

OCT 27 1923

New Style Flewelling and Miloplex Amplifier

Radio Digest

EVERY WEEK

Illustrated

TEN CENTS

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

Vol. VII

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R. D. P. Co. Inc.

SATURDAY, OCTOBER 27, 1923

No. 3

CHARLIE CHAPLIN "ACTS"



BOSTON FIRST USER OF RADIO FIREBOAT

HARBOR PATROL DIRECTED BY HEADQUARTERS SET

Danger of Flames Spreading Is Averted by Use of Airphones in Chief's Office

BOSTON.—This city is distinguished by being the first in the world to realize the advantages of Radio in handling fires. Complete Radio transmitting and receiving sets are being installed at fire headquarters and on each of the three fireboats which operate in the harbor and rivers.

The work is under the supervision of J. E. Callahan, a Boston Radio engineer. Heretofore, when it was necessary to communicate with a fireboat the message was telephoned to the nearest point and then relayed by messenger. If the fire was wide in area, messenger service was inadequate.

With Radio-equipped fireboats, the problem is simplified. If all three boats are fighting a fire in a certain locality when another breaks out fire headquarters could dispatch one boat to the other fire. The fireboats can keep headquarters informed as to the developments of a fire by means of their transmitting sets. The equipment includes loud speakers.

Congratulate WHAZ on Birthday

TROY, N. Y.—Among the thousands of congratulatory messages received on the first anniversary of Station WHAZ, the Rensselaer Polytechnic Institute here, was a cartoon from Owen S. Young, Germantown, Pa.

COMEDY KING AFRAID WHEN FIRST ON AIR

Famous Film Actor Puts Humor into Talk for Ether Audience

Imitates Jazz Band

Quails before Microphone That Takes Message to Thousands but Recovers Confidence

NEWARK, N. J.—Some one long ago said something to the effect that if he could write the songs of a nation he would not care who wrote its laws. And someone said about as long ago something about contributing to the gaiety of nations, in that way keeping them from killing each other.

Some time ago a slender, dapper young man returned to the slums of London in which he was born. He was received in a way that would have caused even the most adroit, the most astute of diplomats to envy. That young man has not as yet written the songs of a nation, although there are many who say he is talented

(Continued on page 5)

Fire Truck Sounds Funeral March for Dallas' Chief

DALLAS, TEX.—Perhaps for the first time Chopin's funeral march was played from a fire truck by Radio recently when a gallant fireman of the local department was buried. A musician at Central station played the famous funeral hymn which was then broadcast over WFAA here. An instrument on the fire vehicle received the broadcast and reproduced it by loud speaker.

Alice Brady (above), stage and screen star, used WMAQ recently to tell why people go to the theater. At the right is wee Leslie Young, mascot of the "Clinging Vine" company, who sang at the same Chicago station



Mabel White, ingenue of the musical comedy "Dew Drop In," broadcasts her songs at WIP and WDAR, Philadelphia

POWER LEAKS CAUSE OHIO "DEAD SPOTS"

CLEVELAND. — Radio operators have discovered a "dead" spot in the air between Norwalk and Cleveland, Ohio. To connect the two cities by air operators say they must transmit hundreds of miles in a roundabout manner. The theory is that the electricity given off by the power houses at Beach Park and Elyria cause the trouble.

Declares Atlanta's Best Advertisement Is WSB

City Official Finds Station Draws Locality into Spotlight

ATLANTA, GA.—"WSB, the station of the Atlanta Journal, is the finest advertisement the city has," declares Willis A. Sutton, local superintendent of schools, who made an extensive tour of the West and East during the summer.

"Wherever I went," the superintendent said, "everyone knew about WSB."

RADIO LEADS PUBLIC RECENT DATA SHOW

REPORTS REVEAL RADIO AS GREAT EDUCATOR

All Phases of Life Indicate Development by Means of Addresses and the Arts

SPECIAL REWARD OFFER Coupon Number 22 This Special Reward Coupon appears each issue in Radio Digest until further notice.

Educators of the United States and its possessions or dependencies have concluded, after a recent survey, that Radio has become one of the greatest factors in the mental development of the people.

Investigation showed, it was said, that every vocation and almost every ambition has been assisted by means of lectures, concerts and other forms of Radio-telephonic communication.

The farm, the shop, the school, the studio, the pulpit, the press, public health, governmental activities of almost every character, the home, the child, physical culture, the arts, the sciences, peace, war—all these and many more phases of life have been affected by Radio, the reports revealed.

Radiophans of this and other countries in which Radio Digest circulates may avail themselves more fully of the opportunities which Radio affords by taking advantage of the parts offer as it appears in detail below. Please remember that changes in devices occur often and on that account the latest issue of Radio Digest must always be consulted.

Rules to Remember

One point must be emphasized to those contemplating taking advantage of the special offer; that is, that the coupons turned in for any item must be numbered consecutively, as for example, 1, 2, 3, and 4 or 3, 4, 5 and 6.

Another point to remember is that cash, checks and money orders but no postage stamps will be accepted.

Class A Articles

For two consecutively numbered coupons and thirty cents (\$0.30) any one of the following articles will be sent: 1 Carter Imp Jack and Plug; 1 Carter 15-Ohm Resistance Unit; 1 Schindler .0025 mfd. Built-up Mica Condenser; 1 Schindler .0005 mfd. Built-up Mica Condenser; 1 Schindler .001 mfd. Built-up Mica Condenser; 1 Schindler .002 mfd. Built-up Mica Condenser; 1 Schindler .0025 mfd. Built-up Mica Condenser; 1 Martin-Copeland Sta Put Plug; Walnut Standard Tube Socket; Walnut UV-199 Socket; Dubilier Micadons Type 601 (.0001, .00025, .0005, .001, .002, .0025, .003 or .004 mfd.); Premier Grid Condenser (.00025 or .0005 mfd.); Premier Variable Resistance; 1 Carter 25-ohm Resistance Unit; Standard Socket Adapter for Delta Midget Tube; Electrad Grid Leak (1 or 2 megohms, with clips); Amso 3-inch Induct; Amso Inductance Switch; Freshman Micon Condensers (.00005, .00025, .00035, .0005, .001, .0015, .002, .0025 or .003 mfd.); Teleradio V. T. Socket; B Metal Mounted Crystal; Aerovox Lightning Switch; Aerovox Series Parallel Switch; Aerovox Contact Lever; Na-Ald Small Space Socket; Se-Ar-De Vernier Adjuster; 3" Radion Dial, black; 2 1/2" Radion Dial, black; 3" Radion Dial, knob with shafts, 3/4" or 1/2" black, 3" Radion Dial, ribbed surface.

Class B Articles

For four consecutively numbered coupons and sixty cents (\$0.60) any one of the following articles will be sent: 1 Carter .04 mfd. Special Fixed Condenser; 1 Carter Jack Switch; 1 Carter Hold-Tite Jack, One Spring Open Circuit; 1 Carter Hold-Tite Jack, Two Spring Closed Circuit; 1 Carter Hold-Tite Jack, Three Spring Filament Control; 1 Carter Hold-Tite Jack, Four Spring Closed Circuit; 1 Carter Hold-Tite Jack, Five Spring Filament Control; 1 Federal Universal Phone Plug; 1 Federal Open Circuit Jack; 1 Federal Closed Circuit Jack; 1 Federal Double Circuit Jack; 1 Martin-Copeland Shur Grip Plug; 1 Martin-Copeland WD-11 Socket; 1 Martin-Copeland WD-11 Adapter; 1 Martin-Copeland UV-199 Socket; 1 Martin-Copeland UV-199 Adapter 1 Martin-Copeland Pull Switch; 1 Martin-Copeland 5-point Inductance Switch; 1 Carter "Tu-Way" Plug; 1 Martin-Copeland SPST Knife Switch; 1 Martin-Copeland SPDT Knife Switch; 1 Martin-Copeland SPST Knife Switch; 1 Martin-Copeland DFDT Knife Switch; Walnut Variable Grid Leak; Walnut Inductance Switch; Dubilier Micadons Type 600 (.0001, .00025, .0005, .001, .002, .0025, .003, .004, or .005 mfd.); Dubilier Micadons Type 601 (.001, .002, .004, or .005 mfd.); Dubilier Micadon Type 601 (.005 mfd.); Dubilier By-Pass Condenser (.1, .25, or 5 mfd.); Premier Universal Tube Socket; Premier Radio Dial (3/4, 1/2, or 3/8 in. black or white face); Premier Universal Radio Jack, Open Circuit; Premier Universal Radio Jack, Two-Circuit Three Spring; Premier Universal Radio Jack, Two-Circuit Four Spring; Premier Universal Radio Jack, Filament Control Three Spring; Premier Switch Lever and 10 Points; Amso 6-Ohm Rheostat; Freshman Fix-O Grid Leak and Condenser; Freshman Variable Resistance Leak (with or without condenser); Freshman Micon Condensers (.006 or .005 mfd.); Teleradio 6-Ohm Rheostat; Teleradio 30-Ohm Rheostat; Teleradio Lightning Arrestor; B-Metal Crystal Tube Detector Type A; B-Metal Adjustable Detector Type D; Aerovox Rheostat; Se-Ar-De Vacuum Tube Socket; 3 1/2" Radion Dial, black; 4" Radion Dial, black; 4" Radion Dial, black, ribbed surface.

Class C Articles

For six consecutively numbered coupons and ninety cents (\$0.90) any one of the following articles will be sent: 1 Carter 6-Ohm Vernier Control Rheostat; 1

Federal Panel Mount Socket; 1 Federal 6-Ohm Rheostat; 1 Federal 3-Ohm (Power) Rheostat; 1 Amperite Automatic Filament Control (with mounting); 1 Martin-Copeland Marco Rheostat; 1 Martin-Copeland Series Parallel Switch; 1 Martin-Copeland DFDT Panel Switch; 1 Martin-Copeland 7-Point Inductance Switch; 1 Martin-Copeland 9-Point Inductance Switch; 1 Martin-Copeland 11-Point Inductance Switch; Walnut Variable Grid Leak with .00025 mfd. Condenser; Walnut Variable Condenser (3-plate .0006 mfd.); Dubilier Ducon; Dubilier Micadon Type 600 (.006 mfd.); Dubilier Micacon Type 610 (.01 or .02 mfd.); Dubilier By-Pass Condenser (1 mfd.); Premier Universal Radio Jack Filament Control Five Spring; CRL Variable Grid Leak, without condenser; Premier No. 250 Variable Resistance, panel mounting; Thordason Vernier Rheostat; Ritter Loop Aerial; Martin Copeland Variable Grid Leak; Amso Multiple Point Inductance Switch; Amso 20-Ohm Rheostat; Amso 50-Ohm Rheostat; Freshman Antenna; Freshman Micon Condenser, .01 mfd.; Teleradio Variable Condensers, (3-plate or 11-plate); Set "Read EM" Blinding Posts (8); B-Metal Crystal Tube Detector Type B; Illinois Cushion Resilient Socket; Aerovox Antenna Plug; Aerovox Potentiometer; Aerovox Crystal Detector; Se-Ar-De Adjustable Vernier Condenser; Radion Panel 3/4"x7"x19", black or mahoganite; Radion Panel 3/4"x7"x12", black.

Class D Articles

For eight consecutively numbered coupons and one dollar and twenty cents (\$1.20) any one of the following articles will be sent: 1 Carter 20-Ohm Vernier Control Rheostat; 1 Chindler Radio Frequency Transformer; 1 Martin-15-Point Inductance Switch; 1 Martin-Copeland 13-Point Inductance Switch; Walnut Variable Condenser (5-plate Copeland 13-Point Inductance Switch; 1 Martin-Copeland .0001 mfd.); Electrad Variotom, with mica condenser; Dubilier By-Pass Condenser (2 mfd.); CRL Variable Grid Leak with Condenser; Resistorox (Type A or 2A); Thordason Variable Condenser, .00025 mfd.; Amso 300-Ohm Potentiometer; Freshman Micon Condenser, .015 mfd.; Teleradio Variable Condenser, 23-plate; Aerovox Crystal Detector and Condenser, mounted; Se-Ar-De Variable Grid Leak, with condenser mounting; Fil-Ko-Stat; R. S. C. Variable Condenser, 3-plate; Radion Panel 3/4"x7"x12", mahoganite; Radion Panel 3/16"x7"x18", black; Radion Panel 3/16"x9"x14", black; Radion Panel 3/16"x10"x12", black.

Class E Articles

For ten consecutively numbered coupons and one dollar and fifty cents (\$1.50) any one of the following articles will be sent: 1 Carter 6-Ohm Automatic Control Rheostat; 1 Carter 20 Ohm Automatic Control Rheostat; 1 Demcal 3-Plate Variable Condenser; Walnut Variable Condenser (13-Plate .00025 mfd.); Turney Genuine Reinartz Coil; Dubilier Variodon (.0004 or .0006 mfd.); Resistorox (Type B); Delta Midget Tube and Socket; Thordason Variable Condenser, .0005 mfd.; Freshman Micon Condenser, .02 mfd.; B-Metal Crystal Tube Detector Type C; Aerovox (Type A or 2A); Aerovox Double Slide Tuning Coil; Na-Ald 3-Plate Vernier Condenser, with dial; Radion Panel 3/4"x7"x18"

mahoganite; Radion Panel 3/4"x7"x21", black; 1 Federal Potentiometer, 1850 ohms.

Class F Articles

For twelve consecutively numbered coupons and one dollar and eighty cents (\$1.80), any one of the following articles will be sent: 1 Acme Pot-Rhoce (potentiometer and rheostat); Walnut Variable Condenser (23-Plate .0005 mfd.); Dubilier By-Pass Condenser (3 mfd.); Premier Variable Condenser without dial (.00039 mfd.); Thordason Variable Condenser, .001 mfd.; Amso Compensating Grid Condenser; Freshman Micon Condenser, .025 mfd.; Teleradio Variable Condenser, 43-plate; Se-Ar-De 3-Plate Condenser; Radion Panel 3/4"x7"x21", mahoganite; Radion Panel 3/4"x7"x24", black; Radion Panel 1/4"x10"x12", black; Radion Panel 3/4"x9"x14", mahoganite; Radion Panel 3/4"x10"x12", mahoganite.

