KFSG, KYW, WGN, WHAS, WJY, WLS, WMAQ, WQJ, WRC, WTAY, CHNC, Toronto, Can. (Eastern, 350), 8:30 p. m., Clarence Causton, violinist; Lionel Bilton, cellist; Simeo Joyce, pianist; R. S. Overand, tenor; Lawrence Defoe, tenor; A. E. Vandervoort, bass; Mrs. A. G. Dominguez, Mexican prima donna.

CKAK, Montreal, Can. (Eastern, 425), 1:45 p. m., Mount Royal hotel luncheon concert; 4, weather and stock reports; 4:30, 10 lessons.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 7:30 a. m., morning exercises, O. Shannon; 9:45, stocks, markets; 11:55, time; 12 m., weather, markets; 12:15 p. m., Daugherty's orchestra; 6:30, dinner concert, KDKA Little Symphony orchestra, Victor Saudek, conductor; 7:15, The Radio Rhythmer; 7:30, "Politics, everybody's Business," Daniel Dwyer; 7:40, stocks, markets; 8, Radio Girl scout meeting, Laura Holland Macdonald; 8:15, "Developing a Pleasing Personality"; 8:30, "KDKA's Fourth Birthday Party"; 9:55, time, weather; 10, anniversary program.

KFAE, Pullman, Wash. (Pacific, 330), 7:30 p. m., "Avaltz," "The Old Music Box," "Tamhourine," Thelma Johnson, pianist; "Gypsy Dance," "The Old Refrain," "Sourier de Posen," "Mighty Like a Rose," Margaret MacLachlan; "Important Points in Poultry Raising," J. S. Carver; "What Happens at Very Low Temperatures," J. L. Culbertson; "Home Treatment of Tuberculosis," U. S. Public Health service; "Winter Rations for Hogs," C. M. Hubbard.

KFI, Los Angeles, Calif. (Pacific, 469), 8-9 p. m., Evening Herald concert; 9-10, Examiner studio recital; 10-11, Ambassador hotel Cocoon Grove orchestra.

KFKB, Milford, Kans. (Central, 286), 8 p. m., Abe Martin's band, concert; 9, lecture, Dr. Brinkley, Jubilee boys' orchestra.

KFOA, Seattle, Wash. (Pacific, 455), 8:30 p. m., Seattle Post Intelligencer program.

KGO, Oakland, Calif. (Pacific, 312), 1:30 p. m., N. Y. stocks; 1:40, S. F. stocks; 1:45, weather; 3, studio musical program, Parrot-Teacher association speaker; 4-5:30, Henry Halstead and his dance orchestra; 5:30-6, Aunt Betty stories, KGO kiddies' club; 9:45, N. Y. stocks; 6:55, S. F. stocks; 7, weather; 7:05, S. F. produce news; 7:10, baseball scores; 7:15, news items; 8, educational program, courses in agriculture, economics, American citizenship, English book reviews; music selections from "Faust," "Serenade," "Broken Melody," "Blue Danube Waltz," "Tarantella," "My Love's Waltzing," Arion trio; 10-1 a. m., Henry Halstead's orchestra.

KGW, Portland, Ore. (Pacific, 492), 11:30 a. m., weather; 5 p. m., children's Roosevelt program; travel story, Aunt Nell; 7:15, markets, weather, news, police reports; 8, Oregonian concert orchestra; Apple club.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:30 p. m., concert.

KDB, State College, N. M. (Mountain, 360), 7:30-8:30 p. m., musical program.

KPO, San Francisco, Calif. (Pacific, 423), 12 m., time, reading of the Scripture; 1-2 p. m., Rudy Selger's Fairmont hotel orchestra; 4:30-5:30, Rudy Selger's Fairmont hotel orchestra; 5:30-6:30, children's hour stories, Big Brother, Book of Knowledge; 7-7:30, Rudy Selger's Fairmont hotel orchestra; 8-9, Theodore J. Irwin, organist; 9-10, Welsh choir, Theodore J. Phillips, director; 10-11, E. Max Bradford's Versaille band.

KSD, St. Louis, Mo. (Central, 546), 6:45 p. m., Aher's concert ensemble, Arno Ameson, violinist; 8:30 p. m., "Moments from the Majestic," stars from the Majestic; 9:30-10:45, concert, Montgomery Ward and company's orchestra.

WBAB, Columbus, Ohio (Eastern, 423), 12 m., Ila Lorbach Owens, pianist.

WCOB, Zion, Ill. (Central, 345), 8 p. m., Htre trio, Mrs. L. J. Htre, pianist, Mr. L. J. Htre, viola, Richard Htre, violinist, assisted by quartet, soprano, contralto.

WCX, Detroit, Mich. (Eastern 517), 4:15 p. m., musical program; 6, dinner concert; 7, musical program, auspices of the Highland Park Musical club.

WOAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's string trio; 6-7, school of the air, piano tuning-in number on the Duo-Art; personal message from Roger W. Babson, statistical expert; the Tell-Me-A-Story lady; music, Hotel Muehlebach Trianon ensemble; 8-9:15, popular program, the Star's Radio orchestra; 11:45-1 a. m., nighthawk frolic, the "Merry Old Chief" and the Plantation players.

WGBS, New York, N. Y. (Eastern, 316), 8:30 p. m., official opening, unusual program to be broadcasted from studio of the new Gimbel Brothers' station.

WGN, Chicago, Ill. (Central, 370), 11 a. m., Uncle Walt reads the funnies to the children; 11:45, concert from Chicago theater; 2:30 p. m., Lyon and Healy organ and Chicago musical college concert; 9, concert, WGN singers, Drake ensemble.

WGR, Buffalo, N. Y. (Eastern, 319), 3-4 p. m., vesper service, Buffalo Council of churches; 4-5, Leonard Adams, organist; 7-15, service, featuring William Wall Shiddit, organist, and Dr. J. MacAlpine, Central Presbyterian church.

WGY, Schenectady, N. Y. (Eastern, 380), 10:30 a. m., service, First Presbyterian church, Rev. William Herman Hopkins; 3:45 p. m., "March Hongroise," WGY Symphony orchestra, Leo Kilwen, conductor; "The Jewel Song," Viola Halles, soprano; "Adagio and Allegro Vivace," orchestra; "Qui La Voce," Viola Halles, solo; "Woodland Pictures," orchestra; "Here's Where the Smugglers Dwell," Viola Halles; "Overture 'Fra Diavolo,'" orchestra; 7:30, services, Albany First Presbyterian church, negro spirituals, Fisk Jubilee singers; Nathaniel Dett, organist.

WHAA, Iowa City, Ia. (Central, 484), 9-9:30 p. m., familiar hymns.

WHAS, Louisville, Ky. (Central, 400), 9:57 a. m., organ music; 10, church service, auspices of the Fourth Avenue Presbyterian church, Rev. Dr. Charles W. Welch, pastor; William E. Conen, organist; choir, Esther Metz, soprano; Mrs. Virginia Shafer Herrick contralto; William Layne Vlek, tenor; William G. Meyer, baritone; 4 p. m., George Lathimer, organist; 4:30, vesper service, Christ Church cathedral; address, Rev. Robert L. McCready; boys' choir; Ernest Arthur Simon, organist.

WHB, Kansas City, Mo. (Central, 411), 9:45-11 a. m., services, Linwood Boulevard Christian church, Dr. Burriss Jenkins, pastor; 8-9:15 p. m., services, Westport Methodist Episcopal church, Dr. W. A. Tetley, pastor.

WHK, Cleveland, Ohio (Eastern, 283), 8 p. m., chapel services, auspices Cleveland Federated churches, Rev. E. B. Wright, conductor; current religious topics, sacred music, invocation; 9, Mary E. Black, soprano; Ruth Sponseller, contralto; Jean Webster Erlsman, soprano; O. A. Bryan baritone, pianist; Leonard Z. Bryan, tenor, violinist.

WHO, Des Moines, Ia. (Central, 526), 7:30-8 p. m., sacred concert and sermon; Bankers Life Radio artists.

WIP, Philadelphia, Pa. (Eastern, 509), 11 a. m., services, Holy Trinity church, Rev. Floyd W. Tomkins, D. D., rector.

WJAR, Providence, R. I. (Eastern, 380), 7:20-9:15 p. m., Roy and his gang, Capitol theater, New York city; 9:15-10:15, organ recital, WEA.

WJAX, Cleveland, Ohio (Eastern, 390), 9 p. m., concert program arranged by Radio Apparatus company, Warren R. Cox, vice-president and general manager; R. A. C. concert orchestra, Max Schmitt, director; Ben Burt, pianist; Ben Silverberg, violin; Joseph Paritzki, violinist; Max Schmitt, cellist.

WLS, Chicago, Ill. (Central, 345), 6:30 p. m., organ, Ralph Emerson; 7-8, musical program arranged by Robert W. Stevens, U. of C.

WLW, Cincinnati, Ohio (Central, 423), 9:30 a. m., Sunday school; 11, sermon, Dr. Frank Stevenson, Church of the Covenant; 7:45 p. m., sermon, Rev. Frederick N. McMullen, Walnut Hills First Presbyterian church; 8:45, Western & Southern orchestra.

WOAW, Omaha, Nebr. (Central, 526), 9 a. m., ladlo chapel service conducted by Rev. R. R. Brown; 9, musical chapel service, Immanuel Lutheran church, Rev. O. Henry, pastor.

WOC, Oavenport, Ia. (Central, 484), 9 a. m., sacred chimes; 1 p. m., the Palmer School Radio orchestra, Ewin Swindell, conductor; 7:30, sport news; 8, church service; 9:30, the Palmer School Radio orchestra.

WOD, Philadelphia, Pa. (Eastern, 509), 10:30 a. m., services, Bethany temple; 2:30 p. m., Sunday school Bethany temple; 8:05, organ recital, Clarence K. Bawden; 7:30, services, Bethany temple.

WQJ, Chicago, Ill. (Central, 448), 10:30 a. m., People's church; Clarence Eddy, organist; 8-10, Ralph Williams and His Rainbow Garden orchestra; Maria Duoprovra,

(Continued on page 18)

Tuesday, November 4

(Continued from page 17)

WFI, Philadelphia, Pa. (Eastern, 395), 1 p. m., Myer Davis Bellevue Stratford concert orchestra; 3, closing prices, Chicago grain market; 3:07, Carolino Hoffman, pianist; 6:30, Myer Davis Bellevue Stratford concert orchestra; 7, Sunny Jim, the kiddies' pal; 8:30, medical talk, Dr. John B. Becker; 9:15, Artists' Glee Club and string band.

WGS, New York, N. Y. (Eastern, 316), 10 a. m., shopping talk; 10:10, Harriet P. Dietrich, pianist; 10:20, "The Black Spot In Your Kitchen," Walter D. Smith; 10:30, Harriet P. Dietrich, pianist; 10:40, "Dress Appreciation," Sarah Gilman; 10:50, Nardi music trio; 1:30 p. m., Benjamin Lucartoto, pianist; 1:45, Richard B. Gilbert, popular songs accompanied by Taropatch; 2, Benjamin Lucartoto, pianist; 2:15, Richard B. Gilbert, popular songs accompanied by Taropatch; 3, Terese Rose Nagel on "The Miracle" production; 3:10, Edith Rennyson, soprano; 3:20, "Why I am Going to Vote," Mrs. Walter Timme; 3:30, Edith Rennyson, soprano; 3:40, students' period; 3:50, Dr. Joseph Kalmann, tenor; 6, Fnele Gebree; 6:30, Loretta E. Brady, author of "Green Forest Fairy Book"; 6:45, Charles Wold, musical glasses; 7, Genevieve Williams, soprano; 7:15, Charles Wold, musical glasses.

WGN, Chicago, Ill. (Central, 370), 1:10 p. m., Drake ensemble and Blackstone string quintet; 2:30, recital from Lyon and Healy concert hall; 3, rocking chair time; 5:30, Skeezix time; 6, Lyon and Healy organ recital; 6:30, Drake concert ensemble and Blackstone string quintet; 8, the classic hour, vocal and instrumental music; 10, Jack Chapman's dance orchestra and latest popular songs.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1 p. m., George Albert Bouchard, organist; 2:30-4:30, Buffalo Courier and Enquirer, musical program; 6, Hallpryd string quartet; 7:30, election returns.

WGY, Schenectady, N. Y. (Eastern, 380), 11:55 a. m., time; 12:30 p. m., stocks; 12:40, produce markets; 12:45, weather; 2, "The Art of Looking Up Pictures," Mrs. C. N. Moore; 6, produce and stock markets, news; 6:30, dinner music, Trio from Hotel Ten Eyck; 7:15, WGY orchestra, election returns; "Air," "Melody," "Chanson Espagnole" orchestra; "Can a Wallflower Come Back," Liberty magazine; "Mandolinata," "Joli Berger," "Pheonnette," "March, Here Goes," orchestra; 11:20, Stephen E. Boisclair, organist.

WHAA, Iowa City, Ia. (Central, 484), 12:30-1 p. m., "Synthetic Resin," Prof. P. A. Bond; 8, program speech department faculty.

WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., Alamo theater orchestra; weather; "Just Among Home Folks," readings, Courier-Journal and Louisville Times editorials; 7:30-9, Carl Zoeller's melodists.

WHB, Kansas City, Mo. (Central, 411), 2-3 p. m., ladies' hour program, Sweeney Radio trio; 8-9, classical program from the studio; 9-10, dance music, Sweeney Radio orchestra.

WIP, Philadelphia, Pa. (Eastern, 509), 1 p. m., Karl Bonawitz, organist; 6:05, Ehrenzeller's concert orchestra, George Ehrenzeller, conductor; 7, Uncle Wip's bedtime stories; 8, WIP magazine of the air including talk on commerce, finance, music, radio, the theater and city government; 11:05, Harvey Marchburger and his Vaudeville orchestra from Cafe L'Aiglon.

WJAR, Providence, R. I. (Eastern, 360), 1:05 p. m., music; 7:30, musical program; 8, talk; 9, Eveready entertainers from W.E.A.F.

WJAX, Cleveland, Ohio (Eastern, 390), 7:30 p. m., election returns.

WMAQ, Chicago, Ill. (Central, 447.5), 4 p. m., lecture, Red Cross home nursing service; 4:30, program, Glenn Dillard Gunn school; 6, Chicago theater organ recital; 6:30, Hotel LaSalle orchestra; 8, Harry Hanson literary editor; 8:20, Clara E. Laughlin, travel talk; 8:30, ten-minute talks, Association of Commerce; 8:50, talk, United States Civil Service Commission; 9:15, program, faculty of the Cosmopolitan School of Music.

WMC, Memphis, Tenn. (Central, 500), 12:30 p. m., Noontday program, Skyline serenaders; 8:30, election returns, Bernard and Robinson; 11, Ernest F. Hawke, pipe orkaust.

WNJ, Newark, N. J. (Eastern 233), 10:30-12:30 p. m., Frank Dally and his Meadow Brook orchestra.

WOAM, Omaha, Neb. (Central, 526), 6 p. m., "Advice to Lovelorn," Synthn Gies; 6:25, dinner program transmitted from WOAM, studio in the May Sood & Nursery company's building, Shenandoah, Ia.; 9, program, courtesy of Knights of Columbus; 10:30, WOWL frolic.

WOO, Philadelphia, Pa. (Eastern, 509), 11 a. m., organ recital, Meary E. Vogt; 12:02 p. m., Wanmaker crystal tea room orchestra, Robert E. Goulden, director; 5:15, Mary E. Vogt, organist.

WOR, New York, N. Y. (Eastern, 405), 2:30 p. m., Matilda Rosentraneh, pianist; 6:15, Halsey Miller and orchestra; 6:30-6:45, man in the moon stories; 7, Halsey Miller and his orchestra.

WQJ, Chicago, Ill. (Central, 448), 11-12 m., "Brassiers," Estelle Popp; "A Talk on Meat," Graen Vial Gray; 2-4 p. m., "Phoning Your Winter Menu," Cora Betman; 7-8, Ralph Williams and His Ralhuo Garden orchestra; Exceislor quartet; 11-2, Ralph Williams and His Ralhuo Skyvarks; James Mitchell, baritone; Merrlo Boyd Mitchell, soprano; Carl Linner, pianist; Nels Allen, contralto; Viola Graf, soprano; Edna Solomon, contralto.

WRC, Washington, D. C. (Eastern, 469), 6 p. m., children's hour, Peggy Albion; 7:30, election returns; 9:55, time, weather.

WSA, Cincinnati, Ohio (Central, 309), 7 p. m., Hotel Gibson orchestra; 7:30, chimes concert; 7:45, sleepy-hour stories, Ethel Knapp Behrman; 8, Gibson orchestra; 9, special program, Cincinnati College of Music faculty; 9:50, popular songs, Hughes & Axman.

WTAY, Oak Park, Ill. (Central, 283), 6:45-7:45 p. m., Glenn Bruce bedtime story teller; Sandy Meeck, baritone; Raynor Dalheim & company orchestra; 9-9:45, 10:15-11:15, Guyval Paradise Ballroom orchestra.

WWJ, Detroit Mich. (Eastern, 517), 8 a. m., settling-up exercises, R. J. Horton; 9:30, talk, women's editor, Detroit News; 9:45, Fred Shaw, pianist and songster; 12 m., musical program; 3 p. m., Detroit News orchestra; 8:30, Detroit News orchestra.

Additional Programs

(Received Too Late for Classification)

Wednesday, October 29

WEBB, Chicago, Ill. (Central, 370), 7-8 p. m., fifteen minute talk, Dr. R. Edgar Tulloss; Edgewater Beach Orlole orchestra; everyday songs, Edgar A. Guest; musical bits, Riviera theater; 9-10, Margaret Wertz, contralto; Marie Kelly, reader; Langdon brothers, Hawaiian guitarists; twenty minute talk, Dutton Clark; Edgewater Beach Orlole orchestra; 11-12, Marie Kelly, reader; The Three Musketeers, soloist; Edna Solomon, contralto; Rosa Mary Hughes, soprano; Edgewater Beach Orlole orchestra.

