

Once a Convict—Now an Artist, Radio Did It, the Story of Max Sasanoff; Helpful Hints to Get Most from Radio; Programs for All Large Stations

Radio Digest

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

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

Vol. X Copyright 1924 By Radio Digest Publishing Co. SATURDAY, OCTOBER 4, 1924 No. 13

GIVE DE FOREST PATENTS

MOOSE CALL ON AIR SOON; NEW STATION

JACK NELSON ANNOUNCER AT WJJD, MOOSEHEART

Big Opening Mooseheart Day; Many Novel and Entertaining Features Scheduled; Radiophans Tune in

MOOSEHEART, ILL.—Station WJJD, located in this city, owned and operated by the Loyal Order of Moose at their home for children who have lost their parents, will go on the air Mooseheart Day, October 27, for the first time.

Jack Nelson, former program director at Station WDAP, will be announcer and "master of ceremonies" at the new station. At the operating end will be Ralph Shugart, formerly connected as chief operator at WDAP, and now chief operator at WJJD.

This station will have a capacity of 500 watts output and will operate on a wave length of 278 meters. It will be located on the Woman's building which will be completed about October 5.

It is not known just which night of the week will be silent night. On the other nights and at certain times in the afternoon, exact period to be determined later, there will be concerts by the various organizations connected with the home. Occasionally people of prominence who visit Mooseheart will make short talks.



AWARD OPENS COMPETITIVE SET BUILDING

Father of Radio Wins Twelve Year Battle Securing Long Denied Rights

NEW YORK.—Unrestricted manufacture of regenerative receiving sets, the vindication of Dr. Lee DeForest's twelve-year-old claim to the regenerative principle and oscillator inventions, and the process of declaring invalid the famous, much-litigated Armstrong patent, are the three important Radio developments resulting from the recent issuance of two patents to Dr. DeForest, finally recipient of protection denied him for years but given to E. H. Armstrong.



Above is shown Ruth Buhl, well known to Radio audiences for her ability as a reader. She recently entertained from Station WEBB. Left, Ruth Arden, noted soprano who has been featured in a series of broadcasts from WJZ, presented by Ned Jakobs, eminent impresario. Right, Helen Kessing won fame as a soprano soloist of the Cincinnati Lion's Club quartet before she became a Radio star. Her voice is heard frequently from WSAI.

VIENNA FIRE-FIGHTERS TO EQUIP WITH RADIO

Will Overcome Inaccurate and Poor Alarm Information

WASHINGTON, D. C.—Plans are being completed by the fire department of Vienna, Austria, to make extensive use of Radio.

For the past six months experiments have been conducted and the first department headquarters have been equipped with sending and receiving stations, while six fire fighting vehicles are being equipped with receiving sets with different wave lengths.

WBZ Heard in Virgin Islands
SPRINGFIELD.—Heavy static has thus far failed to interrupt the reception of Station WBZ at the Virgin Islands, according to fan mail coming from there.

Without precedent in patent law, De Forest, "Father of Radio," has been awarded two important patents, one covering the feedback principle and the other the use of a vacuum tube to produce oscillations. Both are important to receiving set manufacturers.

The two patents, numbers 1,507,017 and 1,507,016 respectively, hitherto denied Dr. DeForest by an alleged mistaken issue of the regenerative circuit and feedback patent (No. 1,113,149) to Armstrong, signify in tangible form the honor that has been due DeForest for years but that has been erroneously given Armstrong by newspapers, scientific societies, Radio amateurs and even manufacturers who purchased manufacturing rights from the wrong inventor.

(Continued from page 2)



WANT COMPETITION BETWEEN BUILDERS

VERDICT REMOVES FEAR OF FUTURE TROUBLE

DeForest Receives Just Rights After Twelve Long Years of Battle for Patent Ownership

(Continued from page 1)

The DeForest company now owns the feedback or regenerative and tube oscillation generator patents and has (some years ago) licensed but one other firm, the American Telephone and Telegraph company, to use these.

Officers of the DeForest organization declare that it will not join with the A. T. & T. company to sue the seventeen Armstrong licensees. Open competition in set manufacturing as a means of improving sets and for the good of the industry, is the desire of the DeForest company.

Victory Pleases DeForest

"Purely aside from any financial return that may accrue from the issuance of these patents to me," said Dr. DeForest when interviewed, "I am most highly gratified for sentimental reasons. For almost a dozen years I have claimed to be the inventor of the feedback circuit and the oscillating audion. It was a bitter blow, indeed to see patents for them granted to another claimant.

"But never once did I doubt that justice would eventually be given me. That day is now here. My claims have been proven by the last courts, and I am now in possession of the patents which were withheld from me for so long. It is a splendid victory, and I am very happy at the outcome."

Westinghouse Hard Hit

The DeForest Radio Telephone and Telegraph company, following up its signal victory in obtaining the two patents, has now filed suit against the Westinghouse Electric and Manufacturing company, owner of Armstrong's patent, to declare the latter void, inoperative and invalid.

The suit filed also asks that a temporary injunction be granted restraining the Westinghouse company from bringing or prosecuting any suit that may pertain to the infringement of Letters Patent No. 1,113,149, the patent sold to Westinghouse by Armstrong for \$500,000 and which has been the subject of so much litigation.

WLS STARTS NEW FARM BROADCAST

Most Complete Farm Service Will Cover All Phases of Agriculture

CHICAGO.—The most complete Radio farm news service in the world is now broadcast over the Sears-Roebuck Agricultural Foundation station, WLS. Beginning September 29, reports of weather and market changes throughout the day and night are substituted for the twice daily readings formerly given. WLS is the first Chicago station to establish a complete market service.

Reports are sent out at 9 and 11 o'clock every morning and again at 3 o'clock in the afternoon. At 6 o'clock in the evening a summary of all farmers' markets—live stock, grain, dairy, fruit and vegetables, hay and feed markets are read. At 8 o'clock a national commodity summary, prepared especially for WLS by the United States bureau of Agricultural economics, is broadcast. The reports are given in brief and in the language of the farmer.

Weather forecasts are Radiocast at 9 and noon and again at 10 in the evening. Special storm warnings, issued regularly, are supplied by the United States Weather bureau. A weekly weather crop summary will feature the 1 o'clock farm program Wednesday noon. The weather outlook for each succeeding week will go on the air at 1:30 p. m. Saturday.

Radio League Holds Convention

CINCINNATI.—Elaborate exhibits of Radio apparatus embracing all the latest and most improved instruments were shown here at the convention of the Amateur Radio Relay league on September 26, 27 and 28. Business and social sessions were held at the Hotel Gibson where Radio authorities from all parts of the country discussed the issues confronting Radiocasting and all its branches.

Milwaukee Club Reports

MILWAUKEE.—The annual report of the Milwaukee Radio amateur's club for the year of 1923-1924 has been issued. It is a resume of the activities of the organization for the entire season. Regular meetings of the club were resumed on September 18 in the Milwaukee Public Museum.

PERNIN CELEBRATES TWO YEARS AT KYW

CHICAGO.—Radio stations, just like big families, have a birthday party now and then. Westinghouse Station KYW celebrated one on Thursday, September 18.

Rev. Claude J. Pernin, S. J., the man behind the voice in the station's regular Thursday evening feature—"Twenty Minutes of Good Reading"—had his second birthday party with the station.

It was just two years ago that Father Pernin stood before KYW's microphone and gave his first reading—"The Gift of the Magi," by O. Henry—and O. Henry is still his favorite. In the two years that have passed Father Pernin's audience has grown by leaps and bounds, until today this is one of the station's most popular features.

Father Pernin is one of the popular members of the KYW family. Minutes mean much in a broadcasting station. A minute late is a cardinal crime. Father Pernin has never been guilty of the offense. When the "World Crier" looks up after the eight o'clock schedule—there stands the voice for that "Twenty Minutes of Good Reading."

Father Pernin, when not before the microphone, is head of the English department at Loyola university.



Rev. C. J. Pernin

Philadelphia Boasts New Station; WCAU

Located on Top Floor of Hotel Pennsylvania

PHILADELPHIA.—Another large broadcasting station will be opened October 1, when WCAU of this city will have completed its new station on the top floor of the new Hotel Pennsylvania. For some time, the hotel has been broadcasting its orchestra selections through WCAU by land wire.

Durham and Company, who operate WCAU, decided to install an entirely new equipment, and instead of having it where the old station is located, decided to install everything in the Hotel Pennsylvania. The studio will be on the first floor of the building, and the wires from the microphones will run up to the fifteenth story to the control room and other apparatus will be installed. The aerial masts will be 90 feet high, the highest in this city. WCAU will retain its old wave length of 286 meters, but that the call letters will be changed on its becoming a class B station.

The remodeling of this station makes five 500-watt broadcasters in Philadelphia. The others are WOO, WIP, WFI and WDAR. Philadelphia is surpassed only by New York and Chicago in point of 500-watt stations.

Radiophans Troubled with Strange Phenomena Lately

MARIETTA, OHIO.—Much conjecture and theorizing is rife in this vicinity as to the cause or causes of an interference in the air which prevents the reception of Pittsburgh and Cincinnati here between 6 p. m. and dawn. For the past few weeks the phenomenon has been noticeable.

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Looking Ahead

An Improved Eight Tube Super-Heterodyne, built and tested under the direction of H. J. Marx, will be described in detail beginning with next issue, October 11. The super-heterodyne shielding problem was one of the difficulties encountered and surmounted by Mr. Marx. Ambitious builders of "super-hets" should follow this series closely.

"Secrets of Selectivity and Regeneration" will be told by William W. Harper in a short series of articles under this heading that will begin next week. Mr. Harper, who has acted as research engineer for the Zenith Radio corporation, will tell many important facts every Radiophan should know.

Who Won the Radio Digest Presidential Straw Vote? How did the ladies vote? Where was "Silent Cal" strong, how did John W. Davis fare, and what victories can "Fighting Bob" claim? Read next week's issue to learn how this Radio poll, the first of its kind, resulted.

"Topsy and Eva," or Better, the Duncan Sisters, tell what they have learned about broadcasting, in an interview readers of next issue will appreciate. The famous actresses will be pictured in one of the much commented on Digest pages of photographs.

An Inexpensive Table Stand for Your Receiver will be described in detail by Charles F. Smisor in the fourth article of his series telling how to do Radio woodworking.

KYW in Photographs was promised for readers of this issue, but inadvertently had to be postponed. Rest assured, however, that the feature is worth awaiting and will appear in an early issue.

Newsstands Don't Always Have One Left

WHEN YOU WANT

Radio Digest

YOU WANT IT!

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SEND IN THE BLANK TODAY

Publisher Radio Digest, 510 N. Dearborn St., Chicago, Illinois.

Please find enclosed check M. D. for Five Dollars (Six, Foreign) for One Year's Subscription to Radio Digest, Illustrated.

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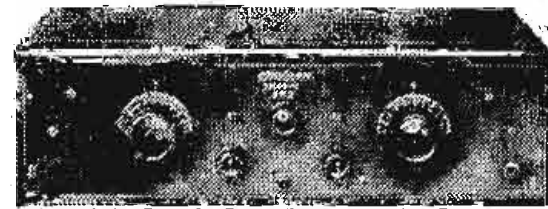
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Of course its a CROSLEY Better-Cost-Less

TO COMBINE the two most desirable things in radio—distant, clear reception at the lowest possible price—there is only one radio receiver for you. That is a Crosley.

Quality radio receivers built in quantity production is the secret of Crosley popularity. The fact that Crosley made and sold more sets, in the past twelve months, than any other manufacturer in the world is self evident proof.



The Crosley Trirdyn Regular here shown, a three tube set combining radio frequency, regeneration and reflex, is only \$65.00, with tubes and Crosley phones, \$80.75. Or you can start with a Crosley 50 at only \$14.50, with tube and Crosley phones, \$22.25, and add to it as you desire. Crosley purchase prices range from \$14.50 to \$120.00. Prices west of the Rockies, add 10 per cent.

Compare first, then you will buy a Crosley.

Crosley regenerative receivers licensed under Armstrong U. S. Patent 1,113,149

SEND FOR COMPLETE CATALOG

The Crosley Radio Corporation

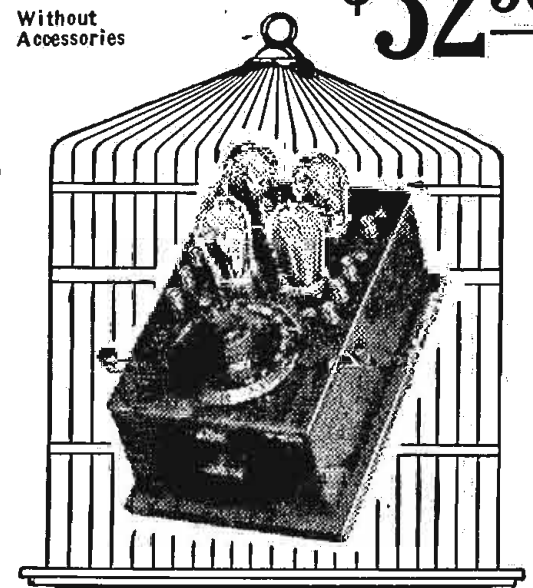
POWEL CROSLEY, Jr., President
10491 Alfred St. Cincinnati, O.
Crosley owns and operates Broadcasting Station WLW

Hansen "BIRD-CAGE" Radios



4 Tube Radio Set \$32.50

Without Accessories



NIGHTINGALE RADIO

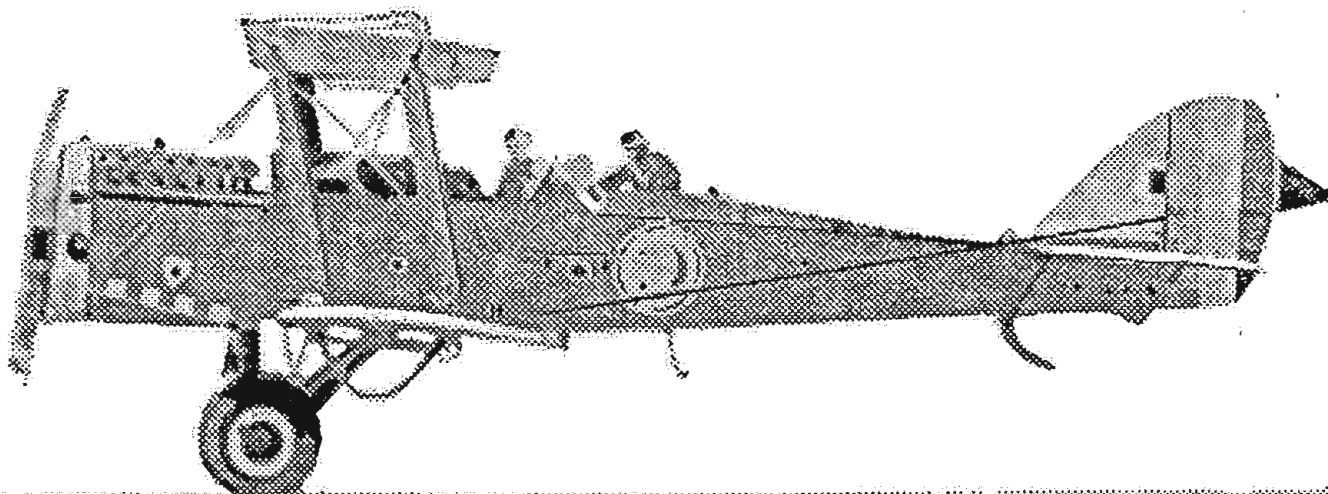
A simplified, loud speaking, long range set at a price within the reach of all.
Hansen BDBLINK..... \$25.00
2 Tube Reflex..... \$50.00
Hansen CARDINAL..... \$50.00
3 Tube Reflex..... \$57.50
Hansen BLUE BIRD..... \$57.50
4 Tube Radio Frequency..... \$150.00
AMERICAN EAGLE. This we believe to be the best high grade 6-tube loop set on the market today..... \$150.00

Ed. Munn RECEIVERS \$90.00
4 tube very selective..... \$135.00
6 tube loop.....

Write for Now Catalogue Dealers and Jobbers—Our line is interesting and profitable.



DISTRICT DISTRIBUTORS
Badger Radio Co. Milwaukee, Wis.
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Goulding Mfg. Co. Milwaukee, Wis.
Maxwell Elec. Co. Toledo, Ohio
Inland Ignition & Radio Co. Spokane, Wash.
Chas. B. Scott Co. Scranton, Pa.
Pelav J. Constant. Now York



Radio stations throughout the country picked up the broadcasting from the plane at the left which accompanied the round the world flyers after their arrival in this country. A special built set of broadcasting apparatus was carried by the plane. Lower photo shows a view of the apparatus on the ground which relayed the plane's messages to WJZ and WGY, from which stations the messages were broadcast to the entire country. Major Lester D. Gardner, noted announcer, is shown watching the fliers through field glasses and telling the public of their progress.

K. & H. Photo

BROADCAST MOTION PICTURES TO HOMES

EXPERIMENTS CONDUCTED AT WMAF SUCCESSFUL

Several Experts from Massachusetts Institute of Technology Helping Col. Green Perfect His Invention

NEW YORK.—Moving pictures may be radiocast within the coming year if the experiments of Col. E. H. R. Green, son of the late Hetty Green, are as successful in the future as they have been in the past eighteen months.



Col. E. H. R. Green

Col. Green has already succeeded in transmitting pictures over 60 feet at his South Dartmouth, Mass., laboratory.

According to W. H. R. Marshall, Green's secretary, the success of the 60 foot moving picture transmission was attained only after more than a year had been spent perfecting and constructing apparatus.

He also stated that a new laboratory had been built to carry on the work and the services of several experts had been obtained through an agreement with Dr. Samuel Stratton of the Massachusetts Institute of Technology. These men will go to South Dartmouth where all their expenses will be paid by Col. Green.

Although Mr. Marshall talked freely about Col. Green's Radiocasting station, known as WMAF, from which entertainment at the Strand theater is broadcast, he was exceedingly reluctant to discuss the Radio motion picture or Col. Green's experiment.

However, he did state that numerous letters received from England and other countries asserted that WMAF was being heard more plainly than most other American stations.

If the experiments are successful every Radiophan using a set of the proper character will be able to receive and enjoy motion pictures in his home identical with those shown at the theaters.

WCX Plans Feature Programs for Winter

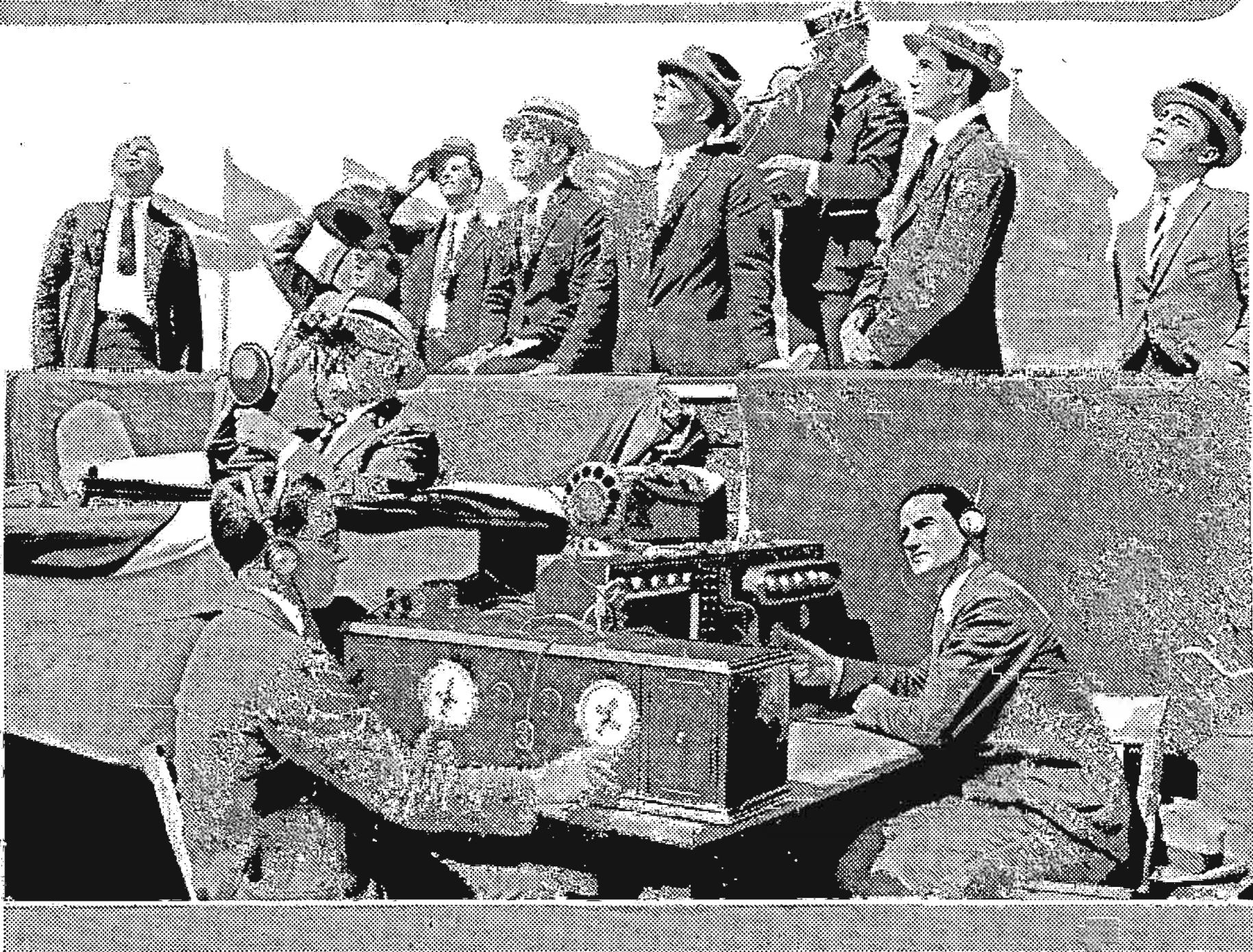
Will Add Sunday Organ Recitals to Schedule

DETROIT.—Station WCX, owned and operated by the Detroit Free Press, is preparing for some unusual features during the coming fall and winter. The Red Apple Club, which has become famous all over the United States and Canada, will be made more entertaining than ever.

Among the fine musical organizations which will be heard almost every day will be the Chinese Pavilion orchestra, every member of which is an artist. Another feature that will come out of Station WCX this fall and winter will be the organ recitals from the Central M. E. church. The instrument used on these occasions is a Skinner organ, similar to the one that was heard all last winter from WEAJ, New York.

Rev. M. L. Thomas Leaves KYW

CHICAGO.—The Reverend Martin Luther Thomas, pastor of the Deerfield Presbyterian church recently bid goodbye to his KYW friends. The pastor has been one of the most staunch advocates of the Radio sermon since its inauguration at KYW over two years ago. From here he goes to the Presbyterian church at San Pedro, California.



SET NEW RECORD WITH AMATEURS

Hear MacMillan from Arctic Circle to Australia—Span Distance of 9,060 Miles

CHICAGO.—All long distance 200-meter wave transmission records were broken recently when the astounding news that WNP, the MacMillan arctic expedition, frozen within 11 degrees of the North pole, had been heard in Australia.

Although amateurs with low power stations have succeeded in working across the Atlantic and over other great distances the MacMillan transmitter far outdistances all of them. During the entire year the expedition was in the polar regions, communication was maintained with stations in all parts of the United States. This was deemed an excellent performance.

However, Donald Mix, MacMillan's operator, little realized the distance his signals were carrying until W. Cotterel of Coogee, Australia, heard him calling Major Lawrence Mott at Catalina Islands and reported it.

According to Cotterel there was no difficulty encountered in identifying the station call and the peculiar 500-cycle rectified note characteristic of the type of transmitter used by the Bowdoin. The ship was in the perpetual daylight circle at the time.

The distance from MacMillan to Cotterel is 9,060 miles by airline.

Railway and Utility Men to Hear Harris Over WJAX

CLEVELAND.—Railway and public utility men throughout the eastern half of the United States will have an opportunity to hear Mr. Joseph Porter Harris discuss the subject of "Electric Railway Financing" when the speech will be radiocast from the annual convention of the American Railway association through Station WJAX.

Mr. Harris, vice-president of the Union trust company of Cleveland is nationally known as one of the outstanding figures of the electric railway field.

Broadcast Waterway Project Next Monday

WQJ to Handle "Chicago-to-the-Gulf" Banquet Speeches

CHICAGO.—Broadcasting on silent night, WQJ, Rainbo-Calumet station here, will break a precedent next Monday night, October 6, when the speeches of dignitaries will be put on the air direct from the banquet hall at the million dollar Rainbo Gardens, where the "Chicago-to-the-Gulf" waterways banquet is to be held. The importance of the banquet to the Middle West and South is indicated by the number of reservations already made. Over 2,500 persons will be in attendance.

The "Chicago-to-the-Gulf" waterway project is being sponsored by former Mayor William Hale Thompson of Chicago, who predicts that with the completion of the waterway project, the Mississippi valley will rapidly increase in wealth and population.

Not alone will exponents of the gulf waterway be heard, but representatives of the various other waterway projects will be asked to state their cases. One to be discussed will be the Welland Canal-St. Lawrence river plan. The broadcast banquet program is expected to last three hours.

COMMISSIONERS FIND STATION'S COST HIGH

Atlantic City Building New Municipal Broadcast Station

ATLANTIC CITY, N. J.—The high cost of broadcasting has been demonstrated to the city commissioners of Atlantic City. Plans have been in progress for some time for the erection of a municipal station to be located at the Airport, but the project had hung fire until several days ago, when virtually all the contracts were awarded for the construction of the station. So far about \$40,000 has been expended by the city. No announcement has been made as to when the station will begin actual broadcasting.

WEAO TO RADIOCAST OHIO GRID BATTLES

PLACE TEN "MIKES" ABOUT HUGE ATHLETIC BOWL

Announcer Will Use Hushaphone, But Will Let Radiophans Hear Cheering

COLUMBUS.—Play by play results of the gridiron battles between Ohio State university and the eight teams they are scheduled to play will be announced directly from the field and broadcast through stations WEAO and WBAV when the season opens.

Station WEAO will announce the six home games and Station WBAV will announce the two out of town contests.

Elaborate arrangements have been made by the electrical engineering and athletic departments at the station in the work of arranging the apparatus in the most efficient possible manner. Ten "mikes" will be placed at intervals about the stadium. At each an observer will be stationed. He will keep in constant communication with the announcer located in a soundproof room at the top of the stadium, who will tell the listeners of every play and movement of the teams.

To Use Hushaphone

All noise will be eliminated, but at will the announcer can cut in the cheering sections, pick up the music of the band or any other feature that would be of interest. It will be a case of bringing a big ten football game to the fans' own backyard.

Fans desiring grid graphs, or diagrams upon which they can record the progress of the ball as it is radiocast will be furnished free upon request mailed to A. Lee Henderson, Station WEAO of the Ohio State university at Columbus, Ohio.

The schedule of football games is as follows: October 4, Purdue; October 11, Iowa, at Iowa City; October 18, Ohio Wesleyan; October 25, Chicago; November 1, Wooster; November 8, Indiana; November 15, Michigan; November 22, Illinois at Urbana.

MUST ALLOCATE 12 NEW WAVE LENGTHS

WILL REFER PROBLEM TO NATIONAL CONFERENCE

Class C Stations Must Transfer to Classes A and B or Quit Game

WASHINGTON, D. C.—There are twenty new Class B stations now under construction in different parts of the country, according to the records of the commerce department. The erection of about twenty-five more is under consideration. Not all these high-powered broadcasters are new literally, some of them are applying for transfers from classes A and C.

The problem for the bureau of navigation Radio section is not lessened by this fact, however. Somehow a dozen new wave lengths will have to be found. In general each of the fifty-six class B stations has an exclusive wave length so as to insure no interference from other broadcasters within a very wide territory. Originally there were fifty separate wave lengths assigned to B stations, but before long some of the stations on opposite coasts or in the same cities had to share wave lengths or time. Later a few were given experimental broadcasters and now the band is exhausted.

Conference to Set Wave Lengths

How to find a number of exclusive wave lengths for these newcomers is a problem that will probably have to be referred to the National Radio conference called for October 6. It is rumored that some of the higher wave lengths allocated to amateurs, before the new short wave lengths were opened to them, may be reassigned to class A broadcasters, while some of their waves will be transferred to class B. In all probability the class C wave of 360 meters, which was the original broadcasting wave, will also be revoked and given to two or three B stations.

The 360 meter wave length is now used by only 89 class C stations, all of which it is believed will soon have to transfer to classes A and B or quit. There is also a possibility of securing a few more wave lengths, suitable for the use of B broadcasters, from bands in the possession of the government stations, if the conference should so decide.

SCOOPS LEOPOLD-LOEB VERDICT

TIME was when only newspapers were interested in "scoops." But comes now the "Radio Scoop." Westinghouse Station KYW scored one on the day that Judge Caverly gave his verdict in the celebrated Loeb-Leopold murder case, with "Steve" Trumbull announcing.

A rival station was "scooped" by several minutes and the people around KYW were as jubilant as though they had put an "extra" on the street ahead of a rival. KYW gave the world the news almost instantaneously. It was 9:42½ when the verdict was announced, and it lacked several seconds of being 9:43 when the news went out on the air.

The fifteen minutes of broadcasting brought the station 5,000 letters.



HIGHER POWER FOR REORGANIZED WLAG

CIVIC ASSOCIATIONS TO FINANCE ENTERPRISE

Fans Rejoice at News of New Western Electric 5 K. W. Set for Northwest

MINNEAPOLIS. — The twin cities, Minneapolis and St. Paul, are again to take their places as Radiocasters when on October 1 the revamped Station WLAG under new organization will broadcast its first regular program.

Old WLAG, formerly owned by several business houses, went into bankruptcy several months ago. Broadcasting was stopped and the station was placed in the hands of a receiver.

All apparatus and equipment of WLAG was recently purchased from the receiver by the Washburn-Crosby Milling company after an agreement between the company and the Minneapolis and St. Paul Civic and Commerce associations had been reached.

By this pact a new 5 kilowatt Western Electric transmitter is to be purchased to replace the present one. The money is to be furnished in three divisions; \$50,000 by the Washburn-Crosby company, \$30,000 by the Minneapolis Civic and Commerce association and \$20,000 by the St. Paul Civic and Commerce association.

It has been agreed that the station will not be used for any advertising purposes by the organizations represented. It will only be known as the "Gold Medal" station at Minneapolis and St. Paul. No time will be allotted to subscribers.

The direction of the station will be in the hands of a committee of three representatives, one from each of the civic organizations and one from the milling company. They will dictate all policy pertaining to the station.

If expectations are fulfilled the new transmitter will be in full operation by March 2, 1925. Until that time the old equipment and call letters will be used in Radiocasting events of special importance and all market results, along with a regular program. On Defense Day the station Radiocast General Pershing's address.

Radiophans in the northwest are jubilant over the reopening of the station.

First Time Signals Sent from Paris During 1904

ZURICH, SWITZERLAND.—According to the "Journal Suisse d'Horlogerie" (Swiss Clock Makers Journal), the first time signals were sent out by Radio was in 1904 during tests between two Paris observatories. This was done by the French scientist Bigourdan, president of the Academy of Sciences, using a Branly coherer.