Class G Articles

For fourteen consecutively numbered coupons and two dollars and forty cents (\$2.40) any one of the following articles will be sent: 1 Federal 7-Plate Variable Condenser; 1 Federal 11-Plate Variable Condenser; 1 Federal 21-Plate Variable Condenser; 1 Federal Anti-capacity Switch; 1 Demcal Variable Condenser 11-Plate Walnut Variable Condenser (43-Plate .001 mfd.); Dubilier Variodon (.001 mfd.); Dubilier By-Pass Condenser (4 mfd.); Premier Variable Condenser with dial (.00078 mfd.); Premier Hezohog A. F. Transformer, 4 to 1 Ratio; Thordason A. F. Transformer, 3.5 to 1 Ratio; Thordason Variable Condenser, with vernier, knob and dial (.0005 mfd.); Thordason Variable Condenser, with vernier, knob and dial (.00025 mfd.); Ritter Grand Crystal Set, Amso Double H. C. Coil Mounting; Na-Ald 13-Plate Precision Condenser, with dial (.000297 mfd.); Na-Ald 23-Plate Precision Condenser, with dial (.000523 mfd.); Se-Ar-De 9-Plate Condenser; Se-Ar-De 17-Plate Condenser; R. S. C. Variable Condenser, 23-plate; Radion Panel 3/4"x7"x24", mahoganite; Radion Panel 1/4"x10"x12", mahoganite; Radion Panel 3/4"x12"x21", black; Radion Panel 3/4"x14"x18", black.

Class H Articles

For sixteen consecutively numbered coupons and three dollars (\$3.00) any one of the following articles will be sent: 1 Federal Audio Frequency Transformer No. 226 W; 1 Demcal 23-Plate Variable Condenser; 1 Acme Audio Frequency Transformer; 1 Acme Radio Frequency Transformer (R-2, R-3, or R-4); Walnut Variable Condenser (13-Plate vernier); Walnut Variable Condenser (23-Plate vernier); Dubilier Duratran (R. F. transformer); Premier Micrometer Variocoupler with dial; Premier Variable Condenser with dial (.0015 mfd.); Premier Variable Condenser with vernier (.0004 mfd.); Premier Hezohog A. F. Transformer, 10 to 1 Ratio; Premier Hezohog A. F. Transformer, Tube Socket Type, 4 to 1 Ratio; Thordason A. F. Transformer, 6 to 1 Ratio; Thordason Variable Condenser, with vernier, knob and dial (.001 mfd.); T. B. H. Radio Head Set, 2,000 ohms; Tullip Loud Speaker, 15-inch, white; Teleradio Vernier Condenser 23-plate; Teleradio 2,000-Ohm Head Set; Na-Ald Tuned R. F. Transformer, one stage; Na-Ald 43-Plate Precision Condenser with dial (.001 mfd.); Se-Ar-De 35-Plate Condenser; R. S. C. Variable Condenser, 43-plate; Radion Panel 3/4"x12"x21", mahoganite; Radion Panel 3/4"x14"x18", mahoganite.

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Looking Ahead

The Mystery Man of the Miloplex—Next week will unfold to you what some of his engineer friends have to say about the theory of the Miloplex. Of course he will have his usual comments, too. He wants all Miloplex builders to read his next article and then tell him what they think the theory is.

By the Way, Speaking of the Miloplex, E. G. Hoffman of Cleveland, Ohio, has developed a circuit somewhat similar to the Miloplex. He claims dandy results from it and passes it on for your approval. Mr. Hoffman's hook-up will be given as R. D.-103 next issue.

Not that Next Week's Radio Digest Will Be a Special Miloplex Number—far from that—but H. J. Marx will start his series of articles telling just how to proceed in building the King Miloplex III. The set designed by Mr. Marx has all of the final developments in the circuit, together with several suggested improvements. It consists of detector and two stages of audio frequency amplification. Warning: don't put your headphones on the amplifier stages if you value your ears!

Inductance Dope for Everybody—Marvin Thompson will give more interesting information about various types of inductances in the second part of this chapter of his series. Winders of coils will find this article valuable.

How to Make a Vernier Two-Coil Honeycomb Coil Mount—This will be but one of the worth while "kinks" next issue of the Digest. A vernier control is often desired for honeycomb coil coupling. Make one.

Newsstands Don't Always Have One Left WHEN YOU WANT

Radio Digest

YOU WANT IT! BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW

SEND IN THE BLANK TODAY

Publisher Radio Digest, 123 West Madison St., Chicago, Illinois. Please find enclosed check M. O. for Five Dollars (Five, Foreign) for One Year's Subscription to Radio Digest, Illustrated. Name, Address, City, State.



Where Shall We Go Tonight?

To New York, Cuba, Atlanta, San Francisco or perhaps Honolulu? Far distant stations are continually being brought in clearly and distinctly with a Crosley Model X-J. Unsolicited letters from users, telling of new distance records are received daily. You, too, at a very small cost, can enjoy the many pleasures and conveniences that this new Crosley Model affords.

CROSLY MODEL X-J \$65

A 4-tube radio frequency set, incorporating one stage of Tuned Radio Frequency Amplification, Detector and two stages of Audio Frequency Amplification, with jack to plug in on three tubes for head phones; new Crosley multistats; universal rheostats for all makes of tubes; new condenser with molded plates; filament switch and other refinements of detail. This receiver is exceptionally efficient in long range reception. It will bring in stations at almost unbelievable distances clearly and distinctly.

We unhesitatingly claim the Model X-J is the best radio receiver ever offered, regardless of price. The Crosley Model X-J, together with the complete Crosley line of receivers, ranging in price from \$26 to \$150, are for sale by best dealers everywhere.

CROSLY Better-Cost Less Radio Products Write for Free Catalog CROSLY MANUFACTURING COMPANY Powel Crosley, Jr., President 10494 Alfred Street Cincinnati, Ohio



WALNART Inductance Switch

\$1.00 List Price

Why drill ten holes in your panel—not only a difficult thing to do, but if you ever make a change in your hook-up, your panel is marred—when by drilling only one hole you can use a Walnart Inductance Switch.

Positive contact; attractive Bakelite knob and pointer make a much more attractive panel, and simpler adjustment. And the price is no more than switch points with pointer lever would cost.

Ask your dealer for Walnart Inductance Switch; if he cannot supply, write us. Catalog of Walnart radio accessories and parts on request.

WALNART ELECTRIC MFG. CO. Dept. 406, 1251 West Van Buren Street CHICAGO, ILL.

WEIGHTY AIR RIGHTS CASE BEFORE COURT

MAY SUBPOENA HOOVER IN BERGMAN SUIT

Suit to Enjoin Dwight, Ill., Amateur Important to Transmitters and Broadcast Listeners

CHICAGO.—Not only are the rights to the air of every DX amateur in the United States involved in the suit for injunction filed recently by a rich man against the son of a plasterer in Dwight, Ill., near here, but, it is said, the rights of the owners of receiving sets everywhere in this country. The case went to trial a few days ago in Pontiac, Ill.

So important are the questions involved in the legal action that the attorney for the defense may, if necessary, bring to the witness stand Secretary of Commerce Herbert Hoover, others of the president's cabinet and high army and navy officers. The case may be carried to the United States Supreme Court. It involves jurisdiction of the federal government as vested in the interstate commerce commission and a decision of the court itself. Congress itself may be asked to review the situation.

Seeks to Restrain Amateur

All this because Edward McWilliams of Dwight complains of and seeks relief in the courts from what he calls the noisy interference of the amateur station ICA, built, owned and operated by G. W. Bergman, eighteen years old. Opinion for and against the principles in the suit have made of Dwight a town divided. And the cleft may spread until certain powers of the government itself may hover on the brink.

When McWilliams wanted to hear a program for which he had waited several days, Bergman's station, according to McWilliams, would break into the air with "unseemly and irritating sounds," thus marring the peace, quiet and comfort to which McWilliams and his household had been accustomed.

Now of his sending set the Bergman youth is very proud. He has a right to be, his friends say. The Bergman transmitter has been heard, it is said, as far away as the Pacific coast. Its signals are received almost every night on the Atlantic coast. But that doesn't alter the plight in which McWilliams' set, which it is reported cost \$500, finds itself when 9CA goes on the air.

Denies McWilliams' Allegations

The primary object of McWilliams' suit against Bergman, who is a district superintendent of the American Radio Relay League, is to obtain an injunction based on what the plaintiff alleges is Bergman's unlawful interference with McWilliams' set. Through the attorney, Irving Herriott, of Chicago, retained by the A. R. R. L., Bergman denies that he is interfering with McWilliams and denies, too, that he is violating the Radio regulations of the government and the league. Bergman also denies McWilliams' contention that 9CA, "a station of great power operated not for profit," interferes, too, with all other receiving sets in Dwight.

Chief among the legal points of the defense is that the courts of the State of Illinois have no jurisdiction in the case, that the question of regulation or specifically whether Bergman interferes with McWilliams is a national rather than a state issue, that according to the United States Supreme Court any action once within the purview or determined by agencies of the government remains within federal jurisdiction.

One of the most important questions to be raised during the trial of the suit is whether Congress has the right to regulate Radio amateurs. The defense will proceed along the line that state regulations as to Radio conflict with national and that the latter must supersede.

WASHINGTON.—Radiotelegraph bulletins giving hurricane warnings in the Caribbean sea and the gulf of Mexico have been supplemented by Radiophone broadcasts through the San Juan Station, WKAQ, of Porto Rico.

RADIO FINDS RUM ON FORMER GOULD BOAT

NEW YORK.—The seventy-one-foot motorboat Atlanta, once owned by the late George J. Gould, was caught by Radio recently while attempting to run rum in the East River channel here. A police tug, launch and harbor station, all Radio equipped, flashed messages back and forth, reconnoitering until the Atlanta was cornered. Police officials found 386 cases of whiskey aboard.

GUINEA HENS NOISY WHEN STATIC'S BAD

SHREVEPORT, LA.—An 82-year-old farmer near here predicts Radio reception for the evening by the manner in which his guinea hens go to roost! The formula used by the octogenarian is: When the guinea hens go to roost making a lot of noise, atmospheric conditions will interfere with listening in, but if they go quietly to roost, there is to be a fine Radio evening.

LOTS OF GOODIES ON THE AIR



Little Marie Field, whose father could buy several islands, likes her single tube set best of all her playthings because she can listen to bedtime stories every evening

Mother Christian Science Church Service Put on Air

BOSTON.—For the first time in the history of either Christian Science or Radio, services of the Mother Church of Christian Science in Boston were broadcast by radiophone from Station WNAC here recently. The entire service of the

First Church of Christ, Scientist, known as the Mother Church, the first founded and built by Mary Baker Eddy, was sent out by WNAC, including the hymns, Scripture readings, responses and Christian Science readings.

An audition that works on a dry cell can be used in the same circuit that the audions requiring storage batteries can.

RADIO GIVES 'DOPE' CLEW; TWO SIEZED

U. S. AGENTS RAID SHIP'S WIRELESS ROOM

Secret Code Repeated Regularly from Same Position at Sea Arouses Suspicion

By E. A. Sullivan

NEW ORLEANS.—Federal agents and police rushed the Radio room of the steamship Emergency Aid this week, and arrested the operator and a supposed narcotic peddler on the charge of participating in an international drug smuggling plot. The men are said to have admitted their guilt.

The Emergency Aid is in the New Orleans-Germany trade. Federal agents say they knew for some time narcotics were being smuggled into this port from Germany, but it was not until they arrested a man who gave his name as Herman Bruegermann of Ft. Worth, Texas, said to be a confessed drug peddler, that a clue to mysterious Radio code messages was disclosed.

Flashed from Sea in Secret Code

These messages, it is said, were flashed from approximately the same position at sea for several months. The repetition of these messages with such regularity aroused the suspicions of the Department of Justice, whose operatives have been puzzled over the secret code for months.

The agents, through a process of elimination, cut down the three possibilities of smuggling—undesirable aliens, rum and narcotics—to the supposition that the code referred only to narcotics, and to the date upon which the vessel carrying the drug was expected to reach port.

Get Data on Fourteen Ships

It is said the agents found information on Bruegermann which cleared the mystery. They declined to say whether the papers revealed the key of the secret code. The magnitude of the gang's operations was disclosed, it is said, by the finding of papers which referred to fourteen other ships besides the Emergency Aid, upon which supposed conspirators were bringing in narcotics from Germany.

With this information in their possession, federal agents and city police stormed the Radio room. Earl Ferguson, Radio operator, was arrested, authorities say, as he was in the act of handing over a large quantity of morphine to Bruegermann. Bruegermann was induced to carry out the pre-arranged plan of accepting the narcotics from the unsuspecting operator.

Both were taken before United States Commissioner Carter and held under heavy bonds to await action of the federal grand jury.

15,000-MILE STATION FOR PACIFIC HARBOR

To Serve Coastal Shipping Southward from Los Angeles

LOS ANGELES.—Work of construction was recently commenced on a new Radio station by the Radio Corporation of America, at Wilmington, Calif., which is the inner part of Los Angeles harbor. According to present announcements, when completed in about three months, the plant will be of such power as to be able to both send Radio messages and receive a distance of 15,000 miles.