Thursday, October 30

WEBB, Chicago, Ill. (Central, 370), 7-8 p. m., fifteen minute talk, Mary E. Markley; Edgewater Beach Orlole orchestra; Otto Moore, baritone; musical bits, Riviera theater; 9-10, Edgewater Beach Orlole orchestra; Danjo club, University of Chicago; 11-12, Harry Davis, baritone; Edgewater Beach Orlole orchestra; songs, Collins and Stept; Edgewater Beach Orlole late revue.

Friday, October 31

WEBB, Chicago, Ill. (Central, 370), 7-8 p. m., Edgewater Beach Orlole orchestra; Helen Snyder, soprano; musical bits, Balaban and Katz; 9-10, dance selections, Edgewater Beach Orlole orchestra; Frederick Agard, tenor; musical bits, Riviera theater; Rita McFawn, soprano; 11-12, Edgewater Beach Orlole orchestra; Winter Garden Four; Edgewater Beach trio, banjo, accordion, piano.

Saturday, November 1

WEBB, Chicago, Ill. (Central, 370), 7-8 p. m., Edgewater Beach Orlole orchestra; Radio Sunday School lesson, Dr. Herbert W. Virgln; Dean Romek, pianist; musical bits, Riviera theater; 9-10, Edgewater Beach Orlole orchestra; Marie Kelly, reader; Langdon brothers, Hawaiian guitarists; William H. Hunt, Yellow, Red and Orange tales; musical bits, Riviera theater; 11-12, Edgewater Beach Orlole orchestra; Marie Kelly, reader; Langdon brothers, Hawaiian guitarists; Nick Lucas, songs; Edgewater Beach Hotel trio.

Sunday, November 2

WEBB, Chicago, Ill. (Central, 370), 5-6 p. m., twilight musicale; 7-9, artists' program.

Monday, November 2

KYW, Chicago, Ill. (Central, 536), 6:30, 7, 8 a. m., physical exercises, director, Y. M. C. A.; 9:30, news, market reports; 11:35, table talk, Anna J. Peterson; 6:02-6:18 p. m., news, financial, final markets; 6:35-7, bedtime story, Uncle Bob.

Tuesday, November 4

KYW, Chicago, Ill. (Central, 536), 6:30, 7, 8 a. m., physical exercises, director, Y. M. C. A.; 9:30, news, market reports; 10:30, farm and home service; 11:35, table talk, Anna J. Peterson; 2:35-1, afternoon frolic; 4, "Bringing the World to America," editors of Our World; 6:02-6:18, news, market reports; 6:35-7, Uncle Bob's bedtime story; 7-7:30, dinner concert, Congress hotel, Joska DeBabary's orchestra, Coon Sanders' original Nighthawks; 7:30-7:45, "Around the Town," stage revue; 8-8:20, musical program; Louise Navigato, soprano; Nathan Gold, tenor; Myrtle E. Nelson, accompanist; Henrietta Nolan, violinist; Blanche E. Robinson, pianist; Sallio Menkes, accompanist; 8:20-8:50, American Farm Bureau federation; 8:50-9:30, musical program; 10-11:30, at home program, Sanders' Original Nighthawks.

Experimental Circuit

The accompanying illustration is that of an experimental hook-up and is not exactly suitable for the novice to tackle. The circuit has given excellent results for it is equal to a detector and two stages of audio frequency using a UV-200 as a detector and two UV-201s for the amplifiers.

The grid condenser is mica but a paper one will suffice. It should be .00025 mfd. or about that capacity. The grid leak can be variable and it should be separate from the condenser, but if a non-variable leak is used it should be 4 or 5 megohms. The variometer L1 should not have more than 25 feet of wire, 15 feet being preferable. The variometer L2 can be of any good standard make.

The variable condenser L3 is 43 plates or .001 mfd., but a 23-plate or .0005 mfd. may be used. This condenser may be placed in the aerial lead as well as the ground. The other variable condenser L4 is .001 mfd. or higher. It can be made higher by the addition of a .0005 mfd. fixed condenser.

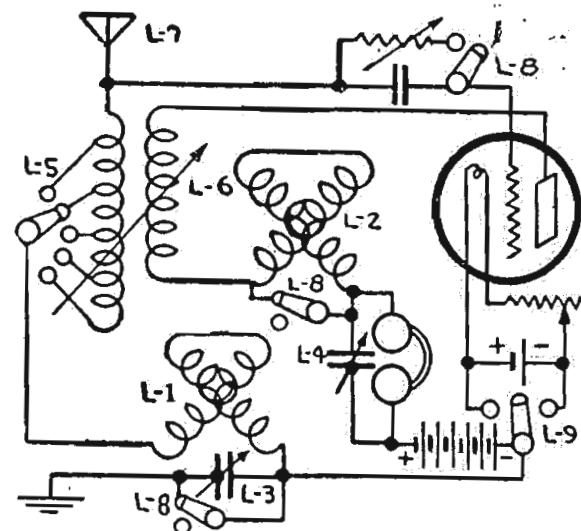
The parts L5 and L6 represent a variocoupler primary and secondary. The pri-

mary should have about 60 turns and it need not be finely tapped. The secondary may have to be rewound if it has not enough wire on it, from 30 to 60 turns.

The rheostat is one of 10 ohms. Try the rheostat in both the negative and positive side.

The aerial, L7, is made up of 10 wires about 12 feet long. The length is optional.

The switches L8 have switch levers and contact points. In L9 three points are



used so that the lever will not short the A battery.

The B battery is variable from 22½ volts to 90 volts.

The set is operated the same as an ordinary set, but a sound, either a whistle or a knocking, is encountered. At the edge of this the signal is the loudest. The sound should be fairly shrill. It can be made so by using the tickler plate variometer, the rheostat or phone condenser, or by adjusting the plate voltage.—Harris Pound, Winnipeg, Canada.

Remove Corrosion on Parts

Look over your rheostat carefully. Is there any green on it or on the potentiometer? How about the spring contact arms on your tube sockets where the binding post screws go through? That is an occasional source of trouble. Then down at the storage battery. Keep the top dry. Keep water up over the plates. Keep the terminals bright and clean. Disconnect the clips and scrape off all the corrosion. If any binding posts go through wood see that they are insulated. If the battery leads go through wood, unless the leads are rubber covered, put in insulating bushings.

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THE MASTER OF RADIO

The SUPER HILCO-DYNE RECEIVER, composed of the Super Hilco-Dyne Kit and a few standard Radio parts, procurable of any dealer, is superior in every way to the conventional super-heterodyne or any of its modifications. It is a simple, quick job to put it together. It tunes on only two dials. It is extremely selective—you can get far distant stations and tune out your local stations. Each station can be located by turning the dials to the point where that station came in before. Distortion is reduced to minimum. You really have to hear music on the SUPER HILCO-DYNE to know how true every note sounds. Static is reduced to a minimum. Coast to coast reception was obtained this summer using no antenna but merely the "ground." It requires only a 7x28 inch panel. Operates on storage battery or dry cell tubes. Completely carries wave range of from 90 to 600 meters. Does not re-radiate.

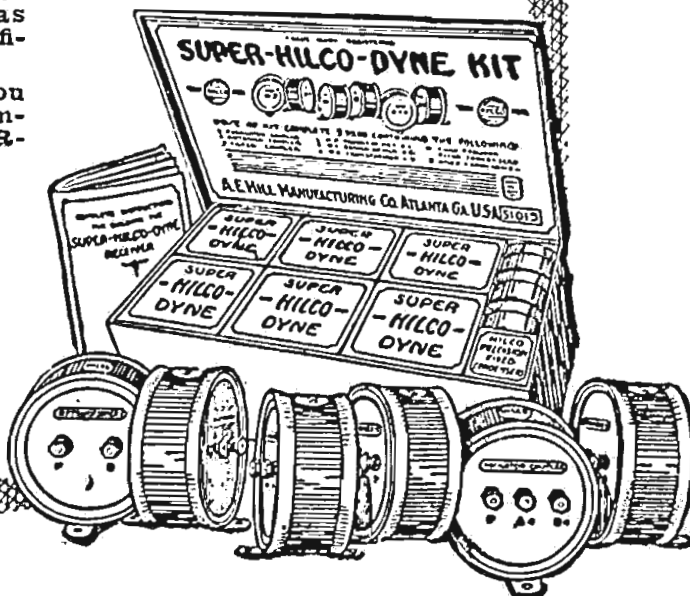
The perfection of this set is obtained by innovations in circuit and by using only balanced and exactly rated apparatus that has been thoroughly tested in our own testing laboratory.

For a total of approximately \$75.00, which includes the price of the kit, you can build a set that will be a constant source of pleasure to yourself and a source of wonder to your friends who have not already built the SUPER HILCO-DYNE.

We GUARANTEE the SUPER HILCO-DYNE KIT, in every particular, the same as we do each and every one of our scientifically constructed Radio parts.

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- 1 Hilco Oscillator Coupler
- 1 Hilco Antenna Coupler
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- 3 Hilco Intermediate Frequency Transformers
- 5 Hilco Precision Fixed Condensers
- 3 Hilco Handycans
- 1 Instruction booklet which completely explains this exceptional circuit and contains complete blueprints. Price separate from set, \$1.

Batteries, Their Use, Abuse, Care and Upkeep

Part I—Power Necessary to Operate Receiving Set

By William Fenwick

BATTERIES have, until very recently, enjoyed great popularity. Obviously, this is directly due to the advent of Radio, for every vacuum tube receiving outfit—requires at least two batteries, namely, the A, or filament battery, and the B, or plate battery, with the exception only of circuits based on the unidyne (or solodyne) principle which make use of just an A battery. Although several combinations have appeared from time to time utilizing the house lighting current as the source of power supply by the introduction of transformers, rectifying systems, etc., few have succeeded in completely eliminating the A. C. hum.

Batteries may well be classed among the three things that have made Radio possible as we know it today, the others of which are vacuum tubes and reproducers. Many have devoted their time to explaining and describing the operation of all these, but few have told the beginner how to get the most out of his batteries, how to become economical and saving. Therefore, it is the writer's aim to give the novice a few pointers in this regard.

The Storage A Battery

The A battery, which supplies the filament current, if of the accumulator type, should be taken constant care of, as it is, in a sense, a very delicate part of the equipment of any station.

Wherever a storage battery is in use, a hydrometer should also be kept handy if the owner wishes to take proper care of it and make it last for years instead of months. The hydrometer is such a necessity that it would be better if manufacturers were to include them with each battery, but as this is not the case, one should be purchased with the battery.

To make the test, insert the hydrometer in the filling holes of the battery and draw up enough of the solution so that the glass indicator inside of the instrument will float. Where the liquid crosses the scale on the indicator, the reading is taken, and must be between 1.250 and 1.300 when the battery is fully charged. This test should be made at least once a week.

The specific gravity should never be allowed to go below 1.180 as this denotes that the battery is fairly well discharged; operating a battery in this condition will result in permanent injury to it. The same will happen if a discharged battery is left standing for any period of time as it will cause extreme sulphation of the plates and will destroy them.

The electrolytic solution in the cells should always be kept about 1/2 inch above the plates. By not doing so the

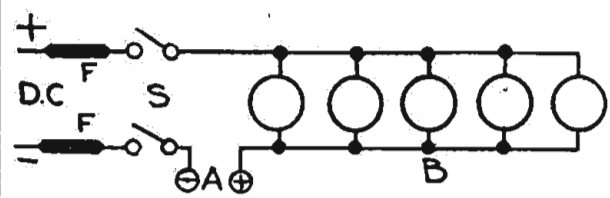


Figure 1

portion of the plates above the solution will not generate current, consequently part of the ampere-hour capacity of the battery will be lost; i. e., it will need recharging oftener. Pure distilled water must be added now and then to maintain this level, but under no consideration should acid be added, for it is the water only that evaporates.

Always keep the top of the battery and the terminals dry, clean, and tight. Never let any dirt or other foreign matter fall into a cell. Do not allow a green, gray, or yellow substance to form on the terminals as this will corrode them. Be sure you have the clips on all batteries coated with a thin layer of vaseline, as it affords better contact and prevents them from being eaten away.

During the course of time the electrolyte becomes weak, and also a certain amount of sediment accumulates at the bottom of each cell. This paste must be removed before it piles up high enough to make contact with the plates as it will short-circuit them. Hence it is advisable to put the battery in the hands of some reliable person and have it thoroughly cleaned and completely overhauled about once every two years.

Charging With Direct Current

There are numerous ways to charge a storage battery, but like all other Radio apparatus, they have their advantages and disadvantages. Manufactured products are the best of course, their only disadvantage being the price, which is higher than that of the ordinary accumulator. Few beginners, indeed, are in a position to pay the price for a reliable battery and battery-charger merely to light the filament of their vacuum tube. Naturally they look around for some other cheaper means of rectifying the alternating current.

The one who has his home supplied with direct current is very much in luck, for all that is necessary for him to do, is connect the battery to the lighting circuit and insert a resistance. The wiring diagram is shown in Figure 1. A is where the battery to be charged is placed; B is a bank of 5 or 6 100-watt lamps, either carbon or tungsten; S is a double pole, single throw knife switch, and F is the fuses. Great care should be taken when making the connections that the positive pole of the battery connects to the positive of the circuit, and that the negative of the battery connects to the negative of the circuit. Failure to do this may re-

sult in the battery being further discharged due to the wrong direction of current flow which will ruin it.

Polarity Indicators

To find the polarity of the lighting circuit, it is best to use a polarity indicator, which may be obtained in any electrical supply store, while for the battery, if the terminals are not marked, any of the following methods are feasible. Cut a potato in half and insert the two battery leads. A green formation will be noticed around the positive lead.

Put a teaspoonful of salt in a glass of water and place both leads in, being careful they do not come too close together. Bubbles will collect on the negative wire under water.

A correct reading can only be taken off a D. C. voltmeter when it is connected right. After getting a reading, mark the connecting posts on the battery.

Alternating Current Battery Charger

Now that we have described how easily batteries may be charged with direct current, let us turn to the less fortunate fan who has only alternating current at his disposal. As this is injurious to the

Continued on page 28)



Just ONE Dial to turn to get coast to coast range. Just ONE Dial to adjust to get perfect tone reception. Just ONE Dial to tune to get the utmost in selectivity.

Here—at last—is a five tube tuned radio frequency Receiver with a decidedly different and distinctive simplicity of design. It is a beautiful set—beautifully made,—and with its simple ONE Dial Control it will do anything any other five tube set will do,—and do it easier, quicker and better.

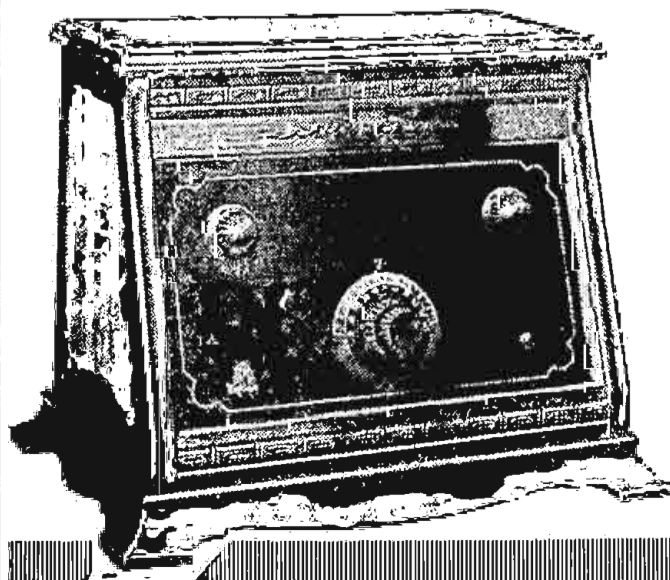
The Mohawk Tunes Out Local Stations

And Brings in Distant Ones Easy

Just ONE Dial to turn on the MOHAWK, and as you turn it you tune in station after station covering the complete range of radiocasting wave lengths. It cuts out the nearby stations with ease and brings in the distant ones clear and distinct. You can operate it with an aerial of any length,—inside or outside,—without making adjustments and it will give satisfactory results under varying conditions.

The Mohawk 5-Tube Receiver

Built in a distinctive period type walnut cabinet, here is a Radio set which will instantly appeal to the artistic taste of the most critical. Yet its beauty is not "only skin deep." The quality goes clear through. If you want the last word in Radio Receiving Sets, don't fail to see the MOHAWK,—hear it, and try it, before you buy. You might pay more for a Radio set,—but you cannot buy a better one than the MOHAWK.



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1 R-130 }

Maximum amplification at intermediate frequencies, with absolute quietness of operation.

When you build your ultimate set, take no chances with parts of unknown quality. Use the tried and dependable products of the world's leading transformer maker.

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Radio Digest

PROGRAMS Illustrated

Published by the Radio Digest Publishing Company, Inc.
510 North Dearborn Street
Telephone: State 4372, 4373, 4374, 4375
Chicago, Illinois

E. C. RAYNER, Publisher
Evans E. Plummer.....Managing Editor
Charles F. Smisor.....Editor
Harry J. Marx.....Technical Editor

Eastern Office, 611-12 Times Bldg., Times Sq., New York;
Telephone Bryant 4909, 10462

Member of the Audit Bureau of Circulations

241
PUBLISHED WEEKLY

SUBSCRIPTION RATES
Yearly In U. S. and Possessions and Canada, \$5.00
Foreign postage, \$1.00 additional. Single copies, 10 cents.

Vol. XI Chicago, Saturday, November 1, 1924 No. 4

Music of the Stars

Whistle of a Bullet Can Be Heard—Why Not Planets?