Place Compass Station on Jagged California Coast

HONDA, Calif.—A new Radio compass station has been opened about sixty-five miles north of Santa Barbara, California, above the jagged rocks of this section of the coast line and where one year ago seven destroyers of the United States navy plunged to wreckage on the unseen rocks with a loss of twenty-three lives.

Why it is Better

LOOK at this illustration—see for yourself the eleven distinctive features in the construction of the Federal Condenser. Every feature is a distinct point of superiority—essential to clear, sharp tuning and clear reception.

You can get the outstanding advantages of Federal Tone and Federal Selectivity in your pet hook-up only by insisting on Federal Parts.

There are over 130 Federal Standard Radio Parts bearing the Federal iron-clad performance guarantee. Use them—for your own protection and enjoyment.

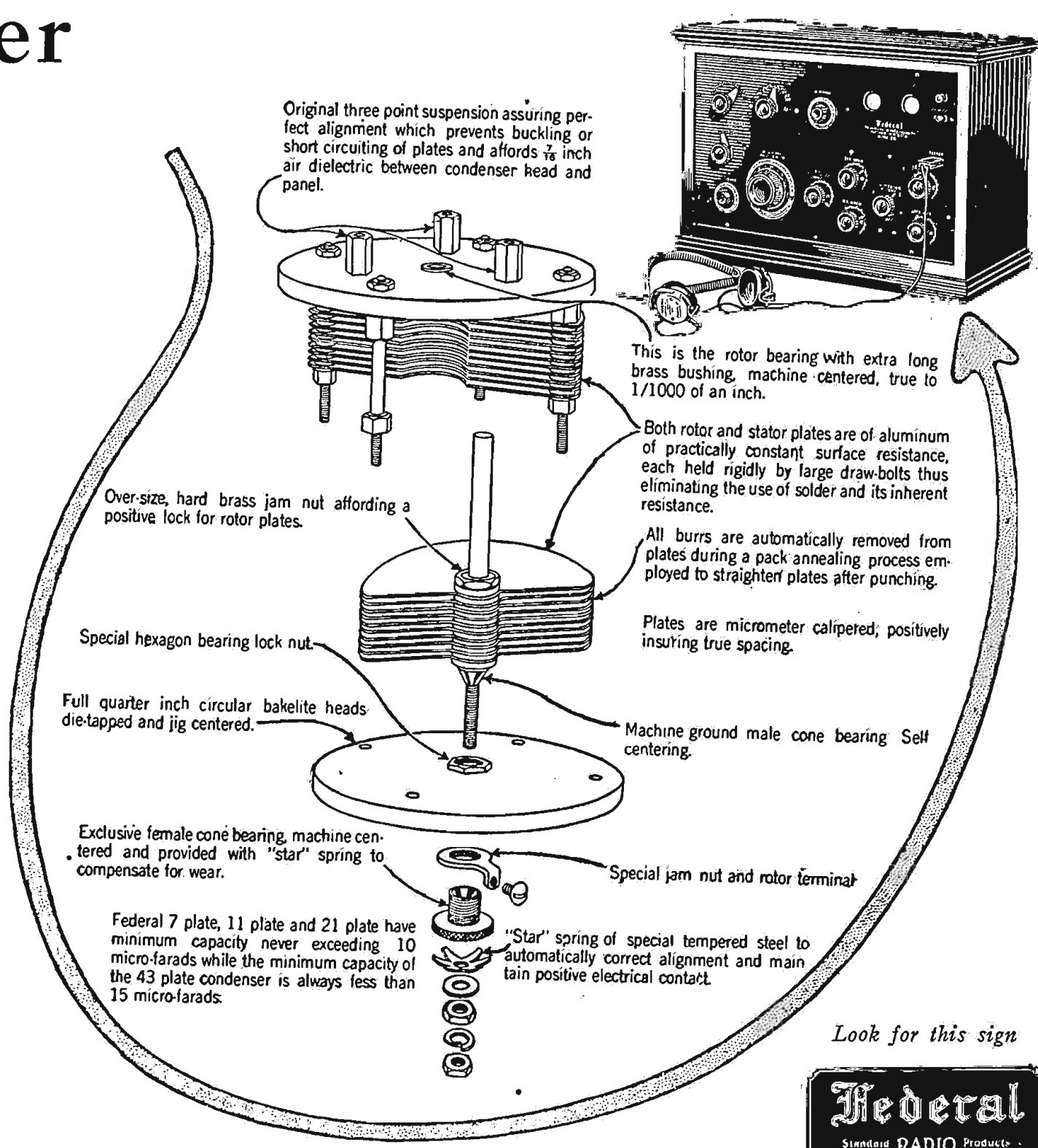
FEDERAL TELEPHONE MANUFACTURING CORPORATION
BUFFALO, N. Y.

Boston New York Philadelphia Pittsburgh Chicago
San Francisco Bridgeburg, Canada

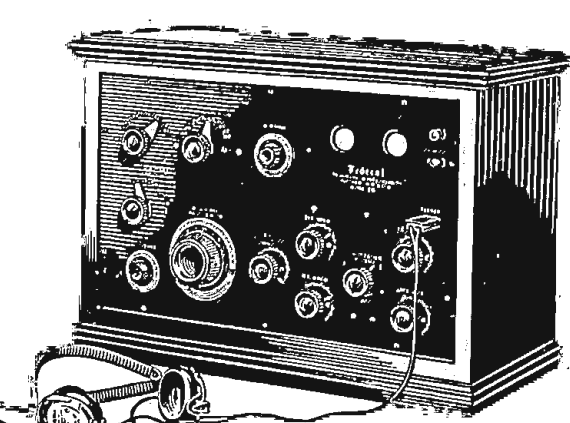


Federal

Standard RADIO Products



Original three point suspension assuring perfect alignment which prevents buckling or short circuiting of plates and affords 1/16 inch air dielectric between condenser head and panel.



This is the rotor bearing with extra long brass bushing, machine-centered, true to 1/1000 of an inch.

Both rotor and stator plates are of aluminum of practically constant surface resistance, each held rigidly by large draw-bolts thus eliminating the use of solder and its inherent resistance.

All burrs are automatically removed from plates during a pack-annealing process employed to straighten plates after punching.

Plates are micrometer calipered; positively insuring true spacing.

Over-size, hard brass jam nut affording a positive lock for rotor plates.

Special hexagon bearing lock nut.

Full quarter inch circular bakelite heads die-tapped and jig centered.

Exclusive female cone bearing, machine centered and provided with "star" spring to compensate for wear.

Federal 7 plate, 11 plate and 21 plate have minimum capacity never exceeding 10 micro-farads while the minimum capacity of the 43 plate condenser is always less than 15 micro-farads.

Machine ground male cone bearing Self centering.

Special jam nut and rotor terminal

"Star" spring of special tempered steel to automatically correct alignment and maintain positive electrical contact.



His Voice and Painting Won Him a Parole

From Prison to Renown

By Bonnie Barnhardt

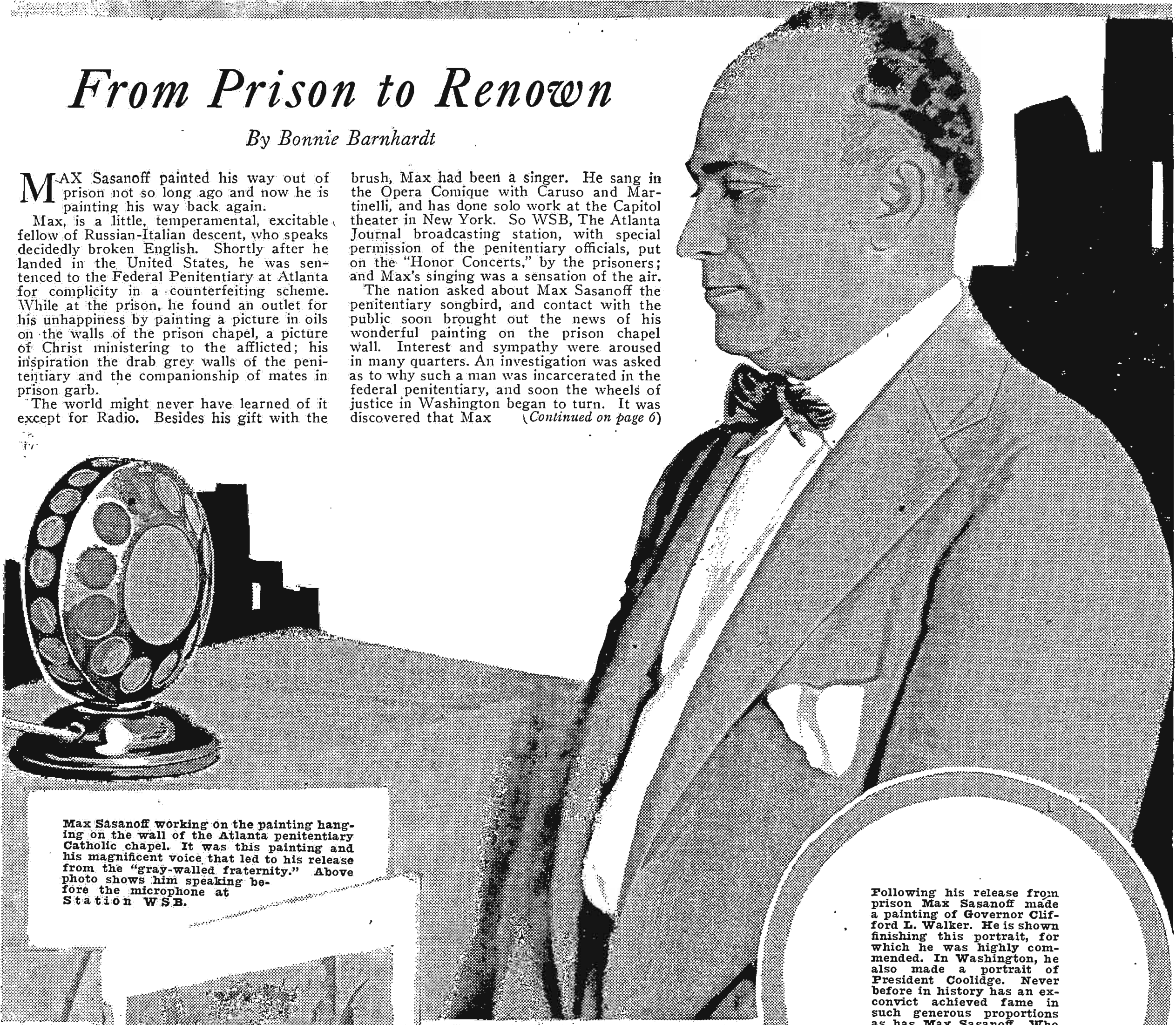
MAX Sasanoff painted his way out of prison not so long ago and now he is painting his way back again.

Max, is a little, temperamental, excitable fellow of Russian-Italian descent, who speaks decidedly broken English. Shortly after he landed in the United States, he was sentenced to the Federal Penitentiary at Atlanta for complicity in a counterfeiting scheme. While at the prison, he found an outlet for his unhappiness by painting a picture in oils on the walls of the prison chapel, a picture of Christ ministering to the afflicted; his inspiration the drab grey walls of the penitentiary and the companionship of mates in prison garb.

The world might never have learned of it except for Radio. Besides his gift with the

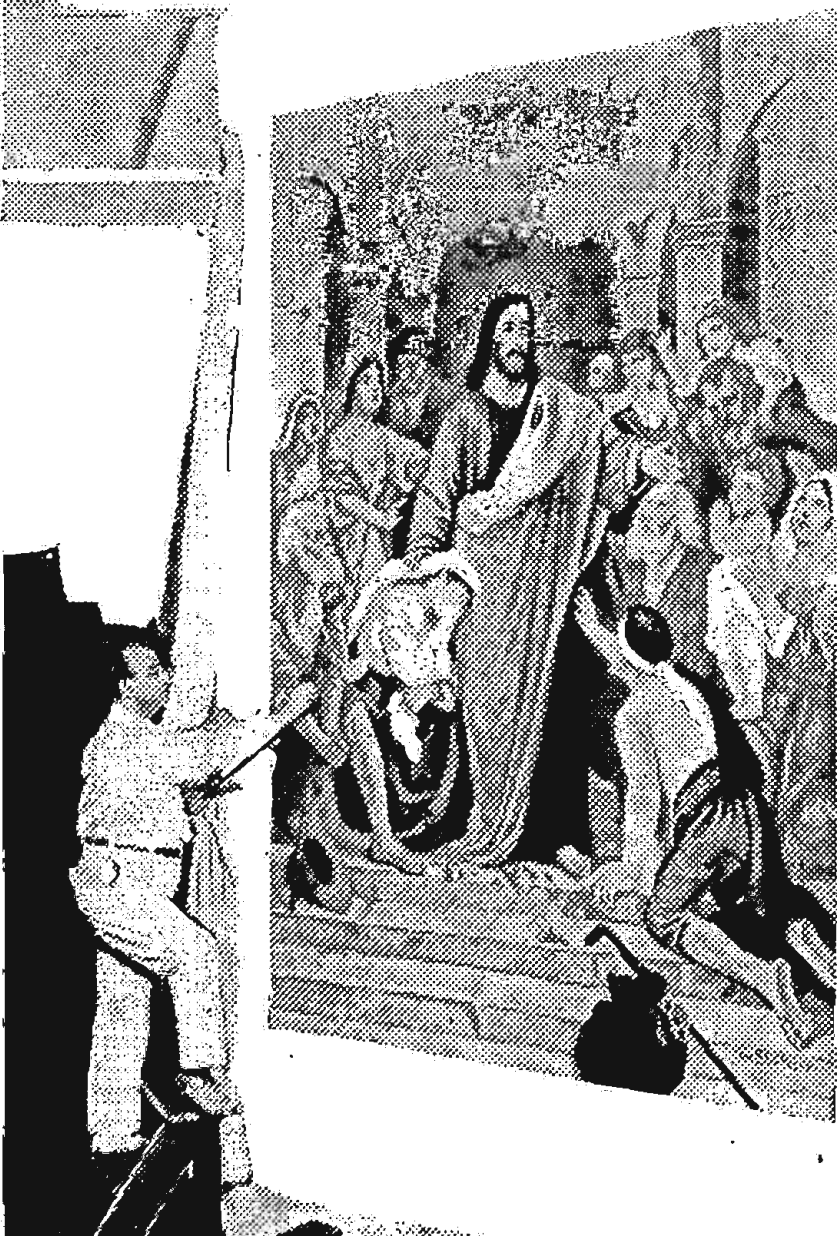
brush, Max had been a singer. He sang in the Opera Comique with Caruso and Martinelli, and has done solo work at the Capitol theater in New York. So WSB, The Atlanta Journal broadcasting station, with special permission of the penitentiary officials, put on the "Honor Concerts," by the prisoners; and Max's singing was a sensation of the air.

The nation asked about Max Sasanoff the penitentiary songbird, and contact with the public soon brought out the news of his wonderful painting on the prison chapel wall. Interest and sympathy were aroused in many quarters. An investigation was asked as to why such a man was incarcerated in the federal penitentiary, and soon the wheels of justice in Washington began to turn. It was discovered that Max (Continued on page 6)



Max Sasanoff working on the painting hanging on the wall of the Atlanta penitentiary Catholic chapel. It was this painting and his magnificent voice that led to his release from the "gray-walled fraternity." Above photo shows him speaking before the microphone at Station W.S.B.

Following his release from prison Max Sasanoff made a painting of Governor Clifford L. Walker. He is shown finishing this portrait, for which he was highly commended. In Washington, he also made a portrait of President Coolidge. Never before in history has an ex-convict achieved fame in such generous proportions as has Max Sasanoff. Who was the person that passed the remark, "They never come back?" This man proves otherwise!



CENTRAL CHURCH IS NEW WGR FEATURE

OVERCROWDED CHURCH IS CAUSE OF INNOVATION

Rev. Dr. Robert J. MacAlpine's Sermons
to Be Brought to Radiophans—
Is Extremely Popular

BUFFALO.—For the first time in the history of Station WGR here, church services will be broadcast direct from the pulpit on Sunday, October 5.

Station WGR has made arrangements with the Central Presbyterian church for the broadcasting of not less than one church service each month. This is by contract between the Central church and Federal Telephone Manufacturing company, who does the installation and has charge of the church transmission through WGR by remote control.

Elaborate preparations are being made to make the church transmission as near perfect as possible. Two microphones will be installed near the altar in the church and three direct wires will lead from the church to the studio of WGR on the top of Hotel Statler. Both microphones will be ready for instant use, although only one will be used at a time. The extra microphone and wires will be used in case of emergency.

Church Too Crowded, Reason

The Central church has the reputation of attracting the greatest crowds of any church in the city. It is understood that overtures were first made by the church authorities through the management of WGR relative to the transmission of some of its Sunday night services primarily because large numbers of people are often turned away from the church on Sunday evening because the seating capacity is not sufficient to accommodate the crowds.

While arrangements between the Radio station and the church call for at least one church service transmission each month, it is likely at first that three or four services will be given until further notice. The great attraction at the Central church is the sermon of Dr. Robert J. MacAlpine, whose views are rather liberal, but who is also tremendously forceful in expressing them.

Doctor MacAlpine has a remarkable pulpit presence and is extremely popular among the clergy and church people of

all denominations in Buffalo. Another great feature of this service will be the organ music which is played on one of the most popular organs in the city by William Wall Whiddit, who is also musical director at the Central church. An important part of the musical service is the work of the male quartet and the chorus of fifty voices which Mr. Whiddit has trained.

The broadcasting of the service will begin with a musical program at 7:15 Eastern time each Sunday evening. Dr. MacAlpine will begin to preach about 7:30. While an operator from WGR will be on duty at the church during the services, all announcements concerning the services will be made direct from the studio of WGR by one of the regular announcers, who will be in direct telephone communication with the operator.

EX-CONVICT NOW STAR

(Continued from page 5)

had been made a dupe in the counterfeiting scheme soon after he had arrived in this country and before he had mastered any of the language or learned any of the laws. And it wasn't long before Washington vindicated Max by sending him a parole.

Sasanoff stayed in Atlanta long enough to paint portraits of Governor Clifford Walker and Mayor Walter Sims, and then went to Washington and painted a portrait of President Calvin Coolidge; one of General Stone, and one of Stone's special aide, Martin. He nearly completed the painting of "The Man of Sorrow," another impression of the Saviour. This was at the behest of a Virginia woman who generously sent funds to the artist, even before he was freed.

Max was back in Atlanta for a day last week. He no longer needs his parole. The original term he was serving has expired. Deputy Warden Fletcher of the penitentiary officially confirmed the expiration of the sentence and expressed his high regard for Max as a man and as an artist.

Sasanoff has gone to Montgomery, Ala., where the Big Brothers Bible class of a Montgomery church has engaged him to paint another picture of Christ. They will pay him \$2,000 or more for the work. Two months, at least, will pass while the picture is in the making, and of his own volition, Max will paint it in prison, too. The wall of a prison will be the background and a prisoner will be his model.

Speaking of his plans to paint again in prison, Max said: "Many times I have

thought of the words of Christ, 'Go and Sin No More,' and I am going to paint my picture around that thought. You will see Christ in a prison. Before Him two prisoners will be kneeling, their heads bowed. The Saviour's hands will be raised in a benediction as He grants them the priceless right to begin anew—as I did.

"To make it a true picture, I am going back to prison to paint it. So for two months I will shut myself up in the Kilby prison in Alabama. When I come out I will bring my masterpiece with me."

Radiocast News Bulletins When Telegraphers Strike

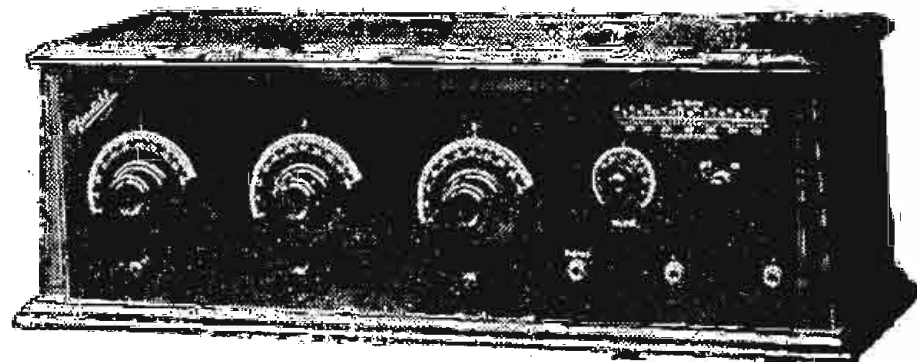
TORONTO.—News service of the Canadian Press was continued during the time of the recent strike of telegraphers by use of Radio. News was Radiocast from Station CFCA of the Toronto Star to all stations within its radius. The service was sent at regular intervals throughout the day, serving particularly papers from Belleville in the east to London in the west of Ontario.

Have You Thought It Possible

to unite in one receiver the desirable qualities of selectivity, simplicity and volume and at the same time to perfect a reproduction so clear, sweet and pure as to urge you to the desire of broadcasting to the world that you have found a perfect receiver?

If you have not we urge you to hear the new

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Model 7
Receiver



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PFANSTIEHL RADIO CO.

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The New Goodrich V. T. Socket

A Spring Lock—No Turning or Twisting the Tube



The socket in which the tube can be either inserted and fastened or unfastened and removed without turning or twisting.

A spring lock—an exclusive Goodrich feature—accounts for this tremendous socket improvement.

Tube locks automatically when inserted—touch the spring lock . . . it is released.

"Wiping" type contacts automatically cleaned when tube is inserted—can be further cleaned without unlocking tube with slight turn back and forth.

Completely eliminates danger of tube breakage due to forgetting which way to turn tube to unlock it—a vast improvement over bayonet lock style.

Socket construction of specially treated hard rubber—so dielectric losses are much lower than in sockets made of other materials. Furnished complete with all fittings. Get the new and improved Goodrich V. T. Socket today.

THE B. F. GOODRICH RUBBER COMPANY
Akron, O. ESTABLISHED 1870

Goodrich V. T. Socket

8XB FIRST STATION TO RADIOCAST

Simple Set Used in Cincinnati as Radio Stimulant

By Lieut. H. F. Breckel

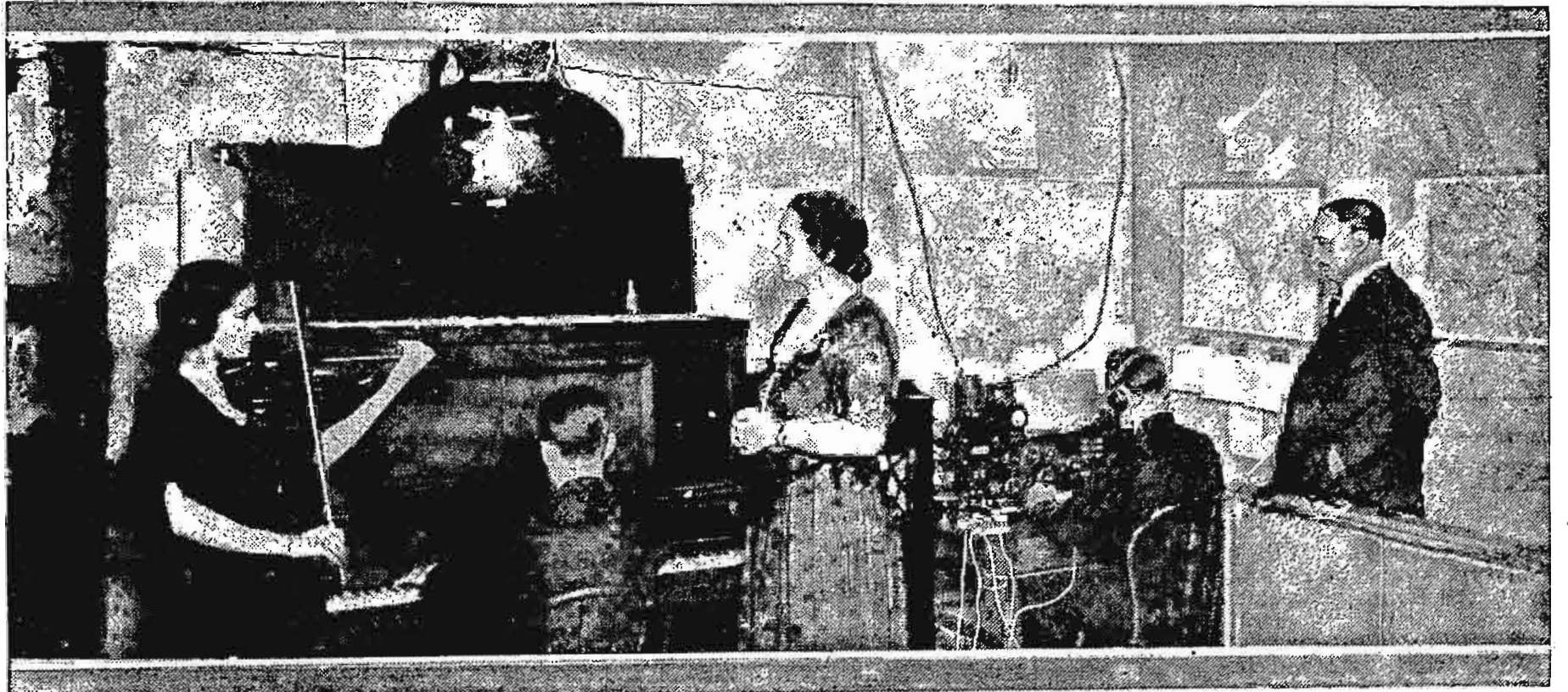
On the 5:15,
Hear the whistle blowin',
On the 5:15,
Boy, she's right on time,
On the 5:15,
Steamin' into Frisco,
Everybody's happy on the 5:15.

SUCH was the first musical selection radiocast by a Radio telephone transmitting station located at Cincinnati, Ohio, which station, it is believed, was actually the first placed in service for the express purpose of Radiocasting



Lt. H. F. Breckel

entertainment matter and the like for the benefit of the Radio public. This event occurred during the earlier part of the year 1920 and the above selection was the title of a phonograph record which was used during the testing of the apparatus while undergoing construction. Although not generally known, it is believed that this station, which operated under the call letters 8XB and later WMH, was actually the pioneer station in the field of Radiocasting in the United States and its conception was original with The Precision Equipment company, although the same thought or idea may have been conceived by others "theirs was the first Radiocasting station."



Broadcasting Station 8XB and later WMH, the first station specifically designed and operated for the express commercial purpose of broadcasting useful and entertainment matter for the benefit of the Radio public of the United States. It was conceived in 1919 and operated by the Precision Equipment company, Cincinnati, Ohio, now out of existence. The individuals in the photo are: at the piano, Luther J. Davis and two artists, Miss Dorothy Richards, violinist, and Miss Margaret Spaulding, soprano. Standing at the extreme right of the photo is John L. Gates, former president of the Precision Equipment company. Seated before the broadcasting equipment and operating it is Lieut. Harry F. Breckel, author of this article. WMH, on the air once more, is now operated by Ainsworth Gates company, Cincinnati.

How its establishment came about will be set forth below.

The station was owned and operated by The Precision Equipment company, now no longer in existence, which concern carried on the manufacture of Radio receiving and transmitting apparatus for sale to the Radio amateurs throughout the country. The demand for equipment of this sort was confined to a comparatively limited market, consisting of the telegraphing Radio amateurs who did not exist in sufficient numbers to warrant a steady production program and the business was at that time a very unstable one, to say the least.

The matter of stimulating interest in the art and thus creating a wider market

happened to come up at a more or less informal conference or rather discussion by members of the company and it was at this time that the writer recalled the great and un-disguised interest which had been manifested by those who had listened in to the Radio musical concerts which had been transmitted during the war by the United States Ship George Washington Radio telephone apparatus for the benefit of the destroyers and submarine patrol force at anchor in the harbor at Brest, France and the suggestion was made by the writer, "Let us Radiocast music" with the idea in mind that this procedure if adopted and carried out might stimulate the public's interest in the art and thus provide for a wider market for the sale

of Radio receiving apparatus and thus put the business on a much more stable plane.

The outcome was that it was decided to construct and install a Radio telephone unit for this express purpose, i. e., the Radiocasting of entertainment matter via Radio for the benefit of Radio fans. The station was located in the plant of The Precision Equipment company of which Mr. John L. Gates, was president. The actual designing, construction, installation and testing was carried out by the engineering staff of the company, comprising Mr. Thos. E. New and the writer. The first regular Radiocasts were transmitted under the experimental license call

(Continued on page 8)

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

Junior Audiophone
11-inch Bell

Baby Audiophone
With Fibre Horn

Price.....\$30.00 Price.....\$22.50 Price.....\$12.50



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



The GREBE SYNCHROPHASE

(Trade Mark)

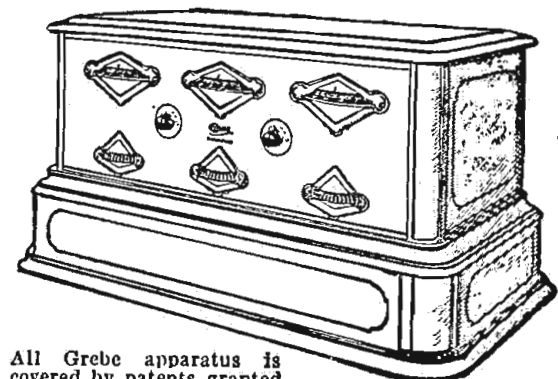
A BROADCAST Receiver that marks another long step forward in radio design and establishes a new set of standards in craftsmanship.

"It is only when the cold season comes that we know the pine and cypress to be ever-green."

—Confucius

In the coming cold season be not surpassed by thy neighbor—set the pace with your Grebe Synchronphase.

Doctor Mu



All Grebe apparatus is covered by patents granted and pending.