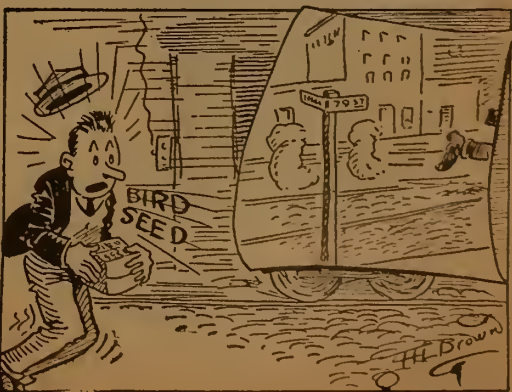
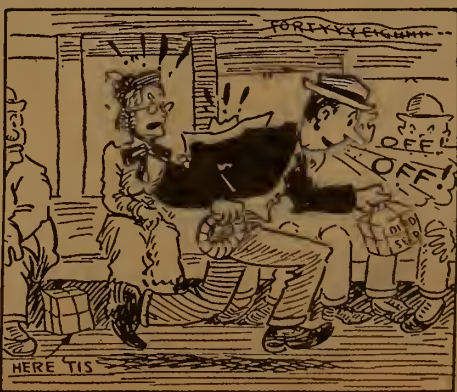
Reliable Radio service to and from Darien, Canal Zone, will be one of the special features of the new station, which will especially appeal to shipping men, and which will also serve to check better the progress of ships and their arrivals in the intercoastal trade.

A special Radiophone transmitting set of increased capacity will be installed by the same company in anticipation of arrangements with the telephone companies whereby a ship called by Radiophone at sea can talk direct with her principals in Los Angeles by connection to land wires at waterfront station.

THE ANTENNA BROTHERS

Spir L. and Lew P.

All He Needs Is the Bird



"LOST" VOICE STILL PLEASES THOUSANDS

FORMER MINSTREL RIDDLE TO ARMY OF LISTENERS

Will Collins, Accompanied by Bernice Raeburn, Broadcasts Songs from WCX by Coosing Them

By Fred J. Huntley

DETROIT.—During the last six or more months thousands of Radio enthusiasts have been delighted by the Red Apple Club which puts on a program of popular music and "stunts" every Tuesday night between 10 o'clock and midnight at Station WCX, the Detroit Free Press. They have heard the "Chief" announce that "Will Collins will now entertain you, with Bernice Raeburn at the piano." Then they have settled back for a musical treat.

It is only at irregular intervals that the "chief" is able to announce Will Collins and Bernice Raeburn; they are not always in Detroit.

Who They Are

"Who is Will Collins?" and "Who is Bernice Raeburn?" are frequent questions.

Well, Will Collins formerly was a minstrel. He has "cracked" more jokes and sung more songs on the stage than most present-day entertainers. One day, two or three years ago, he suddenly lost the full use of his voice. His days of entertaining were at an end.

Collins' Loss the Public's Gain

Did he despair? No. He's too big a man for that. He turned his talent to composing. The world since has been enriched by such delightful music as "Falling," "After Midnight," "You Are Easy to Remember," and other hits.

But how can he sing, as he does over the Radio, if he has lost the full volume of his voice?

One should see Will Collins as he sings at Station WCX to appreciate his work. Collins places his lips within two inches of the microphone and the Radio waves do the rest. The "chief" says Collins "coos" his ballads which are broadcast with as much power and purity as if he were singing.

Collins says that wherever he is introduced into musical circles he will hear, "Oh, yes, I know; you sing for the Red Apple Club." And Will is proud to reply—"Yes, that's right."

ZR-1 HAS ITS AERIAL BELOW GONDOLA CAR



No overhead antenna for the new "greyhound of the air." The aerial is dropped from the gondola with the aid of an outrigger on the side and trails below the big bag for a hundred feet or more. John T. Robertson, Radio operator of the ZR-1, in the porthole, is commencing to let it out. K. & H. Photo

Who is Bernice Raeburn? Well, Miss Raeburn is a charming young Detroit woman, a proficient pianiste. She, too, travels about the country entertaining many people.

The "chief"? He is none other than C. D. Tomy, prominent in newspaper circles, director of WCX since Detroit Free Press opened the station about three years ago. It was he who originated the Red Apple club.

145,000 SETS SEEN ON FARMS IN U. S.

Federal Agricultural Survey Shows Average of 51 to Each County

WASHINGTON, D. C.—The alacrity with which farmers have taken up Radio is shown in a recent survey made by the United States Department of Agriculture which shows that there are approximately 40,000 Radio sets on farms in 780 counties. This is an average of 51 sets to a county. Applying the average to 2,850 agricultural counties as total, it is estimated that there are more than 145,000 sets on farms throughout the country.

The county agents' estimates cover every state. In New York it is estimated that in 37 agricultural counties there are 5,502 sets on farms. The agent for Saratoga county, New York, reported 2,500 sets. In 51 counties in Texas there are 3,085 sets. Forty-three counties in Illinois show 2,814 sets; 26 counties in Mis-

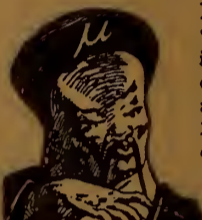
souri, 2,861 sets; 42 counties in Ohio, 2,620 sets; 40 counties in Iowa, 2,463 sets, and 26 counties in Kansas, 2,054 sets. New Jersey, Pennsylvania, Michigan, and Minnesota have 1,000 to 2,000 sets each.

Federal weather forecasts, crop reports, and market quotations are now broadcast from 150 Radio stations throughout the country. Special agricultural news in the form of so-called "Agriograms" and talks as to various phases of the work of the Department of Agriculture are also sent out regularly from 250 stations.

Broadcast State Ballroom Syncopation by Direct Wire

BOSTON.—Broadcasting of dance music direct from the State ballroom of this city is the latest edition of talent booked at WNAC, the Shepard Stores here. Listeners in can now get music direct from a public ballroom and fancy themselves on the floor with the other merry-makers, "tripping the light fantastic." A special telephone line from the ballroom, about two miles away, connects with the operating room of WNAC, and this will be a regular weekly feature of the program.

The New Grebe Broadcast Receiver



Mr. Abrahamson, of Detroit Elec. Co., writes on July 7:—"Last night, with the Grebe Broadcast Receiver, we tuned in the following stations: N. Y. City, Schenectady, Chicago and Omaha. In spite of high temperature and heavy atmosphere, reception was exceptionally clear, using only 20-foot indoor wire. Unable to receive any results at all on other sets during the same time."

Licensed Under Armstrong U.S. Pat. No. 1,113,149

Ask Your Dealer

A. H. GREBE & CO., Inc. Richmond Hill, N. Y.



THE TRADE MARK AUDIOPHONE

Quality of reproduction such as only the original itself can equal. Speech that is so distinct that the voice heard is the actual voice of the speaker. Music that requires no tolerant imagination to be recognized as music of the finest type.



Bristol's Single Stage Power Amplifier



gives additional VOLUME with any two stage amplifier. No separate batteries required. It provides the additional volume necessary to bring in very distant stations on the loud speaker.

Write for bulletin and address of the nearest dealer handling our instruments

THE BRISTOL COMPANY
WATERBURY, CONN.

Boston New York Philadelphia Pittsburgh Detroit Chicago St. Louis San Francisco

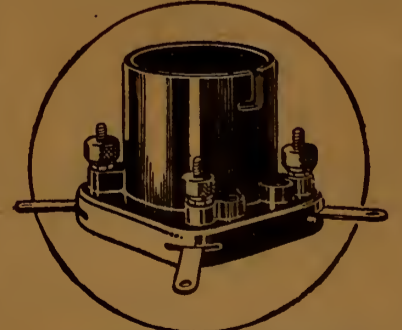
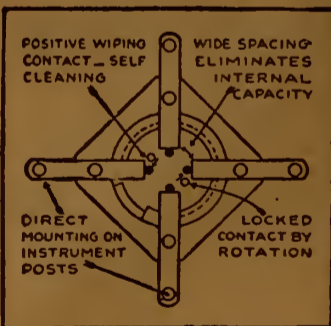
GENUINE—

E. T. Flewelling Sockets

Can You Incorporate Any More Desirable Features In A Socket?

Mr. E. T. Flewelling's years of experience in Radio development work showed the need of a really good socket that would work satisfactorily in Radio Frequency and his well known Super Circuits.

Socket contacts have the same action as plates of a condenser. If they are brought close together they act as condensers and have a detrimental effect on the action of the set.



Standard Tube Socket \$1.00. At your dealer or, until he is supplied, post paid upon receipt of price.

But in the Flewelling socket the contacts are spaced from 5 to 10 times as far apart as in the usual socket and there is no condenser effect. This socket is the maximum in mechanical and electrical efficiency.

E. T. Flewelling says: "A Radio Frequency Circuit that does what it should do is a rare thing. Most of these circuits suffer because we are not able to eliminate feedback action due to stray parasitic capacity effects. Every effort should be made to keep these effects at a minimum."

BUELL MANUFACTURING COMPANY
2977 Cottage Grove Avenue
CHICAGO

CHAPLIN IMITATES A JAZZ BAND---NOT

"QUITE AN ORDEAL," SAYS
BROADCASTER CHAPLIN

Comedian Puts One Over on Fans in
Address at WOR—His First
Radio Talk

(Continued from page 1)

enough to do it. But that young man has contributed to the gaiety of nations in a way, during these troublous times, that has, in a sense, relieved the tension between peoples.

For where there is a motion picture theater (and where is there a town with none?), usually is shown the capers and the whimsicalities, the eloquent elbows, the sentimental shoes, the perky hat, the flippant cane and rising mane of Charlie Chaplin, the world's premier comedian. With the comic film he has girdled the globe and with Radio here recently he, for the first time in his career, hurled his humor through the ether. Even the Radio waves curled in delight as they eagerly hurried onward to bring fun to eager thousands.

Charlie Fears Ordeal

The man who, as a juggler and make believe drunkard, faced critical audiences; the man who afterward appeared on the silver screen before millions, the man whose vocation as actor and director required unusual poise, was visibly agitated as he made ready in the studio of Station WOR to speak into the microphone.

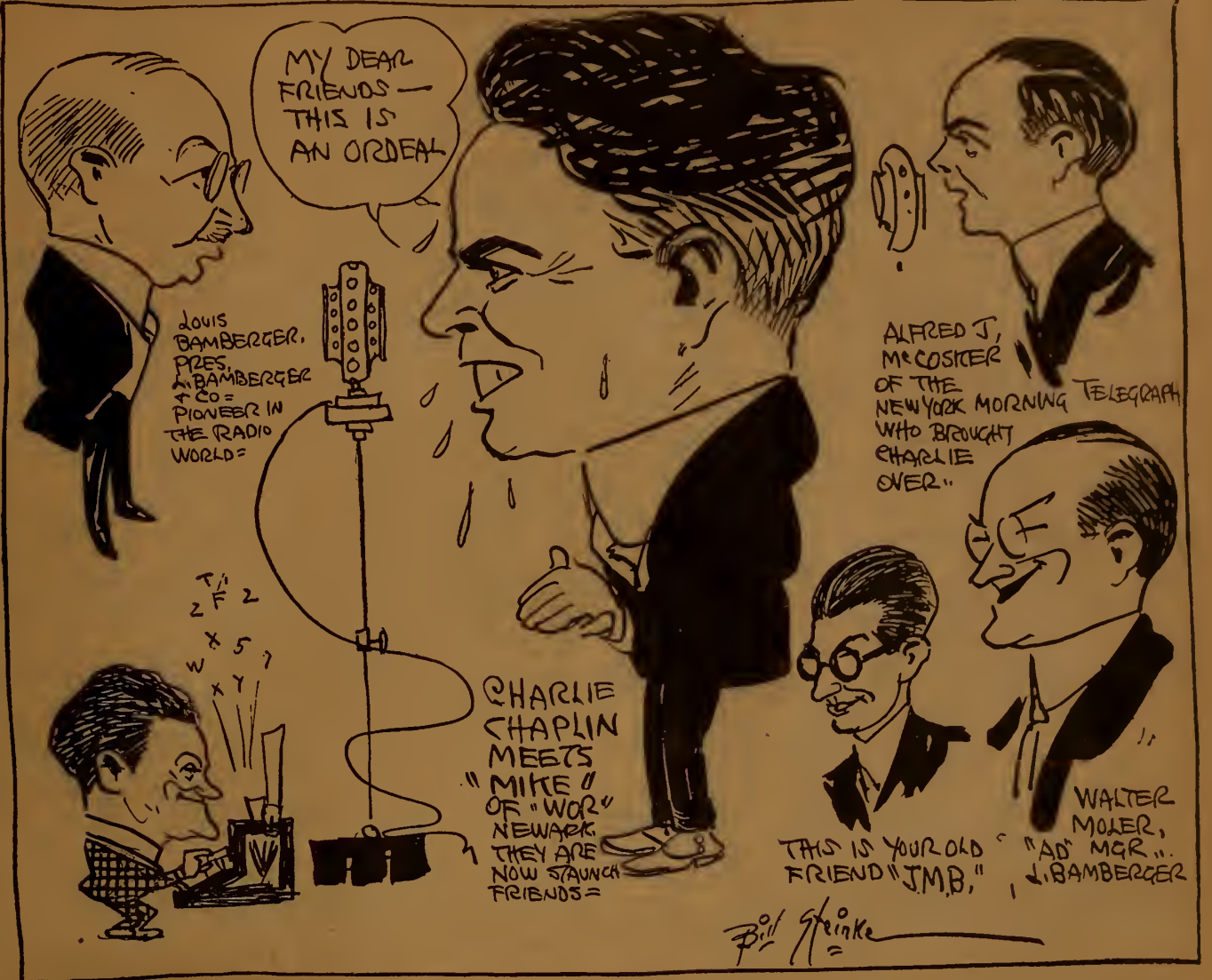
It was not without much patience and diplomacy that the famed mimic was finally induced to face what he termed "that funny little thing." It was one thing to "cut didoes" before a camera; it was another, a far more exacting thing, to talk through a "dojigger" of metal to an unseen audience miles away.

Chaplin approached the microphone gingerly. "This is quite an ordeal, you know," he volunteered to J. M. Barnett, director of WOR. "You have to use your imagination so much." As if a Chaplin would find it hard to imagine!