POWERFUL American Radio stations, public and private, have been listening lately in the hope of catching signals from Mars. No conclusive method has been received, but some of the listeners have fancied that they have caught snatches of some strange code, such as might have been sent through millions of miles of empty space from intelligent beings on another planet. Some have had their attention excited by bits of faint sounds like music, coming out of nowhere and not attributed to any known earthly broadcasting station.

This straining of the ears heavenward is at least a harmless pastime, and is the thing that is most needed to us earthlings. And if poetic tradition has any basis, the listeners are likely to catch melody than unmusical code. The music of the spheres is one of the most ancient of human fancies.

It would be worth building a very elaborate receiving set to hear the morning stars singing together or the planets roaring out a celestial chorus.

According to some authorities, every planet has a distinctive note. And why not? A bullet whistles. So does a baseball. Perhaps some of the Radio astronomers can tell soon what note is sounded by Mars, as he swings around his big circle. And what note does the Earth play, in the cosmic tone?

Precursor of the Radiophan

First Person in Tuning Out on Record

THERE was a certain person who, being deaf, used to go to church and hear the sermon through the aid of an ear appliance. It was noticeable that she always wore the complacent expression of a spiritualized soul who was content, no matter how tedious the sermon or how verbose the speaker. Later it was learned that the listener had a little lever on the ear amplifier and when she became tired of listening she turned off the receiver and heard nothing.

Little did this person know that this was the precursor of the Radiophan. For the chief charm of listening to the Radio is that when you begin to get bored all that you have to do is to turn it off. Anyone who attends lectures or goes to hear a campaign speech may be bored to distraction with no descent escape. Further, if the speaker is irritating one must suffer in silence because heckling is almost unknown in this country and exercised only by the rowdy or router.

The speaker has the satisfaction that he does not know he is speaking to an unappreciated public. He can speak as long as he pleases and not know that thousands are forsaking his talk for a program being sent out by another station.

Eye and Ear Satisfaction

Science Tells Us Eye Comes First, Ear Next

IN THE opinion of one of the motion picture magnates Radio will never dwarf, eclipse or obliterate the motion picture. Some owners of amusement houses view with alarm the growth of Radio. Their fears are groundless for two reasons, scientific and human.

Necessarily the eye in the primitive man first served to pass impressions to the sluggish brain of the cave-man. Next in the scale of development the ear carried other messages to the brain. Being creatures of instinct and retaining part of the impulses of our ancestors, we of today must rely most upon the eye for education rather than upon the ear.

The demand for eye satisfaction is slacked in pictures. But pictures only satisfy up to a certain point and motion pictures completely satisfy.

The ear is satisfied with music, gossip and Radio. So much for science. The eye has the advantage in that pictures speak a universal language. At present Radio cannot do that. The eye understands in every land. Radio is local in appeal unless there is a language universally taught.

RADIO INDI-GEST

WOS

Lines written apropos to the announcement made from Radio station WOS that night programs would be discontinued.

Well, my dear Mr. Witten,
No language that's written
Can tell you how badly we feel;
That your wonderful station
Pride and joy of the nation,
Will its mirth and its music conceal.

No mortal supposes
When Jefferson closes,
That listening will be much the same.
For Louis and Bryan
We'll ever be cryin'
And Witten the man of great fame.

We joined in the fun
Over Witten's new son,
And smiled when Snodgrass was playing.
Now in dire distress
We sigh for WOS
From station to station we're straying.

That Capitol dome
It brought to our home
Its voices were blithesome and gay.
On nights that were dreary
It was glad some and cheery,
Drove worry and dull care away.

Now, please remember
In June or December,
Every thought, every wish, every prayer;
We hope and we yearn
Your station's return
To that vacant place now in the "air."
JAMES ROAN.

One o' Them Dang Announcers, Dern It!

Things had come to a serious pass. Mr. Doe realized it well enough. If he hadn't, the rest of his family would have made him.

For quite a while Ethel Doe had been a rabid Radiophan. Her boudoir smelled like anything but what a young lady's boudoir should. Her vocabulary sounded Checko-slovenlyish: consisting for the most part of such stuff as PWX, WDAF, etc. Then she was always highly technical and expensive. Truly all of that was bad enough.

But now there seemed to be something more serious that would happen every night now, that it was summer. Mr. Doe resolved not to let it continue and called Ethel to the library for a conference.

"My dear," he said, "confide in your dad. What's the trouble?"

She averred consistently and stubbornly that there was naught.

"Then," he demanded, "why is it, after you spend an hour or so with a soldering iron and a mess of wires, you listen and cry, 'I'm so glad, there's Static.'"

"I think it's darn foolish to go on over somebody you can't see. Who is this guy Static?" 5XV

S'all Right. You're Elected

We are a bunch of Radiophans,
And Kansas is our home—
Where corn is figured by the quart
And not by the bushels grown

We are enemies of Morpheus
And pray for a late sunrise—
For WHB to transmit all night,
While we never close our eyes.

Many a night it is almost dawn
Before our beds we seek—
It makes our wives get very sore,
And grouchy for a week.

We seek admission to the "Bugs,"
And hope to make the grade;
We sure expect to do it, too,
If our signals do not fade. P. S. ROY.

Mrs. Partington Speaks Out

Dear Indi: Mizz Partington reads in Digest where it says "Hoover gives fans square deal" but there ain't nothin' funny about that, for the Hired Hand, Lambdin



THE AUTHOR OF MRS. PARTINGTON

Kay, Paul Green, Powell Crosley and some more square folks was down to Washington to back him up and see Walter Johnson pitch ball. She says she knows Hoover is O. K. because he is a Civilized Engineer, and they have to be square. She says she heard Heinz 57 varietles last night and President Coolidge was one of the 57 in a business speech. Secretary Weeks, he was talking politics, and Bob LaFollette was hollering pretty loud, at Chicago. The Hired Hand left Washington right after the 12th inning and got to WSB for late Transcontinental Radlowl entertainment that helps the Atlanta Journal "Cover Dixie like the dew." and he gave Lambdin Kay some illustrations and examples on transmission of Radio Truth, while Grace and Ed. McConnell furnished the entertainment. The Hired Hand is stopping off at Pensacola to help his friend Daniels catch fish and to coach him on the truthful announcing about the big one that got away. Lambdin Kay keeps WSB way out in front, so to please his audience last night he picked up KDKA's short wave transmission of President Coolidge's speech, jazzed it up to 429 meters and spread it all over Dixie and in perfect style just like KDKA on 326. SIGNING OFF.

Speaking from Experience



Condensed

By DIELECTRIC

I'm going to take this space to give a word of praise to the excellent spirit existing between two of Cincinnati's Radiocasters, WSAI and WHM, both using the same wave length, something had to be done about the arrangement of time. They not only co-operate in that with the best feeling between them, but show unusual courtesy in tipping off the listener as to the other's feature following their own sign off.

A good deal is done to acquaint the listener in with some of the mysteries attending the whole Radiocast process; explaining what must take place at the transmitting end and how to get the most at the receiving end. KDKA has offered splendid informative talks on the subject of Radio as delivered by Mr. Ware. These are worth hearing.

Possibly you didn't know why you bought Sun-Kist oranges, Sun-Maid raisins, etc., until a speaker at WLS informed everyone of the co-operative organizations which are doing the trick for fruits; yes, and tobacco. Such talks are worth while. They show what is going on among the farmers in a business way and it enlightens the other farmers as well as the city dwellers.

WEEI, the new Edison station in Boston, has much to commend it to the listeners in. Its programs are well directed and the quality of transmission is all that could be desired. While a soprano (a rarity on any program) was filling the mike, I listened critically to the piano to find that instrument beautifully recorded in my ear muffs from deep bass to high treble, with the singing tone perfectly preserved.

We all are likely prejudiced in favor of some one of the many orchestras on the air, but certainly few listeners find better performances of popular music than is afforded through WGN, presenting Jack Chapman's players. This station is giving very good numbers, in the main, mixing its programs well and comes through in good volume.

Another orchestra worthy of mention is that of the Detroit News. You can count on carefully prepared programs well rendered from WWJ.

How about the World Series? Not much business going on where anybody could get at a receiver during those exciting games! Graham McNamee kept a fairly smooth line of descriptive talk going until the eighth inning of the final game, then events got him—and us—so wound up it was out of the question to keep calm. He deserves a lot of credit for making each play a perfect picture in the minds of listeners.

Have you heard Danny Cook's orchestra? Try them out some time at Station WTAS. I think you'll like them as I do.

Did you hear Miss Virginia Thompson at KDKA? She is a soprano, yes. Most of her songs were in French, and I'm hear to tell you, who didn't hear the lady, that her French diction was fascinating, vocalizing entirely adequate and interpretation of a high order. Encore.

WRC gave an evening's entertainment, but felt that wasn't sufficient, so called for aid. The aid came from Station WJZ, with several numbers by the Hotel Biltmore orchestra handed to fans tuned to the Washington station. It was good. The music didn't lose in transit.

Eight Tube Super-Heterodyne Receiver

Part IV—Vernier Condensers and Tuning

By Harry J. Marx

THE problem of a convenient vernier construction for controlling the variable condensers, that at the same time would not introduce losses and body capacity effects, was not one easily solved. Whenever the rotor shaft projects through the panel and a dial is mounted on that shaft the effect of hand capacity becomes noticeable. Vernier dials with metal gearing only increase the effect.

In order to eliminate all metal shafting that is electrically connected to the circuit the design illustrated in Figure 15 was developed.

The condenser is first mounted on a subpanel detailed in Figure 14 (left side). A hard rubber gear, detail 1 Figure 15, is mounted on the condenser shaft. The shaft still projects 1/4 inch beyond the gear. On this projection is mounted the fiber collar assembly, detail 2 of Figure 15. This collar projects through the panel and the indicator pointer is fastened on the end.

Four hard rubber spacers, detail 7, are used to mount the assembly to the front panel. Use four flat head 6-32 brass machine screws about 1 1/2 inches long. The small brass bushing and nut (detail 8) is mounted on the subpanel in the hole in the center of the bottom end. A small brass pinion (detail 3) engages the gear and is mounted on the pinion shaft (detail 5).

Two collars with setscrews (detail 4) are used to hold the pinion shaft in position as shown in the assembly cross-section on the right side of Figure 15.

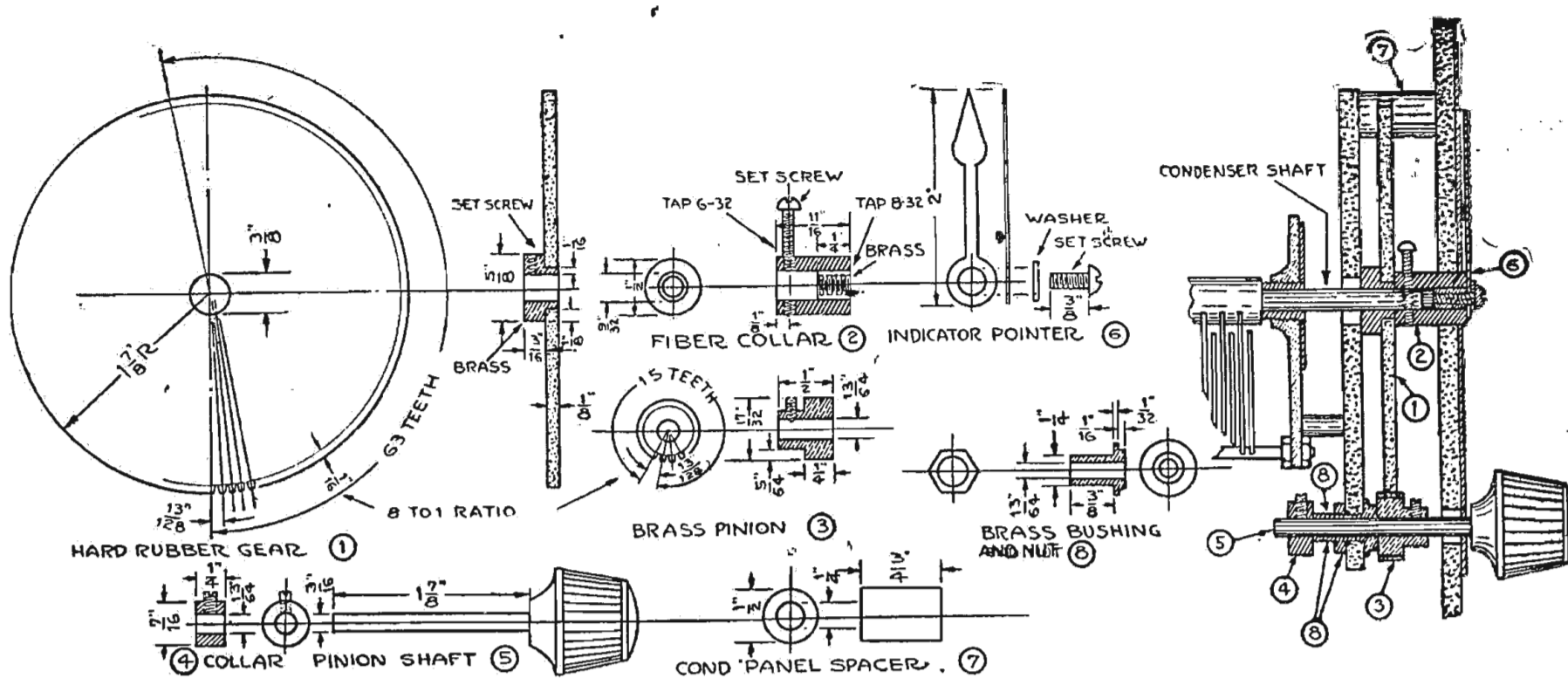


Figure 15

chime screws after the holes have been tapped in the panel.

Binding Post Sub Panels

Figure 14 gives the dimensions of the two small sub-panels on which the binding

posts are mounted. The proper identification for the posts is indicated in Figure 6 of Part III of this series. Brass angles are used to hold these connection panels in place on the base panel. The smaller of the two strips is held on the one side against the oscillator box by means of a flat brass strip. The one end of this strip is held in place by the center screw that fastens the back plate to the box.

The Cabinet

The dimensions of the cabinet are given in Figure 18. This is a standard size and can be purchased or made at home. Figure 17 shows how the sides are slotted so the entire set slides into place without the addition of any screws. This permits accessibility to the set at any time without using tools to take it all apart.

The rear and right side of this cabinet

is lined with copper foil. The left side is covered by the oscillator box. For further shielding the top can also be covered on the inside. This shielding must be properly electrically connected. A flexible connection is illustrated in Figure 18, this has a forked terminal at the free end which should be clamped under one of the cover screws of the oscillator box. This gives a final shielding arrangement that is completely grounded and shuts out all possible interference effects.

Connections

If the N tubes are used, then the A battery should be about 9 to 12 volts.

(Continued on page 22)

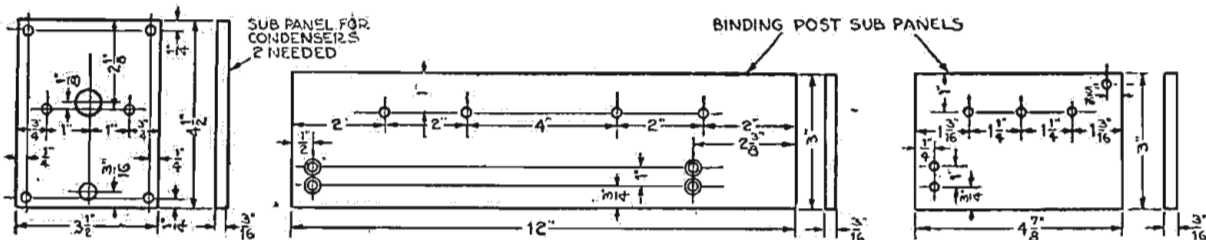


Figure 14

tion as shown in the assembly cross-section on the right side of Figure 15.

The graduated plate shown in Figure 16 is fastened to the panel by means of four round head nickel plated 4-36 ma-

ing posts are mounted. The proper identification for the posts is indicated in Figure 6 of Part III of this series. Brass angles are used to hold these connection panels in place on the base panel. The

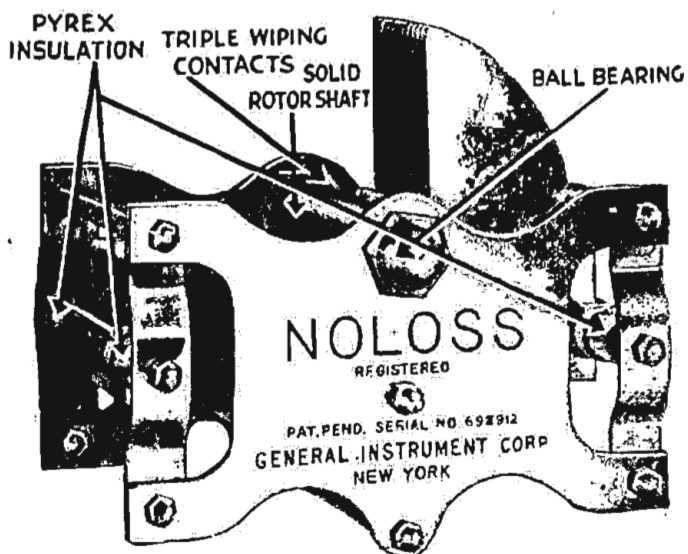
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SUPER-HETERODYNE

(Continued from page 21)

The rheostat should not be turned further than a total voltage reading of 8.25 across all the tube filaments. In this series connection arrangement only one tube can possibly blow in case of an overflow of current. The B battery should consist of a 22½ and a 45-volt unit. The negative terminal on both is connected to the A-B post. Then the B+ of each is

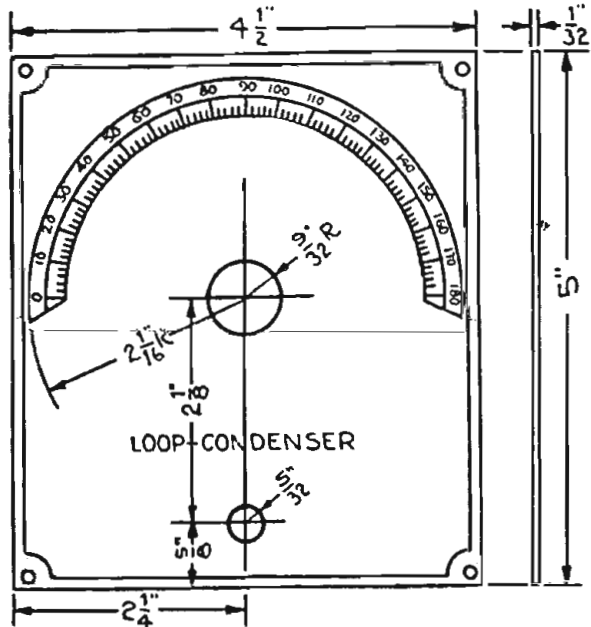


Figure 16

connected as called for in the circuit diagram Figure 1 Part I.