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

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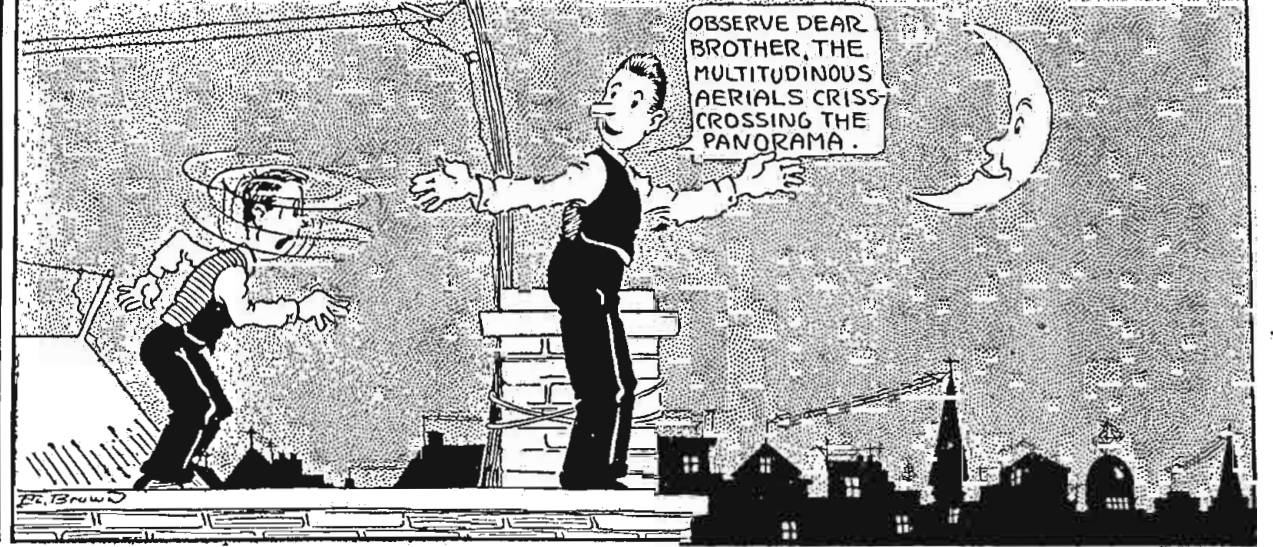
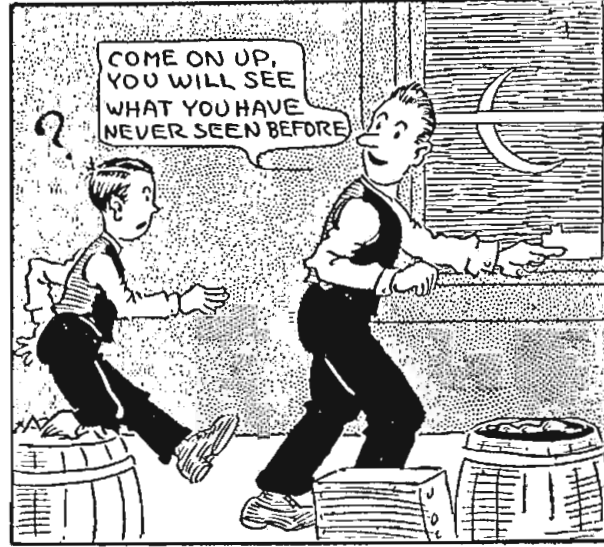
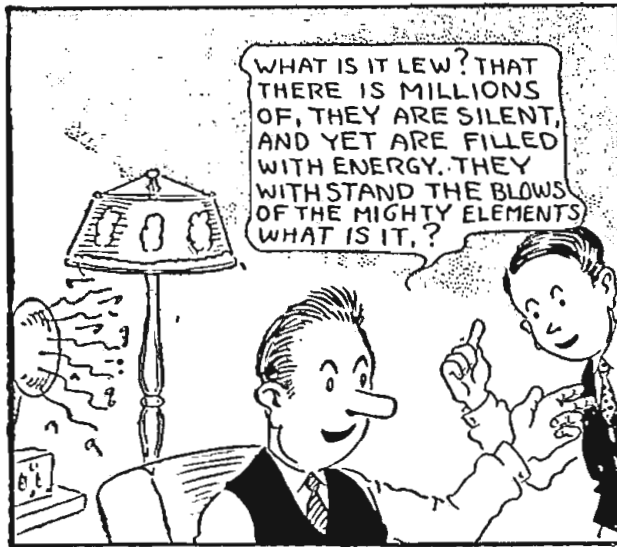
Richmond Hill, N. Y.

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

THE ANTENNA BROTHERS

Spir L. and Lew P.

Or Strap Hangers?



8XB, PIONEER STATION

(Continued from page 7)

letters "8XB" as at this time stations of this type were not interpreted as coming under the commercial classification and it was not until many months later that it was so classified and the call letters "WMH" were assigned it.

The art of Radio telephony was at that time still in comparative infancy and many difficulties were encountered before a rugged, practical unit was developed which would stand up under continued operation.

We were handicapped in attempting to design a high-powered unit at that time mainly because of the inability to secure vacuum tubes of the transmitting type.

The First Transmitter

The first transmitter incorporated four amplifier tubes connected in parallel, the filaments of which were supplied with current by a storage battery, the plate current being supplied by a high voltage B battery of high current capacity. The modulation circuit was of the so-called grid type, in which the voice frequency currents were impressed directly on the grid circuit of the oscillator tubes.

The "pick-up" device used for collecting the voice or music was of the simplest type, comprising a special microphone of the train dispatchers' type, which was fastened on the end of a large brass phonograph horn and which is clearly shown device was always used when Radiocasting selections rendered by groups of players, or singers, but for phonograph music only, the microphone alone was employed, as the volume of sound was great enough to properly react on the modulation circuit without using the horn to concentrate it.

Phonograph Records for First Concert

At the time of our first Radiocasts the art of Radio telephony was not generally known by the public to be in existence and in fact many of the amateurs were not aware that it had been developed to a point where it could be considered practical. Great was the surprise among those individuals with receiving equipment residing within range of the station when they happened to tune in on the proper wave length and heard the strains of music instead of the usual "di-da-di-da" of the "brass pounders" and their "rock crushers." Little or no publicity was given the earlier concerts, which were very much of an experimental nature, being held in connection with the testing of the apparatus during its designing, and the sole artist besides the engineer with his familiar (in those days) long, drawn-out, "Hello-o-o-o-o-o-1-2-3-4" to appear before the microphone, was the phonograph. It so happened that the record "On the 5:15" was the title of the first selection played and only the ether knows how many times it was played while tests in connection with the oscillation and modulation circuits were being conducted, it being considered impractical to change records while doing so, on account of their variance in volume of sound.

High Powered Station Built

The returns from our Radiocasting venture were so satisfactory in the way of increased demand for receiving equipment that it was decided to proceed with the installation of a higher powered equipment which would give the station a greater transmitting radius, this being done late in 1920, at which time more modern equipment was available. With the new station in use we were able to increase our range and it wasn't long before the public began to show an ever-increasing interest in this new and most modern diversion.

Of course, after preliminary experimental work in connection with the station was completed, we made every effort to get all the publicity possible through the medium of the local press and it is very amusing now to read some of the clippings which were taken from various local papers in those days, headed in big type and containing such statements as "Music Is Sent By Wireless for More Than a Mile"—

"Concert Given By Wireless"—"Phonograph Records Heard Ten Miles Away" and the prediction carried by one paper—"Radio Phones in Homes Soon."

Those of us who were instrumental in conceiving and introducing this now nationally, nay—internationally popular art of Radiocasting, little realized the wide-

spread effect the establishment of the first station would have on the public, and although it is no longer in existence, it served its purpose in bringing pleasure to thousands of listeners located within its range. And finally, it will go down in history as having been the first Radiocasting station conceived, designed and

placed in operation for the specific purpose of Radiocasting entertainment matter and the like, for the express benefit of the Radio listeners of the United States.

Radio hath its charms,
To bridge the empty space,
Bringing voices from afar—
Music—through the gloomy night.

It's Results that Count!

When you build a 5 tube tuned radio frequency receiver you want a set that does not oscillate and does not require laboratory testing before it can be of service.

**SELF BALANCED LOW LOSS
TUNED RADIO FREQUENCY KIT**

**WILL NOT
OSCILLATE**

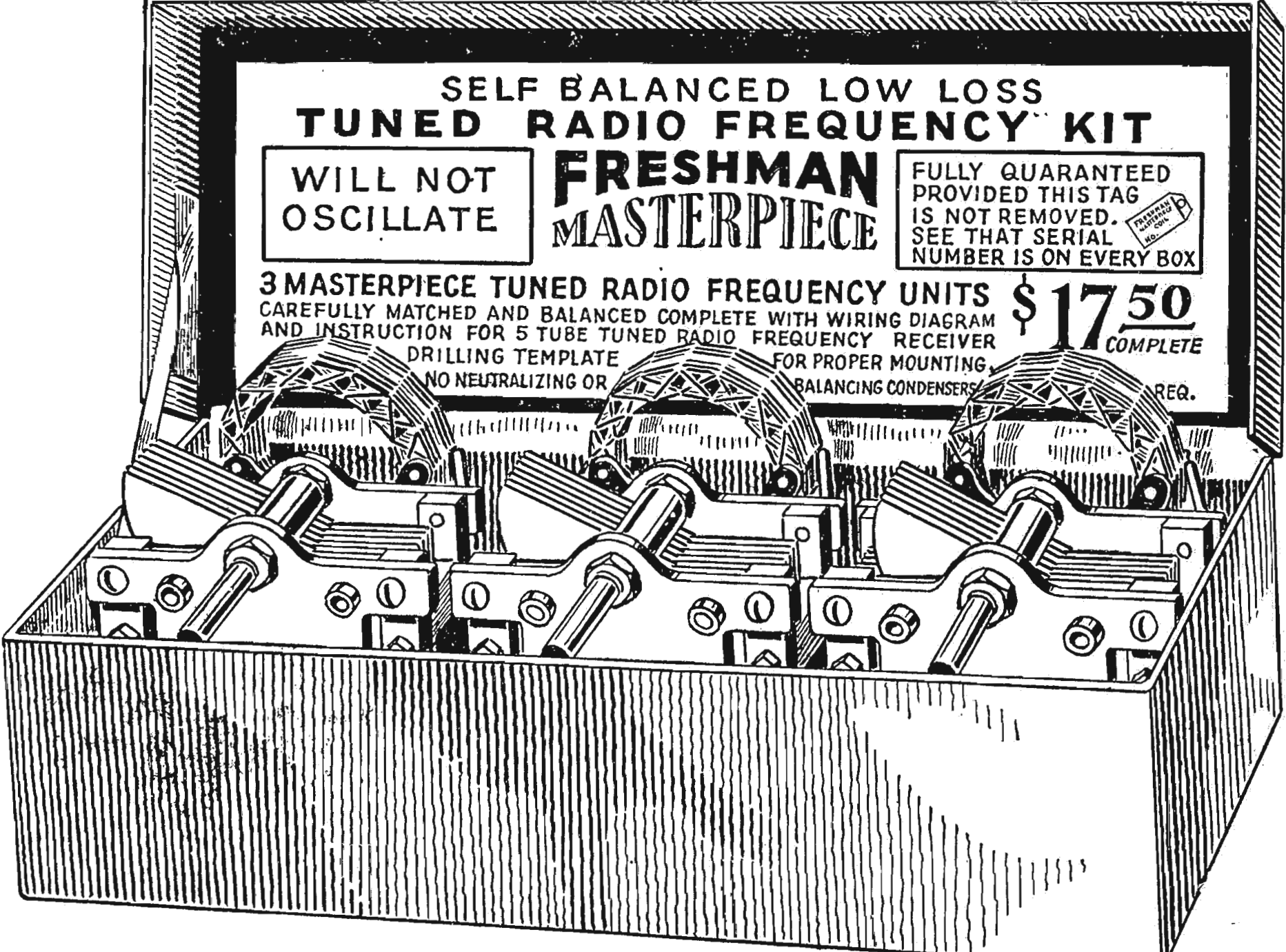
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3 MASTERPIECE TUNED RADIO FREQUENCY UNITS \$17.50

CAREFULLY MATCHED AND BALANCED COMPLETE WITH WIRING DIAGRAM AND INSTRUCTION FOR 5 TUBE TUNED RADIO FREQUENCY RECEIVER

DRILLING TEMPLATE FOR PROPER MOUNTING
NO NEUTRALIZING OR BALANCING CONDENSERS REQUIRED



NO NEUTRALIZING OR BALANCING CONDENSERS REQUIRED

With these marvelous units you can easily build a five tube tuned Radio Frequency Receiver that will be highly selective as well as a remarkable distance getter, bringing in all stations with pleasing clarity and volume.

Kit consists of 3 Masterpiece Tuned Radio Frequency Units carefully matched and balanced. Complete with wiring diagram and instructions for building any 5 tube tuned radio frequency receiver and also drilling template for proper mounting

\$17.50

Each and every Freshman Masterpiece Coil bears a serial number and Trademark—our guarantee of electrical and mechanical perfection. Every genuine Freshman Coil is made of specially insulated wire to prevent short-circuiting, so often caused by inferior coils. For your protection demand only the genuine. At your dealers, otherwise send purchase price and you will be supplied without further charge.

CHAS. FRESHMAN CO., INC., 106 Seventh Avenue, New York City

Helpful Hints to Get Most From Radio

Chapter III—Radio Inductance and Tuning

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 IV—Radio Inductances and Tuning, Part 2.
- Chapter V—Variable Condensers.
- Chapter VI—Crystal and Tube Detectors.
- Chapter VII—Sockets and Rheostats.
- Chapter VIII—Grid Leaks and Biasing.
- Chapter XIX—Jacks and Switches.

THE sole purpose of the tuning elements in a Radio receiving set is to separate the currents induced in the aerial by Radio waves from the various broadcast stations so that the impulses from any desired station may act upon the detector and amplifiers to the exclusion of all others. The selectivity of a tuner is a measure of its ability to completely eliminate all unwanted signals and to permit only desired impulses to be reproduced.

Since the Radio waves are transmitted at differing wave lengths the length of time elapsing between successive waves striking the aerial will vary and consequently the frequency with which an impulse is given the aerial will differ with each broadcast station. A tuner is simply a sort of filter that will permit currents of a certain frequency to flow freely in the circuit, and damp out or offer high resistance to currents of a higher or lower frequency.

Tuning with Inductances and Capacities
Tuning is accomplished by means of inductances and capacities. Inductance is that property possessed by all conductors but more marked so when they are wound in the form of a coil of adding what might be termed electrical inertia to the circuit they are connected into.

The effect of the inductance is to oppose any change in the current flowing through the circuit. Thus when they are connected into a circuit carrying high frequency currents that are alternating in direction of flow, when the current tends to decrease the lines of force around the coil collapse and induces a current in the coil in the same direction as the current in the coil, thus opposing the decrease in current.

When the current is increasing and the magnetic field of the coil building up the current induced in the coil is in opposition to that flowing in the coil and again opposes the increase of current. As the frequency of the currents in the circuit is increased the strength of the opposing currents becomes greater.

The effect of a condenser in a circuit is somewhat different. Whereas an inductance causes the current to lag behind the exciting voltage a capacity tends to make the current lead the voltage. Just how this effect is obtained will be described in a succeeding chapter, the point to be considered here is that the two characteristics are so balanced against each other that a circuit containing both inductance and capacity will have a certain time period of oscillation. That is, the circuit will pass freely a current of a certain frequency and damp out those of a different frequency.

Forms of Inductances

Inductances take many forms, some good and some bad, but to obtain highest efficiency an inductance must meet certain conditions. It must have a low ohmic resistance, have a low distributed capacity and also a low high frequency resistance.

To meet the first condition, fairly heavy wire must be used in winding them. Number 24 gauge is the smallest size that should be used while the larger sizes are to be preferred.

The distributed capacity depends upon the method of winding the insulation on the wire and the binder used to hold the turns together. Since a capacity always exists between two conductors each turn in a coil forms a tiny condenser with the turns adjacent to it. It is the capacity between the turns of an inductance that forms the distributed capacity in an inductance. It is reduced by spacing the turns of wire.

When the wire is wound on a plain coil the kind of insulation on the wire affects the distributed capacity, therefore enameled wire should not be employed for winding unspaced inductances, while the practice of painting the windings with shellac likewise increases the distributed capacity. The effect of distributed ca-

capacity is to broaden the tuning and materially reduce the selectivity.

The high frequency resistance of an inductance is affected by the method of supporting the winding and the substances within the magnetic field of the coil.

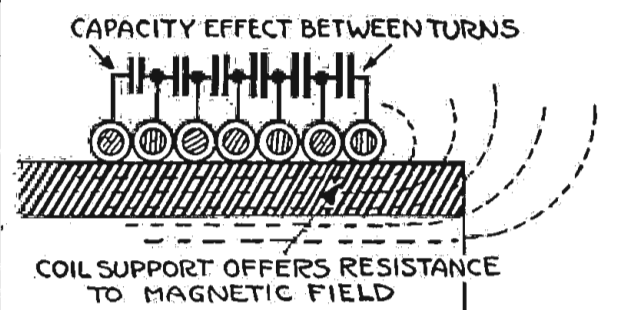


Figure 5—Detail of cross section of plain inductance showing source of losses.

Since an inductance carrying a Radio frequency current is surrounded by a magnetic field that is constantly changing in intensity the lines of force around the windings must have a free path for their flow.

Various materials used for supporting inductance offer resistance to the passage of these lines of force and cause hysteresis

losses, which have the effect of increasing the resistance of the inductance at high frequency.

The importance of the above factors cannot be overlooked, for it is impossible to obtain sharp tuning and selectivity with inductances that have a high resistance due to the use of fine wire on supports of materials that absorb energy.

Winding Inductances

We shall now consider the various methods of winding inductances with their advantages and disadvantages. The simplest inductance is made by winding a single layer of wire on a tube. Even when large size wire is used in this type of winding there remain losses due to distributed capacity and the hysteresis loss in the tube supporting the wire. This form of inductance is the most common, but is being rapidly replaced by the other types which are more efficient.

For plain coils it has been found that well shellaced or paraffined cardboard tubes are better than bakelite or fiber. The former has a high hysteresis loss at all times, while the latter absorbs moisture and acts with the result that eddy current losses develop. Hard rubber is excellent, but the best form of inductance

is one that has no solid support. The source of losses in a plain inductance are illustrated in Figure 5.

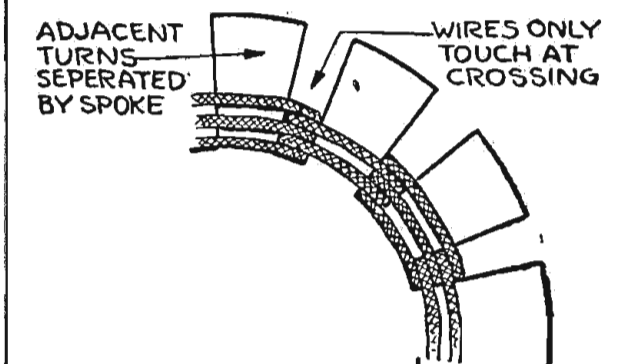
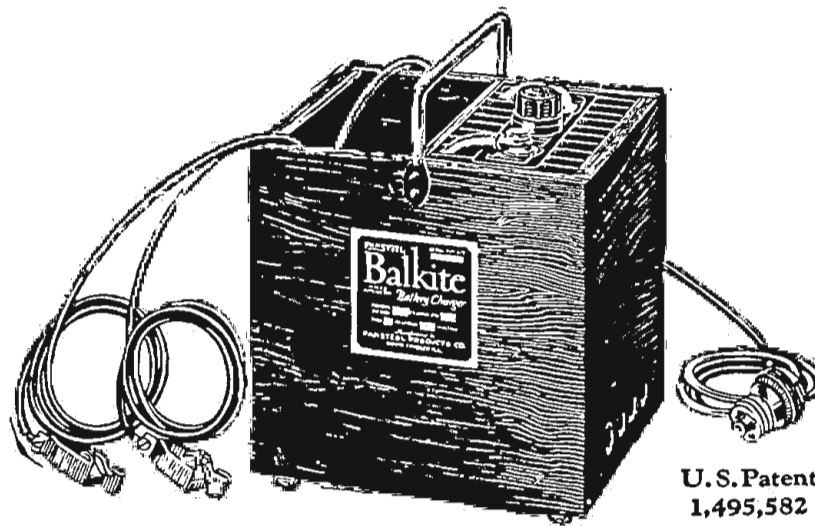


Figure 6—Detail of spider web showing how distributed capacity is reduced by increased spacing between wires.

The honeycomb or duo-lateral coils were designed to reduce distributed capacity by separating the wires and still keep the inductance compact. The winding is therefore more efficient and gives good tuning qualities and makes a very convenient inductance for certain purposes. The practice of binding them with

(Continued on page 10)

TESTED AND LISTED AS STANDARD BY UNDERWRITERS' LABORATORIES



U. S. Patent 1,495,582

This noiseless, bulbless battery charger can be used while the set is in operation

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.

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FANSTEEL
Balkite Battery Charger
Price \$19⁵⁰
West of the Rockies \$20 • In Canada \$27⁵⁰

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

Table with columns for 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 for Meters Call, listing stations and their corresponding wave lengths.

GET MOST FROM RADIO

(Continued from page 9) a fiber strip is very poor, simply tying them to the mounts is far better. The spider web inductance was next introduced and met with popularity chiefly because of its ease of construction as compared to the honeycomb coils, which invariably require a machine for their proper winding. As shown in Figure 6, the distributed capacity is kept down by spacing the wires on opposite sides of the spokes of the web with a gain in tuning qualities, but the hysteresis losses were retained. They can be eliminated when heavy wire is used for the winding by cutting the spokes where they join the

center piece and withdrawing them after the wires are bound together with cotton thread. This makes a very efficient winding when mounted clear of other apparatus.

Low Loss Coil

The so-called low loss coil is really a tubular spider web made by setting a number of pegs, always an uneven number, in a circle and winding the wire in and out around the pegs. After winding, the coil is tied together and removed from the form. There are a number of ways the wire can be wound around the pegs, but the result from the viewpoint of efficiency is always the same. A practically perfect inductance, almost free from distributed capacity with no hysteresis losses. These advantages cannot be retained if the coil

is mounted close to other masses, particularly if they are conductors, so all inductances should be kept in the open as much as possible and not mounted flat against the panel or base or placed around condensers. (In the next chapter the various methods of combining inductances to form the instruments used in the modern Radio receivers to achieve the best results will be considered.—Editor's Note.)

Recharging Dry Cells When your dry cells go dead bore two holes in the top of the cell, on opposite sides of the center connection, each 1/4-inch in diameter and 3 inches deep. Fill these holes with cider vinegar or a 20 per cent solution of sulphuric acid and water, then plug up the holes with paraffin wax to prevent evaporation. A dry cell may be charged several times in this manner.

M-B-G RADIO CABINETS ARE NEAT. Includes images of radio cabinets (Cabinet No. 29, Cabinet No. 31) and descriptive text about their features and pricing.

ALL-AMERICAN and Reflex. CIRCUIT after circuit—panel after panel—we have all striven during the past year for the ultimate arrangement of wires and connections which would give us the best radio reception, and at the end of our search we find what the unprejudiced authorities of radio practically agree on today—that with a few exceptions one circuit is about as good as another; difference in performance between various sets having the same number of tubes depends chiefly on the design, quality and arrangement of the parts of the set. ALL-AMERICAN presents in addition a one-tube reflex receiver of highest quality, opening up wonderful possibilities of distance reception in the loudspeaker—placing within easy reach of every man's purse the joys of "travel by radio."

FOOTBALL GAMES BROADCAST SATURDAY

Wednesday, October 1

Silent night for: CKAC, KGO, WAAW, WFAA, WFI, WGY, WIP, WJY, WMC, WOAW, WRC.

CKAC, Montreal, Can. (Eastern, 425), 1:45 p. m., Mount Royal Hotel luncheon concert.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 12:15 p. m., Daugherty's orchestra; 8:15, dinner concert, KDKA Little Symphony orchestra; 7:15, children's period, Wimble, the Wanderer and his story-cap; 8:30, KDKA Little Symphony orchestra; Alice King, soprano; George L. Arms, baritone.

KFAE, Pullman, Wash. (Pacific, 330), 7:30 p. m., Agnes Dills, soprano; Vay Kerns, contralto; "How to Study," Dr. G. Allen Coe; "Typhoid Fever," U. S. Public Health service; "Tacking Bees for Winter," B. A. Slocum; "Buying Hogs from Responsible Parties," Prof. R. T. Smith.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., detective talks; vocal concerts; 7:30-8, "Mammy" Simmons and Crosby sisters; 8-9, Evening Herald, Kennedy broadcasters; 9-10, Examiner studio program; 10-11, Hollywoodland community orchestra; 11-12, Ambassador Hotel Coconut Grove orchestra.

KFKB, Milford, Kansas (Central, 236), 7:20 p. m., "College of the Air," Kansas State Agricultural college; 7:30, "Burner" and Other Equipment Needed in Using Oil as Fuel," J. P. Calderwood; 7:45, "Sources of Water Supply for the Farm Home," H. B. Walker; 8, KFKB, orchestra; 8:30, "Examination of Patents," Dr. J. R. Brinkley; 9, KFKB musical program.

KFNF, Shenandoah, Ia. (Central, 266), 7:30 p. m., concert, Shambaugh, Lewis E. Howard, director.

KFOA, Seattle, Wash. (Pacific, 455), 12:30 p. m., luncheon program, Seattle Rotary club; 8:30, International Cyro club, Stanley Barker, director; Vaughn Jones, Welsh tenor; Rodney Dunbar, baritone; "The Principles of Gyro," Stanley Barker.

KFSG, Los Angeles, Calif. (Pacific, 278), 2:30-4:30 p. m., auditorium service, organ; congregational singing; prayer; testimonies; "Deeper Bible teachings on Divine Healing," Almee Semple McPherson; altar call; 6:30-7:30 Gray studio children's program, Mrs. Edward Hughes, Eagle Rock, assisted by her daughters, Mary Elizabeth and Betty; Mrs. Rose, pianist-accompanist and other artists.

KGO, Oakland, Calif. (Pacific, 312), 3 p. m., musical program, Cora L. Williams Institute speaker; 4-5:30, concert orchestra, Hotel St. Francis.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., talk, Jeanette P. Cramer; 8, concert; 10, dance music, George Olsen's Metropolitan orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., concert; garden talk, Fred C. McNabb of Aggeler & Musser Seed company; 6-6:30, Art Hickman's concert orchestra, Edward Fitzpatrick, director; 6:30-7:30, children's hour, "American History," Prof. Walter Sylvester Hertzog; Dick Winslow, screen juvenile and reporter; bedtime story, Uncle John; 8-10, lecture, Dr. H. F. Baumgardt; concert, the Piggly Wiggly Girls; Maude Burnett, soprano; 10-11, Art Hickman's dance orchestra, Earl Burnett, director.

KLX, Oakland, Calif. (Pacific, 509), 8-10 p. m., Berthe Andre, Rodrigo Kern; Gerard Tallandier, pianist; Grover Rosentreter, banjoist; Norman Deans, guitarist; American theater orchestra.

KPO, San Francisco, Calif. (Pacific, 423), 1-2 p. m., Rudy Selger's Fairmont hotel orchestra; 2:30-3:30, Garry Fisher's Amphions of Calabria cafe; 4:30-5:30, Rudy Selger's Fairmont hotel orchestra; 5:30-6:30, children's hour stories, Big Brother of KPO; 7-7:30,

Headliners of the Week

CLEVELAND artists will be given an opportunity Wednesday night to have their own compositions heard as far as Radio waves will take them and there are Radiophans to listen in. The symphony of Walter Logan, the ballads of Ruth King, and the songs of Carl Rupp are all very fine. Later on if you have not heard the new Boston Station WEEI tune in for Dok Eisenbourg and his Sinfonians.

Thursday, Senor Manuel Rodriguez, the famous Spanish tenor will appear at WQJ, Chicago. Dream of old Castilian romances and fair senoritas.

KFI will give an American Indian program Friday. Chief Yowlache, whose baritone voice has charmed more than one Radiophan, will be the leading soloist. By the way, if you enjoy a good crook play do not neglect WGY tonight. "Silence," will be given by the WGY players. This is an old fashioned melodrama and as WGY employs many stage properties, it promises many thrills.

Three football games are scheduled for Saturday afternoon and perhaps many more will be broadcast. WSAI will give the details of the Cincin-

nati university-Georgetown college game; WCAP, the game between the teams of the U. S. Marines and the Catholic university of Washington, D. C.; and WEAO, the Purdue-Ohio game.

Sunday morning while mother and father are away at church two special programs are listed for the little folks. Uncle Walt will read about himself and the rest of the comics of WGN, and WJZ will give a regular children's hour of original stories and music.

Girls here is a tip. Dial for WHN Monday and get the latest on the new pointed bob. Who said the hair would be long this winter?

WIP has a new feature of unusual interest to listeners in. It is to be known as the "WIP Magazine" and will be Radiocast every Tuesday evening at eight o'clock. It will consist of talks on city management, science, Radio, the theater, and current events. When sufficiently wise to last another week, hop on the dial for WSB, Atlanta. As usual this station has something new, a snappy paraphrase of the comic opera, "Oh Boy," to be given by the Lyric theater players.

8-8:30, Chas. Magnoute, accordion player; 8:30-8:45, Sylvia Schacter, pianist; 8:45-9, S. LeRoy Fisher, baritone; 9:15-9:30, "Building American Sportmanship," Dr. John H. Finley; 9:45-10:15, Critterton Idle Hour orchestra.

WEAO, Columbus, Ohio (Eastern, 360), 9 a. m., music, Marguerite Manley Siedel School of Music talent; 11 a. m., music, Stedel School of Music talent; 1:30 p. m., music, Stedel artists; 4 p. m., farm talk, Ohio State university faculty member; music, Stedel artists.

WEBB, Chicago, Ill. (Central, 370), 7-8 p. m., Otto Moore, baritone; poems, Robert Bonell; Ferdinand Steindel and his orchestra; Arnes McLaughlin, musical readings; 9-10, Langdon brothers, Hawaiian steel guitarists; Marie Kelly, reader; Ferdinand Steindel and his orchestra; Cyrus Reed, saxophonist; Albert M. Tilton, Jr., tenor; 11-12, Ferdinand Steindel and his orchestra; Paul Locker, tenor; Ferdinand Steindel, pianist.

WEEI, Boston, Mass. (Eastern, 303), 12 m., luncheon music, Dok Eisenbourg and his Sinfonians; 2 p. m., music, educational talk; 8, Navy night, 40 piece naval band.

WFAA, Dallas, Tex. (Central, 476), 12:30-1 p. m., musical program, Dallas theater.

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

WGN, Chicago, Ill. (Central, 370), 1:40 p. m., luncheon concert, Drake concert ensemble; Blackstone string quintet; 2:30, rocking chair hour, features for women; 5:30, Skeezix time, Sen Kaney; 6:30-7:30, dinner concert, Drake concert ensemble; Blackstone string quintet; 8:30-9:30, Helen Wilson, soprano; Leola Alkman; Fred Agaard; 10:30-11:30, Jack Chapman dance orchestra.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1 p. m., George Albert Bouchard, organist; 6:30-7:30, dinner music; 9-11, concert, New York Drugless Practitioners' society, Mrs. Ursula Dietrich Hollinshead, director; 11, supper-dance music, Vincent Lopez Hotel Statler orchestra, Harold Gleser, director.

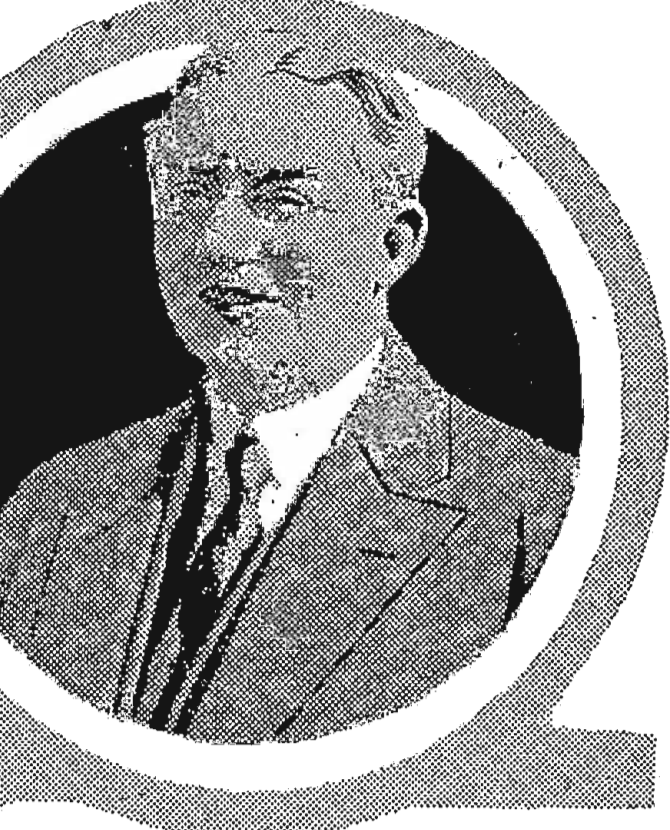
WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., Alamo theater orchestra; 7:30-9, Tropical Hawaiian quintet, Frank Plada, Mrs. Frank Plada, Merritt Lamb, Joseph Scabaros, Clarence Young; Fred Hughes, baritone.