Can't Remake Broadcast

"You can face the camera," the noted comedian continued, "knowing that if you make a mistake, if you slip up, you can try again; you can make over the picture. But think of all the thousands of people out there in the world hanging onto every word I say." Charlie mopped his brow and

SILVER SHEET COMIC KING PUTS LAUGH ON AIR



other than Charlie Chaplin himself, in person."

His First Time Before Microphone

The poor little, rich little man squirmed. He, like those around him, could see hundreds of thousands of men and women and boys and girls, the mighty and the lowly, grin and then grin again. "Charlie Chaplin—think of it!" Why, the night itself seemed to hesitate, to anticipate!

Chaplin braced himself, opened his mouth, shut it, opened it again then—"This is the first time I have spoken over the Radio," he said tremulously. When he saw that the microphone was safe, wouldn't bite nor talk back to him, Charlie went on. "It is, to me, ghastly to think of you out there in your homes with Tom, Dick, Katherine, Harry and the baby all gathered around, and me here by this funny little thing perforated with holes (the thing, not I), my knees trembling, my hands tightly clasped." And Charlie smirked.

"Imitates" Full Jazz Band

"I feel like the young actor whose only line was, 'There is a man downstairs who calls himself Solomon Isaacs.' As the young actor was pushed onto the stage he managed to splutter something that sounded like Si-mol-ix." The greatest of 'em all turned in his chair and nodded first inquiringly, then confidently.

"Now I'm beginning to get a little confidence," Chaplin continued. "So I'm going to give you a few imitations. First, I'll imitate a violin." Then there floated onto the air the strains of the stringed instrument. It was a real violin, no imitation. But Charlie didn't play it. It was played by one of the artists who compose the staff of Station WOR. "Next, I'll imitate a saxophone," continued Chaplin. Surely enough, the drone and moan of brass went to the ears of throngs. "Now, all of you—listen to the jazz band." No imitations were these. But the trickery of the comedian tickled almost the whole country.

Shakes Fist at "Mike"

Charlie's "act" neared its end. "When you have nothing else to do," he concluded, "go to see my new picture, which I directed—'A Woman in Paris.' That was all. One could see the look of regret on the faces of the vast audience in the great outside. But they had heard the voice of Chaplin and that was enough. They would long remember it.

WGI Truck Set Hears Chicago

MEDFORD, MASS.—A novel performance was reported recently by WGI when the Radio equipped truck of Station WGI, here, returned from Nantasket Beach, where employees of the American Radio and Research corporation enjoyed an outing. The truck's receiving set picked up Station WDAP, Drake Hotel, Chicago. The close of the program was clearly heard through a loud speaker a block away. The truck had an antenna only thirty-five feet in length, installed on the roof.

As Charlie left the studio he asked anxiously: "Did I talk sense to that thing?" Then he shook his fist at the microphone, grinned the grin that has earned him a fortune, and went on his way.

But before he passed personally out of the lives of those in the studio and station, Chaplin declared enthusiastically that he owned a Radio set and that he listened in often to the programs.

AN EVENING AT HOME WITH THE LISTENER IN

(SEE INSTRUCTIONS FOR USE BELOW)

Station and City	Mct.	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
CFCA Toronto, Ont.	400	7:00-8:00	7:00-8:00	7:00-8:00	7:00-8:00	7:00-8:00	7:00-8:00	5:45-6:45
CFMN, Calgary, Alta.	440	12:00-1:00		11:00-2:00			11:00-1:00	
CKAC, Montreal, Que.	430		6:00-8:30		6:00-8:30		6:00-8:30	3:30-4:30
KDKA, E. Pittsburgh, Pa.	326	4:00-8:00	4:00-8:00	4:00-8:00	4:00-8:00	4:00-8:00	4:00-8:00	6:30-7:30
KDZE, Seattle, Wash.	455	10:30-12:30		10:30-12:30			10:30-12:30	
KFAF, Denver, Colo.	360	0:00-10:00	9:00-10:00		8:30-9:00	9:00-10:00		
KFI, Los Angeles, Calif.	469	8:45-1:00	8:45-1:00	8:45-2:00	8:45-1:00	8:45-2:00	8:45-2:00	10:00-1:00
KGW, Portland, Ore.	492	10:00-12:30	10:00-1:00	10:00-1:00	10:00-1:00	10:00-1:30	10:00-1:00	8:00-10:00
KHJ, Los Angeles, Calif.	395	8:45-12:00	8:45-12:00	8:45-12:00		8:45-12:00	8:45-12:00	10:00-12:00
KPO, San Francisco, Calif.	423	10:00-12:00	10:00-12:00		10:00-12:00		10:00-2:00	10:00-12:00
KSD, St. Louis, Mo.	546	8:00-10:00	8:00-10:00	8:00-10:00		8:00-10:00	8:00-10:00	
KYW, Chicago, Ill.	536		8:00-9:00	8:00-9:00	8:00-9:00	8:00-9:00	8:00-9:00	
NAA, Radio, Va.	435	5:45-7:20	6:05-7:20	6:25-7:40	5:45-7:40	7:05-7:40		
PWX, Havana, Cuba	400			8:00-10:30			8:00-10:30	
WBAP, Fort Worth, Texas	476	7:30-10:30	7:30-10:30	7:30-10:30	7:30-10:30	7:30-10:30	7:00-7:30	5:00-6:00
WBVA, Columbus, O.	390	7:00-9:00						7:30-8:30
WBZ, Springfield, Mass.	337	6:30-8:00	6:30-8:00	6:00-8:00	6:30-8:00	6:30-8:00	6:30-8:00	5:20-8:00
WCAP, Washington, D. C.	469		5:30-6:30		8:45-11:00		5:30-11:00	
WCBD, Zion, Ill.	345	8:00-10:00				8:00-10:00		2:30-5:30
WCX, Detroit, Mich.	517	7:30-9:00	7:30-11:00	7:30-9:00	7:30-9:00	7:30-9:00		6:15-7:15
WDAF, Kansas City, Mo.	411	8:00-1:00	11:45-1:00	8:00-1:00	11:45-1:00	8:00-1:00	11:45-1:00	4:00-5:00
WDAJ, College Park, Ga.	258	7:30-11:30	7:30-11:30	7:30-11:30	7:30-11:30	7:30-11:30	7:30-11:30	7:30-11:30
WDAP, Chicago, Ill.	360		7:00-1:00	7:00-1:00	7:00-1:00	7:00-1:00	7:00-1:00	9:15-11:15
WDAR, Philadelphia, Pa.	395	6:30-9:55	6:30-7:00	6:30-10:00	6:30-7:00	6:30-12:00	6:30-7:00	
WDT, New York, N. Y.	405			6:00-7:00		10:00-11:00		
WEAF, New York, N. Y.	492	6:30-9:00	6:30-9:00	6:30-9:00	6:30-9:00	6:30-9:00	6:30-10:00	6:30-9:00
WFAA, Dallas, Tex.	476	8:30-9:30	8:30-12:00		8:30-9:30	6:30-9:30	8:30-12:00	9:30-11:00
WFI, Philadelphia, Pa.	395	6:00-6:30	6:00-8:00	6:00-6:30	6:00-6:30	6:00-6:30	6:00-6:30	6:30-7:30
WGI, Medford, Mass.	360		6:00-7:30	6:30-8:00	6:00-7:30	6:30-8:00	6:30-8:00	7:30-10:00
WGR, Buffalo, N. Y.	319	5:30-9:00	5:30-7:45	5:30-9:00	5:30-7:45	5:30-9:00	5:30-7:45	
WGY, Schenectady, N. Y.	380	8:45-9:00	6:45-9:00		6:45-9:00	6:45-10:30		5:30-6:30
WHA, Madison, Wis.	360	7:30-8:30		7:30-8:30		7:30-8:30		
WHAS, Louisville, Ky.	400		7:30-9:00	7:30-9:00	7:30-9:00	7:30-9:00	7:30-9:00	4:00-5:00
WHAZ, Troy, N. Y.	380	8:00-9:30						8:00-10:00
WHK, Kansas City, Mo.	411		8:00-10:00		8:00-10:00			8:00-10:00
WHK, Cleveland, O.	360	5:00-5:30	5:00-5:30	5:00-5:55	5:00-5:30	5:00-5:30	5:00-5:30	7:00-8:55
WHN, Brooklyn, N. Y.	360	6:30-11:00	8:30-11:00	6:30-11:00	8:30-11:00	8:30-11:00	6:30-11:00	8:30-11:00
WIP, Philadelphia, Pa.	509	5:00-6:30	5:00-11:00	5:00-6:30	5:00-10:00	5:00-6:30	5:00-11:00	3:30-4:30
WJAX, Cleveland, O.	390		6:30-8:30		7:00-9:30			
WJAZ, Chicago, Ill.	448		10:00-2:00	10:00-2:00	10:00-2:00	10:00-2:00	10:00-2:00	6:00-9:00
WJY, New York, N. Y.	405							1:30-5:00
WJZ, New York, N. Y.	455	6:30-10:30	6:30-10:30	6:00-10:30	6:30-10:30	6:30-10:30	6:30-10:30	7:00-9:30
WKAQ, San Juan, P. R.	360		7:00-8:30				7:00-8:30	
WLAQ, Minneapolis, Minn.	417	7:30-10:00	7:30-10:00	7:30-12:30	7:30-10:00	7:30-10:00	7:30-12:30	7:45-8:45
WLW, Cincinnati, O.	309	8:00-10:00	10:00-12:00	8:00-10:00	10:00-12:00			
WMAO, Chicago, Ill.	448		7:00-10:00	7:00-10:00	7:00-10:00	7:00-10:00	7:00-10:00	4:30-5:00
WMC, Memphis, Tenn.	500	8:30-9:30	8:30-12:00		8:30-9:30	8:30-12:00	8:30-9:30	
WNAO, Boston, Mass.	278		7:00-9:00	8:00-10:00	7:00-9:00	7:00-9:00	8:00-10:00	5:30-7:30
WQAI, San Antonio, Texas	385		9:30-10:30		7:30-8:30		9:30-10:30	9:30-10:30
WQAW, Omaha, Neb.	526	9:00-10:00	9:00-10:00		9:00-10:00	9:00-10:00	9:00-10:00	9:00-10:00
WOC, Davenport, Ia.	484	8:00-9:00		8:00-11:00	8:00-9:00	8:00-9:00	9:00-10:00	7:00-10:00
WOO, Philadelphia, Pa.	509	6:45-10:00			6:45-10:00		6:45-10:00	
WOR, Newark, N. J.	405	5:15-10:00	5:15-6:30	5:15-10:00	5:15-6:30	5:15-6:30	5:15-10:00	
WOS, Jefferson City, Mo.	441	8:00-9:30		8:00-9:30		8:00-9:30		
WSAI, Cincinnati, O.	309		8:00-10:00		8:00-10:00		10:00-12:00	
WSB, Atlanta, Ga.	429	8:30-12:00	8:00-12:00	8:00-12:00	8:00-12:00	8:00-12:00	8:00-12:00	7:30-9:15
WSY, Birmingham, Ala.	360	8:00-8:45		8:00-8:45		8:00-8:45		8:00-9:00
WTAM, Cleveland, Ohio	390			7:00-8:30			8:00-10:00	
WWJ, Detroit, Mich.	517	7:30-9:00	7:30-9:00	7:30-9:00	7:30-11:00	7:30-9:00		4:30-5:30

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 broadcasts, and on Sunday, the late afternoon program.



Charles Chaplin as he appeared when making his first broadcast © U. & U.

grimaced in the way that has thrown millions into uproarious laughter. "I don't know what to say; I haven't prepared a speech," he said pitifully.

Chaplin paced the studio. This was indeed a dilemma. Now if it were only a picture, that would have been not nearly so hard. But this was a Radio, something different; something that couldn't be "made over," nor corrected after its voice had vibrated through the void.

Is Introduced to Listeners

The man whom kings delight to honor perspired. From his finely tailored coat he extracted a kerchief which he pressed to his brow and hands. Nervously he glanced at the microphone. Silently he appealed to his companions to "get me out o' this."

Then the jaw whose laxity in buffoonery has convulsed myriads suddenly set. And Chaplin sat him down to the microphone. He gulped; he shuffled his feet (this time well clad); he buttoned and unbuttoned his coat. But he sat. There came to his aid Alfred J. McCosker, a newspaper man of New York city, who calmly told the world that someone of whom they had probably heard, someone whom they had undoubtedly seen often, would speak to them—"none

FORTY ENGINEERS IN GIGANTIC NAVY LAB

EXPERIMENT ON DEVICES FOR SEA COMBAT

Radio Research Now Prime Aim of Workers in Extensive Quarters at Capital

By L. M. Lamm

WASHINGTON, D. C.—Amateur Radio enthusiasts are likely to reap considerable benefit from experiments which are now being carried on by forty first-class Radio engineers working for the navy department and just assigned to the new navy research laboratory constructed by the Government at a cost of approximately \$1,500,000.

The new laboratory, which is located at Bellevue, D. C., in the outskirts of the city, is being devoted almost entirely at this time to Radio research, but eventually it will be devoted to experiments of all kinds by the navy department. Radio, however, will continue to be one of the main subjects studied.

The navy department in opening up the new laboratory has decided to center all of its Radio experiments here and therefore the navy Radio section at the Bureau of Standards, the naval aircraft Radio section and the naval Radio design section, have all been transferred to the new laboratory.

Laboratory Has Five Buildings

Captain E. L. Bennett, U. S. N., is the Director of the Laboratory; while Commander E. G. Oberland, U. S. N., is the Resident Director; and Dr. A. H. Taylor, is in direct charge of the Radio section, having working under him about forty Radio engineers.

The laboratory consists of five buildings, including the laboratory proper, a machine shop for models, a foundry and a pattern shop, and a power house. The buildings have been under construction for two years and have just been opened for work.