If A tubes are used a six volt storage battery is required. Figures 3 and 4 in Part II indicate 22½ and 45 volts for B battery voltages—this, however, can be increased to 45 and 90 for the A type of tube.

Loop Connections

Regardless of the type of tubes used, the circuit is consistent for loop connections. The loop should be one with about 16 turns wound in a single layer spaced 1 inch apart on a square frame, 30 inches on each side. A tap is made at the exact center, which connects to the center hinding post marked ground. This can be grounded or not, as desired, depending on which method gives the best results. Grounding has the effect of slightly broadening the tuning of the loop circuit.

Tuning

With the first circuit, there are two variable condenser controls and a rheostat. With the second circuit an addi-

tional rheostat and a potentiometer are added. Rheostat controls hardly require explanation at this stage of the game with the possible exception of the suggestion that in super-heterodyne circuits the tube filament current should not be turned any higher than necessary. High filament current always introduces tube noises and with a multi-tube set this soon increases to unpleasant proportions. The filament current consumption will be ample enough without trying to increase it, not saying anything about the plate current required.

When used, the potentiometer is entirely a volume and quality control. The knob should be turned from the positive filament side toward the negative until a slight squeal or rushing sound is heard.

This indicates the tubes are going into oscillation. The potentiometer should be set just before this point, so turn it back to the positive side until the squeal or rushing sound stops, and keep it in that position. After reception has been tuned in any readjustments can be made for improvement of volume and quality.

The condenser control on the left takes care of the oscillator circuit tuning. The second one tunes the loop circuit. The oscillator circuit has two frequencies which, combined with the input frequency, produce the resultant beat frequency. There is then an upper and lower oscillator setting for each wave length. This is advantageous where two stations interfere with one another, since one of the two oscillator adjustments will be without the interfering signal.

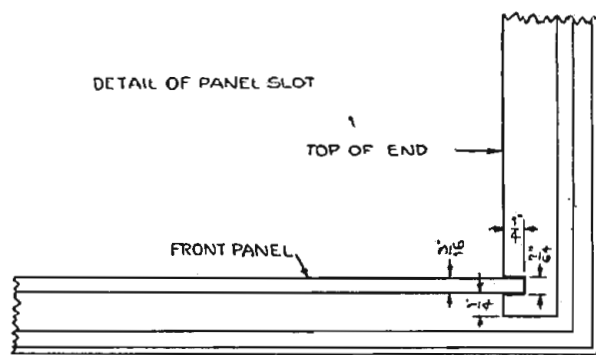


Figure 17

Of the two controls the oscillator control will be found most critical. The best procedure for beginning is to set the loop tuning at about 90 and then rotate the oscillator control back and forth for reception. If nothing is heard

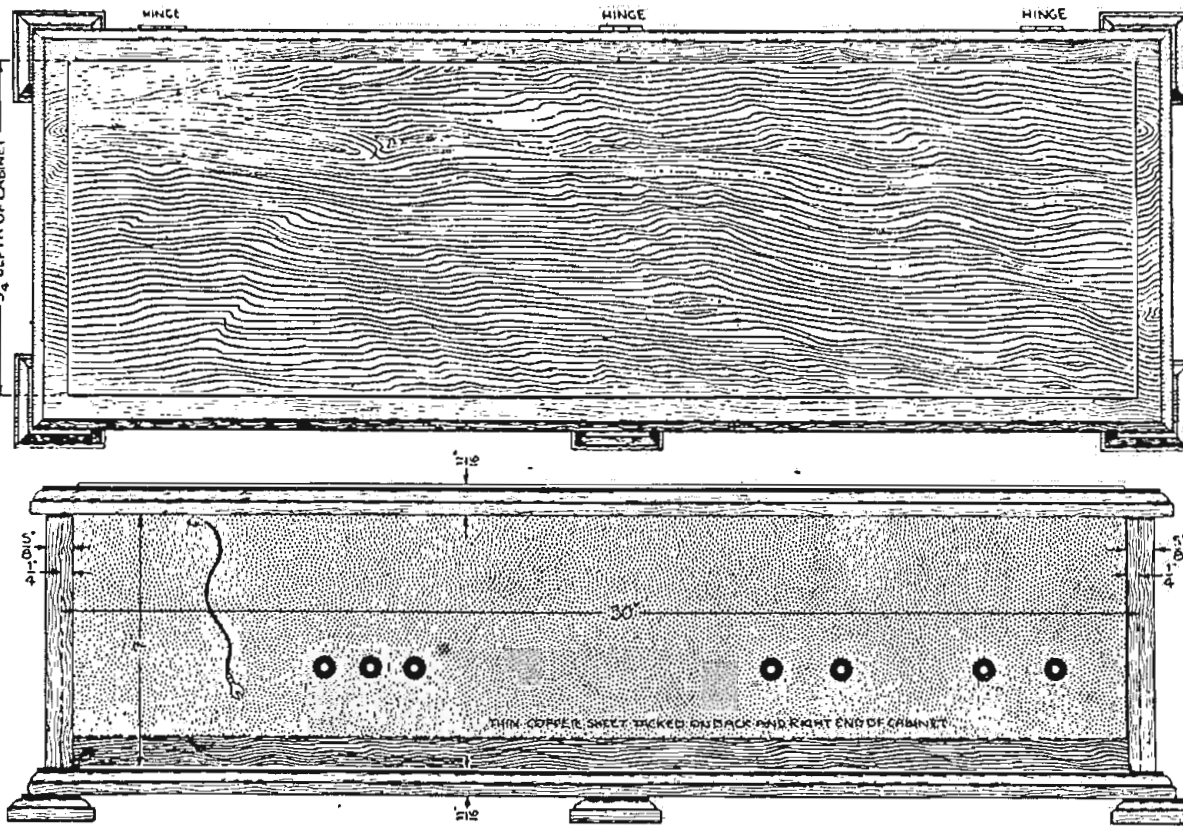


Figure 18

change the loop setting to about 95 and repeat. Keep this up until reception is heard.

When a station is tuned in keep a record of the loop control setting and also the two settings of the oscillator control. Log all these various wave length settings and it will then become

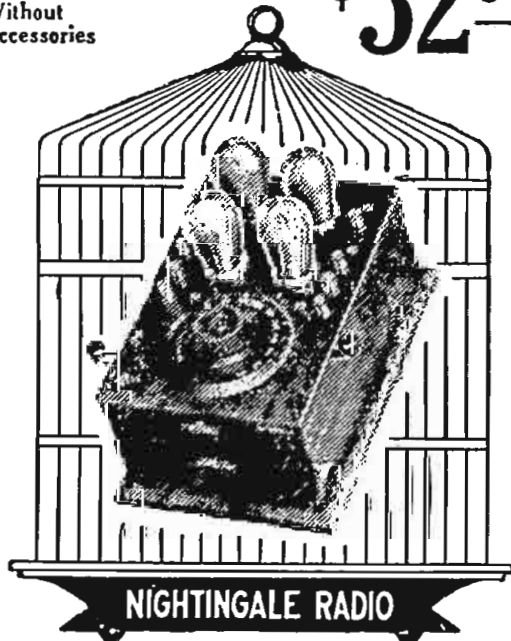
easy to estimate the approximate positions of the controls for any station desired. Later a set of three curves can be plotted giving the exact settings for each wave length and facilitating the quick adjustment of controls for tuning in any station.

(CONCLUSION.)

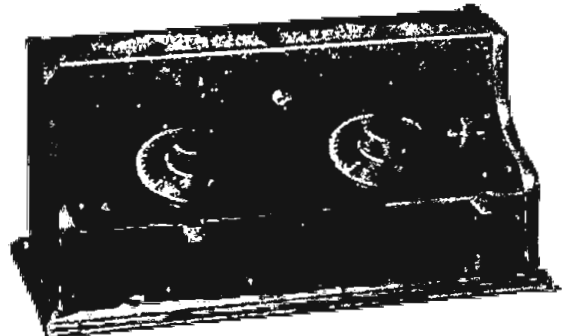
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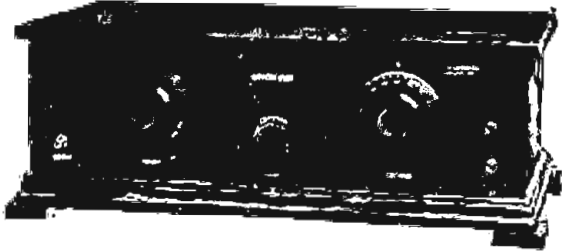
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This radio outfit is entirely different from all others and just the kind of a set you have been waiting for. No outside wires needed. No troublesome storage batteries. It is built complete in a beautiful mahogany finished cabinet, Console type, with the loud speaker built right in so the entire family can listen to it just like a phonograph. No unsightly wires, or batteries lying around—no wires to connect up—no extras to buy. Everything is inside the cabinet. It is a real piece of furniture. You can set this attractive Radio Set in any room in the house and it will harmonize with your best furniture perfectly.

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Helpful Hints to Get the Most from Radio

Chapter VII—Sockets and Rheostats

By Thomas W. Benson

IN THIS series of articles set operation will be told in so simple a manner that the uninitiated can follow instructions and get the most out of reception, whether or not he knows anything about electricity or its application to broadcasting and reception. The series consists of thirteen chapters, of which the six next will be:

- Chapter VIII—Grid Leaks and Biasing.
- Chapter IX—Jacks and Switches.
- Chapter X—Amplifying the Signals.
- Chapter XI—Care of Radio Batteries.
- Chapter XII—Telephones and Loud Speakers.
- Chapter XIII—Hints on Tuning.

TOO often a socket is considered simply as an arrangement to mount a vacuum tube and make connection to the tube terminals. This would be very true were the tube an electrical device operating on low frequency currents but when a device must carry currents with frequencies ranging up to a million cycles per second there are many other factors that enter into the design than the method of making connection to the tube prongs.

The first requirement of a socket is that it should be a good insulator. For this service we have no better material than bakelite or the similar substances derived from phenol which means the socket should be of the moulded type. Porcelain is likewise excellent for the purpose, but the difficulty with this material is that it cannot be worked as accurately and the sockets are not uniform in size.

We learned previously that bakelite is a poor substance to have near conductors carrying high frequency currents but a compromise must be made in this case to obtain its high insulating value. There are many sockets having the appearance of moulded bakelite but a simple test is to touch a hot soldering to the base on the underside and the odor of formalde-

hyde will be noticed. Anyone who has drilled a bakelite panel will recognize it instantly. Other materials used in moulded sockets usually make themselves apparent by their distinctive odor when heated.

Capacity Effects in Sockets

The next thing a socket should be examined for is its capacity effect. As stated in previous chapters any two con-

ductors should be widely spaced to separate them as much as possible and the contact springs should preferably be flat. With this construction only the edge of the springs act as condenser plates and the capacity is kept down.

Mention might be made here of the practice of using adapters to mount the C-299 and UV-199 tubes in standard sockets. The fact that the contacts of

Laminated flat springs are entirely satisfactory if certain points are observed. The tube prongs are usually rounded on the ends. If these are flattened on the bottom by rubbing the prongs with a fine file they make a good contact with flat springs and the connections offer no resistance to the flow of current. The springs of course should be of phosphor bronze which resists tarnish and retains its resiliency.

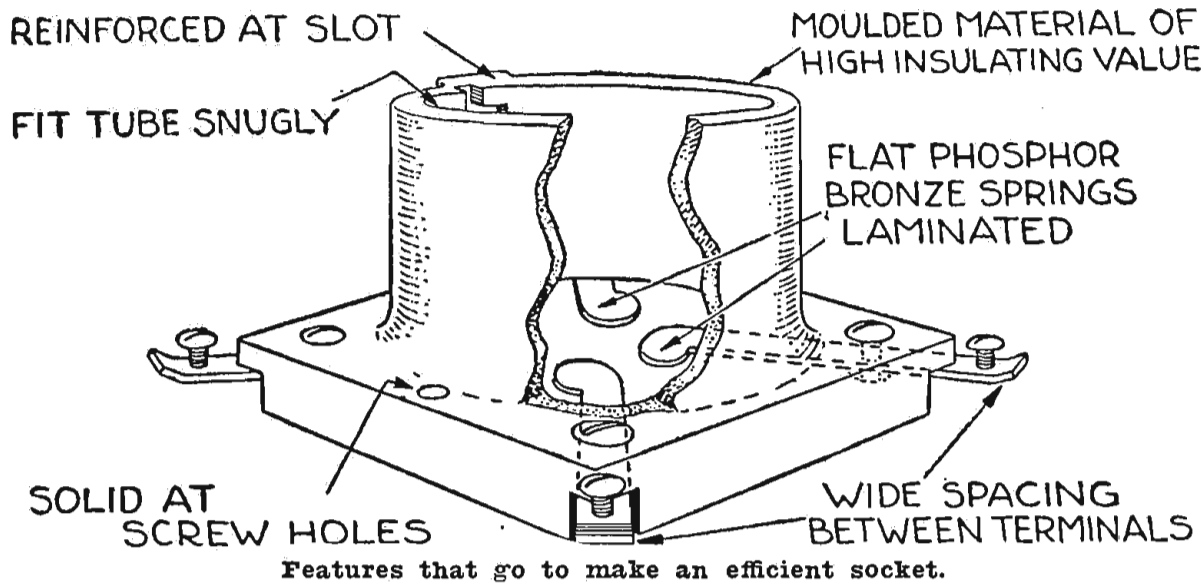
Sockets for dry battery tubes should be mounted so as to absorb vibration. While this is not so important with the larger tubes it often assists in eliminating disturbing noises due to tube vibration. Avoid the use of sockets that use the contact springs to form a resilient mount because they increase the capacity of the socket. Soft rubber pads under the sockets is the best and simplest means to give the proper resiliency to the socket.

Finally the socket should be mechanically strong. It should be reinforced where the pin on the tube shell latches in and have solid sections for the mounting screws to prevent breakage. These socket details may not seem important but the expert Radio man always keeps in mind that it's the elimination of the tiny losses in a set that makes it efficient and in the present day multitube sets socket losses play a large part in results.

Function of Rheostats

And so with rheostats. They function simply to control the filament brilliancy but the operation of the tube depends upon the electronic emission from the filament for its operation. There are two chief uses of the rheostat that determine the design. When used to control the detector it should permit of accurate control of the filament current while with amplifiers the necessity for accurate control is not as great.

Of the two chief types of rheostats, namely, carbon and resistance wire rheostats, the former is preferable for detector tube control, the latter for amplifier tube. When the wire type is fitted (Continued on page 24)



ductors placed close together will have capacity between them. Therefore every socket will have a capacity effect between the metal parts imbedded in it. Such capacity effects are not so important in sockets used in audio frequency stages because the currents dealt with have a comparative low frequency but for Radio frequency amplification the capacities present are very important. The use of metal shells is to be condemned.

True the base of the tube is metal cased but the metal shell of the socket can be eliminated and thus reduce the capacity between the terminals of the socket. The interterminal capacity of a socket will depend upon the design of the contacts and their proximity. The ter-

minally the different types of tube are arranged differently makes necessary the placing of the contact springs in the adapter in such a way that the capacities are greatly increased. This offsets entirely the real benefit of using the small tubes with their low inter element capacity. Always use the proper socket for the tube used.

Contact with Tube Prongs

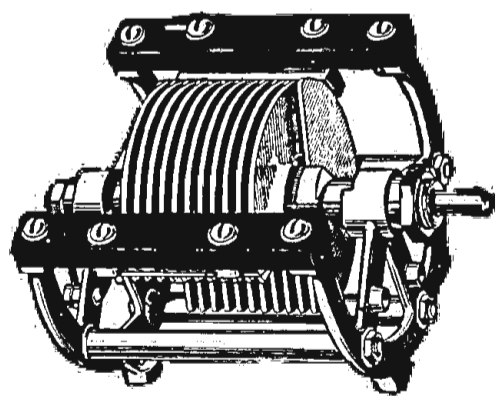
That a socket must make good contact with the tube prongs is almost self evident. Many manufacturers have gone to an extreme in this direction and built sockets with high capacity values, although the contacting members are very efficient from the standpoint of current carrying ability.

The simplest arrangement is the best.