WHB, Kansas City, Mo. (Central, 411), 2-3 p. m., ladies' hour program, Sweeney Radio orchestra; 7-8, program, Congress of Parents and Teachers, "Free School Aid Circles," Mrs. Paul F. Cope; "State Convention," Mrs. W. A. Garnett; piano solos, Francis Kayne; music, Sweeney Radio trio.

WHN, New York, N. Y. (Eastern, 360), 2:15-2:45 p. m., Jimmy Clarke and his entertainers; 2:45-3:15, Al King's Original Louisiana Five; 3:45-4, Mildred Van Vleet Feldman, pianist; 4:15-4:30, Signor Landino, tenor; 4:30-4:45, "Americanism," May M. Goderson; 5-5:30, California syncopators; 6:30-7:15, Olcott VMI's trio and Paul Specht's Alamac orchestra; 7:30-7:45,



Mariann Manship, a young singer of unusual personal charm and marked ability, will sing at WLW, Cincinnati, Wednesday, October 1. She has been asked to be the soloist of two orchestras.



Charles T. Isaacson's travelogues will be a weekly feature at Station WFAF, New York. As he has traveled around the United States in a Packard car, these Tuesday evening talks promise to be worth while. Clifford W. Barnes (above) is the president of the Chicago Sunday Evening club which will be broadcast again this fall by KYW. The first meeting will be Sunday, October 5.

Rudy Selger's Fairmont hotel orchestra; 8-11, E. Max Bradfield's Versatile band; "Vocational Education for Your Boy and Mine," William T. Elzing.

KQV, Pittsburgh, Pa. (Eastern, 270), 9-10 p. m., artists' program, Morgan Miller, baritone; Mrs. Morgan Miller, pianist; Ford Miller, bass-baritone; Mary Fisher, soprano.

KSD, St. Louis, Mo. (Central, 546), 6:45 p. m., Abergh's concert ensemble; Arne Arnsen, violinist; 9, studio recital, Margaret Chapman Byars.

KYW, Chicago, Ill. (Central, 536), 10:35 a. m., table talk, Mrs. Anna J. Peterson; 6:35-7, children's bedtime story, Uncle Bob; 6-6:30, dinner concert, Congress hotel; 6:30-7, Duncan Sisters Music Publishing company; 7-7:30, Sherwood Music school, Ruth Lathrop, director; 7:30-7:45, around the town with KYW in Chicago; 7:45-8, musical; 8:05, "Good Roads," Chicago Motor club; 8:15, "Better Lighting," William A. Durgin; 8:45-11:30, midnight revue.

WBAP, Fort Worth, Tex. (Central, 476), 7:30-8:30 p. m., Frenley Moore's Black and Gold Serenaders orchestra; 9:30-10:45, concert, Will Foster, organist.

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

WBBR, Staten Island, New York (Eastern 273), 8 p. m., Frances Mayer, soprano; 8:15, "Progression of the Divine Plan," Bible study; 8:45, Frances Mayer.

WBZ, Springfield, Mass. (Eastern, 337), 6 p. m., dinner concert, WBZ trio; 7:10, address, Leland Livermore; 7:20, information concerning Civil Service examinations; 7:30, bedtime story for the kiddies; 7:40, WBZ trio; Arthur S. Cann, tenor; Mrs. Eleanor Turner LaZizzera, accompanist; 9, Minnie Stratton Watson, director; Ethel Wolcott Ross, soprano; Alessandro Noccoti, violinist; Frank Watson, pianist; Ramon Heald, tenor.

WCAE, Pittsburgh, Pa. (Eastern, 462), 3 p. m., Fred Rosenfeld, pianist; 6:30, Dinner concert, William Penn hotel; 7:30, Sunshine girl; 8:30, musical program.

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

WCAP, Washington, D. C. (Eastern, 469), 7:30-9 p. m., music; 9-9:15, "Science News of the Week;" 9:15-9:30, music, 9:30-9:45, short address, on the political aspect, Republican National committee; 9:45-10, music.

WCAV, Milwaukee, Wis. (Central, 266), 6:30-7:30 p. m., musical program, sponsored by the Boston store; Hazel Cullen, violinist; Cecelia Cullen, pianist; Myrtle Spangenberg, soprano; Teddy Corraggio, piano accompanist.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 6, dinner concert; 8:30, musical program.

WDAF, 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; address, auspices, Health Conservation association; address, speaker from the Meat Council of Greater Kansas City; the Tell-Me-a-Story lady; music, Fritz Hanlein's Trianon ensemble, Hotel Muehlebach; 8-9:15, program arranged and presented by Amy E. Winning; 11:45-1 a. m., Nighthawk frolic, the Plantation players, Hotel Muehlebach; Eddie and Bobbie Kuhn's K. C. A. C. orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., dully almanac; 12:02 p. m., Stanley theater organ recital; 12:30, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; 4:30, Edna Finestone, pianist; 7:30, Dream Daddy's bedtime stories; 8:20, play, Walnut street theater; 10, Howard Lanin's Arcadia cafe dance orchestra.

WEAF, New York, N. Y. (Eastern, 492), 11-11:30 a. m., musical program; 11:30-11:45, young mothers' program; 4-4:45 p. m., Moonlight instrumental trio; 4:45-5, Christopher Meehan, tenor; 6-7, dinner music, Waldorf-Astoria; 7:45-8, services, United synagogues; 7:30-8, Poyet sisters; 7:45-8, talk, American Agriculturist;

heart to heart talk with Emily; 7:45-8, Al Raymond and his orchestra; 8:10-8:20, "Atonement," Rabbi Isidor Goodman; 8:20-8:30, Cantor Isidor Lauer "Val Yday Azodecha;" 8:30-8:45, Fitzpatrick brothers; 8:45-9, boys' period, Kiwanis club; 9-9:15, Alfred Dulin, pianist; 9:15-9:30, Vincent Lane, tenor; 9:30-10, Gem Safety Razor orchestra; 10-11, Clover Gardens orchestra.

WHO, Des Moines, Ia. (Central, 526), 7:30-9 p. m., Bankers Life Radio orchestra; Eleanor Daniels, pianist; Cornelius Ahern, baritone; Dixie stars, Al Bernard & Russell Robinson.

WIP, Philadelphia, Pa. (Eastern, 509), 1 p. m., Glnbel Brothers' tea room orchestra; 6, Walter Schmidt's dance orchestra; 7, Uncle Wip's bedtime stories.

WIAR, Providence, R. I. (Eastern, 360), 10 a. m., Mrs. Wood; 10:45, McCall talk; 1:05 p. m., studio program; 7:30, program, New York, WEAF.

WJZ, New York, N. Y. (Eastern, 455), 10-10:10 a. m., "Housewives League Daily Menu," Mrs. Julian Heath; 10:10-10:25, "Household Equipment," Ethel R. Peyer; 10:25-10:40, "Introducing Mr. Steer," John C. Cutting; 10:40-10:50, Tribune Institute, Bertha Baldwin; 10:50-11, Eleanor Gunn's fashion talk; 4-5 p. m., specialty numbers; 5:30-6:30, New York stock exchange reports; 8-8:10, Wall Street Journal review; 8:10-8:30, Max Kalfus, tenor; Keith McLeod, accompanist; 8:30-8:45, educational talk; 8:45-9, Max Kalfus, tenor; 9-10, specialty numbers; 10:30-11:30, Billy Wynne's Greenwich Village Inn orchestra.

WLS, Chicago, Ill. (Central, 345), 12-1 p. m., Sears-Roebuck 4 Aces of harmony; "The Billion Dollar Bug Bite," Prof. L. Haseman; 6:30, Ralph Emerson, organist; 7, Isham Jones and his College Inn orchestra; 7:15, Vivian McCarthy, contralto; 7:30, Isham Jones and his College Inn orchestra; 7:45, lullaby time, Ford Rush, Glenn Rowell; 8-9, Radio questions and answers, Matt Friedman; "The Farmer and his Insect Foes," Prof. L. Haseman; "Co-operative Livestock Marketing," Charles Stewart; 9, Isham Jones' orchestra; 9:15, WLS' trio of Lone Scouts; 9:45, Mailee and Little; 10, "Poem Period," H. D. Sadder; 10:15, Edward Overton, tenor; 10:30, Isham Jones and his College Inn orchestra; 10:40, Ford and Glenn time.

(Continued on page 12)

WGY PLAYERS IN CROOK PLAY; FA

Where to Hear Concerts

Central Standard Time

THESE are the stations for music lovers to dial, and you can hear, providing you dial correctly and read the programs carefully, everything from jazz to opera.

Wednesday: 6, WBY, WDAF, WMAQ, WVJ; 6:30, KYW, WBAF, WCAP, WFAF, WJAR; 6:45, KSD, WTAY; 7, KYW, WBBR, WFAF, WEEI, WHB, WHK, WHN, WTAM; 7:30, KDKA, KFNF, WBAF, WCAE, WCX, WHAS, WHN, WOO; 7:45, KYW, WBBR; 8, KFKE, WBZ, WCB, WDAF, WHN, WOC; 8:15, WCAP; 8:30, KHJ, WGN; 8:45, KFI, KYW, WFAF; 9, KFKE, KSD, WLW, WOR, WTAY; 9:15, WLS, WMAQ; 9:30, KFAE, KFI, WMH; 10, KFI, KGW, KHJ, KLX, WQJ, WSAI; 10:15, WLS, WTAY; 10:15, WLS, WTAY; 10:45, WLS, WSB; 11, KFI, WSAI; 12, KFI.

Thursday: 6, WDAF; 6:30, WFAF, WLS; 6:45, KSD, WBZ, WLS, WRC, WTAY; 7, CNRM, WFAO, WEEI, WGY, WHK, WJAX, WQJ, WRC; 7:15, WJAR; 7:20, KYW; 7:30, KDKA, KFNF, WAAW, WBZ, WCAE, WCX, WHAS; 7:45, WRC; 8, KFKE, KHJ, WBBR, WCB, WFAF, WHB, WMH, WSB; 8:30, WBAF, WFAA, WFI, WGN, WMC, WMH, WRC; 8:45, KFI, WHN, WBBR; 9, KFKE, KYW, WCAE, WOA, WOC, WTAY; 9:15, WMAQ; 9:30, WGY; 10, KHJ, KPO, WLW, WQJ; 10:15, WLS, WTAY; 10:30, KDKA; 10:45, WLS, WSB; 11, KFI, KPO, WFAA, WLW; 11:30, WLS; 12, KFI, WLS, WOA.

Friday: 6, WDAF, WWSJ; 6:30, KYW, WCAP, WFAF; 6:45, WBZ, WLS, WTAY; 7, CNRT, KDKA, WBAV, WEEI, WGY, WJAR, WQJ; 7:15, WLS; 7:30, KDKA, KFNF, WBAF, WCAE, WCX, WHAS, WHO; 7:45, WFAF, WLS; 8, KFKE, KQV, KSD, WAAW, WCAP, WDAF, WOC, WSAI; 8:30, KYW, WFAA, WGN, WMAQ, WMC, WOO; 8:45, KFI; 9, KFKE, WMAQ, WOA; 9:15, WLS;

9:30, KFAE, WBAF, WLS; 9:45, KYW; 10, KFI, KHJ, KLX, WBZ, WDAF, WQJ; 10:15, KGW; 10:45, WLS, WSB; 11, KFI, WMC; 12, KFI; 12:30, KGW.

Saturday: 6, WDAF, WJAR; 6:30, WFAF; 6:45, WBZ, WRC, WTAY; 7, KSD, KYW, WBBR, WHN, WQJ, WRC; 7:15, WBZ, WFAF; 7:30, KDKA, KFNF, WAAW, WCAE, WHAS; 7:45, WBBR, WHN, WRC; 8, KHJ, WFAF, WHK, WHN, WLS, WMAQ, WRC, WSB; 8:30, KYW, WBZ, WFAA, WGN, WHN, WMC; 8:45, WHN; 9, WHN, WOA, WOC, WMAQ, WTAY; 9:30, WHN, WOR; 9:45, WHN; 10, KFI, KGO, KHJ, WIP, WMH, WQJ; 10:45, WSB; 11, KFI, WJAX, WMH, WOA; 12, KFI, KFKE, WCAE; 12:30, WGN.

Sunday: 6:20, WFAF; 6:30, KFNF, WEEI; 7, WLS; 7:15, WJY; 7:30, CKAC, WHO; 8, WHK, WQJ; 8:15, WFAF; 8:45, WLW; 9, WFAA; 9:15, WGN; 9:30, CKAC; 10:30, KPO.

Monday: 6, WCX, WDAF; 6:30, WFAF; 6:45, WFAF, WGY; 7, WHB, WTAM; 7:30, WAAW, WBAF, WHO; 8, KFKE, KQV, WCB, WDAF, WHAS, WMH, WSB; 8:30, WFAA, WMC; 8:45, WOR; 9, KFKE, WHN, WLW, WOA, WOC; 9:30, KFAE, WBAP; 10, KGO, KLX, KPO, WSAI; 10:45, WSB; 11, KPO, WHN.

Tuesday: 6, WDAF, WMAQ; 6:30, WJAX; 6:45, WFAF, WGY, WTAY; 7, WFI, WQJ, WRC; 7:15, WFAF; 7:30, KFNF, WCX, WFAF, WHAS, WSAI; 7:45, WRC; 8, KFKE, WFAF, WHB; 8:20, WRC; 8:30, WFAA, WGN, WMC; 9, KFKE, WOA, WSAI; 9:30, WBAP; 10, KGO, KPO, WQJ; 10:10, WLW; 10:45, WSB; 11, WMC.



William L. Marsh is the director of the Bankers Life Radio orchestra which broadcasts through WHO, Des Moines, every Wednesday night.

Wednesday, October 1

(Continued from page 11)

WLW, Cincinnati, Ohio (Central, 423), 8 p. m., Virginia entertainers; 9, Formica band, Walter Esberger, director; Marian Manship, oboist.

WMAQ, Chicago, Ill. (Central, 447.5), 1 p. m., talks, Chicago Association of Commerce luncheon; 4:10, beauty talk, Mme. Grace Earl; 4:30, program; 6, Chicago theater organ recital; 6:30, stories for children, George Faulkner; 8, weekly lecture, Northwestern University; 9:15, music; 9:45, talk, Chicago charities.

WMC, Memphis, Tenn. (Central, 500), 8 p. m., program, St. John's quartet.

WMH, Cincinnati, Ohio (Central, 309), 8 p. m., Goodrich Lubliner company's Silvertown orchestra; 9, "The Romance of Radio," George W. Platt; piano solos, Mary Frederic Nieman; 9:30, bandoneon solos, Herman Maurer; soprano solos, Hanna Y. Loose, Werner Bertrau, accompanist; 10, Jimmy Deering's Rainbow orchestra, Joe Reuzehauser, director.

WOC, Davenport, Ia. (Central, 484), 12 m., chimes; 7 p. m., sandman's night, Val McLaughlin; 8, Erwin Spindell, organist; Howard A. Carroll, tenor.

WOO, Philadelphia, Pa. (Eastern, 509), 11 a. m., Mary E. Vogt, organist; 12:02 p. m., Wanamaker crystal tea room orchestra, Robert E. Golden, director; 4:45, Mary E. Vogt, organist; 7:30, A. Candelori's concert orchestra from Hotel Adelphi; 8:30, organ recital, Harriet G. Ridley; 9, J. W. C. I. band concert; 9:30, WOO orchestra; Robert E. Golden, director; 10, Hotel Adelphi's roof garden dance orchestra.

WOR, Newark, N. J. (Eastern, 405), 7-8 a. m., WOR morning gym class; 2:30-2:45 p. m., Marjorie J. Coddell, soprano; 2:45-3, Elsie Feldman, pianist; 3:15-3:30, Marjorie J. Coddell; 3:35-3:50, Elsie Feldman; 6:15-6:50, "Music While You Dine," Jersey Collegians, direction of Julie Wintz; 6:50-7, resume of day's sports with "Jolly Bill"; Steinko; 8-8:30, Gene Ingraham's Great Notch Inn orchestra; 8:30-9, "Nostradamus," The Super Man of all History; 9:30-9, W. Caranough; 10-11, program, Manhattan serenaders.

WQJ, Chicago, Ill. (Central, 448), 7-8 p. m., dinner concert, Ralph Williams and his Rainbo Garden orchestra; Lancelotti Smith, bass; Mre. Lancelotti Smith, accompanist; Lillah Olga Williams and his Rainbo Skyarks; Sandy Meek, Scotch tenor; The Melodians, Laurie, Eddie and Bennie, Clarence Theders, tenor; Lew Butler, singing "She Loves Me"; George A. Little and Larry Shay, songwriters; other Radia artists to be announced.

WRC, Washington, D. C. (Eastern, 469), 3 p. m., fashion developments of the moment, women's wear; 3:10, song recital; 3:25, report of the National Conference board; 3:30, songs; 3:45, Eleanor Glynn, pianist; 3:50, sports for women; 4, songs; 5:15, instruction in International code; 6, stories for children, Peggy Aiblon.

WSB, Atlanta, Ga. (Central, 429), 10:45 p. m., Radlow entertainment.

WTAM, Cleveland, Ohio (Eastern, 390), 8 p. m., program arranged by the Cleveland Plain Dealer: "Cleveland Composers' Night," Lilla Robertson, mezzo-soprano; Carabelle Johnson, soprano; Frederick True, baritone; Albert Downing, tenor; Ben Burr, pianist; Walter Logan's WTAM Symphonie ensemble; Catherine D. Carter, soprano; Fred A. Williams, pianist.

WTAY, Oak Park, Ill. (Central, 283), 0:45-7:45 p. m., George Clark, organist; 9:45-10:15, Axel Christensen, pianist; Guyon's Paradise orchestra; ten minute technical talk, Felix Anderson.

WVJ, Detroit, Mich. (Eastern, 517), 8 a. m., settling-up exercises, R. J. Horton; 9:30, talk, women's editor, Detroit News; 12 m., Detroit News orchestra; 7 p. m., Detroit News orchestra; Lolla K. Brown, soprano.

of the R. M. S. "Antonia"; Tom Smith, violinist; Margaret Lyons-Moode, soprano; Mildred Page, reader; "The rouance of the St. Lawrence," Colonel W. I. Gear.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 12:15 p. m., Scalo's orchestra; 6:15, dinner concert, Pittsburgh Athletic association orchestra; 7:15, along-time lady; 7:30, address; 8:30, musicale, auspices of Boggs and Duhl company; 11:30, concert.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Y. M. C. A. lecture; Lillah Carlson, soprano; 8-9, Ambassador Hotel Cocoanut Grove orchestra; 9-10, Examiner concert program; 10-11, concert, Rhue Gill and Beas Rudisill.

KFKB, Milford, Kansas (Central, 286), 8 p. m., KFKB orchestra; 8:30, lecture, Dr. J. R. Brink; 9, KFKB musical program; 10-12, dance program.

KFNF, Shenandoah, Ia. (Central, 266), 7:30 p. m., old time music, Charles H. Gabus.

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

KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m., organ recital, courtesy, B. Ebernst Ballard and assisting artists; 7:30-9:15, auditorium service, organ; congregational singing; prayer; announcements; sermon, Almer Semple McTherson; water baptismal service; 9:15-10, Gray studio concert, the alder band, direction, G. N. Nichols; 10-11, organ recital, courtesy, Esther Frick Green and assisting artists.

KGO, Oakland, Calif. (Pacific, 312), 8 p. m., concert orchestra, Hotel St. Francis; 8, "The Man on the Box," KGO players; Trio Nouveau; 10-1, Henry Halstead's orchestra.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., children's program; 10, dance music, George Olsen's Metropolitan orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., concert; 6-6:30, Art Hickman's concert orchestra, Edward Fitzpatrick, director; 6:30-7:30, children's program, "American History," Prof. Walter Sylvester Herzog; Dickie Brandon, screen juvenile; Catherine Hyatt, age 8, pianist, pupil of Ethel Sanborn; pupils of Carter Weaver, drama department, Earl Wallace theatrical dance studios; Russian string quartet, Paul G. Hoffman company, accompanist; Calmon Lubovitski, first violinist; Norris Stoffer, second violinist; Philip Cohen, violonist and Naum Dinger, cellist; 10-11, Art Hickman's dance orchestra.

KPO, San Francisco, Calif. (Pacific, 423), 1-2 p. m., Rudy Selger's Fairmont hotel orchestra; 2:30-3:30, program, Anna K. Blotky, contralto; 4:30-5:30, Rudy Selger's Fairmont hotel orchestra; 5:30-6:30, children's hour stories, Big Brother of KPO; 7-7:30, Rudy Selger's Fairmont hotel orchestra; 8-9, Theodore J. Irwin, organist; 9-10, Lenore Sollerder Campbell, soprano; Alma Bennett, pianist; Joan Ray, contralto.

KYW, Chicago, Ill. (Central, 536), 10:35 a. m., table talk, Mrs. Anna J. Peterson; 1:35-3 p. m., afternoon frolic; 5:35-6, children's bedtime story, Uncia Boh; 6-8:30, dinner concert, Congress hotel; 7-7:20, "Twenty Minutes of Good Reading," Rev. C. J. Permin; 7:20-8:15, Maria Dneprova, Russian soprano; Sallie Menkes, accompanist; John Staufy, tenor; Dagmar Nordstrom, pianist; 8:15, "Safety First," Z. C. Elkin; 9-10:30, "At Home" program.

WAAW, Omaha, Neb. (Central, 286), 7:30-9 p. m., "Radio Franks," talks, Rev. E. M. Brown.

WBAP, Fort Worth, Tex. (Central, 476), 7:30-8:30 p. m., concert; 9:10-10:15, One Hundred and Twelfth Cavalry band of Mineral Wells.

WBVA, Columbus, Ohio (Eastern, 423), 12 m., religious service, Columbus Council of churches, Rev. Oliver C. Welst, pastor, Firat Community church, speaker; sacred music.

WBBR, Staten Island, New York (Eastern, 273), 9:10 p. m., Arthur Martens, mandolin recital; 9:25, International Sunday school lesson, S. M. Van Sipma; 9:45, Spring Martens.

WBZ, Springfield, Mass. (Eastern, 337), 9:30 p. m., songs, Bill Coty, Jack Armstrong; 6:40, Leo Reisman and his Hotel Brunswick orchestra; 7:10, "At the Theaters," A. L. S. Wood; 7:30, bedtime story for the kiddies; 7:45, Charles R. Hector with his St. James theater orchestra; 8:30, Bertha Morse, soprano; Wilhelm Wagner, accompanist; 9:30, Albert Orcutt, tenor; Ernest Marsh, violinist; Lona B. Knox, accompanist.

WCAE, Pittsburgh, Pa. (Eastern, 462), 4:30 p. m., the Sunshine girl; 6:30, dinner concert, William Penn hotel; 7:30, Uncle Kayhner; 8:30, Moores cafeteria weekly radio review, E. T. Moores, manager.

WCAL, Northfield, Minn. (Central, 360), 9:45 a. m., St. Olaf college chapel services; 8:30, book talk, "Old

New York," Edith Wharton; "The Fabulous Forties," Mead Minnegeerde, Dr. George Welda Spohn.

WCAY, Milwaukee, Wis. (Central, 266), 10:30-12 m., midnight frolic; Arcadia ballroom orchestra; "Waltie," Seltz, ballads; Ben Bertelson, violinist; Rose Bink, soprano.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 6, dinner concert; 8:30, musical program.

WDAF, 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; travelogue, Edgar Allen Linton; readings, Cella Burton; the Tell-Me-a-Story lady; music, Fritz Heinlein's Trioan ensemble, Hotel Muehlebach; 11:45-1 a. m., Night-hawk frolic, the Plantation players, Hotel Muehlebach; Eddie and Bobbie Kuhn's K. C. A. C. orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., daily almanac; 12:02 p. m., Stanley theater organ recital; 12:30, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; 4:30, Magazine corner; 7:30, Dream Daddy's bedtime stories; 8:20, play; 10, Howard Lanin's Arcadia cafe dance orchestra.

WEAF, New York, N. Y. (Eastern, 492), 11-11:30 a. m., weekly program; 11:30-11:45, talk to housewives; 4-4:30 p. m., College club orchestra; 4:30-5, children's stories; 6-7, dinner music, Waldorf-Astoria hotel; 7-7:30, services, New York Federation of churches; 7:30-7:45, Daniel Scherer, violinist; 7:45-8, Grace Richards, soprano; 8-8:15, talk, Bank of America; 8:15-9, "Touring with the Packard," Chas. V. Isaacson; 9-9:15, Warner Janssen, pianist; 10-11, Vincent Lopez and his Hotel Pennsylvania orchestra.

WEAO, Columbus, Ohio (Eastern, 380), 9 a. m., music, Marguerite Manley Stedel School of Music talent; 11 a. m., music, Stedel artists; 1:30 p. m., music, Stedel artists; 8 p. m., Ohio State university chimes concert; program, Stainbrook sextet; Edwin Stainbrook, pianist and director; Louise Griffiths, soprano; Ramona Berlew, contralto; Lucy Howland, soprano; Dean Spaulding, tenor; Dwight Guerin, tenor; Foster Miller, bass.

WEBB, Chicago, Ill. (Central, 370), 7-8 p. m., William Rice, baritone; Sophie Schaefer, songs; popular songs, Dixie Duo; 9-10, Elsie Cole; George Chandler, the man with the musical saw; Triangle trio, vaudeville's best musical and singing entertainers; Ferdinand Steindel and his orchestra; 11-12, Daw and Russell, eccentric singing comedians; Harmony girls; Parrilo and Betty; Winter Garden Four, Chicago's Finest quartet; Ferdinand Steindel and his orchestra; Edgewood Beach hotel late revue.

WEEI, Boston, Mass. (Eastern, 303), 12 m., luncheon music, Dok Eisenbourg and his Sinfonians; 2 p. m., music, educational talk; 8, program from WEAF, New York.

WFAA, Dallas, Tex. (Central, 476), 12:30-1 p. m., "You and Your Duty to Your Body, Your Only Means of Expression," Charles E. Osborne; 8:30-9:30, A. Harris & Co.'s glee club; 11-12, Mrs. LaRue Nelson, director.

WFI, Philadelphia, Pa. (Eastern, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 3, "Radio housewife" program of Delaware recipes and household hints; "Does and Don'ts of Dresses," Isabella Strobbe; political talk, County Women's political organization; 6:30, Meyer Davis Bellevue Stratford concert orchestra; 7, Sunny Jip, the kiddies' pal; 8:30, Loretta Kerk, pianist; boy scouts' radio corps.

WGN, Chicago, Ill. (Central, 370), 8:30-9:30, Hazel O'Neil, soprano; Margaret Keefe, accompanist; R. G. Ball, baritone; John Clark, tenor; 10:30-11:30, Jack Chapman dance orchestra.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1 p. m., George Albert Bouehard, organist; 6-7:30, Hal Prynd stringed quartet.

WGY, Schenectady, N. Y. (Eastern, 380), 2 p. m., "The Lonely House," and other poems, Lucie M. Tate; 6:30, Stephen E. Bolacair, organist; 7:45, "A Few Moments with New Books," William F. Jacob; 8, musical program, Glenn Falls First Presbyterian church choir, Cecil Wright, director; Mrs. Matilda B. Russ, soprano; Mrs. Walter L. Ross, soprano.

WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., Alamo theater orchestra; 7:30-9, concert, auspicea, Mrs. Robert K. Van Pelt.

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

WHK, Cleveland, Ohio (Eastern, 283), 8 p. m., concert program arranged by the Cleveland Press; WHK-Bell Hops orchestra; solo numbers by popular entertainers.

WHN, New York, N. Y. (Eastern, 360), 2:15-3:30 p. m., Bob Schaefer and his entertainers; 3:45-4, Alfred Dulin, pianist; 4-4:15, Marie Silva, tenor and pianist; 4:30-4:45, Frank LaFosse, baritone; 4:45-5, "Tea Time Talk," Loretta C. Lynch; 5-5:30, Hickey Hilekson's Jazz artists; 6:30-7:30, Oldfoll's trio and Paul Specht's Attamac orchestra; 9:45-10, Sara V. Turtil, soprano; 10-10:30, Spear's dance orchestra; 10:30-11, Rosehand dance orchestra; 12-12:30, Parody club orchestra.

WIP, Philadelphia, Pa. (Eastern, 509), 1 p. m., Gimbel Brothers' tea room orchestra; 8:05, Chas. Sansome's dance orchestra; 7, Uncle Wip's bedtime stories; 10, Harvey Marburger's dance orchestra from Cafe L'Algon.

WJY, Providence, R. I. (Eastern, 360), 1:05 p. m., studio program; 8:15, Chamber of Commerce dinner, President W. H. P. Faunce.

WJAX, Cleveland, Ohio (Eastern, 390), 8 p. m., O. A. Bryan, pianist and baritone and L. Z. Bryan, Jr., violinist and tenor, in a program of Spanish music; Jeanette Sinsheimer, soprano; L. L. Snook, whistler; 9:30, Edwin Arthur Kraft, organ recital.

WJY, New York, N. Y. (Eastern, 405), 7:30-8 p. m., Berlitz weekly French lesson; 8:45-9, talk, Democratic National committee; 9-10, Al Reiser's Club Ferrerl orchestra.

WJZ, New York, N. Y. (Eastern, 455), 10-10:10 a. m., "Housewives League Daily Menu," Mrs. Julia Heath; 10:10-10:20, "The Progress of the World," a Review of Reviews talk; 10:50-11, Eleanor Gunn's fashion talk; 1-2 p. m., Nathan Abae Hotel Pennsylvania orchestra; 4-5, specialty numbers; 5:30-6:30, New York stock exchange; 7:55-8, Colliers weekly, John B. Kennedy; 8-8:15, Wall Street Journal review; 8:30-9:30, Wanamaker organ concert; 9:30-10, talk, auspices New York Board of Trade and transportation; 10:30-11:30, Waldorf-Astoria dance orchestra.

WLS, Chicago, Ill. (Central, 345), 10-11 p. m., Carl Craven, tenor; "Man's Insect Friends," Prof. L. Haseman; "Farm Question Box," E. B. Heaton; 6:30, Ralph Emerson, organist; 6:45, Ford Rush, Glenn Rowell; 6:50, Ralph Emerson, organist; 7, Isham Jones' orchestra; 7:15, Otto Moore, Agnes McLaughlin; 7:30, Isham Jones' orchestra; 7:45, lullaby time, Glenn Rowell, Ford Rush; 10:15, Hutter vocal studio; 10:30, Isham Jones' orchestra; 10:40, Ford and Glenn time; 11, Isham Jones' and his College Inn orchestra; 11:10, Overton's students' time out; 11:30, LHerty hour; 12, midnight request program, Ralph Emerson, organist.