The engineers are working out many problems about which the departmental officials do not care to talk for publication, but they affect new Radio apparatus for the use of the fighting ships, the increasing of the selectivity of receivers, the production of directional receiving apparatus, the elimination of static and

JACKIE MEETS MIKE; SAYS HELLO TO FANS



Jackie Coogan, famous juvenile motion picture star who warms the cockles of the hearts of many grown-ups, is here pictured as he was first introduced to "Mike" (the broadcasting microphone). After the formal introduction, Jackie made a very many little speech to his audience of movie-Radiophans

other similar problems. While these matters of course are primarily for the navy, any discoveries that are made (and some must be made where forty men are working day in and day out on a subject) will eventually be made public.

Edison Responsible for Laboratory

Thomas A. Edison, as chairman of the naval consulting board during the war, suggested the advantages of such a laboratory and it was his insistence, in its early stages at least, that led Congress to appropriate the money for the labora-

CHALLENGE SUPPORTS LIST'S CORRECTNESS

ONE DOLLAR will be paid to every 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. 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.

The navy experts are not disposed to discuss the machinery in the buildings but they are insistent in saying that every thing is of the latest design and right up to the minute in completeness.

Air Signals for Astronomer

WASHINGTON.—Another series of time signals is being arranged for the benefit of the Australian Government astronomer, to be transmitted twice daily from Honolulu. These signals will last for a period of three months beginning November 1, 1923.

Australia Plans to Erect Sydney-to-London Station

SYDNEY, AUSTRALIA.—E. T. Fisk, director of the Amalgamated Wireless Company of Australia, who recently returned from Great Britain, has announced before the Sydney branch of the Colonial Institute that next year a high-power Radio station at Sydney would connect with London at two-thirds of the present cable rates.

This station would be in constant touch with important centers throughout the commonwealth.

GENUINE RITTER LOOP



The first portable loop on the market \$1 (equal to the best) sold at this extremely low price. Wonderful results. Set up in a few minutes. Everything complete. Endorsed and approved by Radio News, Popular Radio, N. Y. Mail, Sun and Globe and others. Over 200,000 sold in the past 6 months.

There's a reason!

RITTER RADIO CORPORATION
230 Canal St. New York

Dealers write for exclusive territory proposition



\$250

Coto Special Audio Transformers

Real Coto Quality at a Popular Price

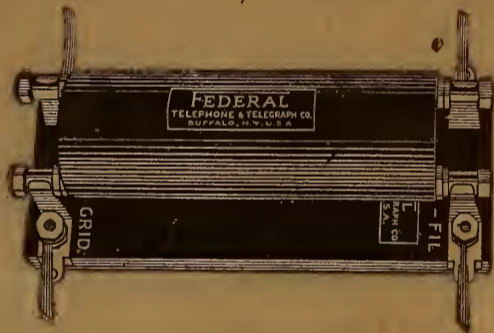
DEALERS!

HAVE your jobbers let you in on this big seller? If not, write us, giving jobber's name.

A marvel of manufacturing economy. In finish, high grade materials and amplifying efficiency, actually superior to many transformers selling at \$5 and over. Ask your dealer to show COTO SPECIAL. If he fails you, send us his name and we will see that he is supplied.

COTO-COIL CO., 87 Willard Ave., Providence, R. I.

Pacific Coast Branch: 329 Union League Building, Los Angeles
Northwestern Branch: Geo. F. Darling, 705 Plymouth Bldg., Minneapolis
Southeastern Branch: C. P. Atkinson, Atlanta Trust Co. Bldg., Atlanta

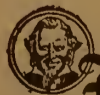


You Can Cover a Tremendous Range of Wave-Lengths with Federal R.F. Transformers

WITH one mounting, you can use any one of four Federal R.F. Transformers covering any wave-length from 175 to 3000. Contacts are made through spring clips, and the transformers can be changed in a few seconds.

Highest grade of materials, and painstaking care in assembly assure efficient amplification of incoming signals without distortion.

130 Federal Standard Radio parts offer the radio enthusiast a complete line of guaranteed parts of one quality—the best



Federal Radio Equipment

Federal Telephone and Telegraph Company

Factory: Buffalo, N. Y.

Boston New York Philadelphia Chicago
San Francisco Pittsburgh London, England
Bridgeburg, Canada

New Thrills from Radio

—outdistance your friends!

Defeat interference, abolish foreign noises, annihilate distance—bring in distant and nearby stations with volume and tone-quality that mean real thrills and make your friends envious. Use



ALL-AMERICAN

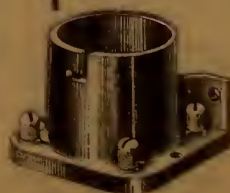
AMPLIFYING TRANSFORMERS

for Audio or Radio Frequency

Largest selling transformers in the world. More than a quarter million in service. Standard equipment on the better sets. Suitable for all circuits.

All Better Dealers Sell "All-American"

RAULAND MFG. CO.
200 N. Jefferson St., CHICAGO
Pioneers in the Industry



"All-American" Bakelite Tube Socket-base or panel mounting 75c

Special Offer!

We will gladly mail the "All-American" Book of Tested Radio Hook-ups—on receipt of 2 cents to cover postage.



"All-American" Audio Frequency Transformer's come in three ratings.

CHARLIE ERBSTEIN AND TWO OF HIS ARTISTS



The noted Chicago lawyer at his broadcasting station, WTAS, near Elgin, Ill. He is here seen adjusting his aerial. The ladies are two of his staff artists; Miss Edna Bodine, dramatic soprano (below) and Miss Catherine Stebbins, pianist (at right) © U. & U.



LAKE ERIE SPLASH IS WJAX MYSTERY

Cleveland Station Puts Slogan Sound on Air—Listeners Wonder How

CLEVELAND.—Have you heard "The Wave from Lake Erie"—have you heard the water sloshing around the rocks on the shore and breaking into a mist of spray? Hundreds of Radiophans have written to WJAX, the broadcasting station of the Union Trust Company, at Cleveland, Ohio, to praise the wonderful realism with which the station has vivified its unique slogan.

One gentleman wrote from New Orleans that he can picture a twelve-pound "muskie" in the swirling water, and a prominent business man of New York City wants to settle a bet by knowing if a microphone is placed on the shore of the lake to catch the sound. A writer from Minnesota states that the effect is perfect and that he should know, as there are 400 lakes within a twenty-mile radius of his home. Hundreds of letters have been received, praising the fidelity of the sound.

E. G. Johnson, announcer for WJAX, originated and developed the idea and, when questioned as to the method of accomplishment, smiled graciously and said something to the effect that "the possibilities of Radio were unlimited." So the mystery is as deep as ever.

Licensed Operator Hired for Part in Arliss Play

NEW YORK.—A duly licensed, union Radio operator was put on the payroll of the Capitol Theater here recently, when George Arliss in "The Green Goddess" was presented. This bit of realism behind the scenes was synchronized with certain Radio messages used on the screen. Two of the most thrilling sequences in the picture are the sending of a decoy message by the scheming Rajah at his private station, and the SOS sent by his helpless prisoners.

CFAC Gives Health Talks

CALGARY, ALTA.—Miss M. E. MacGilvray, Ph.D., Ph.C., physical and health specialist, is now telling Radiophans of the west how to keep well over CFAC, station of the Calgary Herald. This is an innovation in broadcasting in Western Canada and has met with public favor.

in almost every province in Canada; its estimated range is 1,000 miles, but its extreme scope is much greater.

The other reason why WTAS is so widely known is Mr. Erbstein, perhaps the most famous divorce attorney in this country. Among his clients have been men and women of international repute, one of such cases now attracting much interest in the public print.

Builds Station for Hobby

When the burdens of the law became too heavy, when whereases and wherefores and hereinbefores and sobets were so numerous as to weigh heavily, Erbstein decided to build a Radio station. With that persistence and diligence which had brought him to the fore in his profession, the distinguished attorney perfected arrangements which resulted in the erection of Station WTAS on his private estate. (Continued on page 8)

Famous Criminal Lawyer Has Broadcast Plant to Fill in Few Leisure Moments

Charles Erbstein's WTAS Station at Elgin, Ill., Receives a Visitor from Jungles of South America Who Says He "Picked Up" Plant Two Nights Running

By J. L. Newman

'Way down in the jungles of South America, maybe it was in Central America (what difference do a few miles make when Radio is concerned?) a few weeks ago a high official of one of the largest fruit companies, a firm which shapes republics, heard, by way of amusement, a real United States' song.

Now, there are many kin of Uncle Sam below the equator; most of them like to sing at times the airs of the cabaret or theater. But the song that the fruit company's chief heard came not from the deep,

dark outside, nor from the humid bungalows nearby, but from a Radio set in his room. The song stirred him so that he determined to see the station when next he returned to God's country.

Visits Villa Olivia

Shortly afterward he walked into Station WTAS, Villa Olivia, Elgin, Ill., and told C. J. Meyers, operator, and Charles E. Erbstein, owner, that he had heard the station during two successive nights at a place 1,700 miles south of New Orleans.

That is one reason why Station WTAS is known in every state in the Union and

The New Grebe Broadcast Receiver



ON THE evenings of August 17th and 18th, in spite of very heavy static, E. W. Patrick, Brookfield, Mo., enjoyed programs from stations at Schenectady, N.Y., Los Angeles, Cal., and Atlanta, Ga., with a Grebe Broadcast Receiver. The only antenna used was the 20-foot indoor wire.

Write for "Grebe Radio in the Well-Appointed Home."

Licensed under Armstrong U.S. Pat. No. 1,113,149

A. H. GREBE & CO., Inc. RICHMOND HILL, N.Y.



YOUR boy knows the difference in radio receiving sets, even if you don't. Give him a De Forest Radiophone this Christmas and hear him say "Gee, Dad, you certainly know how to pick the winner!"—authorized agents everywhere—satisfied users all over the world.

DE FOREST RADIO TEL. & TEL. CO. Dept. R. D. 2 JERSEY CITY, N. J.

If Located West of Pennsylvania, Address DE FOREST RADIO TEL. & TEL. CO. Western Sales Division Dept. R. D. 2 5680 12th St., DETROIT, MICH.



RADIO CONTROL FOR OLD NORTH DAKOTA

NAVY MAKES PLANS FOR NEW MOVING TARGET

Vessel to Be Scrapped by Armament Conference to Be Bull's-Eye for Aerial Bombing Experiments

By Carl H. Butman

WASHINGTON.—The next Radio-controlled ship of the navy will be the old battleship North Dakota, authorized in 1907 and commissioned in 1910, but designated to be scrapped by the Arms Conference. A lack of available funds for the Radio control equipment will prevent the execution this year of the navy's plan to carry out extensive gunfire and aerial bombardment with this ex-first-line ship as a moving target.

She will be de-commissioned and much of her armament and equipment salvaged in anticipation of equipping her with Radio control apparatus next year. In the meantime, she will be kept in good condition at her present berth at the Norfolk Navy Yard.

"How can the navy afford to sink a vessel whose hull, armor and machinery alone cost \$7,246,687, and whose Radio equipment will cost \$100,000 more?" some critics will ask.

Useless as Fighting Craft

In the first place, she is useless as a fighting craft, but the answer lies in the results of the aerial bombing and the gunfire experiments with the old Iowa, now at rest in Panama Bay. The latter was the navy's first Radio-controlled target ship, and the only full-sized ocean-going craft ever operated by Radio without men aboard. From her, naval radio engineers learned how to equip and control a vessel from a distance; the aviators learned how to bomb moving targets; and the range finders and gunners experienced for the first time long range and even indirect fire at a real battleship while under way.

Designers and ordnance experts also gathered valuable data. Improvement in all lines of the service was noted; hence a second ship is to be Radio equipped when sufficient funds are appropriated. She must be sunk or disposed of eventually, but, with special shells and bombs, it is planned to keep her afloat as long as possible when the final maneuvers start.

Control by Ship Miles Away

The North Dakota will have similar Radio control equipment to that on the old Iowa, sunk last winter. The equipment will enable her to proceed at a higher rate of speed, approximating fifteen knots, it is understood. Radio control will provide for increasing her speed to a maximum from a low initial speed and stopping her. The speed cannot be varied, but she can be maneuvered right and left by her Radio rudder control from the operating ship several miles away.

The new Radio equipment will cost \$100,000, it is estimated, although no definite figures have been prepared. The total cost of partly scrapping, that is removing guns, etc., will also cost another \$100,000, but this amount would be entailed necessarily through the armament agreement.

FANS MAIL OFFERING FOR CHURCH "PLATE"

Two Calgary Pulpits Now Broadcasting Sunday Sermons

CALGARY, ALTA.—CFCN, the Radio broadcasting station of the W. W. Grant Radio, Ltd., at Calgary, has now commenced broadcasting the regular Sunday evening service from Knox Presbyterian church.

Local ministers do not agree that broadcasting of services detract from church attendance and from receipts. Considerable money has been received by Grace Church from Radiophans since broadcasting was commenced, the contributions coming by mail. They are generally larger than those placed on the collection plates by transients, it has been observed. The attitude taken by local ministers is that Radio enlarges the scope of church work.

ATTORNEY HAS STATION

(Continued from page 7)

Villa Olivia. The cost of the plant was \$10,000; it was designed by Mr. Meyers.

Station WTAS, which uses all the power from a 500-watt generator, is distinguished by the "Sapphire Studio," a room of extraordinary beauty where draperies, lights and other appointments yield a hue of bright blue. Here artists of renown have taken part in programs, nightly excepting Friday, arranged by Mr. Erbstein and Mr. Meyers.

Meyers Pioneer Operator

The latter, although only twenty-four years old, is a pioneer operator. Meyers owned one of the first amateur stations in Cincinnati, built at a cost of \$200.

One of Mr. Meyers' duties at Station WTAS is to answer an average of 300 letters a day from twenty-five to thirty-five states in this country. The station has been appointed the official broadcasting plant of the American Legion.