BUELL

E. J. Flewelling

RADIO APPARATUS



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- Flewelling Sockets, 75c

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ATWATER KENT

RADIO

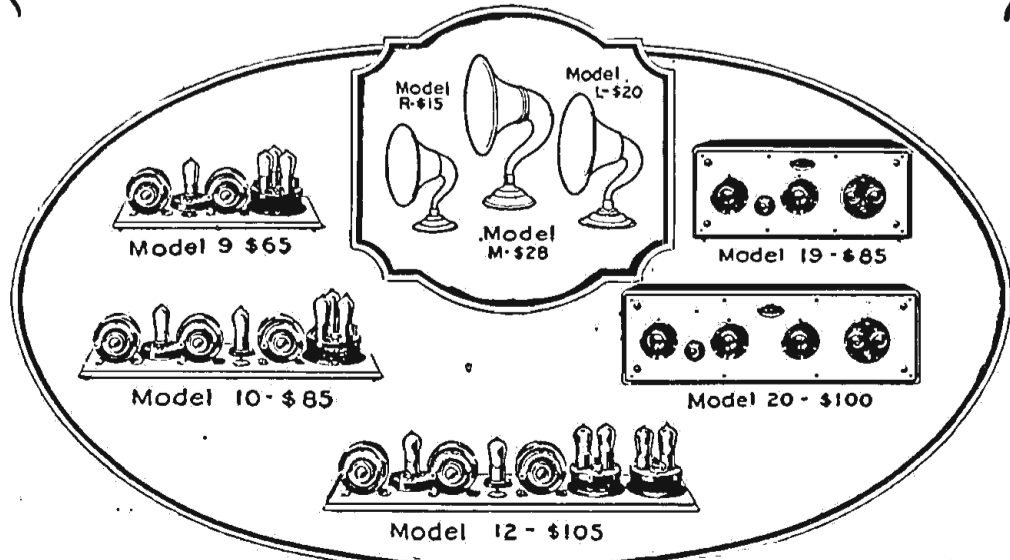
YOU'LL never forget the night you first tune in your ATWATER KENT Radio. Its clear reception, and the ease with which you can bring in distant stations will be a revelation.

ATWATER KENT craftsmen, guided by the experience of skilled engineers, have fashioned the finest materials that money can buy into ATWATER KENT Radio. You will find it combines every feature that means radio satisfaction — unusual selectivity, sensitiveness, distance, volume and tonal quality.

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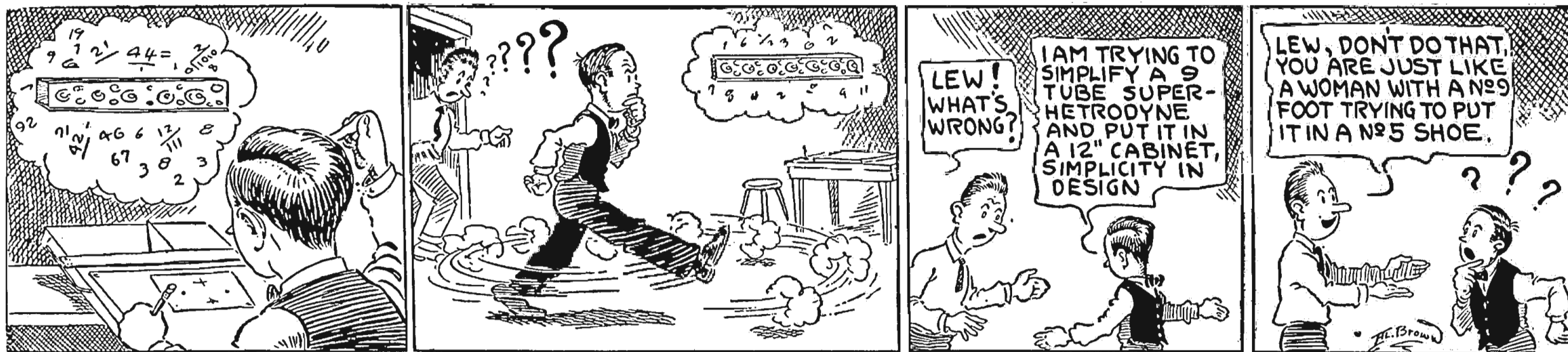


THINK OF WHAT IS BACK OF IT

THE ANTENNA BROTHERS

Spir L. and Lew P.

It Can't Be Done



GET MOST FROM RADIO

(Continued from page 23)

with a vernier winding they can be used satisfactorily with detector tubes.

The advent of the dry cell tube requiring a high resistance rheostat has eliminated the necessity for vernier attachments because the fine wire gives a vernier control over the whole range. The fact that these tubes are all hard tubes makes the filament control less critical than with the soft detector tubes. In selecting a rheostat for a certain purpose these factors should all be considered. For soft detector tubes the carbon type is unquestionably the best. Where a hard detector tube is used or dry cell tubes are employed a wire wound rheostat is entirely satisfactory.

Calculating Wire Resistance

It is possible to calculate nicely the resistance of a rheostat to use with a given tube or given number of tubes but the writer believes the best method is to follow the tube manufacturers instructions in this respect when a single tube is used. Where more than one tube is used on one rheostat the following rule will give the proper rheostat resistance. Divide the resistance of the rheostat recommended for one tube by the number of tubes to be controlled at once and the quotient is the resistance of the rheostat

to use. If none of the exact resistance is obtainable take the next highest resistance that can be purchased. As a rule the detector tube should be on a separate rheostat and the amplifiers controlled separately, that is, all the Radio frequency tubes on one rheostat and the audio frequency on another.

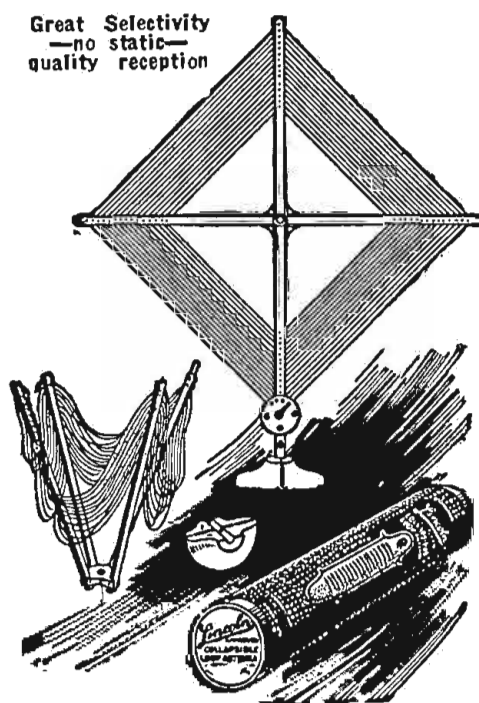
To reduce the number of controls on the panel of a Radio set recourse is had to the so called automatic rheostats. These consist of a fine wire sealed in a vacuum which is connected in series with the tube filament. Their action depends on the fact that the resistance of certain alloys increases rapidly with a rise in temperature. Therefore, should the current through the tube exceed the proper amount the wire heats up and the increase in resistance reduces the current through the tube. As the storage battery falls off in voltage, the current is reduced and the wire cools slightly, passes more current, and keeps the current constant. Such control is entirely satisfactory for audio frequency, and Radio frequency amplification under certain conditions, but is not recommended for the latter purpose.

(In the operation of a receiving set jacks and switches are used and the number required will depend on the hook-up. These parts will be described in the following chapter by Mr. Benson.—Editor's Note.)

Built by Radio Engineers

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Great Selectivity
—no static—
quality reception



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Wave length range with 23 plate condenser is 160 to 600 meters.

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Wire is stranded, flexible and of great tensile strength and high conductivity.

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SAVE \$50.00 Assemble ELGIN SUPER-REINARTZ three tube set yourself

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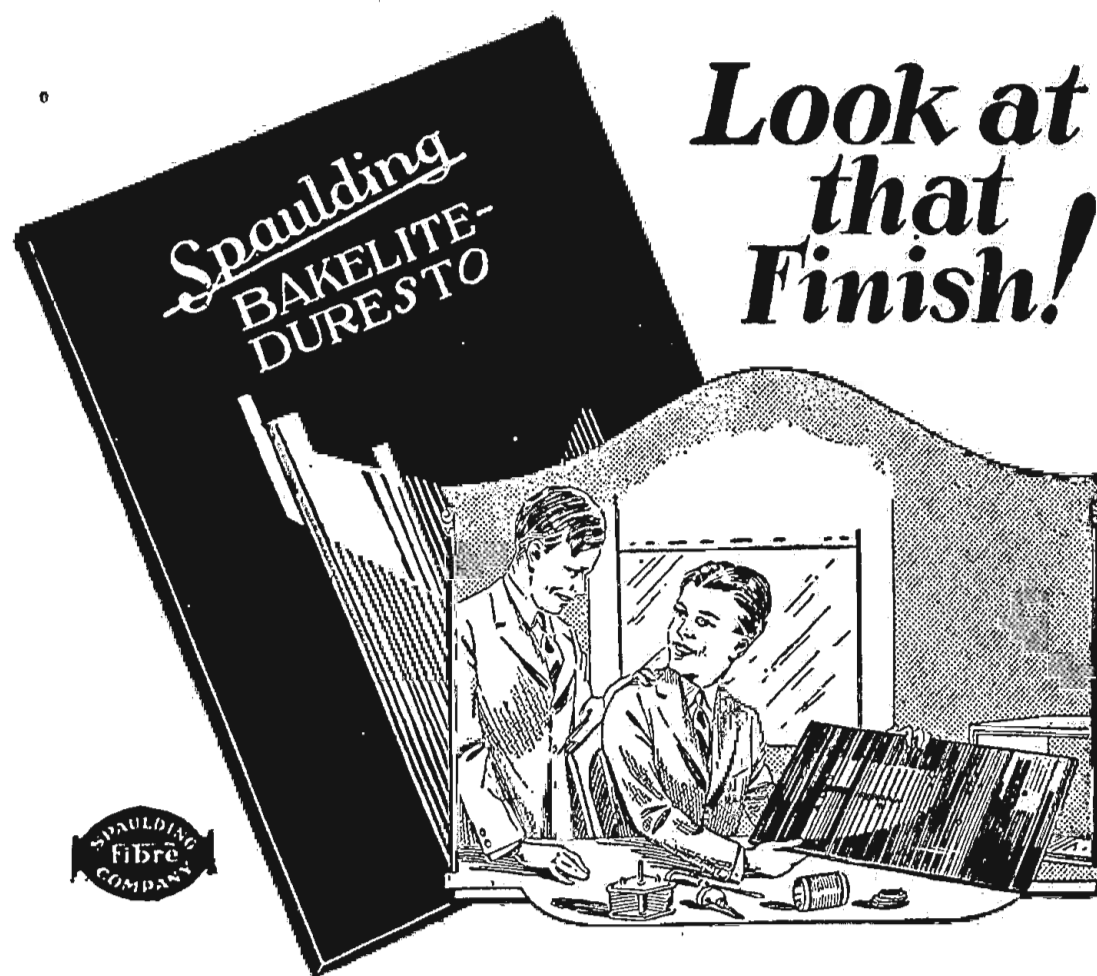
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Secrets of Selectivity and Regeneration

Part III—How Resistance Impairs Selectivity

By William W. Harper

THE importance of regeneration in obtaining maximum selectivity was emphasized in the first article of this series.

In the second article, it was shown how regeneration occurs in a coupled amplifier circuit and the theory given for a specific case. Factors which influence

the degree of regeneration were also presented. It is the purpose of this article to explain how the selectivity of a receiver using a coupled Radio frequency amplifier may be greatly impaired by resistance, even though the resistance is effectively reduced by regenerative action.

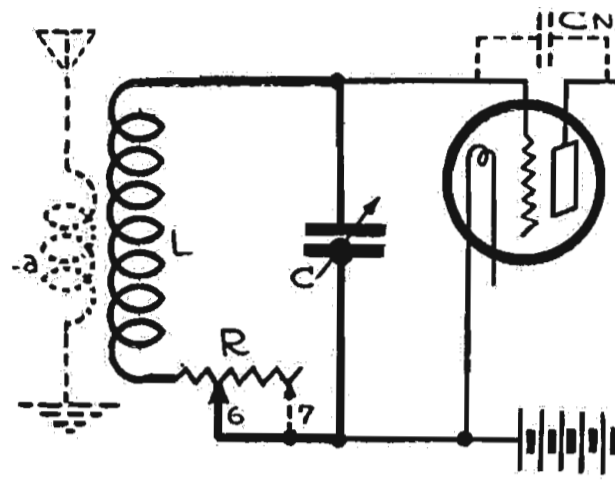


Figure 7

the degree of regeneration were also presented.

It is the purpose of this article to explain how the selectivity of a receiver using a coupled Radio frequency amplifier may be greatly impaired by resistance, even though the resistance is effectively reduced by regenerative action.

In the fundamental drawing of Figure 7, a regenerative amplifier circuit is shown. This circuit corresponds to the circuits of the preceding articles.

To gain a more definite understanding of the effect of resistance on the selectivity of a system of this order, it is feasible to picture the inherent resistance of the tuning circuits LC and L1C1 symbolically by R and R1 respectively. The plate coil, La1, is also depicted as being variable by single turns.

Assuming the natural high frequency

4, as we vary the number of turns in the plate coil. Moving the tap on this coil in the direction of X will reduce the number of turns and a decrease in the reaction current or regeneration through Cn will follow. Sliding the tap in the opposite direction, indicated by Y will increase the regeneration as well as the signal strength and selectivity; these factors reaching their maximum values at point 4. As soon as this point is passed the amplifier sustains an undesirable oscillation. Therefore, the region of the coil from point 4 to the free end is of no use in telephonic reception.

The effect of resistance in the tuning circuits upon the number of turns in the plate coil, La1, is obvious.

Supposing the tuning circuit LC, due to inefficient condenser or coil, has a greater resistance than assumed in the previous

paragraph. This new value may be denoted by point 7 on the resistance R. With this increase in the effective resistance of circuit LC, the condition of critical regeneration at point 4 on La1 will no longer hold. Apparently, with the increase of R the regeneration coming back through Cn is insufficient to give complete

This follows because of the reduction in the amplitude of the field of L1 as the resistance is increased; necessitating greater coupling (more turns in La1) to retain the same regenerative state.

This leads us to the conclusion that the greater the resistance of the tuning circuits LC and L1C1 the more turns will

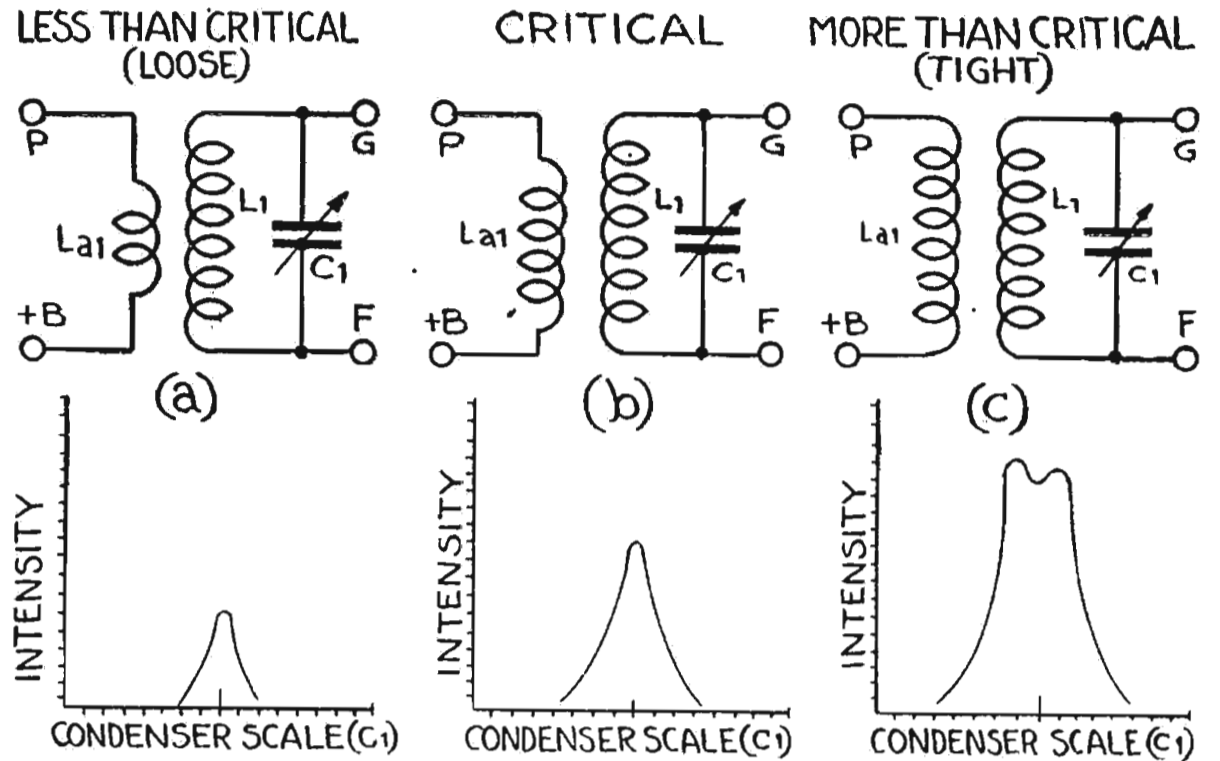


Figure 8

compensation. We must then proceed as before and increase the number of turns in La1 so as to increase this resistance reducing agent, regeneration. Finally, some point, as 5, will be reached where the circuit again is in a state of critical regeneration.

The effect of the resistance, R1, of the tuning circuit L1C1 has the same influence on the regenerative condition.

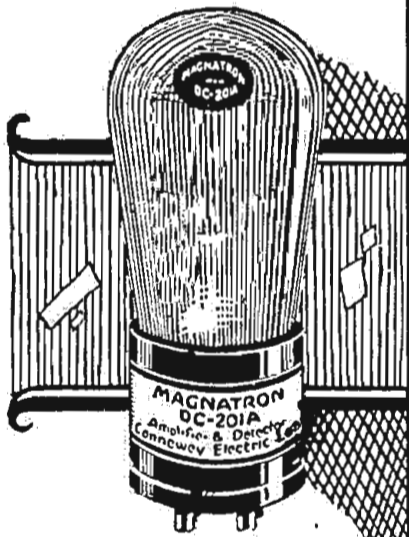
be necessary in La1 to give critical regeneration.