WLW, Cincinnati, Ohio (Central, 423), 10 p. m., Milnor trio; 10:30, Doherty Melody orchestra; 11, Milnor trio; 11:30, Doherty orchestra.

WMAQ, Chicago, Ill. (Central, 447.5), 4:10 p. m., household hour, Mrs. Elizabeth O. Hiller, director; 4:30, musical program; 6, Chicago theater organ recital; 6:30, Hotel LaSalle orchestra; 8, garden talk, James H. Burdett; 8:15, Boy Scout program; 8:45, investment talk; 9:15, Marie Ludwig, harpist.

WMC, Memphis, Tenn. (Central, 500), 8:30 p. m., Hotel Chisca orchestra; Addy Britt, Patrick O'Sullivan.

WMH, Cincinnati, Ohio (Central, 309), 8 p. m., violin solos, Luke D. Ehrigott, Kurt Henkel, accompanist; contralto solos, Margy Reibson, playing own accompaniment; 8:30, Temple quartet, Willard, Ralph, Carl and Edward Duderstadt, Marie Houston, accompanist; 9, Adon dance orchestra, R. C. Fisher, director.

WOAW, Omaha, Neb. (Central, 526), 6 p. m., every child's story hour conducted by Grace Sorenson; 6:30, dinner program, G. R.'s Radio orchestra; 9, program transmitted from WOAW's studio in the Frolic Seek & Nursery company hq.; 12, midnight frolic, Frank W. Hodek, Jr. and his Omaha Nightingales.

WOC, Davenport, Ia. (Central, 484), 12 m., chimes; 7 p. m., sandman's night; 9, Palmers School Radio orchestra; Ralph W. Fuller, baritone.

WOO, Philadelphia, Pa. (Eastern, 509), 11 a. m., Mary E. Vogt, organist; 12:02 p. m., Wanamaker crystal tea room orchestra, Robert E. Golden, director; 4:45, Mary E. Vogt, organist.

WOR, Newark, N. J. (Eastern, 405), 7-8 a. m., WOR morning gym class; 2:30-3:30 p. m., Harry LaFerty's Canary College Inn orchestra; 3:45-4, "Gardening," Rockwell; 6-6:30, "Radio for the Layman," Albert E. Sonn; 6:30-7:30, "Music While You Dine," Jimmy Lent and his orchestra; 7:45-7:50, resume of the day's sports with "Jolly Bill"; Steinko.

WQJ, Chicago, Ill. (Central, 448), 7-8 p. m., dinner concert, Ralph Williams and his Rainbo Garden orchestra; Mrs. Lydia Lochner, contralto; Marlon Henry, pianist; Senor Manuel Rodriguez, Spanish tenor; 10-2 a. m., Ralph Williams and his Rainbo Skylarks; Axel Christensen, pianologues; Grace Wilson, contralto; Hill, Hirsch and Gorny, harmony singers; Nubs Allen, cell-

Thursday, October 2

Silent night for: KQV, KSD, WCAP, WDAR, WHO, WOO, WOR.
 CNRM, Montreal, Can. (Eastern, 430), 8 p. m., orchestra

MAJESTIC INDIAN CHIEF AT KFI FRIDAY



Carabella Johnson (left) is a favorite radio star in Cleveland. Tune in Wednesday for WTAM and you will know why. Madame Homer DuBard's soprano voice will be heard again from WWJ, Thursday.

Patrick O'Sullivan is one of the best known pianists in the south. He will appear at WMC, Memphis, Thursday, October 2.

tralto; Rosemary Hughes, soprano; Malle and Little in their own songs.

WRC, Washington, D. C. (Eastern, 469), 6 p. m., children's hour, Peggy Albion; 7:45, talk on motoring, auspices of the American Automobile association; 8, Fred Eden, baritone; 8:15, music; 8:45, Caroline Manning, contralto; 9:30, Harmonious quartet; program closes 9:55.

WSA, Cincinnati, Ohio (Central, 309), 10 p. m., Hawaiian guitar duets, Collins & Hubbell; 10:30, readings, Margaret Spaulding; 11, vocal solos, LaVergne Sims.

WSB, Atlanta, Ga. (Central, 429), 8 p. m., classic hour, woman's division, Atlanta chamber of commerce; 10:45, Dr. Charles A. Sheldon, organist.

WTA, Oak Park, Ill. (Central, 283), 6:45-7:45 p. m., Madeline Reed, contralto; Marie Kelly, reader; LeRoy North, pianist; Walter H. Gabel, baritone; 9:30-9:45, Sliam Knight Templar band; 10:15-11:15, Guy's Paradise 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., Detroit News orchestra; 7 p. m., Detroit News orchestra; Cornish mixed quartet; Madame Homer DuBard; 10, Goldkette's orchestra; 11, Detroit News orchestra.

Friday, October 3

Silent night for: CKAC, KGO, KPO, WBBR, WFI, WIP, WLW, WMH, WOR, WRC, WSAL.

CKAC, Montreal, Can. (Eastern, 425), 1:45 p. m., Mount Royal hotel luncheon concert; 4:30, first 110 lesson.

CNRT, Montreal, Can. (Eastern, 400), 4 p. m., Jean Alexander, soprano; Sidney Robinson, baritone; Sandy Macdonald, Scotch comic; Wal. Bromby's Melody trio; "The Romance of the St. Lawrence," Col. W. I. Gear.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 12:15 p. m., Daugherty's orchestra; 6:15, Paul E. Fleeger, organist; 7:15, Uncle Ed; 7:30, address; 8, program; 8:30, concert, artists, Mrs. James Stephen Martin studio; Christine Adams, cellist.

KFAE, Pullman, Wash. (Pacific, 330), 7:30 p. m., Lillian Pettibone, pianist; Vincent Hiden, cellist; "How to Study," Dr. G. A. Coe; "Typhoid Fever," U. S. Public Health service; "What Boys and Girls Clubs Are Doing," Elmira White; "Apple Packing," C. L. Vincent; book chat, Alice L. Webb.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-8 p. m., Aeolian organ recital; 8-9, Evening Herald, concert, Carl Edward Hatch; 9-10, Examiner studio concert; 10-11, American Indian program, Chief Yowliche, baritone; Margaret Johnson, violinist; 11-12 m., Ambassador hotel Coconut Grove orchestra.

KFKB, Milford, Kansas (Central, 286), 7:20 p. m., "College of the Air," Kansas State Agricultural college music department; 7:30, "The Characteristics of Effective Business Letters," H. W. Davis; 8, KFKB orchestra; 8:30, "The Tropics," Dr. J. B. Brinkley; 9, KFKB musical concert; 10-12, dance program.

KFN, Shenandoah, Va. (Central, 266), 7:30 p. m., concert, Smith-Belding Harmony orchestra.

KFOA, Seattle, Wash. (Pacific, 455), 12:30 p. m., luncheon program, Council of Seattle Chamber of Commerce; 8:30, Mrs. George Arlund, soprano; Edward Whiting, pianist; Dr. Blase, baritone.

KFSG, Los Angeles, Calif. (Pacific, 278), 8:30-4:30 p. m., organ recital, courtesy, Roy Reid Brignall; vocal numbers by assisting artists; 7:30-9:15, auditorium service, organ; silver band; crusaders chorus; address, Judge Carlos S. Hardy; sermon, Aimee Semple McPherson; after call; 9:15-10, Gray studio program; 10-11, organ recital and program, featuring Dr. Ernest Bullard and assisting artists in vocal selections.

KGO, Oakland, Calif. (Pacific, 312), 3 p. m., studio musical program and speaker; 4-5:30, concert orchestra, Hotel St. Francis.

KGW, Portland, Ore. (Pacific, 492), 8:15 p. m., George

Olsen's Metropolitan orchestra; 10:30, Hoot Owls, George Olsen's Hoot Owl orchestra and Pantages frolic.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., concert; 6-6:30, Art Hickman's concert orchestra; 6:30-7:30, children's hour, "History," Prof. W. S. Herzog; Richard Headrick, screen juvenile; bedtime story, Uncle John; 8-10, concert, courtesy, Globe Ice Cream company, A. K. Berkland, director; 10-11, Art Hickman's dance orchestra, Earl Burnnett, director.

KLX, Oakland, Calif. (Pacific, 509), 8-10 p. m., program, Mildred S. Wareskjold, director; Enrico Sosso, vocalist; Anna Libonati, vocalist; Ethel Guyon, flutist; Robert E. Anderson, pianist; American theater orchestra.

KPO, San Francisco, Calif. (Pacific, 423), 1-2 p. m., Rudy Selger's Fairmont hotel orchestra; 2:30-3:30, Theodore J. Irwin, organist; 4:30-5:30, Rudy Selger's Fairmont hotel orchestra.

KQV, Pittsburgh, Pa. (Eastern, 270), 9-10 p. m., Brockett mixed quartet, Charlotte Brown, soprano; Ellen Willcox, contralto; Ellsworth Davis, tenor; Ashley Brockett, baritone; Melvin S. Hemphill, accompanist.

KSD, St. Louis, Mo. (Central, 546), 8 p. m., 6th Infantry band.

KYW, Chicago, Ill. (Central, 536), 10:35 a. m., table talk, Mrs. Anna J. Peterson; 5:35-6 p. m., children's bedtime story, Uncle Bob; 6-6:30, dinner concert, Congress hotel; 6:30-7, KYW's studio, Duncan Sisters Music Publishing company; 8:30-9:30, midnight revue; 9:30-9:45, around the town with KYW; 9:45-11:30, midnight revue.

WAAW, Omaha, Nebr. (Central, 286), 8 p. m., "Radio Franks."

WBAP, Fort Worth, Tex. (Central, 476), 7:30-8:30 p. m., Texas hotel orchestra; 9:30-10:45, concert.

WBAV, Columbus, Ohio (Eastern, 423), 12 m., Ila Lorbach Owens, pianist; 8 p. m., concert, Columbus mandolinists, L. W. Neeramer, director.

WBZ, Springfield, Mass. (Eastern, 337), 6 p. m., dinner concert, WBZ trio; 7:10, current book review; 7:30, bedtime story for the kiddies; 7:40, banquet of the World War convention; 11, WBZ trio; Anne Wolner, soprano; Mrs. Helen Dingman, accompanist; 11:30, McEnelly's singing orchestra.

WCAE, Pittsburgh, Pa. (Eastern, 462), 4:30 p. m., Sunshine girl; 6:30, dinner concert, William Penn hotel; 8:30, musical program.

WCAP, Washington, D. C. (Eastern, 469), 7:30-9 p. m., United States Navy band orchestra, Charles Benter, leader; 9-9:15, music; 9:15-9:30, "Foreign Affairs," Capt. Gordon Gordon-Smith; 9:30-10, music; 10-12, Irving Berenstein Wardman Park hotel orchestra.

WCAY, Milwaukee, Wis. (Central, 266), 8-9 p. m., musical program sponsored by the Oswald Jaeger Baking company; Pestalozzi string quartet; E. S. Thatcher, baritone; Bradley sisters; Beatrice Royt, pianist.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 6, dinner concert; 8:30, musical program.

WDAF, 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; address, second of a series of Radio piano lessons by Maudellen Littlefield; the Tell-Me-a-Story lady; music, Fritz Hanlein's Trianon ensemble, Hotel Muehlebach; 8-9:15, popular program, the Star's Radio orchestra, and the WDAF minstrels; 11:45-1 a. m., Nighthawk frolic, the Plantation players, Hotel Muehlebach; Eddie and Bobbie Kuhn's K. C. A. C. orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., daily almanac; 12:02 p. m., Stanley theater organ recital; 12:30, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; 7:30, Dream Daddy's bedtime stories; 8:30, Radio play, Walter Greenough; WDAR pianists; 10, Howard Lanin's Arcadia cafe dance orchestra; 11, "Morning Glory" club concert, songs, Lou Herschler and Carl Zoehrs.

WEAF, New York, N. Y. (Eastern, 492), 11-11:30 a. m., musical program; 11:45-12 m., "Visiting a Kindergarten," Major Bradley Martin; 4-5 p. m., club program for women; Lulu C. Phillips, soprano; 6-7, dinner music, Waldorf-Astoria hotel; 7-7:30, children's stories, G. R. Kinney Shoe company; 7:30-8, "Happiness Boys"—Billy Jones and Ernest Hare; 8:45-10, B. Fischer company "Astor Coffee" orchestra.

WEAO, Columbus, Ohio (Eastern, 360), 9 a. m., music, Marguerite Manley Siedel School of music talent; 11 a. m., music, Siedel artists; 1:30 p. m., music, Siedel artists; 4, farm talk, Ohio State university faculty member; music, Siedel artists.

WEBB, Chicago, Ill. (Central, 370), 7-8 p. m., Carroll Keans, baritone; Lloyd Brown, accompanist; Anna Leeb, soprano; Arthur W. Hickman, baritone; Elizabeth Berry, soprano; Ferdinand Stelndel and his orchestra; 9-10, Frederick Agard, tenor; Ferdinand Stelndel and his orchestra; Rita McEwan, soprano; 11-12, Winter Garden Four; Ferdinand Stelndel and his orchestra.

WEEI, Boston, Mass. (Eastern, 303), 12 m., luncheon music, Dok Eisenbourg and his Sinfoniane; 2 p. m., music, educational talk; 7, Big Brother club; 8, program from WBAF.

WFAA, Dallas, Tex. (Central, 476), 12:30-1 p. m.,

Where to Hear Talks Central Standard Time

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

Wednesday: 6, WDAF; 6:45, WEAF; 7, WHB, WHN; 7:15, WBBR; 7:30, KFKB, KYW, WAAW, WOR; 7:45, KFKB; 8, KYW, WCAP, WLS, WMAQ; 8:15, WEAF; 8:30, KFKB, WCAP; 9, WMH, WTAY; 9:30, KFAE; 9:45, WMAQ; 10, KHJ.

Thursday: 6, WDAF; 6:30, WJY; 7, KYW, WEAF; 7:30, CNRM; 7:45, WJY; 8, WMAQ; 8:15, KYW; 8:25, WBBR; 8:30, KFKB; 8:45, KFI, WMAQ.

Friday: 7, CNRT, WHB, WJY; 7:20, WOC; 7:30, KFKB; 8, WDAF,

WLS; 8:15, WCAP; 8:30, KFKB, WCAL; 9:30, KFAE, KYW.

Saturday: 6, WDAF; 7:15, WBBR, WOR; 7:45, WOR; 8, KYW, WOR; 8:45, KFI.

Monday: 6, WDAF; 7, WEAF, WHB; 7:15, WDAR, WOR; 7:30, KFKB, WHN; 7:45, KFKB; 8:30, KFKB; 9:30, KFAE; 10, KGO.

Tuesday: 6, WDAF; 6:50, WDAR; 7, WIP, 7:15, WJY; 7:30, KFKB, WRC; 7:45, KFKB; 8, WMAQ; 8:30, KFKB; 8:50, WMAQ.

Saturday, October 4

address, Dr. Robert Stewart Hyer; 8:30-9:30, Wilmer quartet.

WFI, Philadelphia, Pa. (Eastern, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 3, Caroline Hoffman, pianist; reports, closing prices Chicago grain market; program of Scandinavian music, Mabel Swint Ever; 6:30, Meyer Davis Bellevue Stratford concert orchestra; 7, Sunny Jim, the kiddies' pal.

WGN, Chicago, Ill. (Central, 370), 8:30-9:30 p. m., Campbell Cameron, Lorraine Luckritz, Pershing quartet; 10:30-11:30, Jack Chapman's dance orchestra.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1 p. m., George Albert Bouchard, organist; 6:30-7:30, dinner music; 9-11, concert, Tokio dance orchestra, J. L. Knell, director; 11, supper-dance music, Vincent Lopez Hotel Statler orchestra, Harold Giesler, director.

WGY, Schenectady, N. Y. (Eastern, 380), 2 p. m., "Down from the Top," Paul Floyd Cornish; 7:50, WGY orchestra; 8, "Melodrama," WGY players; 10:30, Earl Hermance and his orchestra.

WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., Alamo theater orchestra; "Just Among Home Folks"; readings, Courier-Journal and Louisville Times; 7:30-9, Keith Kannard and his Kentucky Ramblers; Fred Hughes, baritone.

WHB, Kansas City, Mo. (Central, 411), 2-3 p. m., ladies' hour program, Sweeney Radio orchestra; 7-8, address, "Automobile Batteries," W. G. Robertson, instructor of the Sweeney school; address, representative of the W. C. T. U.; music, Sweeney Radio trio.

WHK, Cleveland, Ohio (Eastern, 283), 8 p. m., concert program arranged by the Hotel Winton.

WHN, New York, N. Y. (Eastern, 360), 2:30-2:45 p. m., Ira Schuster and Bob Miller, songs; 2:45-3, Jos. C. Wolfe, baritone; 3-3:15, Arthur Stone, blind pianist; 3:45-4, Uncle Robert's chat with children; 4-4:15, Mabel Livingston, the children's poet; 4:15-4:45, Genevieve Williams, soprano; Chas. Strickland, pianist; and Sam Steinberg, violinist; 4:45-5, "The Radio Widow" and other readings, Bella N. Zilberman; 6:30-7:30, Olcott Vail's trio and Paul Specht's Almanac orchestra; 9:30-10, Crystal Palace orchestra; 10-10:30, Gem Safety Razor orchestra; 10:30-11, Roseland dance orchestra; 11:30-12, Club Alabam revue; 12-12:30 a. m., Parody club orchestra.

WHO, Des Moines, Ia. (Central, 526), 7:30-9 p. m., Maxime Hankhammer, child soprano; Bert Critchett, baritone; Mrs. Bert Critchett, accompanist; "Cycle of Song," Elmhurst quartet, Mrs. H. E. Paull, soprano; Mrs. Sonia Sells, contralto; R. T. Macdonald, tenor; Hibbard Cleveland, bass; Corinne Neafie, pianist.

WIP, Philadelphia, Pa. (Eastern, 509), 1 p. m., Gimbel Brothers' tea room orchestra; 6:05, Jordan-Lewis dance orchestra; 7, Uncle Wip's bedtime stories.

WJAR, Providence, R. I. (Eastern, 360), 10 a. m., Mrs. Wood; 10:45, McCall talk; 1:05 p. m., Twin Elm orchestra, Martin J. Casey, director; 8, musical program; 11, Providence-Biltmore hotel dance orchestra.

WJY, New York, N. Y. (Eastern, 405), 8-8:15 p. m., "Chats with the Editor," Ernest A. Zaidig, N. Y. Telegram and Evening Mail.

WJZ, New York, N. Y. (Eastern, 455), 10-10:10 a. m., "Housewives League Daily Menu," Mrs. Julian Heath; 10-10:30, Arts and Decorations talk; 10:50-11, Eleanor Gunn's fashion talk; 1-2 p. m., Henry Vander Zanden's Hotel Ambassador trio; 4:30-5:30, Hotel Astor organ recital, Leo Riggs, organist; 5:30-6:30, New York stock exchange reports; 7-8, Lafayette Hotel orchestra; 8-8:15, Wall Street Journal review; 8:25-8:30, Looseleaf Current topics, Dr. Wm. H. Allen; 8:40-9:40, specialty numbers.

WLS, Chicago, Ill. (Central, 345), 12 m., Sears-Roebuck string orchestra; "Insect Carriers of Human Diseases," Prof. L. Haseman; 6:30 p. m., Ralph Emerson, organist; 6:45, Ford Rush, Glenn Rowell; 6:50, Ralph Emerson, organist; 7, Isham Jones' orchestra; 7:15, Runners star program; 7:30, Isham Jones and his College Inn orchestra; 7:45, lullaby time, Ford Rush, Glenn Rowell; 8, "Man's Last Stand," Prof. L. Haseman; "What It's All About," Robin Hood; 9, Isham Jones and his College Inn orchestra; 9:15, Runners star program; 10, Isham Jones' orchestra; 10:15, Saddle's Radio play; 10:30, Isham Jones and his College Inn orchestra; 10:40, Ford and Glenn time.

WMAQ, Chicago, Ill. (Central, 447.5), 4:10 p. m., items of interest to women; 4:30, musical program; 6, Chicago theater organ recital; 6:30, Hotel LaSalle orchestra; 8, weekly wide-awake club program, Mrs. Frances M. Ford; 8:30, musical geography, Mr. and Mrs. Max E. Oberndorfer; 9, program from Joliet.

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

WOAW, Omaha, Nebr. (Central, 526), 6 p. m., story hour conducted Doris Claire Secord; 6:30, dinner program, Gus's Lucky Strike orchestra; 9, community program, Benson, Nebr., auspices, C. B. & Q.

WOC, Davenport, Ia. (Central, 484), 12 m., chimes; 7 p. m., sandman's visit, Val McLaughlin; "Selection of Brood Sows," E. L. Quafe; 8, program, artists from Dixon, A. M. Rawls, director.

WOO, Philadelphia, Pa. (Eastern, 509), 11 a. m., Mary E. Vogt, organist; 12:02 p. m., Wanamaker crystal tea room orchestra, Robert E. Golden, director; 4:45, Mary E. Vogt, organist; 7:30, A. Candelieri's concert orchestra from Hotel Adelphia.

WOR, Newark, N. J. (Eastern, 405), 2:30-2:45 p. m., Bertha Bird, soprano; 2:45-3, Edna Hirschberg, pianist; 3-3:15, Bertha Bird; 3:15-3:30, Edna Hirschberg; 6:15-6:30, Reverend Haines, songs; 6:30-6:45, Man in Moon stories for children; 7:15-7:30, "Jolly Bill" Stelneke, resume of day's sports.

WQJ, Chicago, Ill. (Central, 448), 7-8 p. m., dinner concert, Ralph Williams and his Rainbo Garden orchestra; Frederick W. Agard, tenor; Dorothy Schubert, Jugo-Slavic soprano; Harry Geise, pianist; 10-2 a. m., Ralph Williams and his Rainbo Skylarks; Langdon brothers, steel guitar duets; Edda Solomon, contralto; Paul Lougher, tenor; Lester, Cook and Burns, harmony singers; "Around the Rainbo Company"; Ziegler sisters (Pauline and Sarah).

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; 6, stories for children, Peggy Albion.

WSB, Atlanta, Ga. (Central, 429), 8 p. m., Conklin's Harmonizers Trolley company quartet; 10:35, sacred harp quartet.

WTAY, Oak Park, Ill. (Central, 283), 6:45-7:45 p. m., artists melody night; Glenn Bruce, reader; Sandy Meek, baritone; Black Cat orchestra.

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

Silent night for: KQV, WBAP, WCX, WDAR, WEEI, WFI, WHB, WHO, WJY, WLW, WOO.

CKAC, Montreal, Can. (Eastern, 425), 7 p. m., kiddies' stories in French and English; 7:30, Rex Battle and his Mount Royal hotel concert orchestra; 8:30, special studio entertainment; 10:30, Joseph C. Smith and his Mount Royal hotel orchestra.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 1:30 p. m., Daugherty's orchestra; 3, Pitt-Lafayette football game; 6:15, dinner concert, Westinghouse band; 7:15, children's period, Radio Rhythmer; 7:30, address; 7:45, World's Uniform Sunday school lesson, C. C. Johnson; 8, sport review, James J. Long; 8:30, Westinghouse band, T. J. Vastine; double mixed quartet, Westinghouse community chorus, Alfred Bartlett, director.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-8 p. m., dance orchestra; "India," Basil Webb; 8-9, Aeolian trio; 9-10, Examiner concert features; 10-11, Packard Radio club; 11-12, Ambassador hotel Coconut Grove orchestra.

KFKB, Milford, Kansas (Central, 286), 8 p. m., KFKB orchestra; 12 m., "Early Bird" fun makers.

KFN, Shenandoah, Va. (Central, 266), 7:30 p. m., entertainment, Farmer Puckett, director.

KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m., organ recital, courtesy, Roy Reid Brignall; 7-9:30, auditorium service, musical program and song service; choir and soloists; congregational singing; divine healing, Aimee Semple McPherson; after call.

KGO, Oakland, Calif. (Pacific, 312), 4-5:30 p. m., concert orchestra, Hotel St. Francis; 8, program, Richards hardwood Lumber company; Arion trio; Radio Mixed quartet; Henry L. Perry, bass; Graec Le Page, soprano; Ruth Waterman, contralto; Carl Anderson, tenor; California male quartet; Clarence H. Oliver, baritone; Robert E. Saxe, tenor; "The Rubie and the Singer," Fred Thomas, Carl Anderson; 10-1 a. m., Henry Halstead's orchestra and soloists.

KGW, Portland, Ore. (Pacific, 492), 3 p. m., children's musical program; 10, George Olsen's Metropolitan orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., concert, courtesy, Atwater-Kent company, "Uncle Remus," director; 6-6:30, Art Hickman's concert orchestra, Edward Fitzpatrick, director; 6:30-7:30, children's hour, "American History," Prof. Walter Sylvester Herzog; Helene Pirie, screen juvenile; Vendelle Dart, screen juvenile; bedtime story, Uncle John; 8-10, concert, courtesy, the May company, arranged by W. S. Hamburger; 10-11, Art Hickman's dance orchestra, Earl Burnnett, director.

KPO, San Francisco, Calif. (Pacific, 423), 1-2 p. m., Rudy Selger's Fairmont hotel orchestra; 2:30-3:30, California Varsity orchestra; 3:30-5:30, E. Max Bradford's Versatile band; 8-12, Art Weidner and his popular artists.

KSD, St. Louis, Mo. (Central, 546), 7 p. m., orchestra and specialties, Missouri theater.

KYW, Chicago, Ill. (Central, 536), 10:35 a. m., table talk, Mrs. A. J. Peterson; 5:35-6 p. m., children's bedtime story, Uncle Bob; 6-6:30, dinner concert, Congress hotel; 7-7:58, Ruth Petelle, soprano; Sallie Menkes, accompanist; Thomas B. Stephenson, tenor; Elsie C. Stephenson, accompanist; Indiana male quartet, R. Paul Smith, 1st tenor; D. E. Kistler, 2nd tenor; M. H. Marquardt, baritone; A. M. Hagberg, bass; 8:05, talk, Vivette Gorman; 8:10, Youth's Companion; 8:35-11:35, late show.

WAAW, Omaha, Nebr. (Central, 286), 7:30-9 p. m., latest song hits, Wright and Bessinger; C. E. Bruce, recital, violinist; John Rubinski, banjoist.

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

WBBR, Staten Island, New York (Eastern, 273), 8 p. m., Dr. Hans Haag, violinist; 8:15, Bible questions and answers; 8:45, Dr. Hans Haag.

WBZ, Springfield, Mass. (Eastern, 337), 6:30 p. m., Leo Reisman and his Hotel Brunswick orchestra; 7:30, bedtime story for the kiddies; 7:40, Hotel Kimball trio, Jan Geerts, violinist; Arnold Jansen, cellist; Lloyd Stoneman, pianist; 8:15, Vesta string quartet; 9:30, Bertha Wells, reader, trombonist; Beatrice Clough, soprano.

WCAE, Pittsburgh, Pa. (Eastern, 462), 3 p. m., Prof. Otto Kaites, pianist; 6:30, dinner concert, William Penn hotel; 7:45, popular songs, Lew Kennedy; 8:30, musical.

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

WCAP, Washington, D. C. (Eastern, 469), 3 p. m., exercises, dedicating the new stadium of the Catholic university, game U. S. Marines, and the Catholic university.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 5, dinner concert.

WDAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's Radio orchestra; 6-7, school of the air, piano tuning-in number on the Duo-Art; address, thirteenth of a series of talks by members of the editorial staff of the Star; the Tell-Me-a-Story lady; music, Fritz Hanlein's Trianon ensemble, Hotel Muehlebach; 11:45-1 a. m., Nighthawk frolic, the "Merry Old Chief" and the Plantation players; Eddie and Bobbie Kuhn's K. C. A. C. orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., daily almanac; 12:02 p. m., Stanley theater organ recital; 12:30, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; 7:30, Dream Daddy's bedtime stories.

WEAF, New York, N. Y. (Eastern, 492), 4-5 p. m., Bruno brothers' orchestra; 6-7, dinner music, Waldorf-Astoria hotel; 7-7:30, boys' stories; 7:30-7:45, Gladys Hawkins, pianist, and Albert Frelson, banjoist; 8:15-8:45, Mme. Aileen d'Onofre Isham, soprano; 9-9:15, string quintet, S. S. President Wilson; Vittorio Tasso, baritone; 10-11, Vincent Lopez and his Hotel Pennsylvania orchestra.

(Continued on page 11)

er 4

WDAR, WEEI, WOO. 7 p. m., kiddies' Rex Battle and tra; 8:30, special C. Smith and

326), 1:30 p. m., the football game; and; 7:15, child; 0, address; 7:45, C. C. Johnson; 30, Westinghouse quartet, Westing-lettli, director. 3), 6:45-8 p. m., bb; 8-9, Aeolian; 10-11, Packard; 1 Coconut Grove

8 p. m., KFKB makers. 36), 7:30 p. m., ctor. 278), 3:30-4:30 Reid Brignall; 7-rogram and song gational singing; herson; alter call.), 4-5:30 p. m., cis; 8, program, Arlon trio; Radio ; Grace Le Page, ; Carl Anderson, arence H. Oliver, he Rube and the son; 10-1 a. m., ists.

3 p. m., children's s Metropolitan or- 395), 12:30-1:15 t company, "Uncle man's concert or- r; 6:30-7:30, chil- Prof. Walter Syl- juvenile; Vondelle Uncle John; 8-10, arranged by W. S. dance orchestra.

423), 1-2 p. m., chestra; 2:30-3:30, 30, E. Max Brad- dner and his popu-

7 p. m., orchestra 10:35 a. m., table p. m., children's), dinner concert, le, soprano; Saille Stephenson, tenor; ndiana male quar- ; E. Kistler, 2nd ; A. M. Hagberg, ;:10, Youth's Com-

6), 7:30-9 p. m., gen; C. E. Bruce- niolst. 423), 12 m., Lia

tern, 273), 8 p. m., ible questions and 337), 6:30 p. m., ick orchestra; 7:30, 40, Hotel Kimball id Jansen, cellist; sta string quartet; ambonist; Beatrice

2), 3 p. m., Prof. r concert, William ew Kennedy; 8:30,

360), 9:45 a. m., n, 469), 3 p. m., um of the Catholie and the Catholie

4:15 p. m., musical Central, 411), 3:30-4:30 orchestra; 6-7, school of the Duo-Art; address,

thirteenth or a series of talks by members of the editorial staff of the Star; the Toll-me-a-Story lady; music, Fritz Hanlein's Trianon ensemble, Hotel Muehlebach; 11:45-1 a. m., Nighthawk frolic, the "Merry Old Chief" and the Plantation players; Edith and Bobbie Kuhn's K. C. A. C. orchestra. WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., daily almanac; 12:30 p. m., Stanley theater organ recital; 12:30, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; 7:30, Dream Daddy's bedtime stories. WEA, New York, N. Y. (Eastern, 492), 4-5 p. m., Bruno brothers' orchestra; 6-7, dinner music, Waldorf-Astoria hotel; 7-7:30, boys' stories; 7:30-7:45, Gladys Hawkins, pianist, and Albert Preiss, banjoist; 8:15-8:45, Mme. Aileen d'Orme Bahn, soprano; 9-9:45, string quintet, N. S. President Wilson; Vittorio Tasso, baritone; 10-11, Vincent Lopez and his Hotel Penn- sylvania orchestra.