Not only does WTAS draw the great and near great but it has caused the wily to flee. Not long ago the station broadcast the description of a man who had robbed the patrons and owner of a nearby roadside cabaret. Fifteen minutes after the robbery the thief was captured ten miles away, as he fled toward Chicago.

When repairs or adjustments are necessary to WTAS, Mr. Erbstein is able to drop his law books and tinker at tubes, oscillators, the antenna and the like. Radio is his hobby and WTAS his pet.

"Radio Cops" Guard Canada

DETROIT.—What are known as "Radio cops" have been appointed by the Radio telegraph branch of the department of marine and fisheries for twenty-two districts throughout Canada, from North Sydney to Vancouver. It is understood that in the near future these "cops" will be stationed at Sarnia, Sault Ste. Marie, Regina, Edmonton and Lethbridge.



RADIO AT NEW YORK PRICES

VIA DAILY PARCEL POST

The Prices Quoted Below Deliver Goods to Your Door

R. G. Duns, Bradstreet, Coal & Iron National Bank, Corn Exchange Bank, N. Y. City. No salvaged goods handled. Only standard brands in original packing, which bears our and the manufacturers' guarantee. Due to our tremendous output we can undersell any of our competitors. Send your order in today and insure prompt delivery.

HOW TO ORDER—Write your order plainly; state number, description and price of items wanted. Send Post Office or Express Money Order, personal check or bank draft.



VACUUM TUBES

Standard brand Radio Corp. tubes. Guaranteed brand new.

B50 Detector, U.V.200 each	\$4.25
B51 Amplifier, U.V. 201A each	5.75
B52 1 1/2 volt W. D. 11 each	5.75
B53 W.D.12 ea.	5.75
B54 U.V.199 ea.	5.75
B55 U.V.199 Adapter for U.V.199 tube	.50
B56 W.D.11 Adapter fits W.D.11 tube and any standard socket	.50

Audio Frequency Transformers

The following transformers are guaranteed standard makes, and will produce very efficient results.

B63 Dietzen 3 to 1 Ratio	\$3.95
B64 Dietzen 5 to 1 Ratio	3.95
B65 Dietzen 10 to 1 Ratio	3.95
B66 Acme Audio	4.25
B67 American	3.95
B68 U.V. 712 R.C.A.	5.75
B69 U.V. 714 R.C.A.	5.75

Loop Aerial

B76. Can be assembled by anyone in five minutes, all wood parts, wire and binding posts included, complete \$1.00

Moulded Bakelite Variometer

B79 Ea. \$5.75. List \$8.00
A high grade instrument. Takes in the wave lengths from 250 meters to 800 meters. Table or Panel Mounting.

FRESHMAN VARIABLE GRID LEAK AND GRID CONDENSER

Lowest filament current increases battery life; eliminates howling; zero to 5 megohms.

B102 Freshman Variable Grid Leak alone	\$0.65
B103 Freshman Variable Grid Leak and Condenser combined	.85

Filament Controlled Rheostats

Highest grade of material used, tapered knob.

B104—6 ohm	\$0.39
B105—30 ohm	.49
B106—200 ohm	.79
Potentiometer	.79
B107—400 ohm	.79
Potentiometer	.79

Double Phonograph Attachment

This attachment fits all phonographs; will take any headset. It converts your phonograph into a loud speaker.

B131 Double attachment	\$0.85
B132 Single attachment fits any single phone unit to be used on phonograph	.49

Honeycomb Coil Mountings

B140 2-coil mounting	\$2.85
B141 3-coil mounting	3.79
B142 Single coil mounting	.40
B143 Receptacle for single coil mounting	.50

MISCELLANEOUS

B163 Spaghettil Tubing per yd.	\$0.09
B164 Synthetic Crystal	.30
B165 Ground Clamps	.17
B166 Black Rubber Binding Posts	.05
B167 Nickel Plated Binding Posts 2 for	.05
B168 No. 18 Annunciated Wire half pound coil	.39
B169 6 ft. Phone Cord with tips	.79
B170 20 ft. Extension Cord with tips	1.95
B171 Wall Insulators, Porcelain	.05
B172 Tubular Porcelain lead-in Insulators	.10
B173 Reinartz Coil	1.45
B174 Cockaday Coil	2.45
B175 2 in. Dial and knob	.25
B176 3 in. Dial and knob	.35
B177 4 in. Dial and knob	.49

BUILD YOUR OWN SET

Cockaday CIRCUIT COMPLETE

Consisting of:
1 Cockaday coil and 7 pigtail connections
2 .0005 Variable Condensers
1 Socket
1 Panel 7x18
2 Dials, 3 in.
1 Grid Leak and Condenser
1 Rheostat
1 Switch Lever
1 Base Board
12 Ft. Bus Bar
7 Switch Points
7 Marked Binding Posts
1 Jack
Wiring Diagram and Instructions

\$12.65
B178. Our Price \$12.65

Flewelling CIRCUIT COMPLETE

Consisting of:
1 .0005 Variable Condenser
3 .006 Mica Condensers
1 7x12 Panel
2 Coil Honeycomb Mount
Variable Grid Leak and Condenser
1 50 turn Honeycomb Coil
1 75 turn Honeycomb Coil
2 Coil Mounts with straps
1 Dial, 3 in.
8 Marked Binding Posts
1 Baseboard
Wiring Diagram and Instructions

\$12.45
B180. Our Price \$12.45

HARD RUBBER PANELS

The highest grade panel on the market. Highly polished finish; cut in the following sizes:

B88—7x10	\$0.95
B89—7x12	1.15
B90—7x14	1.35
B91—7x18	1.65
B92—7x21	1.95
B93—7x24	2.20

High Grade Moulded Variometers

B97 Price \$2.65
A real high grade job at extremely low price. Takes in all wave lengths.
B98 Wooden Variometer same as above type. \$2.65
Improved Outdoor Lightning Arrester Passed by the Board of Fire Underwriters. Regularly sells for 1.50
B108 \$0.95

AMPLITONE LOUO SPEAKERS

This speaker will give efficient results when used with any pair of Head Phones; highly nickel plated; 13 inches high.
B117 \$3.95

Standard Brand Head Phones

B134 Brandes Superior	\$5.25
B135 Dictograph	6.75
B136 Baldwin Type "C" Double	9.85
B137 Baldwin Type "C" Single	4.95
B138 Western Electric	\$10.50
B139 Dietzen 3000 ohms extra special	3.95

VERNIER VARIABLE CONDENSERS

Specifications the same as above.

B114—14 Plate Vernier with knob and dial	\$2.95
B115—26 Plate Vernier with knob and dial	3.45
B116—43 Plate Vernier with knob and dial	3.95

MAGNET WIRE—8 OZ.

Double Cotton Covered		Green Silk	
No.	Size Price	No.	Size Price
B144	18 . . . \$0.43	B145	18 . . . \$0.73
B146	2053	B147	2085
B148	2268	B149	22 . . . 1.09
B150	2478	B151	24 . . . 1.13
B152	2688	B153	26 . . . 1.65
B154	28 . . . 1.07	B155	28 . . . 1.95
B156	30 . . . 1.58	B157	30 . . . 2.65

Reinartz CIRCUIT COMPLETE

Consisting of:
1 Reinartz Coil and 16 pigtail connections
2 3 in. Dials
1 .0005 Variable Condenser
1 11-Plate Condenser
1 Socket
1 Vernier Rheostat
3 Switch Levers
1 7x14 Panel
1 Base Board
8 Marked Binding Posts
12 Ft. Bus Bar
1 Grid Condenser
2 doz. Switch Points and stops
Wiring Diagram and Instructions

\$10.85
B179. Our Price \$10.85

Ultra Audion CIRCUIT COMPLETE

Consisting of:
1 7x12 Panel
1 Variable Condenser .0005
1 Socket
1 Variometer
1 Vernier Rheostat
1 Grid Leak
1 .0002 Mica Condenser
7 Marked Binding Posts
1 Base Board
16 Ft. Bus Wire
Diagrams and Instructions

\$9.65
B181. Our Price \$9.65

1 1/2 VOLT DIETZEN TUBE

Two-element Fleming valve effect; operates on one dry cell with or without "B" Battery; wiring diagram free with each tube.

B95 Dietzen Tube	\$1.00
B96 Socket for Dietzen Tube	.40

BAKELITE TUBE SOCKETS

Moulded of brown bakelite; Binding Post Connections.

B99 Standard Type for 201A, 301A, W.D.12, 39e	
B100 For U.V.199	
B101 For W. D. 11	
B102 For W. D. 11	
C11	

RADIO SOLDERING IRON

Indispensable for the man who builds his own sets.

B109	\$2.50
B133 Soldering Paste Tube	.25

VARIABLE AIR CONDENSERS

These condensers are made of heavy aluminum plates high grade bakelite ends.

B110—21 Plate .0005 Mfd.	\$1.75
B111—11 Plate .00025 md. 1.26	
B112—3 Plate .00005 Mfd.	\$0.95
B113—43 Plate .001 Mfd.	2.25

VERNIER VARIABLE CONDENSERS

Specifications the same as above.

B114—14 Plate Vernier with knob and dial	\$2.95
B115—26 Plate Vernier with knob and dial	3.45
B116—43 Plate Vernier with knob and dial	3.95

MAGNET WIRE—8 OZ.

Double Cotton Covered		Green Silk	
No.	Size Price	No.	Size Price
B144	18 . . . \$0.43	B145	18 . . . \$0.73
B146	2053	B147	2085
B148	2268	B149	22 . . . 1.09
B150	2478	B151	24 . . . 1.13
B152	2688	B153	26 . . . 1.65
B154	28 . . . 1.07	B155	28 . . . 1.95
B156	30 . . . 1.58	B157	30 . . . 2.65

WOOD CABINETS

Highest grade Mahogany finish Cabinets. Blazed top. These cabinets are being sold at less than one-half regular value.

B57 Wood Cabinet; panel size 7"x10"	Each. . . \$2.50
B58 Wood Cabinet; panel size 7"x12"	2.75
B59 Wood Cabinet; panel size 7"x14"	3.00
B60 Wood Cabinet; panel size 7"x18"	3.50
B61 Wood Cabinet; panel size 7"x21"	3.75
B62 Wood Cabinet; panel size 7"x24"	4.00

RADIO FREQUENCY TRANSFORMERS

B70 Tri-coil for 201A or 301A tubes	\$1.95
B71 For 199, 299 or W.D.11 and 12 tubes	1.95
B72 Eria AB1	3.75
B73 Eria AB2	3.75
B74 Eria AB3	3.75
B75 Eria Reflex	4.65

VARIOCOUPLER

B77 High Grade 180 Degree Coupler made of Bakelite tubing wound with green silk wire.
Special . . . \$2.65
B78 Variometer same specifications . . . 2.65

PLATE CIRCUIT "B" BATTERIES

The highest grade of battery made at prices lower than they ever were sold before.

B80—22 1/2 Volt Small	\$1.15
B81—22 1/2 Volt Medium	1.45
B82—22 1/2 Volt Large	\$1.95
B83—45 Volt Medium	1.95
B84—45 Volt Large	2.50
B85—45 Volt Extra Large	3.50
B86—360 hr. 1 1/2 Volt twin double duty "A" battery	.75

RUSONITE

B159 The perfect synthetic crystal detector. Sensitive over entire surface. Loud and clear.

Price, mounted	\$0.50c
B160 14 K. Gold Supersensitive Rusonite Catwhisker. Permanent. Will not oxidize. Price	.25c
B161 Rusonite Reflex Crystal. Manufactured expressly for Reflex Circuits. Guaranteed. Price, mounted	\$1.00

JACKS AND PLUGS

Jacks are polished nickel construction with pure silver contacts.

B118 One Spring open circuit	\$0.39
B119 Two spring closed circuit	.49
B120 Round plug as illustrated	.49

AERIAL WIRE

B121 100' solid copperweld wire coil	\$0.49
B122 7' strand 100 ft.	.69
Ground Wire Rubber Covered No. 14	
B123 25 ft. coil	\$0.49
B124 50 ft. coil	.85

INSULATORS

These are very strong strain type insulators.

B156 Moulded insulator	Ea. Doz. \$0.10 \$1.10
------------------------	------------------------

LOUD SPEAKERS

B125 Herald Loud Speaker. No extra battery required. The ideal instrument for the home, school or church.

Now	\$30.00
B126 Magnaron new type	\$29.95
B127 Music Master	\$28.50
B128 Atlas Speaker	\$22.50
B129 Pathé Speaker	\$21.95
B130 Dietzen Speaker	\$18.95

The above prices delivered to your door.

JE WELL
FRENCH HAY-O-V
FROST
KELLOGG
WESTERN ELECTRIC
CROSLLEY
MAGNA VOX
GENERAL RADIO
ALL-AMERICAN
RADIO CORPORATION
24 HOUR SERVICE
G.W. Thompson Company
JOBBER ELECTRICAL RETAILERS
Mattoon, Illinois

Model's 71 Cortlandt St. New York, N. Y.
ESTABLISHED 1905
America's Greatest Radio Mail Order House
ELEVEN NEW YORK STORES

RADIOPHANS DECIDE "BATTLE OF MUSIC"

LETTER CARRIERS' BANDS COMPETE ON AIR

Postmen Distribute Million Voting Blanks to Listeners In for Decision on Prize Band

PROVIDENCE, R. I.—Millions of votes by Radiophans will be cast in what was planned to be the biggest nation-wide contest ever held, when the twenty-nine postal bands, who played on a recent night in all the principal cities of the United States, held a Radio concert contest, or "battle of music."

Plans for the contest were made at the convention of the National Letters Carriers' Association, held here recently, when Emory Johnson, the motion picture producer, and the Film Booking Offices of America offered a cash prize of \$500 and a beautiful silver cup to the best postal band in America.

With the agreement to hold the contest, Radio was immediately accepted as the best means of reaching the public, who was to give the decision. In the United States there are twenty-nine large postal bands, from the Atlantic to the Pacific Coast and the plan called for concerts to be held simultaneously all over the country.