We must then consider the influence of the number of turns in the plate coil upon the selectivity.

The reader will note that throughout these articles the term "critical coupling" has been used and undoubtedly the defini-

(Continued on page 26)

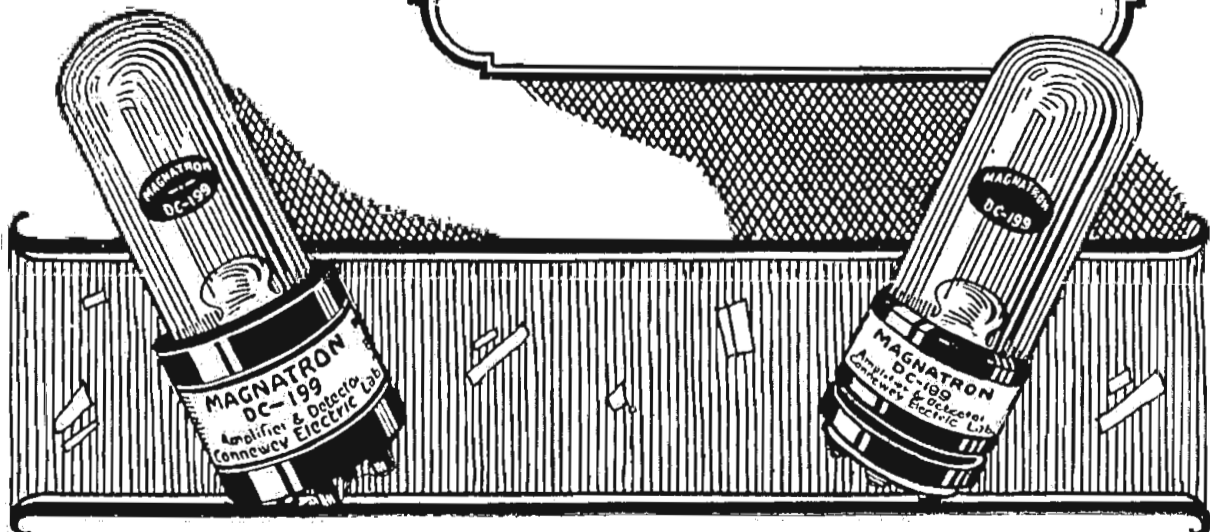
MAGNATRONS



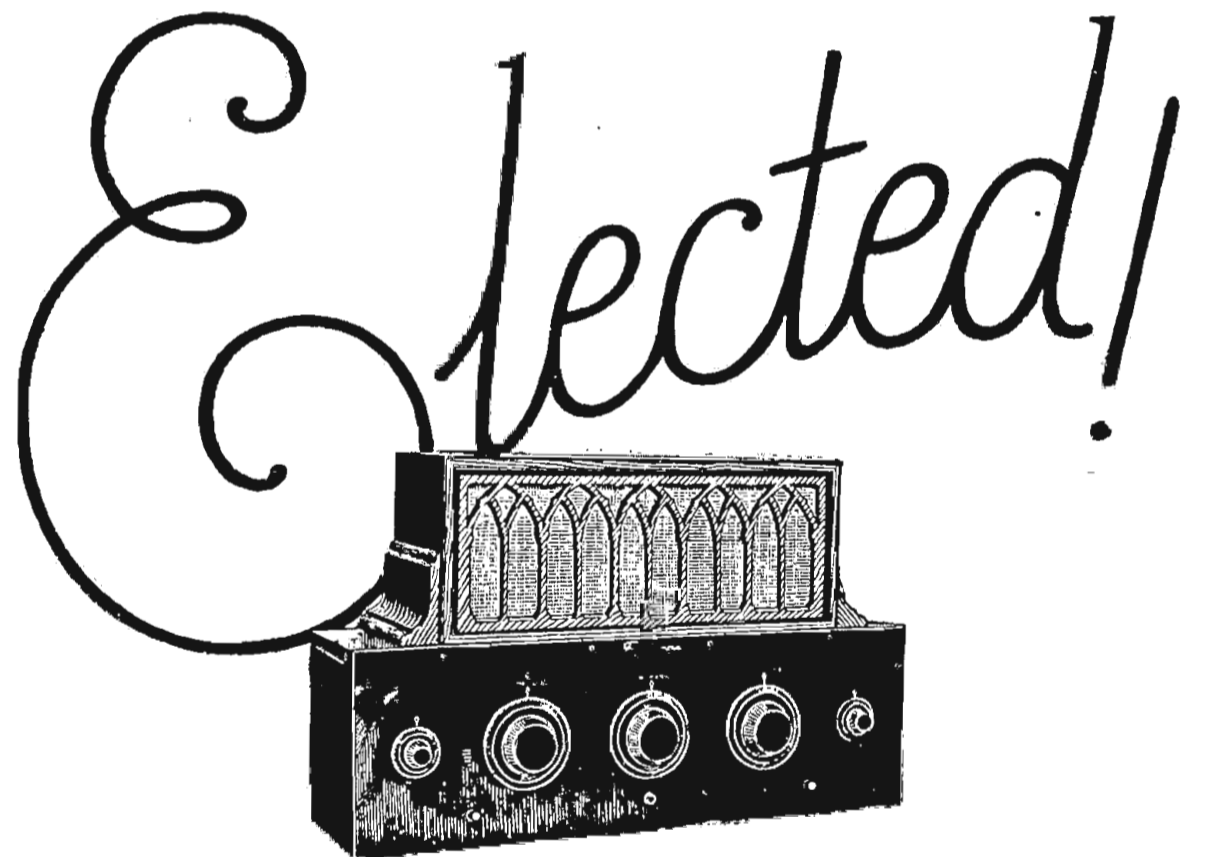
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SELECTIVITY SECRETS

(Continued from page 25)

tion previously given was not well understood.

In the second article it was stated that the extent of the coupling between L₁ and L₂ should approximately satisfy the condition of both critical regeneration and critical coupling.

It has just been shown that the locus of critical regeneration (in respect to the number of turns on L₁) varies with circuit resistance. Therefore the degree of coupling between L₁ and L₂ will depend upon the point where critical regeneration is attained.

To emphasize the effect of these factors upon the selectivity, a brief review of the theory of coupled circuits is in order.

In the diagrams of Figure 8, three distinct coupling conditions are depicted for the transformer coupling L₁-L₂. The secondary, L₂, is constant in value in all cases and is tuned by the condenser C₁. The primary may have any value, depending upon the circuit conditions.

With only a few turns in the primary, L₁, as indicated in Figure 8 (A), a Radio frequency current in the primary

will give a current in the secondary, when the latter is tuned to resonance, as illustrated by the resonance curve to the right. This is equivalent to very loose coupling. A coupling condition of this kind would exist if the tuning circuit LC had an abnormally low resistance, thereby necessitating only a few turns in the plate coil to secure sufficient regeneration to overcome the resistance. Good selectivity is obvious from the sharp peak of the resonance curve.

A greater amplitude of current can be obtained by increasing the number of turns on L₁ without altering the degree of selectivity. Increasing the number of plate coil turns one by one, we finally reach the condition of critical coupling. Critical coupling, in this case, may be defined as the greatest number of turns used in L₁ without losing a secondary resonance characteristic having one sharp peak of maximum amplitude. This condition is shown in (B) of Figure 8. If critical regeneration occurs also at this coupling we have theoretically the ideal condition; having both maximum transfer of energy and maximum selectivity.

After reaching the point of critical coupling, any further attempt to increase the secondary current by increasing the num-

ber of plate coil turns will result in the production of two maximas in the secondary resonance curve. This is shown diagrammatically in (C) of Figure 8. This is the condition we must avoid. If the circuit resistances are excessive it will be necessary to use a large number of turns in L₁ to gain the state of critical regeneration, and this will cause a resonance condition as shown.

It is clear that we have sharp resonance or response in the secondary tuning cir-

cuit to a signal in the primary as long as the coupling does not exceed the critical value. If this value is exceeded an incoming signal will be received with two maximas of intensity as the tuning condenser C₁ is rotated. We may therefore expect to have inferior selectivity.

Similar conditions of coupling also exist between the antenna coil L₁ and the secondary L₂.

(Continued on page 28)

Make Your Selection Carefully

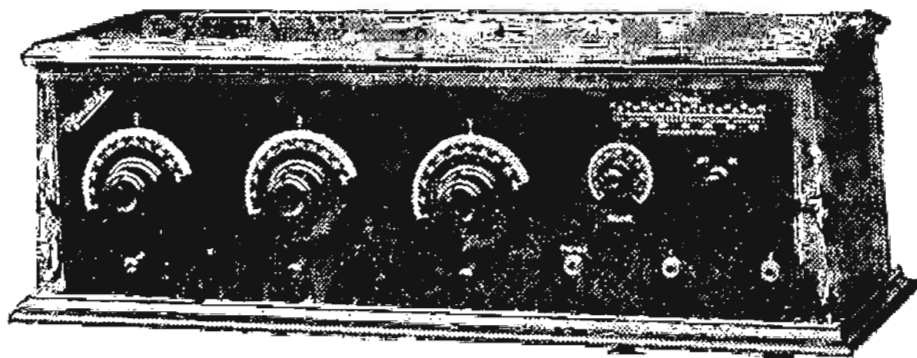
from among only a few of the better receivers. Consider among these the Pfanstiehl Model 7 receiver. You will always appreciate the suggestion.

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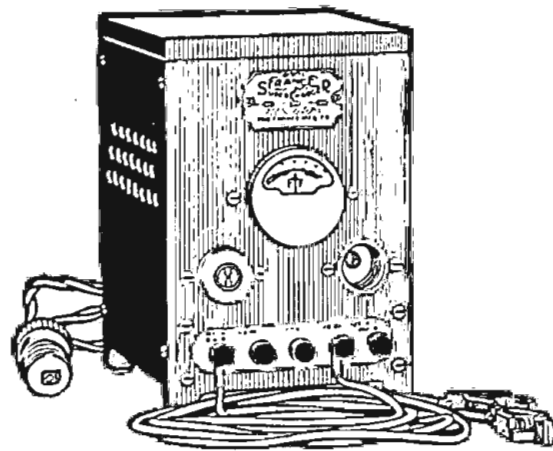
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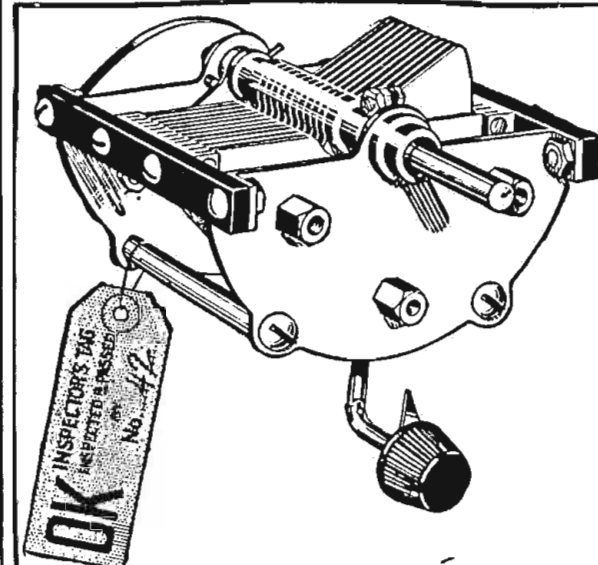
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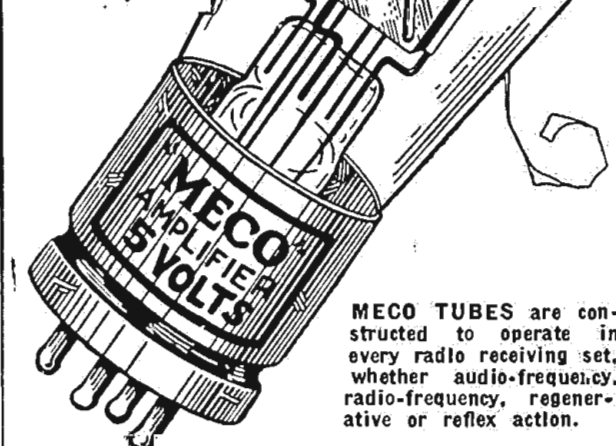


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Des Moines, Iowa



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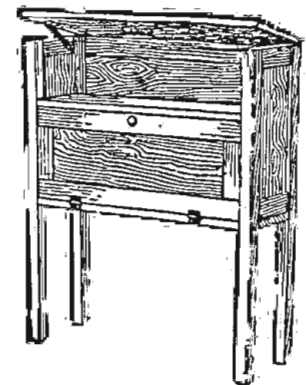
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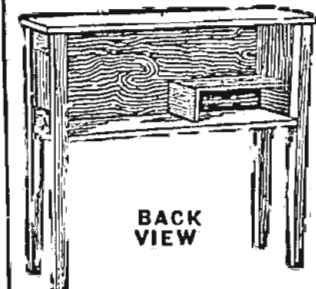
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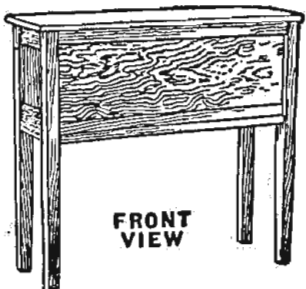
BACK VIEW

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Battery compartment 10"x11"x29". Open back with shelf compartment for B battery. Padded front to conceal batteries. Overall measurements 11½"x32"x29". Set up complete in carton.

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FRONT VIEW

Homemade Coil in Distance Hook-Up

DX Signals Picked Up Through Local Stations

For those who are not able to own an expensive set the hook-up illustrated herewith will give good reception if carefully built in a set, of best parts obtain-

WORKSHOP KINKS EARN A DOLLAR—

THERE are many little kinks worked out at home that would aid your fellow Radio worker if only he knew about them. There are new hook-ups, new ways of making parts and various unique ways of operating sets that are discovered every day. Radio Digest is very much interested in obtaining such material. Send them in with full details, including stamped envelope, so rejected copy may be returned. The work must be entirely original, not copied.

RADIO KINKS DEPARTMENT
Radio Digest,
510 North Dearborn St., Chicago

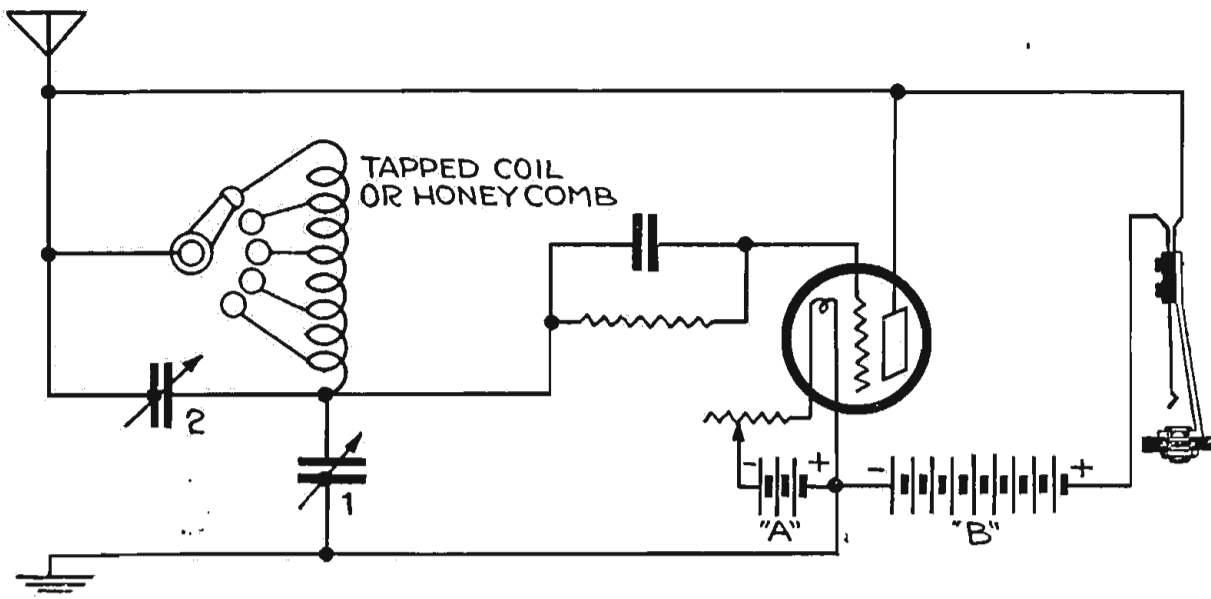
able. The coil is homemade, wound on a tube 5 inches in diameter and using number 24 gauge wire tapped as shown. The condenser number 1, which has 43 plates, is used for tuning in stations, and number 2, which has the same number of plates as number 1, is used for tuning out interference, and is also used for finer tuning.

The grid leak was made of an old rheostat with the wire taken off and a heavy coat of India ink used in place of the wire.

I use the set with a dry cell tube, however better results may be obtained with a regular 6 volt tube. With the set I use two steps of audio frequency amplification.—C. H. Lytton.

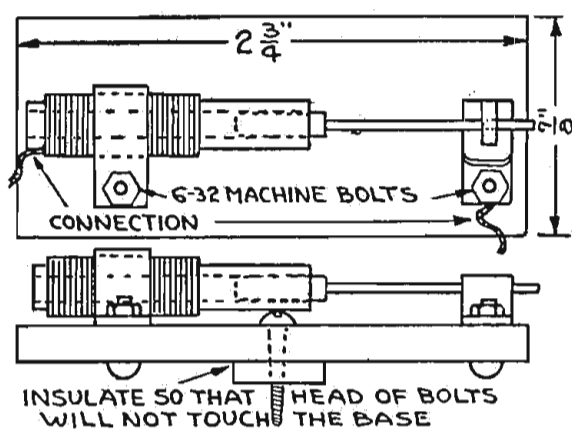
Often that static you hear is nothing more or less than a dying "B" battery. A small portable voltmeter will come in handy to test your batteries.