(Continued on page 14)

KFB, A I, F: 12, Y: 7, BAP, WHN, 9:30, L W, G N, WFAA, 11:30, 11:45, KGO.

lege music department; 7:30-8, KFKB Effective Business Letters, H. W. Davis; 8, KFKB orchestra; 8:30, "The Tropics," Dr. J. B. Brinkley; 9, KFKB musical concert; 10-12, dance program. KFNF, Shenandoah, Ia. (Central, 266), 7:30 p. m., concert, Smith-Belding Harmony orchestra. KFOA, Seattle, Wash. (Pacific, 455), 12:30 p. m., luncheon program, Council of Seattle Chamber of Commerce; 8:30, Mrs. George Arlund, soprano; Edward Whiting, pianist; Dr. Blase, baritone. KFSG, Los Angeles, Calif. (Pacific, 278), 8:30-4:30 p. m., organ recital, courtesy, Roy Reid Brignall; vocal numbers by assisting artists; 7:30-9:15, auditorium service, organ; silver band; crusaders chorus; address, Judge Carlos S. Hardy; sermon, Almee Scoble McPherson; alter call; 9:15-10, Gray studio program; 10-11, organ recital and program, featuring H. Earnest Hallad and assisting artists in vocal selections. KGO, Oakland, Calif. (Pacific, 312), 3 p. m., studio musical program and speaker; 4-5:30, concert orchestra, Hotel St. Francis. KGW, Portland, Ore. (Pacific, 492), 8:15 p. m., George

G. R. Kinney Shoe company; 7:30-8, "Happiness Boys" —Billy Jones and Ernest Hare; 8:45-10, B. Elscher company "Astor Coffee" orchestra. WEAO, Columbus, Ohio (Eastern, 360), 9 a. m., music, Marguerite Manley Siedel School of music talent; 11 a. m., music, Siedel artists; 1:30 p. m., music, Siedel artists; 4, farm talk, Ohio State university faculty member; music, Siedel artists. WEBH, Chicago, Ill. (Central, 370), 7-8 p. m., Carroll Keans, baritone; Lloyd Brown, accompanist; Anna Leeb, soprano; Arthur W. Hickman, baritone; Elizabeth Berry, soprano; Ferdinand Steindel and his orchestra; 9-10, Frederick Agard, tenor; Ferdinand Steindel and his orchestra; Rita McFawn, soprano; 11-12, Winter Garden Four; Ferdinand Steindel and his orchestra. WEEI, Boston, Mass. (Eastern, 303), 12 m., luncheon music, Dok Eisenbourg an his Sinfonians; 2 p. m., music, educational talk; 7, Big Brother club; 8, program from WBAF. WFAA, Dallas, Tex. (Central, 476), 12:30-1 p. m.,

Steinke, resume of day's sports. WQJ, Chicago, Ill. (Central, 448), 7-8 p. m., dinner concert, Ralph Williams and his Rainbo Garden orchestra; Frederick W. Agard, tenor; Dorothe Schubert, Jugo-Slavie soprano; Harry Geise, pianist; 10-2 a. m., Ralph Williams and his Rainbo Skylarks; Langdon brothers, steel guitar duets; Edna Solomon, contralto; Paul Loughor, tenor; Lester, Cook and Burns, harmony singers; "Around the Rainbo Company"; Ziegler sisters (Pauline and Sarah). 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; 6, stories for children, Peggy Albion. WSB, Atlanta, Ga. (Central, 429), 8 p. m., Conklin's Harmonizers Trolley company quartet; 10:15, sacred harp quartet. WTAY, Oak Park, Ill. (Central, 263), 6:45-7:45 p. m.,

How to Make an Inexpensive Three Tube Set

Part II—Assembly and Operation Details

By Harry J. Marx

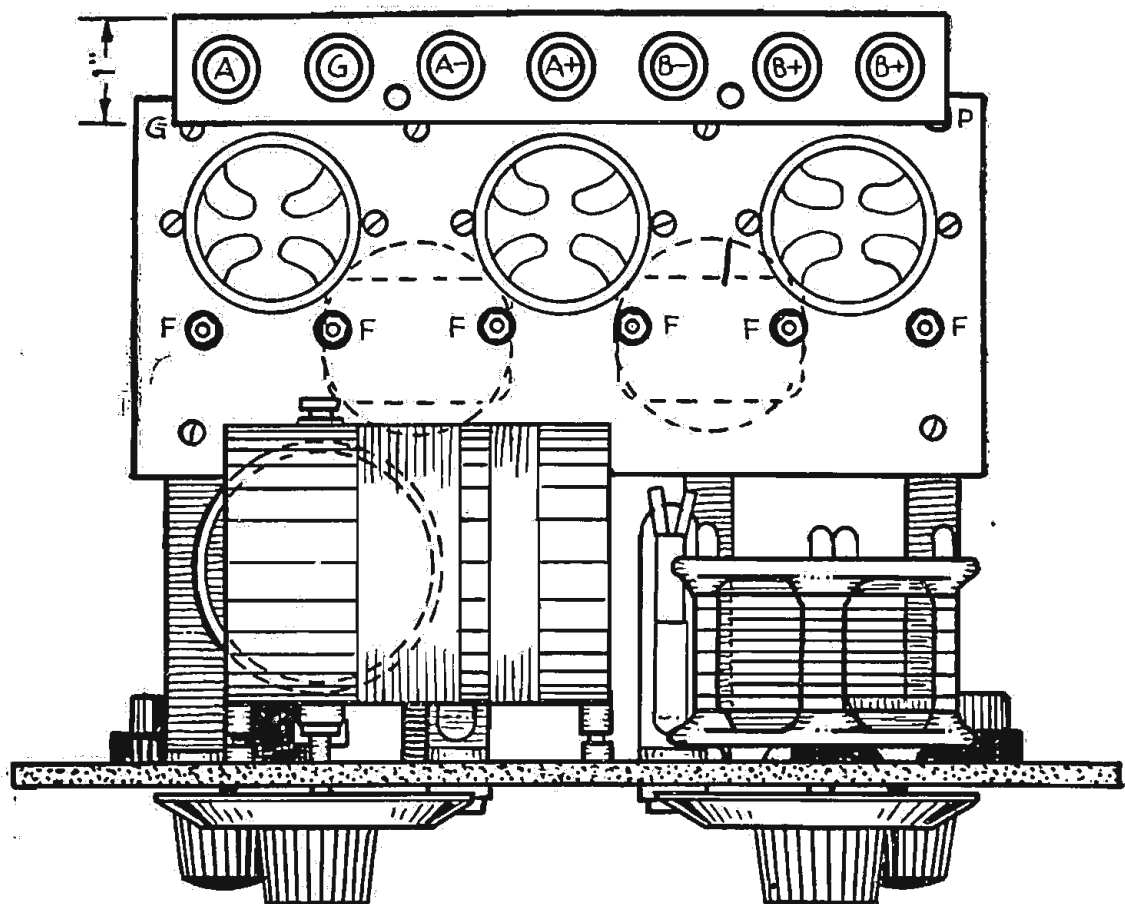


Figure 4

WITH the completion of the front panel the fan becomes interested in what the back of the set looks like. Figure 4 will give him his first idea, while the side view Figure 5 shows the method of assembly of the various pieces of apparatus.

There is no special sub-panel or even a baseboard. The unique use of a triple gang socket and brass supports eliminate the unnecessary sub-panel and only a binding post strip is required. For still further economy and simplicity even this can be eliminated and the binding posts can be fastened to the base strips of the triple gang socket.

Brass Supporting Strips

There are three different brass supporting strips and two of each are required. The two strips, N (Figure 5) support the front end of the triple gang socket and fasten to the front panel by means of holes E and F (Figure 3, part I). The length of this strip is not given as it will depend on the dimensions of the triple gang socket that is used.

The two strips P fasten to the front panel (holes L and M, Figure 3) and support the binding post strip in the rear.

The two small angles Q are fastened to the strip P and support the rear end of the gang socket. The two small audio frequency transformers are also fastened to the lower horizontal stretch of the brass strips P. This is clearly shown in Figure 5. The grid leak and grid condenser can be mounted in any convenient position adjacent to the grid terminal of the detector tube socket.

Wiring the Set

Keep all the leads as short as possible (long ones are unnecessary) and take care of spacing the wires in order to avoid the possibility of a short circuit. See that all soldering is carefully done. Avoid the use of an excessive quantity of soldering paste as it spreads around and develops leakage paths which destroy the efficiency of the set.

Most of the wiring, for appearance sake can be kept below the gang socket. The use of spaghetti or spaghetti covered wire is recommended as it will save many a fan the cost of some tubes through short circuit disasters.

Keep your soldering iron clean and well tinned, you'll find soldering a much easier job than with a dirty iron. Avoid the

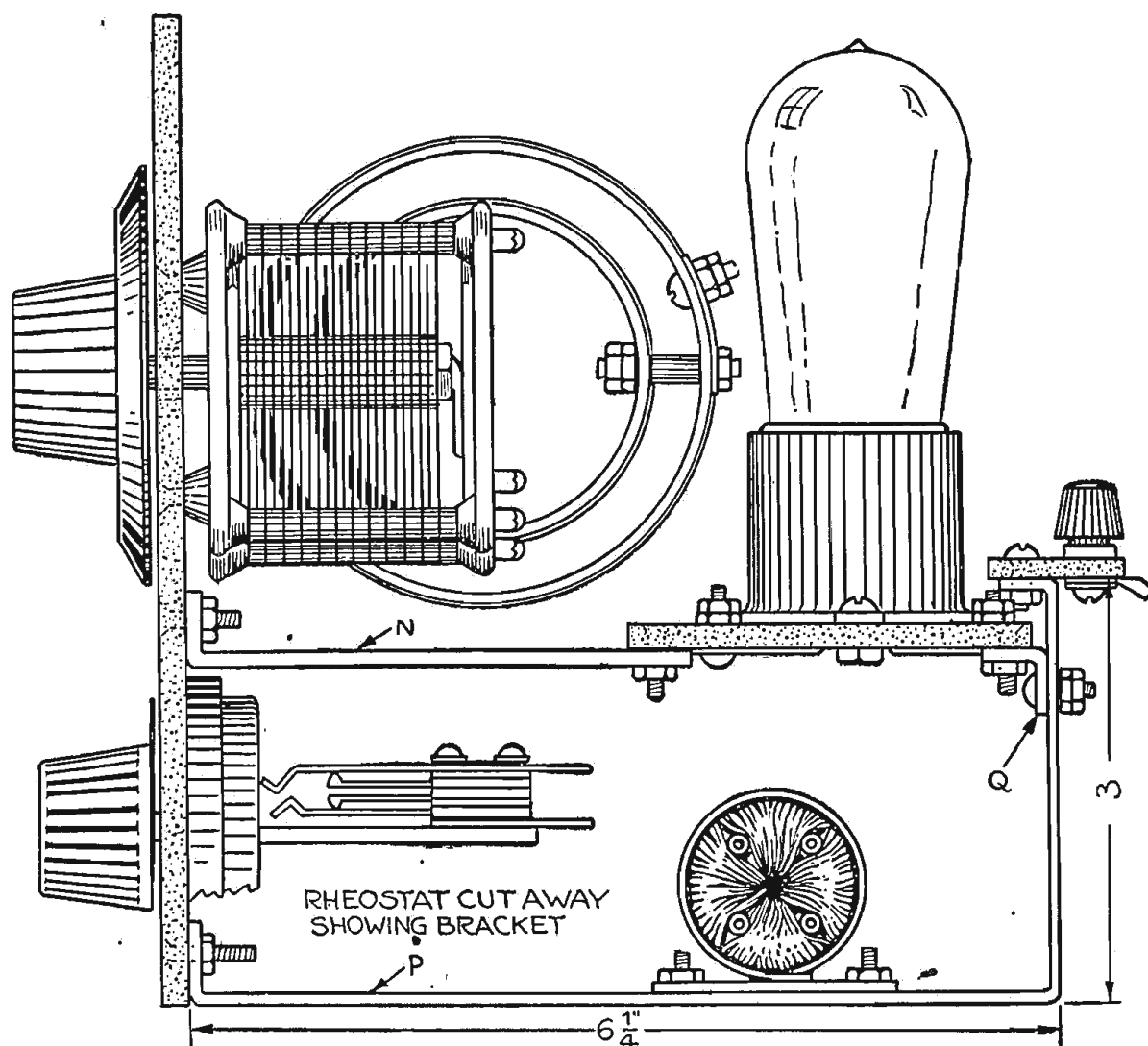


Figure 5

splashing of excess solder on the apparatus. It has a bad habit of short circuiting various parts of the set.

Take your time in doing this work and then you will not be compelled to do so much rechecking and altering afterwards.

Cabinet Details

A simple cabinet for this set has been carefully illustrated in Figure 6. This can be made of any good cabinet wood.

Only a small opening is required at the top to permit access to the tubes, and to make connections to the binding posts. All connection wires pass through the seven holes in the back of the cabinet. Although piano hinges are attractive two small brass hinges will serve equally as well.

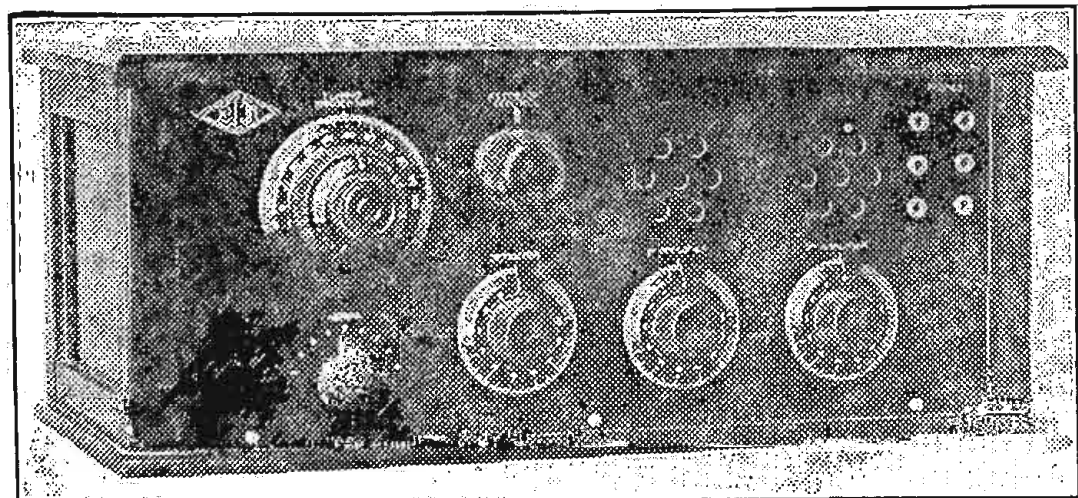
Rather than a high polish mahogany (Continued on page 18)

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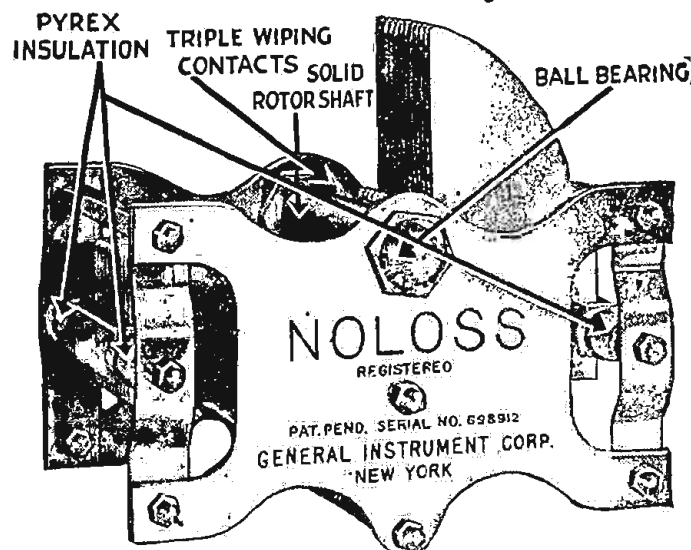
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New Wonder of the World

New Science Claims Right to Eighth Place

SELECTING the seven wonders of the world has been a popular pastime from the early days of recorded history down to the present.

The ancients got almost as much kick out of choosing them as modern writers do from picking an all-American football team, and they had equally bitter arguments in deciding which objects and phenomena to include and which to eliminate.

The earliest list of the seven wonders of the world included the hanging gardens of Nebuchadnezzar, the Colossus of Rhodes, Phidias's statue of Jupiter, the Pyramids, the temple of Diana at Ephesus, the tomb of Mausolus and the palace of Cyrus.

Galloping down along the paths of history, the United States got into the seven wonders game with such entries as Niagara Falls, the Washington monument, the Grand Canyon and the Woolworth building listed along with foreign sights like the leaning tower of Pisa, the great walls of China and the Eifel tower.

But today nobody gets very much excited over the seven wonders. The whole world is much more interested in the eighth wonder.

By common consent, the title of the eighth wonder of the world goes to Radio. The marvel of Radio communication has a universal appeal. It amazes, thrills and serves every country and clime.

The effects of this new art and the utility cannot even yet be measured or fully forecast. Certain it is that this modern method of communication already is profoundly affecting industry, religion, entertainment, political life and home life everywhere. And the real romance of Radio is not alone the spectacular fact of communication through the ether between points thousands of miles apart, but the speed and completeness with which the new utility has made a place for itself in the daily life of millions of people.

In fact, the development has been so rapid that the general public has scarcely given a thought to what makes this wonderful source of education and entertainment possible.

Dispatching Trains

Air to Give Better Service to Railroads

ORGANIZATION of emergency railway dispatch and telegraph systems among amateurs is only another inevitable development of Radio.

Far beyond this is the utilization of this swifter form of communication as a permanent means of dispatching trains and exchanging messages between railroad stations and officials.

While some of the greatest railways in the United States have organized emergency Radio dispatching systems with amateurs all along their lines, Henry Ford has gone even farther and established a permanent Radio dispatching system on his railroad. Dispatches are handled along that line with greater speed and ease than heretofore.

As an emergency, Radio dispatching is particularly beneficial to a line like the Santa Fe, which runs through some of the most hazardous territory in the United States. Terrific sleet and snow storms in the mountain regions of the southwest and the ever-present danger of landslides in the canyons through which this road runs makes this emergency protection necessary.

The Santa Fe has already enlisted between fifteen and twenty amateurs for the emergency service.

Morals of Our Boys

Keep the Boy Busy and Interested to Avert Trouble

JUVENILE cases in the courts have been reduced about 41 per cent in the past two years. This can only be traced to the influence of Radio. The new science has so interested the average boy that he has no time to get into mischief that leads him to the courts.

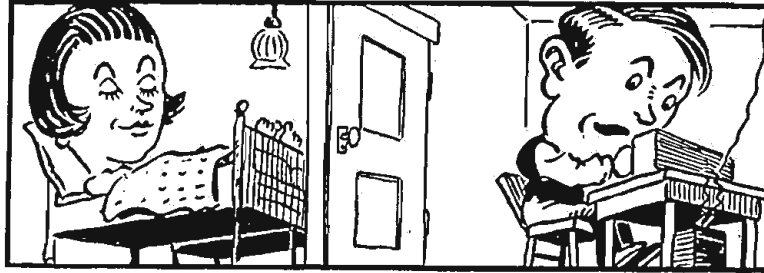
RADIO INDI-GEST

I'm a Single Circuit Pest

I stay up late and turn the dials,
And reach and claw the air for miles;
While wifey goes to bed and smiles—
She doesn't understand it.

But, darn the luck, I know it's there;
I know full well it's on the air;
My wife can laugh but I don't care—
Some of these nights I'll land it.

I turn my rheostats up high;
I try my best to rectify,
But somehow it don't amplify
The thing that I am searching.



I send my squeals out into space;
I know the fans around my place
Call me a neighborhood disgrace
For programs I'm besmirching.

But what care I if they protest,
And what care I if I molest;
I know that I'm a broadcast pest—
But I must get that station.

It's just the ones I fail to get
That makes me fume, and fuss,
and sweat,
On my old single circuit set—
I'm a hound for regeneration!

A. L. KASER.

Yeh! Try an' Get It!

Dear Indi: The other night I was listening (or rather trying to listen) to one of KDKA's late concerts an' when the final number was played the announcer, Mr. Eddie Squires, says for all those who weren't satisfied to write in an' they'll get their money back.

Does this mean that they will hand over to me the price I foolishly paid for my receiver? The manufacturers advertise that this set of mine will bring in all the stations and it certainly does!

The only trouble is it brings them all in at the same time! Kindly tell me what to do as this seems to be a good chance for me to get my money back.
GLOOMY GUS.

Mrs. Partington Speaks Out

Dear Indi: Mizz Partington says General Bob Lafayette don't play fair, for he is busy already broadcasting his stuff about his Russian parties, before either "Cool Cal" or "Decent Davis" knows yet they been nominated, unless some Clarksburg neighbor has went and blabbed about the big surprise party that's to be pulled off at the old home town, as soon as Wall St. slacks up for the dog-days and John W. Comes on his vacation back to the old swimmin' hole.

But then, she says, its different with Lafayette, his parties can't notify him of nothin'; he does all the notifyin' hisself, and then goes right along broadcasting his monologue, "They're all plumb ornery but Bob." She says though, Cal and Charlie have a lot of wood sawed up, and probably will have a good supply of sweet cider, punkin pies and doughnuts, and are getting their studios fixed up nice, to entertain the visitors, when they go on the air next fall.

Brother Charles has been wised up, so if you have tuned in on his short wave "Gov." station you have learned that he won't stand for his cornhuskers to lose a whole day's fall ploughing to soldier around on defense day. He says what his programs may be from his long wave "VP" station is something else again.
SIGNING OFF.

Backward, Turn Backward!

Backward, turn backward, time in thy flight,
Make me a Nighthawk and do it tonight;
For I'm not young like I once used to be,
And Coon-Sanders music sounds pleasant to me.

It makes my wife growl 'cause I don't go to bed,
And she says that Radio has gone to my head,
When I joined the "Owls" she was filled with alarm,
But another little hour won't do any harm.

So trot out the goat—I'm ready to go,
And the way I will ride him won't be very slow;
For I'll grab his whiskers, his back I will straddle,
I'll ride him or bust and without any saddle.

L'Envoi

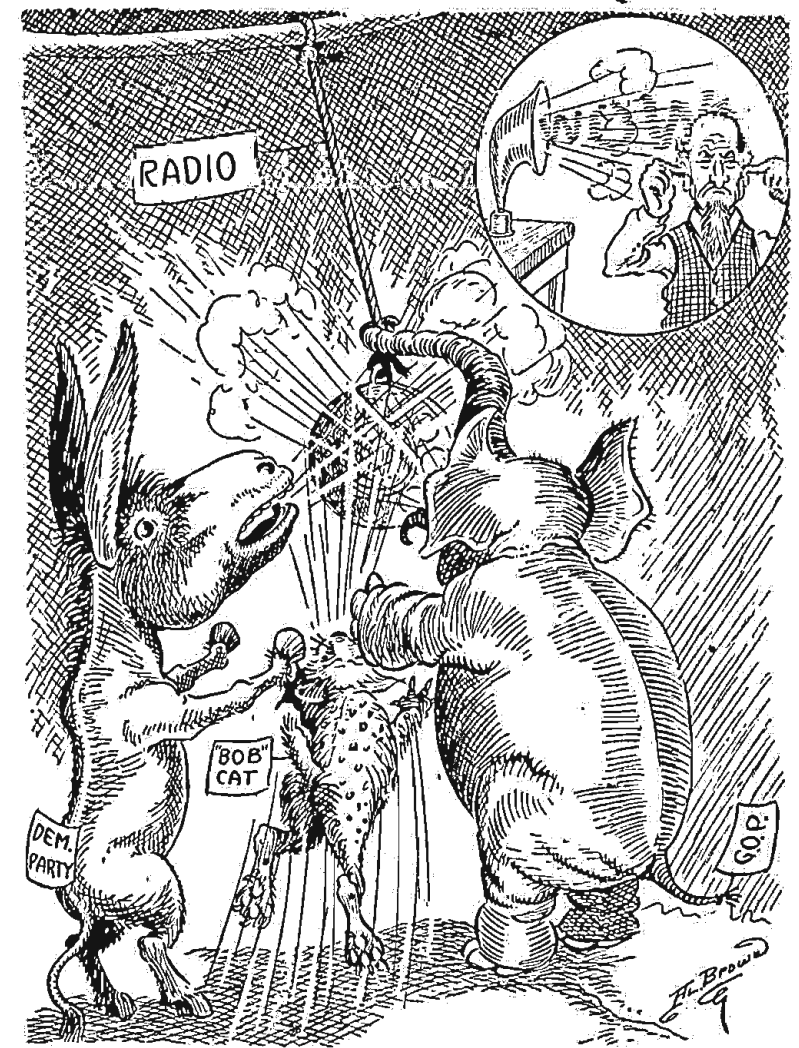
I want my credentials in an upholstered frame,
And if I don't get 'em I'll think it's a shame.

P. S. ROY.

Ain't Antennas Wonderful?

Dear Indi: Before I installed my pair of antennas, them Scherzos from the concerts got all mixed up, but now they come in perfectly whether the announcer says shirtso or skirtso.
GENU HICK.

The Radioblasters



Condensed

By DIELECTRIC

WGN has some good talent to its credit and the programs come through well, but it is to be hoped they won't have to suffer the consequences of letting out questionable matter as unfortunately happened not long ago. Flappers called it "old stuff" and ladies—blushed.

Instead of listening to the stentorian claim of a perfectly healthy singer that "there is no death," Station WOR gave a pleasing and very instructing feature recently when it presented Asa Don Dickinson who spoke on "Good Books." Music is all right at any time, but not all the time. A tip on good books is a real service these days.

We are going to give you an entirely different feature in these columns from now henceforth and in the rare instances where your judgment differs from mine on the content or presentation of any Radiocast number—mark down a point scored by Dielectric. I expect to have both ears open to hear what is good, and say so, and if it is worse, well, I shall express myself with a smile.

There's a certain spice to getting news via Radio that is a step ahead of the next edition of the daily newspaper, and for that reason and the novelty of it, I enjoyed the Radiocasting by our fraternal Canadian station CFCA of news items offered members of the Canadian press during the strike of telegraph operators. The same thing has been put over here during severe storms, but certainly no better.

Even though it did require an occasion for international Radiocasting, and sitting up late to hear it, the speeches of seven governors of western states through Station KGO was something out of the ordinary. Simply the notion that you listen to a Radiocast being heard in many countries outside your own is sufficient to keep that station on center. And I must congratulate its technical success.

I haven't quite recovered yet from listening to the marvelous exhibition of what may be accomplished in communications with the telephone and Radiophony combined, as we heard it Defense Day. General Pershing has a "Radio voice" if ever man possessed one. His conversation with officers under his command was a delight to listen to, both for its familiar expressions and absolute clarity of enunciation.

If some music we hear is called band music, then for heaven's sake let's coin a new term to fit the United States Marine Band. It makes no difference whether this organization is interpreting classical numbers or working a miracle with mediocre stuff, you never feel like swinging the dials while they are on the air. Many times I have marveled at the ability of the Marine Band as of producing orchestral effects.

Those of you who have not served in the capacity of musical critic for the press possibly fail to appreciate to the full the statement made by Zal Jacobs, pupil of the famous pianist and pedagogue, Leopold Godowsky. When Mr. Jacobs appeared before the mike at Station WOR he expressed a desire that his Radio listeners should form their own opinion of his ability from what they heard not from expressions of press critics. I have thought for some time of the advisability of permitting Radio audiences to appraise artists without the influence of laudatory introductions. An artist before the mike cannot detract (nor hypnotize) by the peculiar mannerisms native to so many performers.

Console and Cabinet Making for Receiving Sets

Chapter III—Varnishing and Finishing Wood Surfaces

By Charles F. Smisor

ONE of the first things to consider is the wood which was used in the construction of the cabinet. This matter is of the utmost importance and should be looked into before proceeding with the finished work. The open grained woods are ash, oak, chestnut, walnut, mahogany and butternut. These woods require fillers. The close grained woods are pine, maple, cherry, redwood, birch, beech, cypress, sycamore, whitewood and poplar. These woods do not require fillers and they can be finished in natural colors or stained if preferred.

To obtain the best results it will require five operations, but in the close grained woods the filling process can be omitted. Sandpapering, staining, filling, varnishing and the final polishing, completes the list.

Preparing the Wood Surfaces

As told in the preceding chapters the wood which was used in the construction of the cabinet is supposed to have been planed and sandpapered, but the finished work should be gone over again with what is called 00 sandpaper attached or held on a smooth block and the rough surface rubbed with the grain of the wood, using a moderate pressure, taking care when approaching a square edge not to round it. Wipe all the dust from the surface with a cloth.

Pine or poplar woods will take a stain that will represent the more costly woods. When using pine, cabinets can be made so that the surface will look as if an expensive natural colored wood was used. In wood finishing much trouble in working will be avoided if the best stains are used. There are two kinds of stains, oil and water, each having their good points.

Covering Sap in Wood

Woods, like pine, contain considerable sap and after applying the stain the grain becomes somewhat rough. Such a surface should be given two coats of white shellac after the stain has dried. When the shellac has dried smooth the surface again with sandpaper. The shellac keeps the sap from discoloring the finish. Varnish-

ing, rubbing down and polishing are the things to do in the order named.

The stains may be applied with a brush after which they are rubbed in with a piece of cheesecloth. This distributes the color evenly and absorbs the surplus moisture which in the case of water stains is apt to raise the grain of the wood, thus making it necessary to do more sandpapering. If the rubbing-in process is done properly there will be a uniform tone. If the first application does not give as deep a color as desired, give it another coat.

If it is desired to use an open grain wood, such as mahogany or walnut, using

have all pores filled but no filler on the surface.

Applying the Varnish

The next thing to do is to apply the varnish. Be sure your work is dry and the surface smooth then apply a thin coat of white shellac varnish. If the shellac is thick thin it with alcohol only. Dip the brush into the varnish and wipe off all surplus before applying it to the surface. Never try to apply too thick a varnish. This will allow the stain to show. The first coat should be given three or more hours time to dry before applying the second coat. Rub the dried surface with the finest grained sandpaper

lightly with the grain. Set it aside for a couple of days to dry.

Final Polishing

The hand rubbing process is the only method that will give that beautiful smooth gloss finish. This is done with pumice stone. Procure some FF grade pumice stone from a paint store, also some linseed oil and a rubbing felt. Dip the felt into the oil thence the pumice stone which will adhere to the oil soaked felt and rub the varnished surface lightly along the grain. Continue this process until all depressions have disappeared. Hold the work to the light and look diagonally across the surface. Any depressions can be seen as the hollow places will show as dark spots. Remove the surplus pumice with a dry cloth. Apply another coat of varnish and repeat the operation with the pumice stone. The surface will then appear as a dead finish without gloss.

If it is desired to have a glossy finish, dip a piece of felt into the linseed oil and then powdered rotten stone and go over the surfaces in the same manner as with the pumice stone. A higher polish can be procured on the last coat by giving the rotten stone treatment and then rubbing the hard varnish with a soft cloth dipped in linseed oil, using plenty of pressure until a high polish is obtained. The surplus oil is wiped off with chamois skin.