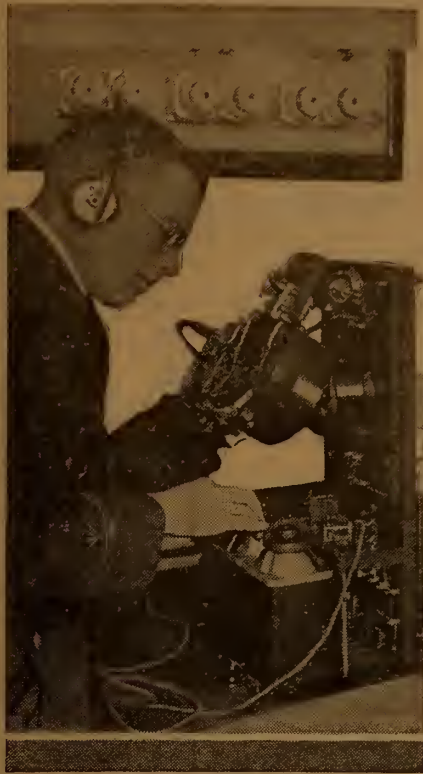
Ballots Distributed to Take Fan Vote

Ballots were printed in the Radio sections of daily newspapers, and 1,500,000 more blanks were distributed by letter carriers to people on their various routes who own receiving sets. The blanks will be the means of deciding the winner. The names of each band and the station from which they broadcast were printed on the ballots so that it was possible to tune in for three or four different bands before the contest finished. As the ballots were sent out several days previous to the concert date, Radiophans had ample advance notice of the event.

The ballots, filled in by those who listened in, are being returned to the carriers, who in turn forward them to the donors of the prizes for counting. Two weeks are allowed from the date of the concert to count the votes, and the winners are to be announced by Radio November 1.

The \$500 cash prize is divided into three,

AMERICAN SHIP HAS GERMAN EQUIPMENT



The U. S. S. Resolute, much in the public eye because she sails under Panama registry in order to remain "wet," has another title to distinction in her "Telefunken" Radio equipment. As one may see, the receiver looks quite different from those familiar to us of the U. S. K. & H. Photo

\$300 for the first prize, together with the silver cup, and \$150 and \$50, second and third prizes respectively.

Whittemore Gets New Job

WASHINGTON, D. C.—L. E. Whittemore, former assistant chief of the Radio section of the Bureau of Standards, has been appointed technical secretary of the interdepartmental Radio advisory committee and from now on will spend all of his time in this work.

The Reader's View

Radio and St. Peter

Just received a copy of Radio Digest at the news stand. I notice in the Questions and Answers, Number 4044, the writer seems to know much more than you.

If he had been as I was more than a year ago with no paper that had the information Radio Digest gives every week and had tried to build his own set without the help you give, he would surely know how to appreciate Radio Digest.

If I were in your place I would be like Saint Peter. A very rich man died and arrived at the pearly gates. He asked for admission. Saint Peter asked Gabriel what he had credited on his book for the man at the gate. After much searching Gabriel found that the rich man had given a dime to the poor. Saint Peter studied a bit and said: "Give him back his dime and let him go to h—l."

I don't think much of the Reinartz circuit. But maybe I think too much of my set to give any other a fair trial. I try nearly every thing that is new.

This letter is for the Question and Answer man who has more patience and Radio knowledge than most of us and should be encouraged.—E. R. U., Princeton, Ind.

Heavy Service Bell Talks

With reference to the article "Talking Transformers," by L. B. Godbey, St. Louis, Mo., I submit the following:

As he so ably explained away the mysteriousness of that case, perhaps he may be able to explain the "why" of a talking electric signal bell in regular use in this office for signaling between this and two adjacent stations about three miles distant on either side.

On several occasions voices have been heard quite distinctly by listening close to the bell; upon removing the receiver from the phone, stations on either side of me were heard conversing.

The bell is for heavy service—coils each 2½ inches by 1¼ inches, gong 5 inches, back frame and removable cover heavy cast-iron at least ⅜ inch thick. There is no thin light metallic part that could function as a diaphragm.

This has occurred only at infrequent intervals chiefly, I believe, when storms approached.—F. A. E., Rome, N. Y.

BRITON SEES RADIO LINK ALL EMPIRE

English Postmaster General Paves Way for Air Communication with Colonies

WASHINGTON, D. C.—Recent statements of the British postmaster general indicate that a solution has been found to the problems connected with the establishment of the British empire Radio chain. Not all points connected with the issuance of Radio licenses have been disposed of but it is considered probable that the British government has adopted a policy which will permit private Radio companies to establish high-power stations both in the United Kingdom and in the colonies. The postoffice will proceed with its own plans for a high-power station at Rugby, England.

The companies which have applied for licenses are the Marconi Wireless Telegraph, Limited, and the Eastern Telegraph; the latter is the largest unit in the British cable system. The Marconi company has contracted with the Union of South Africa and the Dominion of Canada for high-power Radio stations designed to communicate directly with England; it is associated with the Amalgamated Wireless which has a similar contract in Australia.

The Eastern Telegraph company is the first cable concern of any size to use Radio transmission as an adjunct to its cable service.

A pleasant signal filling a moderate size room should be enough to give satisfaction. It is not worth while producing signals which deafen the neighbors. It is wasteful to insist on tremendous signals which are generally not pleasant.

Morrison



Loud Speaker.

A LOUD Speaker that DOES reproduce with perfect distinction and clarity of tone—that DOES eliminate all harsh vibration and rattle.

Phonograph OR Horn

Morrison attaches to practically any phonograph or horn in a moment. Hundreds of users write enthusiastically of the enjoyment they now get out of radio. For you can adjust from soft, mellow tones to loud, full volume by the turn of a little dial. We positively guarantee Morrison Loud Speaker.

Nickel Plated Model, Complete with 5 ft. cord **\$10.00**

Ask your dealer for demonstration or send order to us direct.

DEALERS

Investigate today—we will show you the wonderful possibilities of Morrison Loud Speaker.

Write for Illustrated Catalog

MORRISON LABORATORIES, INC.
343 Jefferson Avenue, East, Detroit, Mich.



Works everywhere -city or country-

Here is a set which brings distortionless speech and music to you no matter where you live. The Moon is operated by simply grounding to a water pipe or radiator—no antenna, loop or indoor wire is necessary.

Stations within a conservative 1,000-mile radius are regularly received with a non-power loud speaker on this set.

It is the ideal set for use in apartments, automobiles, yachts or railroad trains where an antenna is not practical. Extremely sensitive, unusually selective, yet simple to operate.

Write today for our folder "California or Newark."

DEALERS:—Ask about our franchise

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RADIO PANELS
POLISHED BLACK FINISH

CUT PERFECTLY SQUARE TO ANY SIZE

1/32" THICK	1/2¢ PER SQ. INCH
1/16" THICK	3/4¢ PER SQ. INCH
3/32" THICK	1¢ PER SQ. INCH
1/8" THICK	1 1/2¢ PER SQ. INCH
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1/4" THICK	2 1/2¢ PER SQ. INCH
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"The detector tube supreme." Noted for stability, long life, and uniformity. A six-volt standard base tube for any receiving circuit.

Radiotron UV-200 with its long distance reception—clearness—and good volume—is the basis of many a receiver's splendid performance.

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This Symbol of quality is your protection

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Sales Offices—Dept. 3002: 233 Broadway, New York

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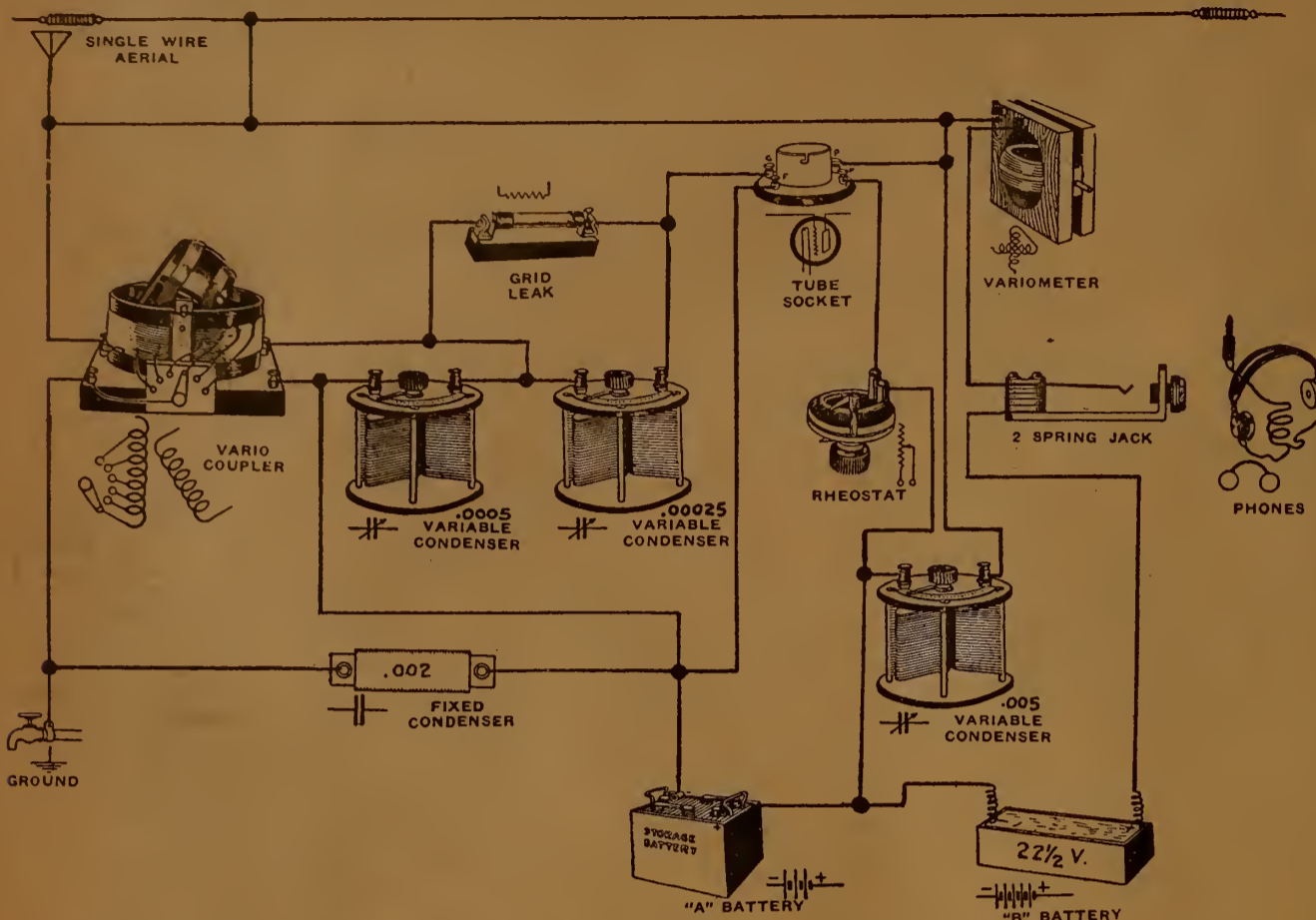
433 California St., San Francisco, Cal.

Be sure that every vacuum tube you buy is marked **RADIOTRON.**

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REG. U. S. PAT. OFF.

REGENERATIVE CIRCUIT IN SIMPLEX DIAGRAM



A popular form of the regenerative circuit is shown in the Simplex diagram. Through a liberal use of variable condensers, accurate control of the circuit and increased selectivity is possible.

The grid leak is fixed and has a resistance of 2 megohms, but the grid condenser is variable. Do not have the rotary plates on the grid side, or capacity effects will

be marked. The plate circuit is tuned by means of the variometer and the variable condenser.

A soft tube (detector) is recommended with a B battery of only 22 1/2 volts' pressure.

The circuit has unusually good volume and the range for long distance work. It is best to have the panel carefully shielded

in order to eliminate the occurrence of body capacity effects.

Home-made Grid Leak

If you are away from home and need a different value in your grid leak or if you want to find out if a different value will change the set, at any time, take a match or similar bit of wood, coat it all over with pencil marking and lay it

across the leak contacts or from grid to filament post. This expedient has kept a set in operation for a week when away from a Radio supply store. It has solved many a squeal and howl, even in the city.