CIRCUIT USED WITH AMPLIFICATION



Simple Homemade Neutrons

The regular type of neutrons consist of very few parts and these can be purchased by the fan and put together. The parts necessary are as follows:



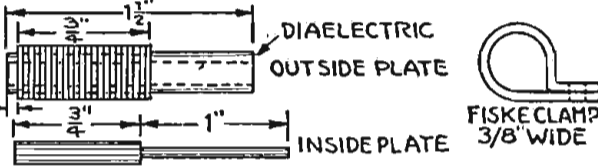
- 1 glass tube 3/8 inch inside diameter, 6 inches long.
- 1 piece of number 26 or 22 gauge copper wire.
- 1 clip.
- 1 piece of hard rubber 2 3/4 inches long,

3/8 inch wide and 1/4 inch thick.

The glass tube should have as thin a wall as possible. It can be cut into pieces 1 1/2 inches long by filing a groove around the outside with a three cornered file and then snapping it off with your fingers.

Wind the bare wire tightly around the tube until it forms a sleeve 3/4 inch long and then cover it with solder. When it cools it will fit the tube tightly.

To make the inside plate of the condenser take a piece of heavy wire 3/4 inch long which will just slide inside the

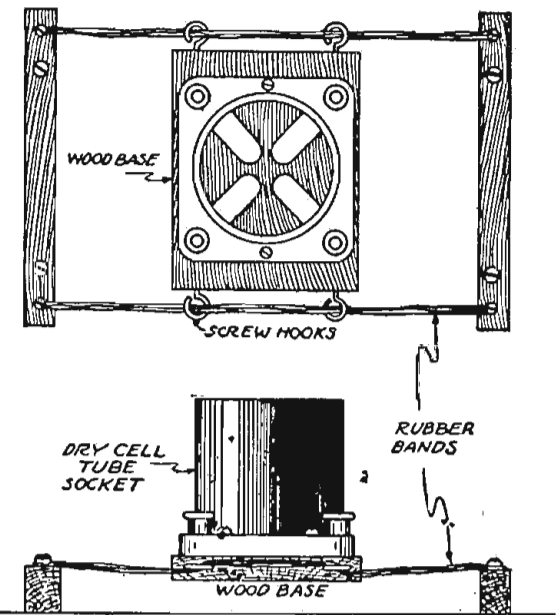


glass tube and solder it to a piece of round bus wire 1 inch long.

The glass tube may be purchased from a drug store and the other parts may be procured at your electrical dealer.—H. F. Watson, Philadelphia, Pa.

Flexible Socket Base Made of Rubber Bands

One way to get maximum results from a dry cell tube is to mount the socket on a flexible base. The illustration shows



a simple way to make such a base. It is suspended on ordinary rubber bands.—Joseph S. Ott, Chicago, Ill.

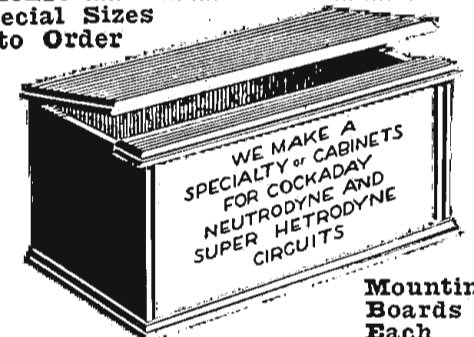
Keep spaces between turns even on spider web coils.

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7x26x7	6.05	10.00
7x28x8	7.25	11.50
7x27x9	7.25	12.50
7x40x10	11.25	18.00

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(References: Dun or Bradstreet's)

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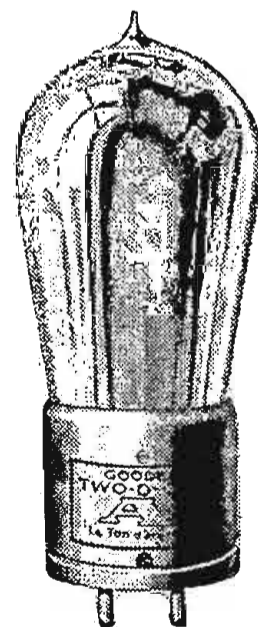
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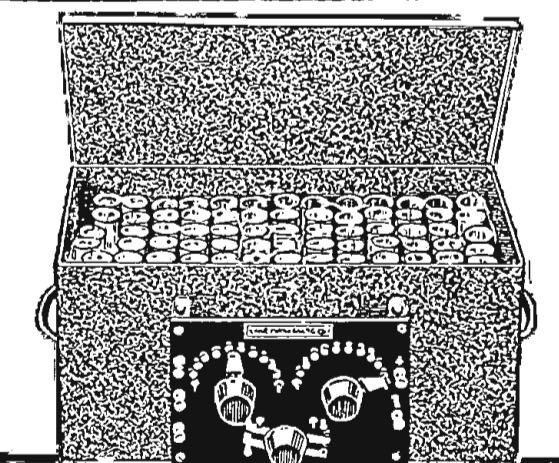
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Incorporated
OWENSBORO - - KENTUCKY



LANE 100 Volt

Non-Acid Storage

"B" BATTERY

NO MUSS NO SPILLING—CLEAN, ATTRACTIVE
Makes a wonderful improvement in your radio set. Gives it more life and pep. Makes listening in a real pleasure. Gives a clearer reception than you have ever experienced. Brings in more stations louder and clearer, takes the guesswork out of distance reception.

Life of Battery Unlimited
LITTLE OR NO REPAIRS EVER NECESSARY
No deterioration—easiest, quickest to charge—will operate a 3 tube set continually for over 50 hrs. Ordinary use one to four months without recharging.

PANEL SWITCHES Gives Instant and Correct Voltage
A great and necessary improvement on batteries. Gives instantly correct voltage at all times and perfect reception. Allows for charging in two equal parts. Comes in handsome \$25 At your dealer's or indestructible case, direct. 150 v. \$37.50.
Attractive Proposition to Dealers and Jobbers.
LANEMFG. CO., Dept. 12 2941 W. Lake St., CHICAGO

HOW TO OPERATE SET

(Continued from page 11)

Every NR-5 is very carefully tested and the "capacity coupling" between the grid and plate circuits is carefully neutralized. Absolutely no adjustment should ever be made in the neutralizing condensers and they should never be tampered with, regardless of the advice of any local expert.

Changing vacuum tubes in the receiver does not affect the neutralization inasmuch as there is so much fixed coupling between the grid and plate circuits of each vacuum tube that any slight variation in the capacity between the grid and plate of the vacuum tubes is an insignificant percentage of the total amount of fixed coupling in the receiver.

SELECTIVITY SECRETS

(Continued from page 26)

The layman, after reading this qualitative data, will probably be interested in hearing about something more definite. The question, "How many turns should I use in the plate coil?" will come into his mind. Unfortunately, it is practically impossible to give any quantitative information about the circuits of tuned regenerative amplifiers. The circuit constants vary with resistance, tube characteristics, and electromagnetic and electro-static coupling phenomena.

It has just been shown how the value of the plate coil is practically dependent upon the circuit resistance and in a previous article the effect of the coupling to the secondary upon this factor was also discussed.

Conclusions

The easiest and most accurate way to arrive at the correct number of plate coil turns is to put on more turns than necessary, so that the amplifier oscillates over the complete condenser scale, and then take them off one by one until the am-

plifier no longer oscillates. You may feel certain, in this way, that the number of plate coil turns is correct for the circuit resistance present. This process should obviously be carried out after the receiver has been completely finished and connected to the antenna and ground. The antenna circuit also has an influence upon the regenerative condition, and consequently the number of plate coil turns, but for any certain installation its effect is practically constant. This subject will be taken up in a future article.

Regarding critical coupling, there is no criterion the layman may go by in reaching this condition. It is at least safe to say that critical coupling will be approximately attained if the losses and circuit resistance are kept low by using efficient coils and condensers, as well as careful design.

(The effect of stray couplings upon the conditions of regeneration and selectivity will be presented in the next article.—Editor's Note.)

CARE OF BATTERIES

(Continued from page 19)

battery if applied directly, it must be rectified first.

As I have said, manufactured chargers are rather expensive, therefore it is not uncommon amongst amateurs to build

their own. The main types used are the chemical rectifier and the gas rectifier. Undoubtedly the latter is better than any other capable of being homemade, but incidentally it costs more, for a step-down transformer must be included in the circuit.

The chemical rectifier, or as it is usually called, the electrolytic rectifier, has as its chief disadvantage, the passage of a very small amount of current; less than one ampere. But taking into consideration the cost of constructing one, it is an ideal charger for the amateur who isn't trailing

after Radiocasts each night, as he can let his battery stand for a couple of days every two weeks or so, without getting the impulse to try to listen to a sing-song from some station or other across the continent.

(In the following article by Mr. William Fenwick he will tell you how to make an electrolytic rectifier which he has used for more than a year and has given uniform results. It charges batteries at low cost.—Editor's Note.)

FREE



To Each Purchaser of a World Battery

A 24-Volt "B" Storage Battery positively given FREE with each purchase of a WORLD "A" Storage Battery. The WORLD Battery is famous for its guaranteed quality and service. Backed by years of Successful Manufacture and Thousands of Satisfied Users. You save 50%.

Prices That Save and Satisfy

Auto Batteries	Radio Batteries
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6-Volt, 13 Plate 14.25	6-Volt, 120 Amps. 14.50
12-Volt, 7 Plate 17.00	6-Volt, 140 Amps. 16.00

Shipment Express C. O. D. subject to examination. 5 per cent discount for cash in full with order.

2-Yr. Guarantee Bond In Writing With Each World Storage Battery

proves satisfactory World performance. Mail this ad with your name and address—we will ship battery day order received, and give you your choice of "B" Storage Battery or a handsome nickel finish Auto Spotlite, FREE. Write TODAY.

WORLD BATTERY COMPANY
60 E. Roosevelt Road Dept. L. CHICAGO, ILL.
The FREE "B" Storage Battery takes the place of dry cell "B" batteries. Can be recharged and will last indefinitely. To be sold retail for \$6.00. It is the only battery of its kind equipped with solid rubber case—and insurance against acid and leakage. Take advantage of this remarkable introductory offer NOW. (To those who prefer it, we will send FREE a handsome nickel finish Auto Spotlite, instead of the "B" Battery. Be sure to specify which is wanted.)

GIVEN FREE
To introduce this new and superior World "B" Storage Battery to the Public

PREMIER Microstat
THE SLIDING SCALE VERNIER RHEOSTAT



FINE TUNING MADE EASY

Premier "MICROSTAT" is a wonder for tuning in the distant stations. Stands alone in its fineness of adjustment and minute control. Two resistor units—one six ohms and one forty ohms—connected in parallel. Vernier adjustment on high resistor. Noiseless in operation. Insures freedom from sputtering and scratching.

Premier "DUOSTAT" combines two rheostats in one. Provides all necessary control of two tubes with one panel mounting. Premier Double Disconnect Potentiometer is the last word in plate current control. Its special feature, a double break switch, automatically disconnects "A" and "B" batteries when lever is off. Prevents battery waste and tube burn out danger.

All three above instruments are typical in design. Each requires only one hole in panel. Bakelite moulded. Silver etched dials. Many other superior features. All one price, \$2.50 each.

Write for Free Bulletin No. 94 showing complete line of Premier Quality Radio Parts. Ask your dealer if he has Premier free hook-ups. If not, send his name and receive a set free.

Premier Electric Company
3810 Ravenswood Ave., Chicago

PREMIER Quality Radio Parts



Apex Vernier Dial

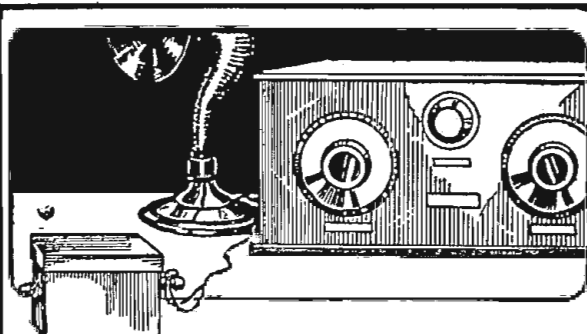
Do not bother with geared condensers, requiring many holes in the panel and careful lineup of pinion shafts, when this marvelous instrument provides the fine adjustment for tuning in distant stations. Ratio 10 to 1—quickly applied to any shaft. For sale by all good radio dealers. If unable to obtain, fill in coupon and enclose \$2.50 for nickel finish or \$3.50 for Gold Plated finish.



Coast To Coast On An 18-Inch Loop

Assemble Your Own 7 Tube Super-Heterodyne—on a 7 x 18 panel in three hours, \$97.50 buys the parts complete, including drilled and engraved panels, condensers, sockets, transformers, dials, connecting plugs, cables, etc., with drawings, diagrams and instructions. Price of cabinets to fit—furnished on application. If your dealer cannot supply these parts for this complete Microdyne Radio Set, fill in coupon, mail check or money order and send dealer's name.

Apex Electric Mfg. Co.,
1410 W. 59th Street, Chicago, Illinois, Dept. 905
Gentlemen: Enclosed find \$..... for which send me.....
Name.....
Street.....
City.....State.....



A New Charm to Radio

For more than a year Morrison engineers have worked to perfect the Toner for the 1924 market.

"Clears up Radio," that is what the Toner actually does. Attach the Toner to your set—then you will understand. Never before did you really hear radio in its best form. Its performance is little short of miraculous.

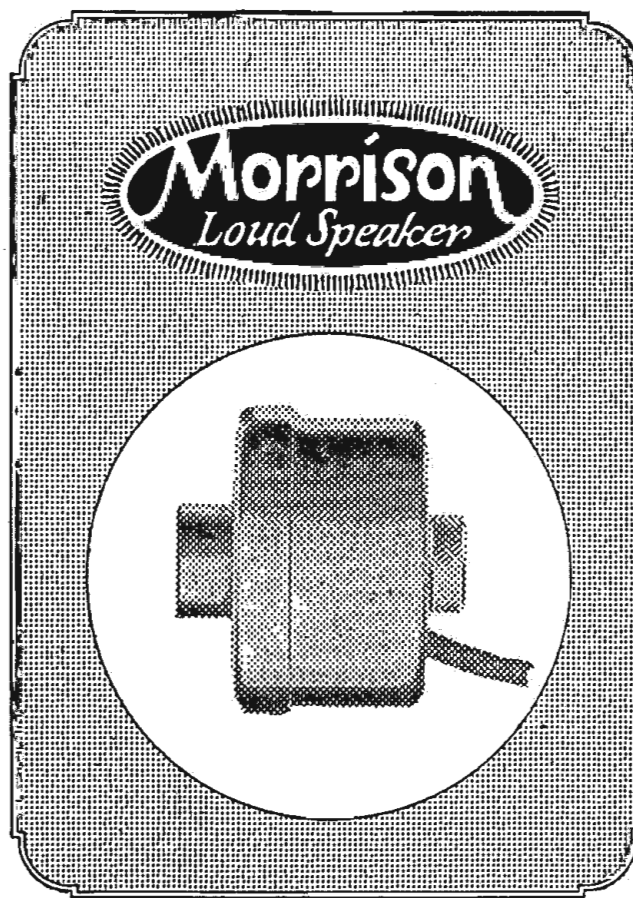
Gives the Third Step of Audio Frequency

With a Toner you can add another Tube for three steps of Audio Frequency—Greater Volume and Purer Tones.

So new that many dealers are not yet supplied you can have order filled immediately from factory; \$10 List. "Money-back guarantee."

Send for descriptive booklet showing hook-up.

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A Radio Achievement

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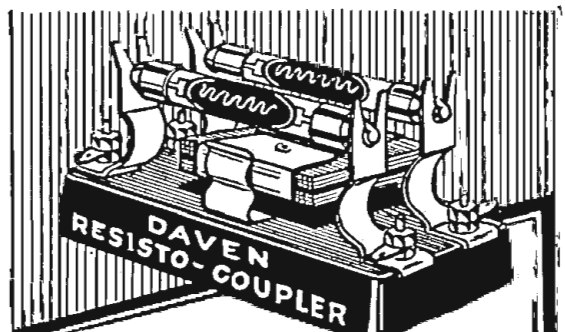
Exactly the same unit in every respect—except the price. You, the radio fan, are profiting by standardized and improved production methods. Such is the Morrison policy.

Morrison is the unit you need, for either phonograph or horn, to reproduce all the tones truly and with plenty of volume.

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IMITATION IS THE SINCEREST FLATTERY

—and is inevitable with so fine and worthy a product. But an imitation rarely satisfies.

The discriminating fan will insist upon the original and only RESISTO-COUPLER. Price, \$1.25

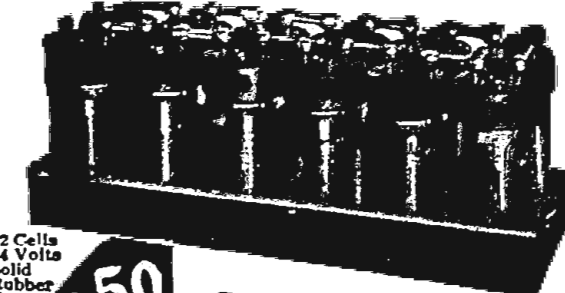
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12 Cells 24 Volts Solid Rubber Case \$3.50 COD

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World Storage "B" Battery

(12 CELLS—24 VOLTS)
To ten million homes with Radio Sets—and to countless millions of prospective buyers—this WORLD Storage "B" Battery brings a new conception of battery economy and performance. Here is a battery that pays for itself in a few weeks, will last for years and can be recharged at a negligible cost. And you save \$2.00 by ordering now.