Varnished and polished surfaces of all descriptions should not have any strong soap powders applied for cleaning purposes to remove finger marks as it will turn white in spots. Use nothing but a good furniture polish which will clean it and restore the finish at the same time.

(In the articles to follow there will be various stands, tables and consoles described, the first being an inexpensive table stand with enclosure for the B batteries. This stand was originally built from the leaves of an old oak extension dining room table, but it could not be told from a manufactured article.—Editor's Note.)

Refined "Super" Begins Next Issue

IN THE issue of October 11, Harry J. Marx begins a series of articles on his improved Super-Heterodyne. The experience gained in building three or four predecessors has all been utilized in constructing this latest one—and the list of stations logged reads like a Who's Who of U. S. Radiocasters.

The oscillator—tube, coils and condenser—is entirely enclosed in an easily constructed aluminum box. The resulting sharpness of tuning is a

delight to the DX hound. Panel and baseboard are armored against interfering waves; line the cabinet with thin copper and the result is What You Want When You Want It. Shielding made easy might well be the title of part of this series as the reader will find all the difficulty removed from this unusually unpleasant job. The vernier construction is unique and brand new; not only does it give prevision control but prevents capacity as well.

stains to make them a deeper color, the pores will need to be filled after staining; otherwise staining can be omitted, but not filling, which is necessary. Suppose that such a wood has been stained. Procure a paste filler of a color to match the stain as nearly as possible; put some of the filler on a piece of cloth and rub it on the wood. As soon as this filler has dried a little, not too hard, continue to rub the surface until all pores are filled, rubbing off any surplus. The object is to

until the wood is smooth. In rubbing use light strokes otherwise the varnish will be rubbed through.

The application of the finish varnish comes next. Be sure to use the best brushes for the work. Procure a good grade of varnish and keep it warm while using it. When too cold it will not flow easily and give a smooth surface. Have just enough varnish on the brush to just give a level coating when it is brushed across the grain. Finish by rubbing

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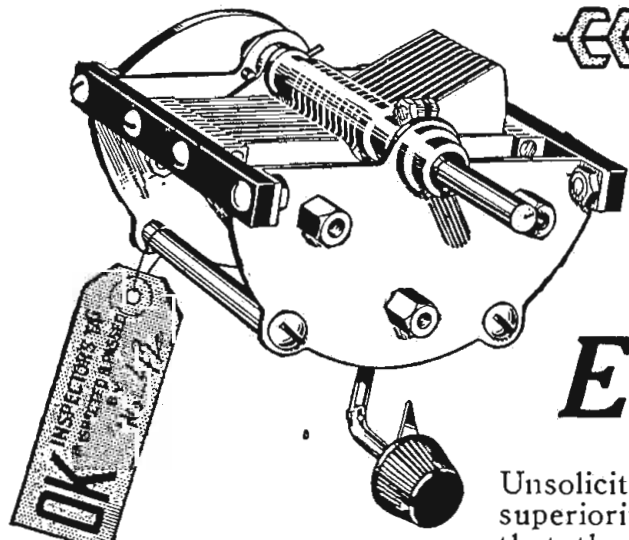
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Philadelphia, Pa.
Dear Sir:
The Low Loss Condenser (.00025 mfd.) greatly improved the efficiency of my tuner.
DX signals are increased in audibility many times by the use of this Low Loss Condenser, and I am hearing many distant stations that were not readable before.
I have used it on both my broadcast receiver and my amateur low loss, short wave receiver for CW signals, copy POZ, Germany, regular on 75 meters. With best wishes.
Yours Truly,
GEORGE E. STERLING,
Asst. U. S. Radio Inspector,
3rd District, Baltimore, Md.

Standard Prices and Sizes. All Capacities Are Exact.

13 plate, capacity .00025.....	\$5.50
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THREE TUBE SET

(Continued from page 15)

finish, a mission style or wax finish is recommended. Radio sets are too easily scratched up and piano finishes then lose their attraction.

Installation Connections

Use a soft detector tube in the first

connects to the B-binding post. The positive of the 22½ in addition connects to the B+DET binding post. The positive of the 45 volt unit connects to the B+AMP post.

The phones should be plugged in the left jack or detector stage. The set is then ready for operation.

readjust the regenerator dial in order to clarify the reception. After the reception has been sharpened and the maximum volume obtained, turn the right rheostat knob lighting up the amplifier tubes. Plug in the loud speaker on the right hand jack and remove the head phone plug.

THE END

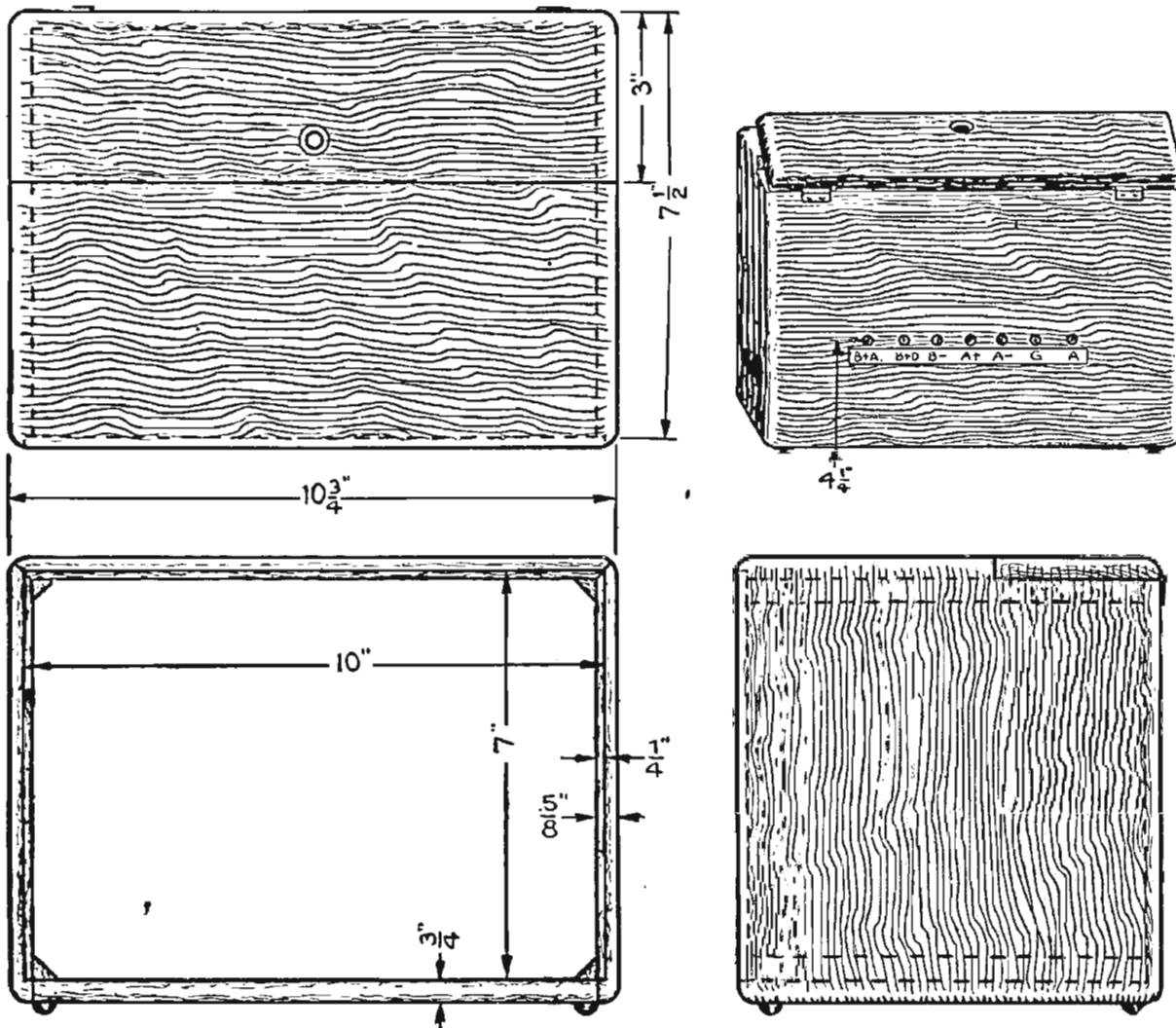


Figure 6

socket from the left, in the other two use "A" type amplifiers. Three volt tubes with standard base can also be used. The antenna and ground connections are clearly marked on the binding post strip. Use a six volt "A" battery. One 22½ volt and one 45 volt "B" batteries are required. Connect these in series with the positive of the 22½-volt unit to the negative of the 45. The negative of the 22½-volt unit

Tuning in for Reception

Turn the left rheostat about three quarters the way around until a soft purring is heard. Now turn the left dial to the point where it starts squealing or the typical regenerating sound. Turn it back just a little from this point. Now turn the tuning (condenser) dial on the right side until the carrier wave of a station is heard. It will now be necessary to

stock solution and use it for the next charge. Throw away the milky sediment.

The rectifier that I described in a recent issue of Radio Digest will rectify 2 amperes and up to about 75 or 80 volts difference between line and the battery. One cell and one 40 or 50 watt light will charge a B battery up to 75 volts.—Herbert H. Freese, Detroit, Mich.

Rejuvenating the B Battery

A run down dry battery may be brought to life and give considerable service if the paper cover be removed and the cell placed in water. Punch a few holes in the zinc so the water can soak in easily. An inexpensive container can be made from a quart vinegar bottle with its top cut off. Remove labels from the bottle and wrap three turns of ordinary cotton twine around the bottle where you wish to cut it, then saturate the string with kerosene. Don't use gasoline. Set the bottle upright, then fire the string all around at as near the same time as possible. When the oil has about burned from string dip in cold water and the top will snap off. Be sure there is no cork in the bottle.—John C. Himebrook, Columbus, Ohio.

Hints on Electrolytic Rectifiers

Use a gallon jar for a stock solution and put in a large box of ordinary borax, then fill the jar up with water, stirring all the time until it becomes a saturated solution.

After this solution has settled down pour off the clear part into the rectifier jar. Fire like sparks will appear and disappear on the aluminum rod and it will turn white, while the lead rod becomes dark brown or chocolate color. Twice as many bubbles should arise from the aluminum rod as from the lead, and the solution will become hot and even boil.

When the solution reaches a milk color pour it off and refill from the stock solution and let the milky solution settle. Pour the clear solution back into the

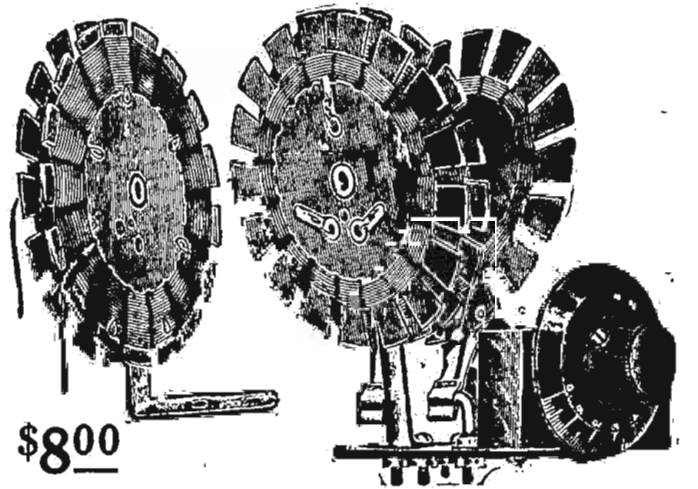
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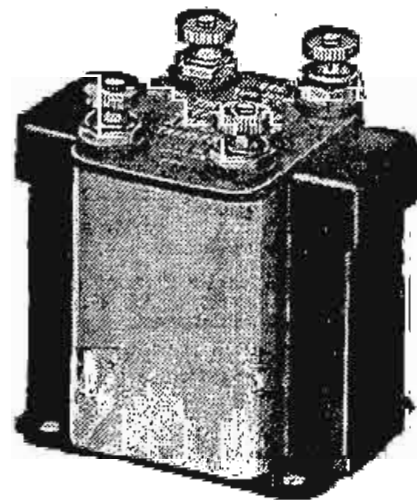
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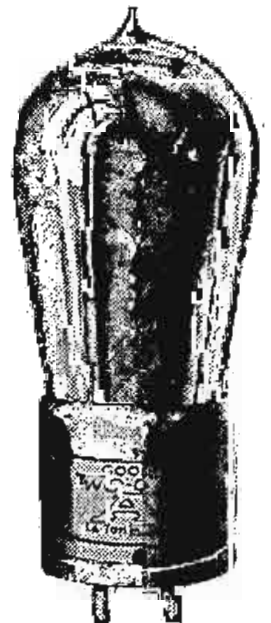
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Amplidyne Type Radio Frequency Amplifier

Part IV—Final Assembly and Operation of the Receiver

By Thomas W. Benson

IN THE final assembly of the amplidyne the writer has found the best method is to proceed in stages as follows: After mounting all the panel instruments with the exception of the amplifiers the panel instruments should be wired as far as possible. The audio frequency unit is assembled and the wiring on that done as much as possible and finally the unit carrying the Radio frequency tubes has sockets and condensers mounted and binding posts mounted and wired as far as practical.

Connecting the Units

The three units are put together. Attach the audio amplifying unit to the panels by bolts through the rheostat frames. It will be found necessary to put a space between the 6-ohm rheostat and the audio panel because these rheostats are a trifle shorter than the 30-ohm rheostats. The Radio frequency tube panel is attached to the main panel by means of the brass strips provided.

When the above is completed the wiring can be continued until everything is wired with the exception of the amplifiers. These can then be mounted on the condensers and the wiring completed. In mounting the amplifiers the first and third tuning unit are mounted parallel with the base while the second is mounted vertical. This places the windings at right angles to each other with minimum coupling between them.

The receiver will now appear as shown in the top view Figure 11. The final touches should now be given the receiver such as leveling up the rear panels by means of the screws mounted on the back edges for legs, placing the dials and a final check up on the wiring.

Testing Out the Circuit

Insert a tube in one of the amplifying stages and connect up the A battery to the proper terminals. Pull out the battery switch and turn on the rheostats to make sure the A battery circuit is O. K. The tube should be tried in all the sockets to make sure the circuit is complete throughout. Now with the tube in one socket disconnect the positive wire of the A battery and connect it to the

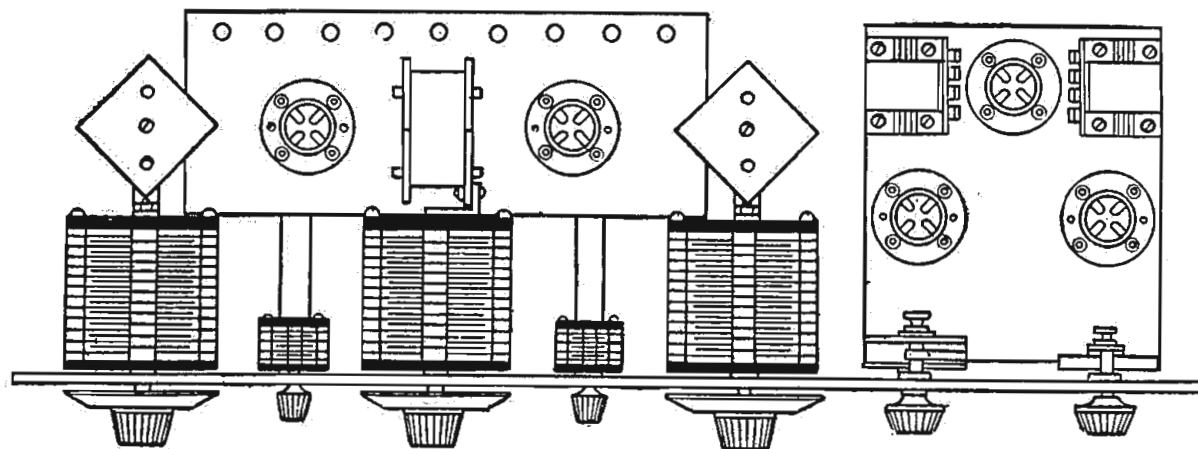


Figure 11—Top view of completed amplidyne set.

positive B battery terminal of the set, shorting the A battery terminals with a short piece of wire. If the tube lights it indicates a short between the A and B battery that must be located and removed before proceeding further. If the tube does not light everything is clear and the receiver can be connected up to aerial and ground and all the batteries connected in.

The tubes should be placed in the sockets. The set is intended to work with a UV-201A in the detector stage as well as the amplifier stages and will be found to compare well with a set employing a soft detector tube. When all the tubes are lighted the set can be balanced out. The purpose of this is to determine the point of balance so that the Radio frequency stages can be brought to a state of neutralization when desired. The procedure is similar to that followed in neutralizing the neutrodyne circuit. Tune in a station at a fair distance so the signals are clear but not loud then remove the first tube from its socket and place a piece of paper over one of the filament terminals.

Replace the tube in the socket and then tune in the signal as loud as possible on the dials. Now adjust the neutralizing condenser until the signal is weakest. Hold the plates of the balancing condenser while the pointer is turned

straight up and then clamped into position by tightening the knob. Thus we know the first tube is neutralized when the balancing condenser is placed in a position with the pointer straight up.

Now keeping the first stage balanced the paper is removed from the filament of the first tube and placed under filament terminal of the second tube and the second stage is balanced out in the same manner. Be careful not to touch the balancing condenser on the first tube while making the second adjustment. Shift the pointer on the second balancing condenser so it is vertical when the tube is neutralized.

Set Ready for Operation

The set is now ready for operation but one other thing may require adjusting before the set functions properly. This is the adjustment of the grid leaks. Loading of the grid will be noticed by a chopping-off effect in the signals and the leak should be reduced till this action stops. A few minor adjustments such as voltages on the plate of the detector and different C battery voltages will assist in getting the best out of the set.

The method of handling this receiver should be fairly obvious. The balancing condensers are normally carried in a vertical position at which point the set is stable and will not oscillate and stations can be tuned in by the dials in the

usual manner. The dials will read nearly alike and the reading may be logged for future reference.

When the signals are picked up and brought in as loud as possible on the dials the final adjustment is made with the balancing condensers. A slight movement of these will unbalance the circuit and make it more liable to oscillate at which point it is in its most sensitive condition and the signals will be brought in stronger. These condensers also act to cut out interference and clear up the signals.

(THE END)

An Efficient Indoor Antenna

When our family moved I was unable to put up an outdoor aerial and so I decided to use the following method. I secured about 100 feet of number 20 sec. wire and two small insulators and I wound the wire around a broom handle very tightly and as close together as possible. I then removed the wire by slipping it off the end of the broom handle and I had what looked to be a long spring.

I fastened the two insulators on the ends and I was then ready to install the aerial. I strung a string through the center of the coil to keep it from sagging when hung across the room. The lead was taken from one end and fastened to the set.

In this case the aerial was strung across a 16-foot room and the results were very surprising.

At that time I happened to be using a single tube regenerative set, using the Ultra-audion Circuit, and many times I heard stations 1,500 miles away and they came in with good volume.

This aerial also eliminates static to a great extent, and therefore is ideal for summer use.—Lee H. Bolen, Hamilton, Mont.

If there is any corrosion in the joints, a scratchy noise results. If the prongs of the tubes do not fit properly, or they are corroded it is another cause for scratchy noises.



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The Reader's View

Acknowledging Receipt of Applause

In the August 23 issue a letter written by Ernest Barron says the Radio artists should acknowledge receipt of applause. When a person listens to an artist who is trying his or her best to please you all of which you get for the mere trouble of tuning in, I certainly do not think the artist should under any circumstances acknowledge it. Think of answering 1,000 to 5,000 cards or letters. How would you like to answer and pay for postage on such a bunch of replies, Mr. Barron? Think how long it would take to write them and how much they would pay for postage. I believe you are greedy at that. I have a suggestion to make and would like to hear from others.

Why not write to each of our favorite stations to quit acknowledging all of our replies? The bunch of mail that is received each day will take several stenographers all day to answer and think of the money spent for postage; as many as 10,000 replies have to be answered each day. Two cents for stamps, two cents for envelopes and cards and stenographic help will make each reply cost the station about six to 10 cents. Think what this expense means. Why not let them spend this for better programs or improvement on their stations?

I certainly do not think the artists should acknowledge applause cards. You would not think of having a movie fan or opera star come out and thank each one on applauding them.—C. F. Meier, Perry, Iowa.

Modified Ultra Audion

I want to thank Radio Digest for the hook-up which appeared a month or two ago, "Modified Ultra Audion, Using a Variometer."

This is one of the best little sets I have ever seen. I am using a department store \$1.00 variometer and a 22½-volt plate current.

I have been able to bring in on a single night when static is not too bad: KFKX, KSD, WTAM, WOR, WOO, WGY, WOS, WHAZ, WLW, WJAR, WCBW, WSB, WCAP, WFAA, WSAI, CFCF and WOC in about three hours. Other stations I have received at different times are:

WJAX, WNYC, WHO, WTAS, WHAS, WMC, KYW, WLS, WQJ, WBZ, WWJ, WCX, KDKA, WEBH, WEAJ, WOA and WJAR.

These stations come in with plenty of volume and extraordinarily clear for this time of the year. At present I do not use a grid return connected between the ground and the + of the tube 1. I have brought in Chicago stations without an aerial.

My aerial is two wires, 50 feet long and 30 feet from the ground, with a 15-foot lead-in, 5-foot ground lead to a water pipe.

Thinking some of the boys would like to hear of results from this circuit, I am submitting my experience with the hook-up.—S. M. Price.

Regarding Underground Aerials

Perhaps you will be interested in having reports on the use of the underground aerial made according to the articles recently published in your magazine.

I built one, using ninety feet of number fourteen rubber covered wire. To insulate the free end of the aerial, I filled a small bottle with hot sealing wax, then I stuck the free end of the wire into the wax and allowed it to stay in and taped the wire to the side of the bottle so the end could not pull out.

I have this aerial buried two feet underground and have about an eight foot lead in to my set.

Now for the results. My set is three-tube regenerative, and the farthest I have picked up with the overhead aerial has been KGO, just 1600 miles from here. On one of the warmest nights at midnight I

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Music by Sooner Serenaders

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Published by Harold Rossiter, Chicago

picked up KGO with overhead aerial but with considerable static. Then I hooked up my underground aerial and tuned my set again. I picked up KGO again (of course the volume was less) with practically no static!

How is this for summer reception, and who has heard any greater distance this summer with the underground aerial? It would be interesting to read reports of others who have built one of these aerials.—J. W. C., Chillicothe, Mo.

Loose binding posts will make a noise. Loose phone connections are another annoyance. The remedy lies in tightening all binding posts and resoldering all loose joints with the use of a little flux as possible.

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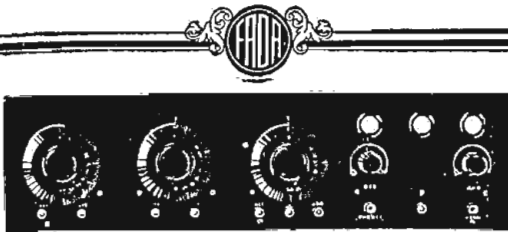
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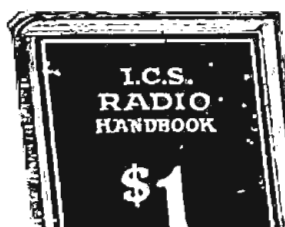
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Wave Trap Effect in Antenna Systems

No Ground Wire Used Connecting to Receiver

For those who have available space to conduct the following experiments they will find them worth while. Various types of wave traps have been used with more or

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

less success and this system is based on the wave trap principle. The systems number 1 and 2 work good, but with less volume than number 3.

The circuit shown in numbers 1 and 3 will greatly improve the selectivity of any receiver, also acts as a static screen and gives better volume than the ground wire system. Nearby stations can be tuned out without any trouble.

The aerial used in this experiment was a small cage 125 feet long, the other aerial was a single wire about 150 feet long and the counterpoise was a fan 80 feet long. It is believed that most any kind of good antennas would give equal results. A direct ground instead of a counterpoise can be used, but will not give as good results.

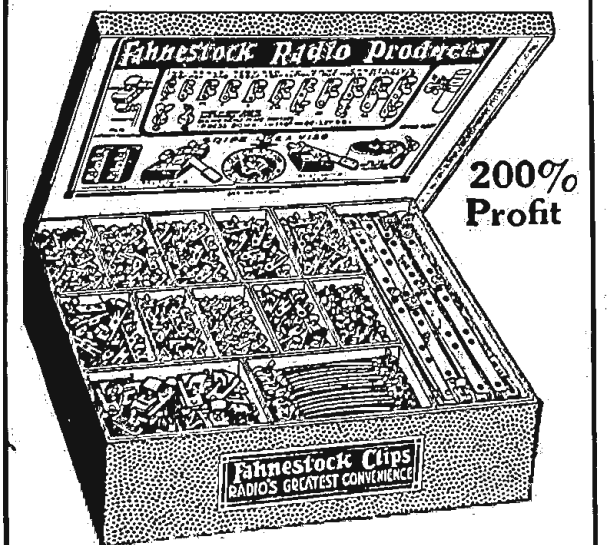
This system was accidentally found while listening in on a receiver on the single wire antenna as in circuit number 3, with a transmitting set connected to the cage antenna and counterpoise. It was found that when the inductance in the transmitter was changed (while the transmitter was not in operation) that the receiver was detuned, and several stations then tuned in on the receiver without changing its tuning.

Probably this system would not be worth while for improving the selectivity of a receiver as there are simpler methods; however, I do believe that it is worth while for those who have the facilities available for reception during the static season.—Ray Blain, Omaha, Nebr.

Sharp Tuning

Sometimes when a fan experiences broad tuning with his new Radio receiver it is a good idea to try a few more turns on the primary winding. This will often make much sharper tuning. The writer lately experienced the same trouble, which was eliminated by this method. The idea is to keep the capacity low and the inductance high, which generally makes sharper tuning.

Dealers Need This



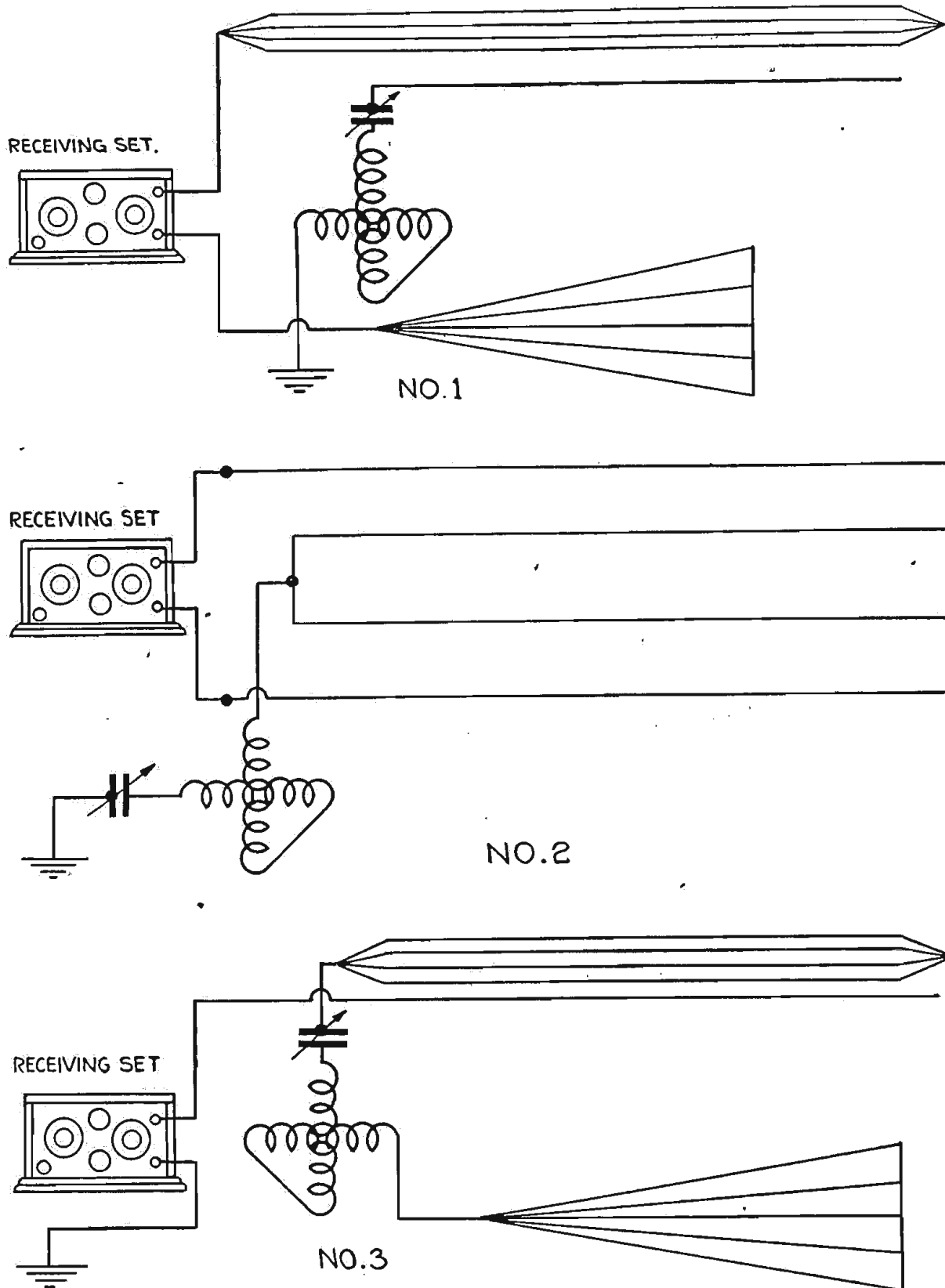
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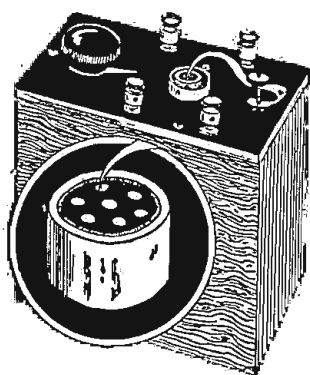
Removing Phone Caps

Many fans have a bad habit of removing the caps from their phones for one reason or another. This is decidedly harmful to the receiver; that is, it impairs the efficiency of the units for the following reason: When the phones are

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The natural wave length of an aerial can be approximately estimated by multiplying the total length of aerial and lead-in in feet by 1.40. This will give the length in meters.

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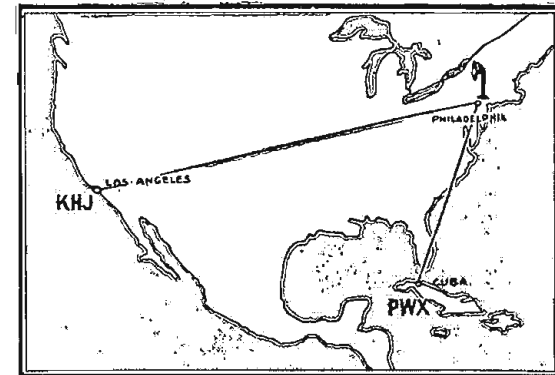


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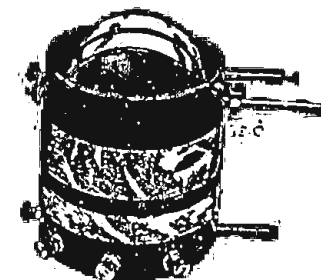
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Questions and Answers

Intermediate Frequency Transformers

(9131) GLK, Woodlyne, N. J.
In reference to the articles on the super-heterodyne by Mr. H. J. Marx, could you advise me the size wire and the number of turns for the super audible or intermediate frequency transformers?
Also, should they be wound in the same direction or in opposite directions?