A Superior Battery Equipped With Has heavy duty 2 1/8 in. x 1 in. x 1 1/4 in. plates and plenty of acid circulation. Extra heavy glass jars allow ready observation of charge and prevent leakage and seepage of current. It holds its charge, while idle, at constant voltage. You will find this battery a boon to long distance reception. It does away with a great many noises so often blamed on "static." Mail your order today.

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Just state number of batteries wanted and we will ship day order is received. EXTRA OFFER: 4 batteries in series (96 volts) \$13.00. Post Expressman after examining batteries. 5 per cent discount for cash in full with order. Send your order NOW and save \$2.00.

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Makers of the famous World Radio "A" Storage Battery
1219 S. Wabash Ave., Dept. 76 Chicago, Ill.

SAVE \$2.00 BY ORDERING NOW!

Questions and Answers

Wave Length
(08053) BIW, Tomah, Wis.
In connection with the Radio end of our business, we sometimes have questions asked of us which we are not able to answer correctly. Last evening a question was asked us by one of the high school Radio club members which we wish to ask of you, and would appreciate an early reply by letter as much in detail as you can do consistently. The question is, "How are Radio waves measured? How do they arrive at their calculations?"

A.—A broadcasting station throws out power into space when it is operating. This power varies during one cycle from a certain positive quantity through zero to the same quantity but minus. If these variations occur 1,000,000 times during every second, the station is said to be working at 1,000,000 cycle frequency. These power impulses travel through space at the rate of 300,000,000 meters, or at about 186,000 miles per second. If a station is operating at 1,000,000 cycles per second the power impulses will have traveled 300 meters during the cycle, when we state that the wave length of the station is 300 meters.

We see thus that fundamentally the measurement is in frequencies. For example, antenna oscillating at 1,000,000 cycles per second—in other words, charging and discharging at that rate.

A wave leaving the antenna and traveling at that speed per second will be approximately 977 feet, or 300 meters away from the antenna before it again discharges. The term "wave length" is employed to designate the distance between the crest of each wave. For simplicity this could also be designated as "cycles" per second, but as the figures involved are so large the convenience of expressing in "wave length" is obvious.

Magnetic Rectifier
(08157) VG, New Haven, Conn.
How could I make a magnetic rectifier which will deliver sufficient current to charge an A battery with 6 volts at 5 amperes per hour with an input of 110 volts 60 cycles A. C.?

I have a chemical rectifier which requires a resistance of 500 watts. Can I make one?

Is there any possible way with which I can use A. C. 110 volts, 60 cycles, for the filament lighting and plate voltage of a two-stage amplifier and detector outfit? If possible, send me complete diagrams.

A.—Cost and difficulty of constructing a magnetic rectifier in consideration of purchase price makes it prohibitive. For that reason we have not given consideration to publishing such details as you request.

An electric iron will serve adequately as resistance unit for your rectifier.

It is not feasible to use A. C. supply for operation of tubes in receiver, due to the hum. This disturbance is of sufficient proportion to drown out signals. New devices, however, on the market are making possible the satisfactory use of A. C. for A and B supply.

Transformers
(07944) VG, New Haven, Conn.

How could I make a step-up transformer which will take 110 volts 60 cycles A. C. which is the house current of our city? I would like to get sufficient current for the plate voltage for a 10 watt transmitting set, with taps at 6 volts for the filaments and a tap at half the plate current so I can use 5 watt tube alone.

Please tell me if this is possible? If it is possible send complete information so I can build one.

A.—We are advising in your inquiry that it is quite impracticable to attempt to use the same transformer for plate and filament supply for transmitter as the voltage drop in filament circuit is quite high when plate circuit is connected.

We are recommending transformer core of 1 1/4 by 1 1/4-inch square. Primary of both transformers to have 400 turns of No. 18 dcc. wire. Secondary of filament transformer to have 40 turns of No. 12 dcc. Secondary of plate transformer to have 2,000 turns of No. 26 dcc.

To prevent scratching of the panel by a dial set close to it, put a soft felt pad between the dial and panel. The result is only prevention of scratching, but lack of any noise in turning the dial.

Erla precision parts get the best out of Erla SUPEREFLEX

circuits; most powerful, tube for tube. Ask for Bulletin 24.

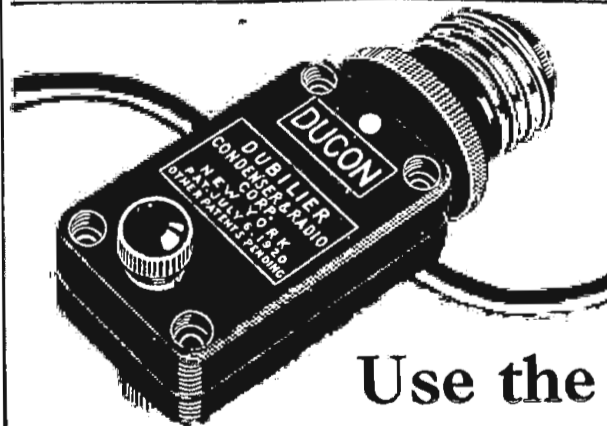
Electrical Research Laboratories, Chicago

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EVEREADY Radio Batteries
—they last longer

Conspicuous for vitality and endurance—the right batteries by test and proof for every radio use.

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Use the **DUCON**

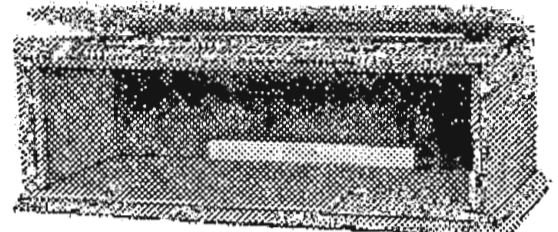
No antenna—just screw the Ducon into your electric light socket and tune in. A great saving in expense and labor—and great results with your set.

PRICE \$1.50

Sold on a 5 day trial basis by all reliable dealers

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CORBETTS CABINETS FOR QUALITY



SPECIAL COCKADAY (rear slot not included in other cabinets)

Size	Oak or Mahogany Finish	Walnut	Size	Oak or Mahogany Finish	Walnut
7x10x8	\$3.60	\$4.50	7x36x8	\$8.00	\$10.00
7x12x8	3.80	4.75	7x40x8	9.00	11.25
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7x18x8	4.55	5.70	8x36x8	8.90	11.10
7x21x8	5.00	6.25	8x40x8	10.69	13.25
7x24x8	5.40	6.75	8x26x8	6.45	8.00
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7x30x8	6.30	8.60	9" deep	6.90	8.60

Mounting boards 25c. above 30" panel 50c. Nicely moulded top and base. Adam Brown Mahogany and Dark Oak finished with DuPont varnishes carefully hand rubbed. Accurately made of best kiln dried lumber and well packed.

WRITE FOR BOOKLET offering best values in radio furniture.

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1415 East St. 5323 N. Carlisle St.
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Pages 12 and 13 of the Shamrock Booklet tell you how to build the Two Variometer Circuit

Write today for the Shamrock Booklet telling you how to build this set and nine others. Full directions simply told.

Mail coupon to-day

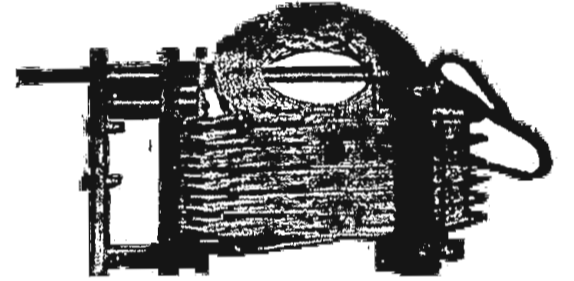
SHAMROCK FOR SELECTIVE TUNING

SHAMROCK MANUFACTURING CO., Dept. 25-B, Market St., Newark, N. J.

I enclose 10 cents (U. S. stamps or coin) for copy of "Shamrock Radio Builder's Guide Book," containing diagrams and complete instructions for building 10 inexpensive sets.

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Address _____
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LOW-LOSS TUNERS



Patent Applied For

The Globe Low-Loss Tuner is designed to give maximum efficiency. All metal parts entirely eliminated. Less than 1 1/2 ozs. of insulating material. Anti-capacity windings.

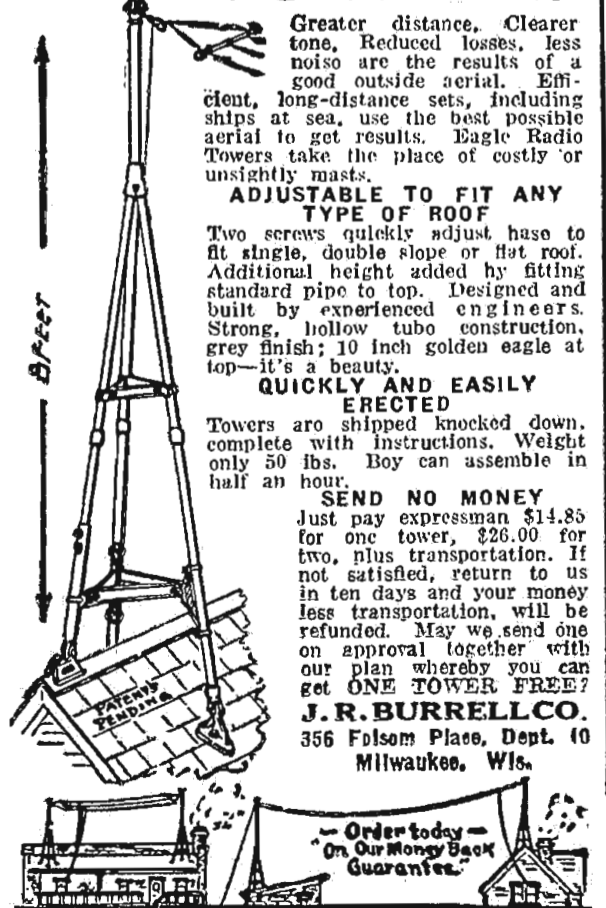
Suitable for use in all standard hook-ups. Special unit for the SUPERDYNE circuit.

PRICES:
Standard Tuner (Broadcast Range).....\$7.00
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Circular on Request. Dealers and Jobbers Write.

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Greater distance. Clearer tone. Reduced losses. Less noise are the results of a good outside aerial. Efficient, long-distance sets, including ships at sea, use the best possible aerial to get results. Eagle Radio Towers take the place of costly or unsightly masts.

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Two screws quickly adjust base to fit single, double slope or flat roof. Additional height added by fitting standard pipe to top. Designed and built by experienced engineers. Strong, hollow tube construction. Grey finish; 10 inch golden eagle at top—it's a beauty.

QUICKLY AND EASILY ERECTED

Towers are shipped knocked down, complete with instructions. Weight only 50 lbs. Boy can assemble in half an hour.

SEND NO MONEY
Just pay expressman \$14.85 for one tower, \$26.00 for two, plus transportation. If not satisfied, return to us in ten days and your money less transportation, will be refunded. May we send one on approval together with our plan whereby you can get ONE TOWER FREE?
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Set-O-Six Radio Socket Wrench

\$1.25

A solidly-built wrench for every radio need. Reaches and fits every round and hexagon nut on any set; works with a fast, screw-driver turn. Compact, light, and handy.

If your dealer cannot supply you order from us

THE PERRY-FAY COMPANY
Screw Machine Products
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200% Profit

The new FAHNESTOCK Display Case

Will stimulate your sales of Fahnestock Radio Products. 14 of the most popular styles and sizes are included. Shows the purchaser instantly the correct place for his set. A constant invitation to buy Fahnestock Products. Dealers are offered 200% profit on each case, an unusual offer on standard merchandise.

Price to Dealer.....\$17.50
West of Mississippi..... 18.50
Transportation prepaid when money order or check accompanies order.

Contents Retail for \$51.50

Refills will be supplied at the regular 100 lot price, shown in catalogue, which comes with case, less discount shown on enclosed sheet. Send check for money order, today.

FAHNESTOCK ELEC. CO.
LONG ISLAND CITY NEW YORK

STAR-ITE THE STAR-ITE CRYSTAL

Because many people have had good results with the STAR-ITE CRYSTAL used as a detector with non-regenerative tube sets, we have had a great many letters from radio folks who seem to be of the impression that this is the—as yet unperfected—OSCILLATING CRYSTAL, of which so much has been said in the radio press.

We have secured oscillation with crystals in a laboratory fashion, but would not attempt to sell the STAR-ITE to take the place of amplifying tubes.

We do say that the STAR-ITE is the absolute pinnacle of perfection as a crystal to be used in a REFLEX Set, or a CRYSTAL Set, and as a detector in many non-regenerative tube sets, and are glad to support our belief by making it extremely easy to try one for yourself.

As this crystal is a new one put out by an old firm in the crystal business your dealer may not have it, but try to get him to order one for you, on our money back guarantee. If he does not wish to do so send us his name with a \$1.00 bill at our risk, and we will send you one with the understanding that you may return it, and we will refund you the \$1.00 at any time within 30 days. Gold Cat Whisker in Each Package

Star Crystal Co
1491 525 Woodward Avenue
DETROIT - MICHIGAN

The Reader's View

Reflex Whistle

In your May 3 issue, Questions and Answers column, I noted question (08004) S. T., Sanitorium, Colo., regarding a reflex whistle. Having had considerable experience with sets of this type, I would like to make a suggestion. I think his trouble is due either to exhausted B batteries causing low voltage or partial rectification by the crystal, or if using A. C. battery it may be caused by an incorrect grid bias. I had the same experience with my reflex and found when I renewed my B batteries it disappeared.—Roy Smith, Detroit, Mich.

DX on Two Tube Circuit

Thanks for the circuit you published in the Digest sometime ago. It is the circuit that one of your Radiophans

A Super Antenna. Great volume. Easily and cheaply made. Less wire. Directions 50 cents. Eugene A. Rhea, Garden City, Kans.

sent in to you who's firm name is Tonkawa Plumbing company of Tonkawa, Okla.

I followed your diagram except that I added another stage of audio frequency and 90 volts on the plate. It can't be beat for volume, selectivity and DX reception. You ended your description of this circuit by stating that it did not resemble any of your standard circuits, and so it would give the experimenter

Radio Applause Cards Free. For quantity write Lettow & Co., 208 Hanover St., Baltimore, Md.

Men to build radio sets for me in spare time. Leon Lambert, 501-H Kaufman Bldg., Wichita, Kansas.

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will work 400 to 1,000 miles if made by my plans. No tubes or batteries. Copyrighted plans \$1.00. Satisfied customers everywhere. Particulars free.

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A bully game that can be played after school by any boy. Lots of fun. Hunters make sure money. You will earn while you learn. The master huntsman will receive

A RADIO SET FREE
This is a special reward offer. Start in business for yourself. Gives you training, fun and profit. For full details and co-operation, write today. Action counts. Boys' Dept., RADIO DIGEST, 510 N. Dearborn St., Chicago, Ill.

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DEALERS send for price list
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Write for Discounts on
ACME FEDERAL
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and Other Standard Lines
PRAIRIE STATE RADIO CO.
39 West Adams St. Chicago, Ill.

"Turn-It" greatly increases the volume, secures greater distance and reduces noises

TURN-IT ADJUSTABLE GRID LEAK

Changes the range of resistance to suit the strength at reception
ABSOLUTELY GUARANTEED



Only \$1 at Your Dealer or Direct from Us
TURN-IT RADIO SALES, Inc.
71 Murray St., N. Y.

something new to play with. Well, I took the chance and I might state that it is well worth playing with, providing good parts are used.—Harry E. Stein, Mount Kisco, N. Y.

BIG money selling new household cleaner. Washes and dries windows. Sweeps, scrubs, mops. Complete outfit less than brooms. Over 100% profit. Harper Brush Works, 200 3rd St., Fairfield, Iowa.

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ALL TYPES \$4.00
Not just a Tube—Say "Genuine Supertron"
VICTOR RADIO MFG. CO., 32 Union Sq., N. Y. C.

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HUNG HEAD DISTANCE SELECTIVE NOT A LOOP
CEILING! FULL SIZE ANTENNA—NO STAYS—NO WIRE—NO LONG
NOT AFFECTED BY WIND, RAIN, SNOW OR LIGHTNING
CERTIFICATE OF APPROVAL by one of Largest Radio LABORATORIES sent
PRICE \$7 POSTPAID: Send \$4 with order; pay balance when fully satisfied.
INTER-STATE SIGNAL CO., Dept. 1, COLUMBUS, OHIO

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FREE Simply send name TODAY for big 48-page catalog of latest radio goods at Wholesale. Live dealers and agents wanted.
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Send NO Money

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I received your \$2.00 card on Oct. 1st and was very pleased with the program. Very clear. I will be sure to use the Bureau later.
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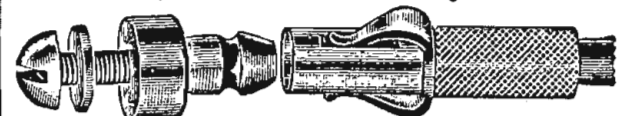
Hear what YOU like. Stations are glad to put on numbers at your request. We print special cards that get ATTENTION. All the RAGE. Thank your favorite stations. Applaud your favorite talent. They appreciate applause just the same as the musician on the stage. Be up-to-date. Get the most out of your radio set. Use Thank You Cards.

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RADIO PRINTERS, 48 Main Street, MENDOTA, ILL.

THE CONNECTION EVERYBODY WANTS

A Positive Instantaneous Connection for Aerial, Ground and Battery Leads



Patented June 20, 1924
RAJAH SOLDERLESS SNAP TERMINALS

Instantaneous in Operation—Positive Contact—Just push on or pull off to make or break connection—No screws to bother with; no springs to bruise the fingers.



Patented June 20, 1924
A positive electrical connection between terminal and cable in ten seconds, without solder or tools, that cannot be pulled off or shake loose.

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