A.—We are directing your attention to page 25 of the January 26 issue for full details for the construction of the intermediate frequency transformers. The primary consists of 500 turns of number 30 dsc. copper wire, the secondary of 2,000 turns of number 36 dsc. copper wire and is divided into two windings of 1,000 turns each in outside groove of spools used. All windings run in the same direction.

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tion for a one hundred foot copper aerial?
A.—The installation of an antenna system is governed necessarily by the facilities and conveniences afforded. It is advantageous to accomplish as great a height as possible, generally from 40 to 50 feet above the earth directly or if confined to a roof 10 feet or higher if available.
If it is necessary to use poles for support they should be put up carefully to avoid danger of collapsing. Aerial can be stretched from building to a pole or a tree. In the latter case some means must be provided to compensate for the swaying of the tree and also proper insulation, which, however, is always understood.

Push Pull Amplifier

(09830) FMK, Owensboro, Ky.
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transformers and two WD-12 tubes. What would be the correct ratio for an additional stage of audio amplification? Something on the order of power amplification, using grid condensers and the like?
I am getting tremendous volume for dry cell tubes, but I still desire greater volume.
What would be the proper connections to my present set, using 90 volts on the plates; 22.5 of this goes to detector? I have an additional B battery if this could be used at an advantage.

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Radiophone Broadcasting Stations

Corrected Every Week—Part IV

FIND MISTAKES AND YOU'LL GET DOLLAR

ONE DOLLAR will be paid to the Radiophan reader of Radio Digest submitting the most errors in any one station's listing in the Directory of Radiophone Stations, which appears in four parts, serially continuously, on page 23. Letters must reach Radio Digest's office not later than one week from date of issue corrected. Readers are not limited to correcting one station, but such corrections must be verified by the stations themselves, and NOT by comparison to other so-called accurate Radiocasting directories or lists. Turn in corrections for as many stations as you can find—if you can find errors! Use separate sheet of paper for each station submitted and place name and address on each sheet. In case of tie, duplicate awards will be made.

(The following schedules complete the alphabetical station data list, Part III of which was given last week.)

WKAN, Montgomery, Ala. 226 meters. 15 watts. United Battery Service Co. Wed, Fri, 8:30-9:30 pm, music, news. Sun, programs. Central.

WKAQ, San Juan, Porto Rico. 360 meters. 500 watts. Radio Corp. of Porto Rico. Announcer, Joaquin Agusti. Slogan, "The Island of Enchantment. Where the World's Best Coffee Grows." Wed, 8-10 pm, band; Fri, 8-10 pm, music, talks, entertainment. Inter-colonial.

WKAR, East Lansing, Mich. 280 meters. 500 watts. Mich. Agri. College. Announcer, Merton M. Cory.

WKAJ, Laconia, N. H. 254 meters. 50 watts. Laconia Radio Club.

WKBF, Providence, R. I. 286 meters. 500 watts. Dutez V. Flint, Inc. Announcer, George Spink. Slogan, "Quality First." Tues, 9-10:30 pm. Eastern.

WKY, Oklahoma City, Okla. 360 meters. 100 watts. WKY Radio Shop. Mon, 9-10:30 pm. Thurs, 9:30-11 pm, concert. Daily ex Sun, 7-7:30, sports. Sun, 11 am, 7 pm, church service. Central.

WLAH, Syracuse, N. Y. 234 meters. 100 watts. Samuel Woodworth. No regular schedule.

WLAL, Tulsa, Okla. 360 meters. 100 watts. Naylor Elec. Co. Wed, Fri, 8 pm, music. Sun, 11 am, 7:30 pm, church services. Central.

WLAP, Louisville, Ky. 286 meters. 20 watts. W. V. Jordan. Tues, Fri, 9:20-10 pm. Central.

WLAQ, Kalamazoo, Mich. 283 meters. 10 watts. Arthur E. Schilling. Daily ex Sun, 11:30-12:30 pm. Thurs, 10:30-12:30 pm. Sun, 2:30-5 pm. Central.

WLAX, Greencastle, Ind. 231 meters. 10 watts. Greencastle Community Broadcasting Station. Tues, 7:30 pm; Thurs, 7:30 pm. Sun, 7:45 pm, church services. Central.

WLB, Minneapolis, Minn. 360 meters. 5 watts. U. of Minn. Dept. of Elec. Eng.

WLB, Stevens Point, Wis. 278 meters. 500 watts. Wisconsin Dept. of Markets. Slogan, "Wisconsin, Land of Beautiful Lakes." Daily ex Sun, 8:45 am, 9:45, 10:45, 11:45, 12:30 pm, 1:45, markets; 2, news. Wed, 8 pm, music. Central.

WLS, Chicago, Ill. 345 meters. 500 watts. Seare, Roebuck & Co. Announcer, George D. Hay. Daily ex Sun, 1-2 pm, farm program. Tues, Thurs, 6:30-1 am. Wed, Fri, 6:30-11 pm. Sat, 8-12 midnight, barn dance. Sun, 6:30-8 pm. Central.

WLW, Cincinnati, O. 423 meters. 500 watts. Crosley Radio Corp. Announcer, Fred Smith. Daily ex Sun, 11 am, 1:30 pm; daily ex Sat, Sun, 3, 4, reports. Mon, Wed, 8-10 pm, entertainment. Tues, Thurs, 10-12 pm, music. Sun, 9:30 am, S. S. services; 11, 7:45 pm, church services; 9, orchestra. Central.

WMAZ, Cazenovia, N. Y. 261 meters. 100 watts. C. B. Meredith. No definite schedule.

WMAF, Dartmouth, Mass. 360 meters. 500 watts. Round Hills Radio Corp. Slogan, "The Voice from 'Way Down East.'" Sun, 11 am, 7:30 pm.

WMAH, Lincoln, Neb. 254 meters. 100 watts. General Supply Co. Club, "Lincoln Root Owl." Mon, Thurs, 8 pm. Sat, 12, midnight owl program, music. Central.

WMAK, Lockport, N. Y. 273 meters. 500 watts. Lockport Board of Commerce.

WMAL, Trenton, N. J. 256 meters. 50 watts. Trenton Thruway. Slogan, "The Home of Good Music." Mon, Thursdays, 7:30-9 pm, music, lecture. Eastern.

WMAN, Columbus, O. 260 meters. 100 watts. First Baptist church. Sun, 10:30-12 m, 7:30-9 pm, church services. Eastern.

WMAQ, Chicago, Ill. 448 meters. 500 watts. The Chicago Daily News. Announcer, Robert Whitney. Mon,

Tues, Wed, Thurs, Fri, 4-7 pm. Daily ex Sun, 12-3 pm. Daily ex Sun, Mon, 8-10 pm. Central.

WMAV, Auburn, Ala. 254 meters. 500 watts. Alabama Polytechnic Institute.

WMAY, St. Louis, Mo. 280 meters. 100 watts. Kings-highway Presbyterian church. Announcer, Owen W. Patt. Slogan, "May Every By-Way—Hear Kings-highway." Sun, 11 am, 8 pm. Central.

WMAZ, Macon Ga. 261 meters. 100 watts. Mercer university.

WMC, Memphis, Tenn. 500 meters. 500 watts. The Commercial Appeal. Announcer, G. L. Deering. Slogan, "Station WMC, Memphis." "Down in Dixie." Club, "Midnight Frolic." Daily ex Sun, 9:45 am, 12:30-1:30, weather, markets, music. Daily ex Sun, Wed, 8:30 pm, program. Tues, Fri, 11 pm, Midnight Frolic. Sun, 11 am, church service. Central.

WMH, Cincinnati, Ohio. 309 meters. 500 watts. Ainsworth-Gates Radio Co. Hotel Alms. Announcer, Arthur R. Ainsworth. Slogan, "The Station on the Hill." Mon, Wed, Thurs, 8-10 pm. Sat, 10-12 pm. Sun, 10 am, 12:30 pm. Central.

WNAC, Boston, Mass. 278 meters. 100 watts. Shepard Stores. Announcer, Jean Sargent. Daily ex Sun, 1-2 pm, 4-5, 6:30-7:30, 8-10. Mon, Wed, Fri, 6-8 pm. Sun, 11-12 m, church services; 3-4 pm, concert; 7:30-9:30, church and concert. Eastern.

WNAD, Norman, Okla. 360 meters. 100 watts. Univ. of Okla.

WNAL, Omaha, Nebr. 258 meters. 20 watts. Omaha Central High School.

WNAP, Springfield, O. 275 meters. 100 watts. Wittenberg College. College activities.

WNAR, Butler, Mo. 231 meters. 20 watts. First Christian church. Sun, 11 am, 8 pm. Central.

WNAT, Philadelphia, Pa. 360 meters. 100 watts. Lenig Bros. Co.

WNAW, Fortress Monroe, Va. 360 meters. 5 watts. Henry Kunzmann. Sun, 2-4 pm, 7-9. Eastern.

WNAX, Yankton, S. D. 244 meters. 100 watts. Dakota Radio Apparatus Co. Daily, 11:30 am, reports; 4:30 pm, reports, music. Wed, Sat, 9-10 pm, music. Central.

WNYC, New York, N. Y. 526 meters. 1000 watts. New York Municipal Radio Station. Announcer, Thomas H. Cowan. Slogan, "Municipal Broadcasting Station of the City of Greater New York." Daily ex Sun, 7:30 pm, 10:30, police; 8:30, entertainment; 11, weather. Eastern.

WOAC, Lima, O. 266 meters. 50 watts. Page Organ Co. (H. P. Maus). Mon, Wed, Fri, Sat, 8:30-9:30 pm, organ. Fri, Sun, 8:30-9:30 pm. Tues, Thurs, 8:30-9:30 pm, orchestra. Central.

WOAE, Fremont, Neb. 280 meters. 15 watts. Midland College.

WOAF, Tyler, Tex. 360 meters. 10 watts. The Tyler Commercial College. Daily ex Sat, Sun, 12 m, weather, markets; 12:40 pm, concert; 4:25, sports; 8 pm, weather, sports codes; 10:15, U.S. Navy press. Sun, 11 am, 7:30 pm, church services. Central.

WOAI, San Antonio, Tex. 385 meters. 500 watts. Southern Equip. Co. (Evening News-Express.) Daily ex Sun, 10:30 am, 12:15 pm, 3, markets; 7, sports, markets. Tues, 9:30-10:30 pm; Thurs, 7:30-8:30 pm, music; Sun, 11 am, church service; 9:30-10:30 pm, music. Central.

WOAN, Lawrenceburg, Tenn. 360 meters. 500 watts. James D. Vaughan. Announcer, Fred M. Green.

WOAO, Mishawaka, Ind. 360 meters. 50 watts. Lyradion Mfg. Co. Irregular schedule.

WOAR, Kenosha, Wis. 229 meters. 50 watts. Henry P. Lundskov. Wed, 7 pm. Sun, 5 pm. Central.

WOAT, Wilmington, Del. 360 meters. 100 watts. Boyd Martell Hamp. Temporarily discontinued.

WOAV, Erie, Pa. 242 meters. 50 watts. Pennsylvania National Guard. Slogan, "Wayne Rangers Club. Neversleep Club." Tues, 8:30 pm. Thurs, 8 pm. Sun, 9:30 pm, music. Sun, 1-4 am, Milkman's matinee. Sun, 10:30 am, 7:45 pm, church services. Eastern.

WOAW, Omaha, Neb. 526 meters. 500 watts. Workmen of the World. Announcer, Lester M. Palmer. Slogan, "Gateway to the West and to the East." Mon, Tues, Thurs, Fri, Sat, 6-7:30 pm, 9-11, concert. Sun, 9-11 am, 6-7 pm, Bible hour; 9-11. Central.

WOAX, Trenton, N. J. 240 meters. 500 watts. F. J. Wolf. Mon, 9:15-11 pm, orchestra. Daily 11:15 am, 12:15 pm, weather, mid-weekly crop report. Eastern.

WOC, Davenport, Ia. 484 meters. 500 watts. Palmer School of Chiropractic. Announcer, Stanley W. Barnett. Slogan, "Where the West Begins and the State Where the Tall Corn Grows." Daily ex Sun, Tues, night; 9 am, markets; 10 am, household hints; 10:55, time; 11, weather; 12 m, chimes; 1 pm, markets; (Sat, 11:15), 5:45, chimes; 6:50, scores, weather. Mon, 10 pm, concert. Tues, 6:30 pm, sandman. Thurs, Sat, 9 pm, orchestra. Mon, Wed, Fri, 8 pm, music. Sun, 9 am, chimes; 1:30 pm, orchestra; 7:30, reports; 8, church services; 9:30, concert. Tues night silent. Central.

WOI, Ames, Ia. 360 meters. 500 watts. Iowa State College. Announcer, H. B. Deal. Daily ex Sun, 9 am, 9:30, market, weather reports; 12:30 pm, market, weather, educational talks; 9:30, weather, music. Central.

WOO, Philadelphia, Pa. 509 meters. 500 watts. John Wanamaker. Daily ex Sat, Sun, 11 am, organ recital; weather; 12:55, time; 12-1 pm, concert; 4:45 pm, organ recital; 7:30, sports, police reports; 10:55, time; 11:02, weather. Mon, Fri, 7:30-11 pm, music, concert. Sun, 2:30 pm, Sunday school; 6, organ; alternate am and pm services. Eastern.

WOO, Kansas City, Mo. 360 meters. 500 watts. Western Radio Co. Announcer, G. W. Harkman. Daily ex Sun, 11, music, time signals. Tues, Thurs, Sat, 8-

9:30 pm, music. Sun, 11 am-12:15 pm, 7-7:45, church services. Central.

WOR, Newark, N. J. 405 meters. 500 watts. L. Bamberger & Co. Announcer, J. M. Barnett. Daily ex Sun, 2:30-4 pm, 6:15-7:30, music, talks. Mon, Wed, Sat, 8-11 pm, music, entertainment, lectures. Eastern.

WOS, Jefferson City, Mo. 441 meters. 500 watts. Missouri State Marketing Bureau. Announcer, J. M. Witten. Slogan, "Watch Our State." Daily ex Sun, first 15 min. of every hour from 9 am-2 pm, markets. Daily ex Sat, Sun, 5 pm, music, markets. Mon, Wed, Fri, 8-9:30 pm, concert. Sun, 7:30-8:30 pm, church service. Central.

WPAB, State College, Pa. 283 meters. 500 watts. Pa. State College. Announcer, Gilbert L. Crosley.

WPAC, Okmulgee, Okla. 360 meters. 100 watts. Donaldson Radio Co.

WPAJ, New Haven, Conn. 268 meters. 100 watts. Doolittle Radio Corp. Tues, Thurs, 8 pm. Sun, 11 am, 9-11 pm. Eastern.

WPAK, Fargo, N. D. 283 meters. 50 watts. N. D. Agricultural College. Mon, Wed, Fri, 7:30 pm, talks. Central.

WPAL, Columbus, O. 286 meters. 500 watts. Avery & Loeb Elec. Co. Wed, 8-10 pm. Eastern.

WPAM, Topeka, Kans. 275 meters. 100 watts. Auerbach & Guettel. Announcer, W. A. Beasley. Daily ex Sun, 1 pm, markets; Wed, 9:30-10:30 pm. Sat, 8-9 pm, music. Central.

WPAR, Beloit, Kans. 230 meters. 10 watts. Ward Battery & Radio Co. Announcer, R. A. Ward. Thurs, 7:30 pm. Sun, 8 am, 11 pm. Central.

WPAU, Moorhead, Minn. 286 meters. 10 watts. Concordia College. Announcer, G. Braatin.

WPB, Charleston, W. Va. 273 meters. 20 watts. West Virginia Radio Sales Corp. Mon, Wed, Fri, 8-9 pm. Eastern.

WQAA, Parkersburg, Pa. 360 meters. 500 watts. Horace A. Beale, Jr. Temporarily discontinued.

WQAC, Amarillo, Tex. 234 meters. 100 watts. E. B. Gish. Irregular schedule.

WQAE, Springfield, Vt. 275 meters. 50 watts. Moore Radio News Station. Slogan, "Among the Green Hills of Vermont." Sat, 7:30-8 pm, 11-1 am. Sun, 8:40-9:30 pm, address. Eastern.

WQAF, Sandusky, O. 240 meters. 5 watts. Sandusky Register. Daily, 10:30 pm, weather. Eastern.

WQAM, Miami, Fla. 283 meters. 100 watts. Electrical Equip. Co. Announcer, Frederick W. Mizer. Slogan, "It Is Always June in Miami." The Most Southern Radiocasting Station in U. S. Daily ex Sun, 12 m, weather, news, music. Wed, 9-11 pm, orchestra. Sun, 9-11 pm, music. First Sun of each month, 8-9 pm, music. Eastern.

WQAN, Scranton, Pa. 280 meters. 100 watts. Scranton Times. Announcer, T. V. Nealon. Slogan, "The Voice of the Anthracite." Daily ex Sun, 12:30-1 pm, 4-4:30, 7:30-8, news, reports, music. Tues, Fri, 8 pm, entertainment. Eastern.

WQAO, New York City, N. Y. 360 meters. 100 watts. Calvary Baptist Church. Sun, 11:30 am, 7:45 pm, church services. Eastern.

WQAS, Lowell, Mass. 266 meters. 100 watts. Prince-Walter Co. Daily ex Sun, 10:45-11 am, 2:30-3 pm, music. Mon, Wed, Fri, 6-7 pm, news, concert. Thurs, silent. Eastern.

WQAX, Peoria, Ill. 248 meters. 100 watts. Radio Equipment Co. Mon, Wed, Fri, 7:15-8 pm. Central.

WQJ, Chicago, Ill. 448 meters. 500 watts. Calumet Baking Co.—Rainbo gardens. Announcer, Jerry Sullivan. Daily ex Sun, 11-12 m, 3-4 pm, woman's hour. Daily ex Sun, Mon, 7-8 pm, 10-2 am, music. Sun, 8-10 pm, music. Central.

WRAF, La Porte, Ind. 224 meters. 10 watts. Radio Club, Inc. Mon, Thurs, Sun, 9 pm. Central.

WRAL, St. Croix Falls, Wis. 248 meters. 100 watts. Northern States Power Co. Announcer, S. S. Robinson. Mon, 8:30-10:30 pm. Tues, 9-10:30 pm. Central.

WRAM, Galesburg, Ill. 244 meters. 100 watts. Lombard College. Occasional programs.

WRAN, Waterloo, Ia. 236 meters. 10 watts. Blackhawk Elec. Co. Announcer, Charles G. Pelton. Slogan, "We Radiate All News." Daily ex Sun, 5-5:30 pm. Central.

WRAO, St. Louis, Mo. 360 meters. 10 watts. St. Louis Radio Service Co. Mon, 7:30-9 pm, dance music. Sun, 3:30-5 pm, music. Central.

WRAY, Yellow Springs, O. 242 meters. 100 watts. Antloch College. Announcer, J. F. Frayne. Wed, 8 pm. Sun, 7 pm. Central.

WRW, Reading, Pa. 238 meters. 40 watts. Avenue Radio Shop. Thurs, 9:30-11 pm. Eastern.

WRAX, Gloucester City, N. J. 268 meters. 100 watts. Flexon's Garage. Mon, Wed, Fri evenings, program. Eastern.

WRBC, Valparaiso, Ind. 278 meters. 500 watts. Emmanuel Lutheran Church. Announcer, Dale Clemmons. Slogan, "World Redeemed by Christ." Sun, 10:30 am, church service. Central.

WRC, Washington, D. C. 469 meters. 500 watts. Radio Corp'n of America. Announcer, Ralph Edmunds. Daily ex Sun, 5:15 pm, code practice; 6 pm, children's hour. Mon, Wed, Fri, 3-6:30 pm, music. Tues, Thurs, Sat, 5:15-11 pm, music. Eastern.

WRK, Hamilton, O. 360 meters. 290 watts. Doron Bros. Elec. Co. Slogan, "The Oldest Station in Existence." Fri, 8:15 pm, music, lecture. Sun, 10:15 am, 7:30 pm, church services. Central.

WRL, Schenectady, N. Y. 360 meters. 500 watts. Union College Radio club. Thurs, 8-9:30 pm, college festivities. Eastern.

WRM, Urbana, Ill. 360 meters. 500 watts. Univ. of Ill. WRR, Dallas, Tex. 360 meters. 30 watts. City of Dallas. Announcer, C. H. Garrett. Daily ex Sun, 11:30-12:30

pm, weather, music; 2:45-3:30, sports, markets, news; music; 8-8:30 pm, music. Mon, Thurs, 9:30-10:30 pm, Ritz Troubadors. Sat, 12-1 am, organ. Sun, 11 am, 7:30 pm, church service. Central.

WRW, Tarrytown, N. Y. 273 meters. 500 watts. Tarrytown Radio Research Laboratory. Slogan, "Everything in Radio." Daily, 9 pm, police reports; Mon, Wed, Thurs, Sat, Sun, 7-8 pm. Mon, Tues, Wed, Fri, Sat, 9-11:30 pm. Mon, 7-8 pm. Thurs, 8-9:10 pm, 10:30-11:30. Sun, 8-9 pm, service. 9-9:10, police reports. 10:30-11:30, concert. Eastern.

WSAB, Cape Girardeau, Mo. 360 meters. 100 watts. Southeast Mo. State Teachers College. Mon, Wed, 3:30 pm, lecture; 9, concerts. Central.

WSAC, Clemson College, S. C. 360 meters. 500 watts. Clemson Agri. College.

WSAD, Providence, R. I. 261 meters. 100 watts. Fosters-Jewelers.

WSAI, Cincinnati, O. 309 meters. 500 watts. United States Playing Card Co. Announcer, P. A. Green. Mon, 10-12 m. Tues, 7-10 pm. Thurs, 10-12 m. Sat, 8-10; 12-1:45 am. Sun, 3-4 pm. Central.

WSAJ, Grove City, Pa. 258 meters. 250 watts. Grove City College. Announcer, H. W. Harmon. Collego activities. Wed, 7:30-9 pm, music. Sat, football. Eastern.

WSAN, Allentown, Pa. 229 meters. 5 watts. Allentown Radio Club. Announcer, R. J. D. Hawes. Tues, Thurs, 8 pm. Eastern.

WSAP, New York, N. Y. 263 meters. 250 watts. City Temple. Announcer, L. K. Dickson. Thurs, 8-9:30 pm. Sat, 10:45-12 m. Sun, 7:30-9:30 pm. Eastern.

WSAR, Fall River, Mass. 254 meters. 100 watts. Doughty & Welch Elect. Co., Inc. Announcer, W. L. Cassell. Daily ex Sun, 12-1 pm. Mon, Thurs, 6-7 pm. Wed, 8-10 pm. Sun, 4:30-6 pm. Eastern.

WSAU, Chesham, N. H. 229 meters. 10 watts. Camp Marienfeld.

WSAZ, Pomeroy, Ohio. 258 meters. 50 watts. Chase Elec. Shop. Daily ex Sun, 5:30 pm, weather. Tues, Thurs, Sat, 5 pm, music. Central.

WSB, Atlanta, Ga. 429 meters. 500 watts. Atlanta Journal. Announcer, Lambda Kay. Slogan, "The Voice of the South." Daily ex Sun, 12-1 pm, music, weather; 2:30, reports; 3:30, baseball; 5, orchestra; 5:30, bedtime story; 8-9, concert (ex Wed); 10:45-12, concert. Sun, 10:45-12:15 pm, 5-6, 7:30-9:15, church services. Central.

WSL, Utica, N. Y. 273 meters. 100 watts. J. & M. Elec. Co. Daily ex Sat, Sun, 11-11:30 am, 5-6 pm, music, news. Mon, Wed, Sat, 8-9 pm. Sun, 10:30-12 m, 7:30-9 pm. Church services. Eastern.

WSOE, Milwaukee, Wis. 246 meters. 100 watts. School of Engineering of Milwaukee. Announcer, O. W. Meissner. Daily ex Sat, Sun, 9-10 am, lecture; 5:30-6:30 pm, concert. Mon, Fri, 9-12 mid, music. Tues, Thurs, Sat, 7:30-9 pm, music. Sun, 12:30-1:30 pm, concert; 7:30-8:30, services. Central.

WTAB, Fall River, Mass. 260 meters. 100 watts. Fall River Daily Herald. Tues, Thurs, 8-10 pm. Sat, 9-11 pm. Sun, 2:30-4:30 pm. Eastern.

WTAC, Johnstown, Pa. 275 meters. 150 watts. Penn. Traffic Co. Tues, Thurs, 7:30 pm. Eastern.

WTAF, New Orleans, La. 268 meters. 10 watts. Louis J. Gallo. Slogan, "The Bayou Station." Daily, 6:45-7 pm, police, baseball, weather. Tues, Sat, 9-10:30 pm; Thurs, 10:30-11:30 pm; Sun, 10-12 midnight, revue. Central.

WTAJ, Portland, Me. 236 meters. 20 watts. The Radio Shop.

WTAL, Toledo, Ohio. 252 meters. 10 watts. Toledo Radio & Elec. Co. Slogan, "The Gateway to the Sea." Daily, 1:10 pm, 7:15. Tues, Thurs, Sat, 8:30 pm. Eastern.

WTAM, Cleveland, Ohio. 390 meters. 1,000 watts. Willard Storage Battery Co. Announcer, F. W. Zimmerman. Slogan, "The Voice from the Storage Battery." Daily ex Sun, 6-7:30 pm, dinner concert; baseball, news. Mon, 8-10 pm, concert. Wed, 8-11 pm, concert. Sat, 9-12 midnight, dance music. Eastern.

WTAP, Cambridge, Ill. 242 meters; 100 watts. Cambridge Radio & Elec. Co. Announcer, G. C. Swanson. Tues, Sat, 12:15-1:15 pm, 9:30-10:15. Central.

WTAQ, Osseo, Wis. 254 meters. 100 watts. S. H. Van Gorden & Son. Announcer, Mrs. C. S. Van Gorden. Daily ex Sun, 10:30 am, 12:15 pm, 6:15, weather, markets. Fri, Sun, 8 pm. Central.

WTAP, Norfolk, Va. 280 meters. 100 watts. Reliance Electric Co. Tues, Sat, 7:30 pm, markets; 8, music. Eastern.

WTAS, Elgin, Ill. 286 meters. 500 watts. Chas. E. Erbstein. Announcer, Charles E. Erbstein. Slogan, "Willie, Tommie, Annie and Saunnie." Daily, 2-5 pm, baseball; 8:15-12 mid, music. Fri, 12:30-1:30 pm, organ. Sun, 2:30-5 pm, music. Central.

WTAT, Boston, Mass. 246 meters. 100 watts. Edison Elec. Illuminating Co.

WTAU, Tecumseh, Neb. 242 meters. 10 watts. Ruegg Battery & Elec. Co. Tues, 8:30 pm. Central.

WTAW, College Station, Tex. 280 meters. 250 watts. Agricultural and Mechanical College of Tex. Wed, Fri, 8 pm. Sun, 11 am, special football games. Central.

WTAX, Streator, Ill. 231 meters. 50 watts. Williams Hardware Co., Radio Division. Mon, 9-10 pm. Thurs, 12-1 am. Central.

WTAY, Oak Park, Ill. 283 meters. 500 watts. Oak Leaves. Announcer, H. B. Marshall. 6:45-7:45 pm; 9-9:45. Central.

WTAZ, Lambertville, N. J. 283 meters. 15 watts. Thomas J. McGuire. Mon, 8-10 pm, music. Eastern.

(The fifth part of the directory, to appear next week, completes the schedules and provides a state-city index to stations.)

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Eveready Heavy Duty "B" Battery. 45 volts. Three Fahnestock Clips. Length, 8 3/16 inches; width 4 7/16 inches; height, 7 3/16 inches; weight 13 3/4 pounds.

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New Heavy Duty 45-volt "B" Battery No. 770 Extra Large Cells—Extra Long Service

FOR maximum "B" Battery economy, use this *New Eveready Heavy Duty* 45-volt "B" Battery, in the following general cases:

- 1—On all receiving sets operating at 90 volts or more, having four tubes without a "C" Battery, and all sets having five or more tubes, with or without a "C" Battery.
- 2—On all power amplifiers.
- 3—On all sets that pull heavy currents from the "B" Battery.

Under the above conditions, the *New Eveready Heavy Duty* 45-volt "B" Battery will give much longer service than the 45-volt "B" Battery of usual size.

If your receiving equipment falls under any of the above classifications, you can make a big saving in "B" Battery costs by using this *New Eveready Heavy Duty* 45-volt "B" Battery No. 770. Buy it and you get the biggest battery value on the market today!

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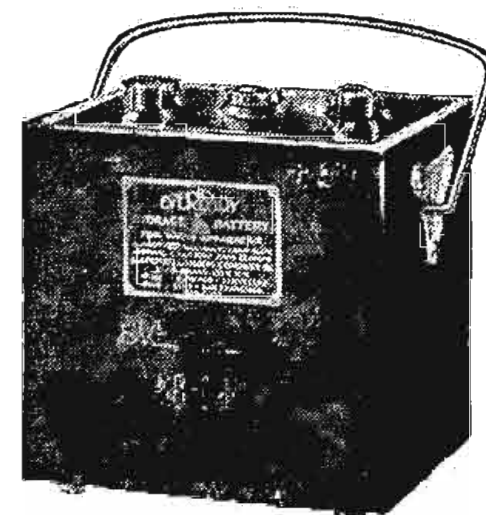
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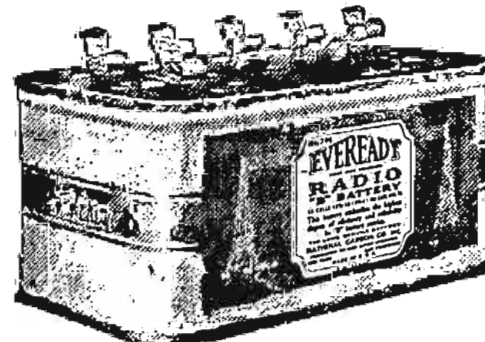
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No. 711
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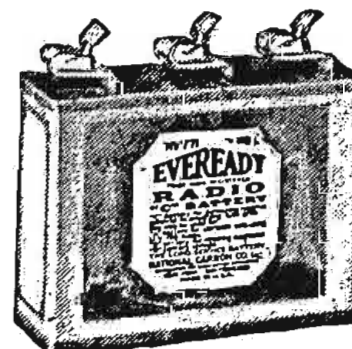
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"A" Battery

No. 766
Eveready "B"
22 1/2 volts. Six
Fahnestock Spring
Clip Connectors



No. 772
Vertical 45-volt, large
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No. 771
Eveready "C" Battery
Clarifies tone and
prolongs "B" Battery life



No. 764
Vertical 22 1/2-volt
"B" Battery

EVEREADY

Radio Batteries

—they last longer