SPECIAL
(IMPROVED MODEL)
Direct From Manufacturer to Consumer
LOUD SPEAKER
Genuine Wood Fiber Horn
(With Unit and Cord)
Entirely eliminates that annoying metallic sound. Positively the only WOOD FIBER HORN on the market today.
10-Inch Bell with Standard Attachment; Complete. Height 24 inches. Colors, Black, Mahogany and Olive Green.
Price **\$8.00**
(For a limited time only.)
Delivered to any part of the United States and Canada
EMIL DECLYNE
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Send M. O. or C. O. D. Dept. R. D., Barclay 6298

The B.T. Universal Vernier Tuner
(The Original 3-Circuit Coupler)
is an entirely new instrument, a fitting companion for the real Vernier Condenser.
It has given a new meaning to close tuning in a great many of the most desirable circuits known.
Buy it for results—experiment later if you wish.
Price **\$5.00**
Our new free booklet will improve your knowledge of tuning. Send 2c for postage and your dealer's name.
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RHEOSTATS AND SOCKETS

Our Price	
MARVEL Rheostat, 6 ohms.....	.35
MARVEL Rheostat, 20, 25 and 30 ohms....	.45
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Potentiometer, 1,850 ohms, Federal.....	2.20
Standard Sockets, bakelite base, \$1.25.....	.75
Na Ald Sockets, 35c; 3 for.....	1.00

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Our Price	
Variable Condenser, .0005 (Same as 23 plate).....	\$5.50 3.00
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Variable Condenser, with Vernier, .001.....	7.50 5.00
Walnut Variable Condenser, .00025.....	1.75

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Our Price	
Moulded Variometer.....	\$6.00 \$4.39
Variometer, All Circuits.....	5.50

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Our Price	
Webster Variocoupler with dial, Type 1A.....	\$4.50 \$2.19
Moulded Coupler.....	5.50 4.19
Moulded Bakelite Variocoupler.....	6.00
All-Meter Variocoupler, 150-2800 meters.....	7.00

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Freshman Grid-Leak with Condenser.....	\$1.00 \$.79
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Switch Lever, 1-A, 1 1/2" Radius, 1 1/2" Knob, 3/8" Shaft.....	.75 \$.35
Presto Aerial Superseder, Adjustable; can be attached to electric light socket or telephone.....	3.00 2.00
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Combination Socket and Rheostat with Vernier.....	3.00
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B-Metal Type "D" Detector, adjustable for reflex work.....	1.00
Hydrometer Perfect.....	.85 .65

1 .0005 Variable Condenser	1 .002 Phone Cond.	1 Socket, Bakelite base	3 Dry Cells
1 Estru Variometer	3 3 1/2 inch Dials	1 Bakelite Panel, 9x14x 1/8	12 ft. sq., brass bus wire
1 .00025 Variable Condenser	1 Potentiometer	1 DeForest D.V.-6 Tube	1 Set Readem Bind. Posts
1 Variable Grid Leak and Cond.	1 Rheostat, 6 ohms	1 B Battery, 22 1/2 volt	ONLY \$28.50

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(Enclosed in substantial beautiful mahogany cabinets)

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Webster 1-A Tuner Unit.....	\$35.00 \$17.50
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Webster 3-B Audio Frequency Amplifier Unit.....	27.50 17.00
Webster 3-A Audio Frequency Amplifier Unit.....	17.50 8.50
Webster 4-A Radio Frequency Amplifying Unit.....	17.00 7.50

Single Tube Webster Receiving Set (Non-Regenerative Type), without head set and tube, in beautiful mahogany cabinet; list price, \$30. Our price, while they last, Only **\$20.00**

The above Webster Receiving Set complete with Baldwin Phones, B Battery, Dry Cells and Tube; list price, \$41.30. Our special price as long as we have them **\$32.50**

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Webster Radio Frequency, 5 A-1, wave length 200 to 500; 5 A-2, wave length 300 to 1200; 5 A-3, wave length 500 to 2,000; \$4.00.....	\$3.19
All American, Ratio 1-5.....	\$4.00
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PHONE RECEIVERS

Our Price	
Webster Double Head Phone Receivers, 2500 ohms.....	\$7.00 \$3.49
Double Phone Cord.....	1.00 .75
Genuine Master-Baldwin Type C Unit.....	6.00 3.49
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LOUD SPEAKER

Audiophene Loud Speaker (Large Size).....	\$22.50
Loud Speaker Cord, 20 feet, 4 tips, our price.....	1.00

WIRE

All kinds of wire put up in 1/4 pound spools, No. 18 to No. 28, silk, cotton and enamel, double or single..... 45 cents a spool
Same wire as above on 1/2 pound spools..... 75 cents a spool
Hook-up Wire, No. 14 square brass, cut in 6 foot lengths, 15c

Madera Clear-Speaker

AT LAST—REAL SPEECH—REAL MUSIC—FROM DIE-CAST WOOD HORN



Finished Crystallized Black and Mahogany Complete with unit

\$15.00

Height 12 inches
Diameter Bell 10 inches

ABSOLUTELY GUARANTEED

Natural tone from Radio made possible by a new process discovered! We break down wood to original fibre, forcing it into steel dies under twelve tons pressure.

You and I would not think of making a violin of metal or cardboard, expecting to receive wonderful tones. Why use it for radio horns? Talking machine people gave up metal horns years ago.

The best violins are made of wood, whose fibres are very close together. The tighter the fibres the better the tone quality. We compress fibres closer than they are in any wood.

We Are Responsible Folks. Money Promptly and Cheerfully Refunded If You Are Not Satisfied
All Orders Mailed Promptly. Parcel Post Prepaid on \$5.00 or Over
Quality Merchandise at Low Prices
Economical Radio House
4600 Lincoln Avenue, Chicago

Everything in Radio Write Us

We Personally Guarantee All Goods

ALL THE PARTS R. D.-99 LONG DISTANCE RECEIVER

(See September 29th Issue Radio Digest)

3 Sockets; 3 Rheostats; 2 A. F. Transformers; 2 Double Circuit Jacks; 1 Open Circuit Jack; 1 Radiometer; 1 Variable Grid Leak and Condenser; 1 .0005 Variable Condenser; 1 .005 Fixed Condenser; 1 75 Turn Honeycomb Coil, Mounted; 1 Single Coil Mounting; 1 Set Readem Binding Posts; 1 Bakelite Panel, 7x16x 1/8.
OUR PRICE.....

\$30.25

"Tri-Coil Reflex" Radio Frequency Transformer \$2.00

Readem Binding Posts. Set composed of 1 antenna, 1 ground, 1 A Battery+, 1 A Battery-, 2 telephones, 1 B Battery+, 1 B Battery-..... \$ 7.5

H. C. COIL MOUNTING

Three Coil Mounting with Dial..... \$5.00
Geared Three Coil Mounting..... 5.00

FREE

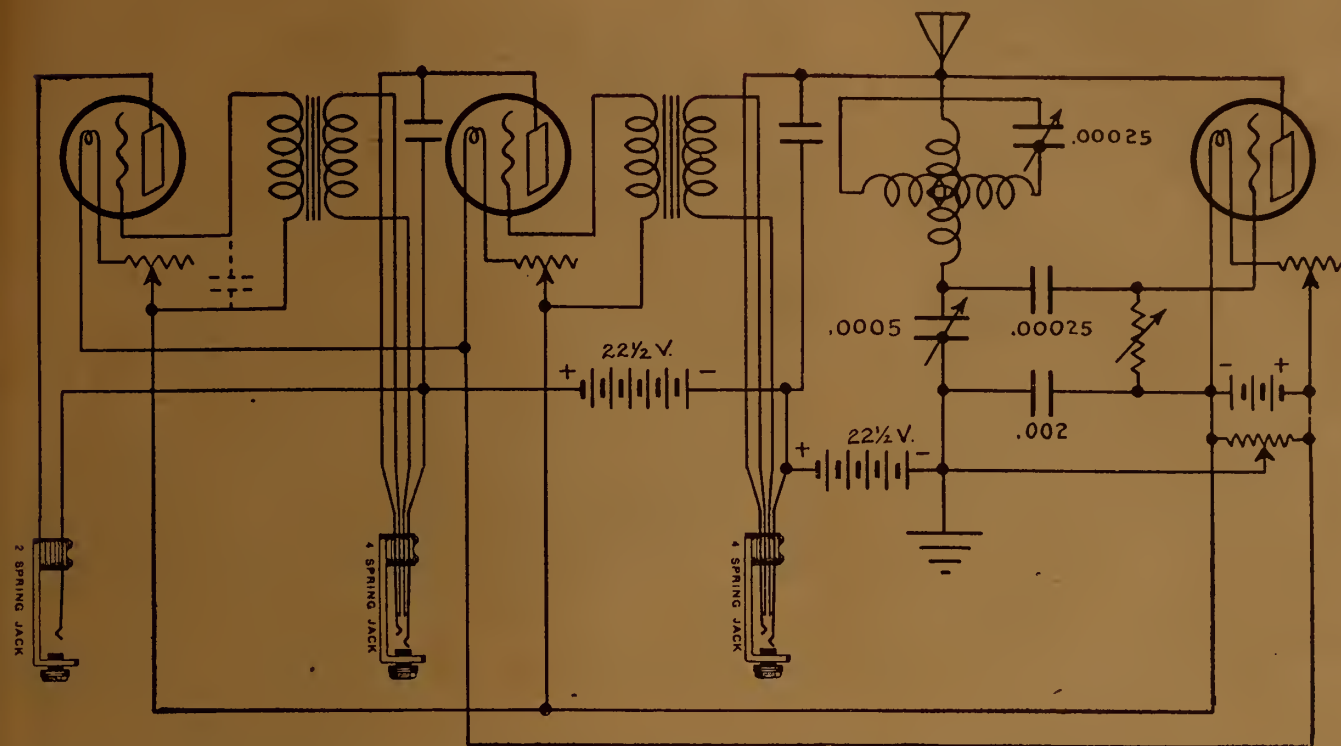
Choice of following items on purchases of Five Dollars or over:

- Freshman Grid Leak and Condenser
- Webster 1-A Dial Knob, 3 1/2 inches, 3/16 shaft
- WEBSTER SWITCH LEVER
- TWO CIRCUIT JACK
- OPEN CIRCUIT JACK

Further Details of the Famous Miloplex Hook-Up

Part V—How to Add Audio Frequency Amplification

By the Mystery Man



WHEN is a circuit not a circuit? Answer me that, somebody, and win the fur-lined bathtub, because, didn't six somebodies hardly wait until the ink was dry on last week's Digest before they were in with special delivery letters. Each wondering how in (mustn't say the naughty word, mustn't say the naughty word) I could call the rotor with a condenser shunting it a circuit, and especially so when it had no physical connection with the set?

Asking that question and expecting an answer is just like asking a barber to "gimme a first class haircut," when you haven't got first class hair. 'Pears like as not I'll have to hogtie and double solder it to a ground lead to put it over. But, yes, sir—it's a circuit and you can hear it work—and that's "Raydeo." Some day, methinks, a merchandiser will spring into the limelight by placing a sign in his window reading "Radio Spoken Here." You know what I mean. But, let's start something. Last week an amplifier was promised, a two-tube job I believe; personally I was going to wait a week in order that you might get better acquainted with your choice of the three circuits offered, but it seems many are clamoring for it, so let's go—very well.

Now, read carefully, three circuits have been given you, out of the three you will pick your pet. Naturally, the bearcat of them all is the King III, yet its operation may have some of you perspiring, yes, and sweating too, as Ole says, therefore take your pick for the present, but try the King. Get him (or is it a her) perking for you like a voice amplifier and I think it will be your choice. There are few, if any tricks in amplifying, but there are some mighty dark alleys you better stay shy of. However, as my friend Carl Meyer says, "If you know your stuff" the rest is easy, or as Charlie Tuska says (pardon the familiarity, Charles), "It's

no trick to stop a howl (choke it) if you know how," and I say it's no trick amplifying either of the circuits if you know your stuff.

I should know, I worked nine long months finding out; you surely can stick on the job nine minutes.

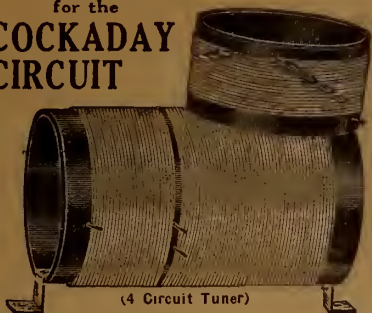
"Brownie" has pictured a standard amplifying circuit intentionally leaving out the do-dads I will put in.

Notice that our grid returns (sure, the tail end of the secondary) go to minus

filament, also peek closely and note that the rheostats are connected in the negative A battery lead to filament. Atta boy! Do it just right and don't slip like they

EASTERN COIL SETS

for the
COCKADAY
CIRCUIT



are now a standard, and in universal use, due to their efficiency in this wonder circuit. Made as per specifications of Mr. Cockaday, using No. 18 wire with D coil bank-wound.

Complete Assembled Set of B, C and D Coils..... \$2.75

Hook-up directions and material list furnished free with each set of coils.

Mail Orders Filled. Dealers Communicate
EASTERN RADIO MFG. CO.
22 Warren Street, Dept. R. D., NEW YORK, N. Y.

You Must Use



RHEOSTATS

to get the best possible results from your set —no matter what type it is. They guarantee noticeable improvement in the reception obtained.



- 6 Ohms.....\$1.00
- 20 Ohms..... 1.25
- 30 Ohms..... 1.30
- 25c extra with dial

Suitable for either table or panel mounting. Condensite base, high grade resistance unit, attractive knob. Adjustable shaft to any thickness of panel.

At all good dealers—or direct on receipt of purchase price. Also write for our complete literature.

AMSCO PRODUCTS, INC.
416 Broome Street New York

did when the Prodigal Son returned and they killed the fatted calf.

Remember where it says, "they fell on his neck;" surely they didn't wear rubbers in those days.

Keep your panel layout for the amplifier down to the last inch of wire, many a real good Radio set has went sputtering along, just because it was loaded with

(Continued on page 14)



Special
for
October

Fada

Complete markdown parts for the 5 tube Fada Neutrodyne Receiver including drilled engraved Bakelite Panel and Base Board..... \$65

Absolutely guaranteed on our money back basis.

AMPERITE—Automatic Filament Control. Unmounted \$.70. Mounted \$1.10

Langbein and Kaufman Variometers \$6.00

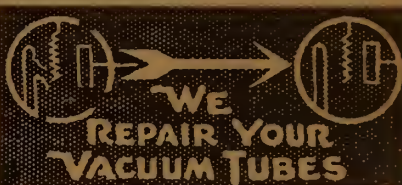
Langbein and Kaufman Variocouplers \$6.00

We personally consider both these variometers and couplers to be the best on the market.

Our stock consists of a most complete line of a standard radio apparatus. Just let us know what you want and we will ship it to you immediately at regular manufacturers' prices.

All shipments made immediately on receipt of purchase price.

RADIO & MECHANICAL TRADING CORP.
23 Warren Street NEW YORK CITY



- WD-11-12, UV-199, UV-201-A
- C-301-A \$3.50 each
- UV-200, C-300 2.75 each
- UV-201, C-301 3.00 each
- DV-6, DV-6-A 3.50 each

All Work Fully Guaranteed

Quick Service—Repaired Tubes shipped C. O. D. unless accompanied by remittance plus postage.

NEW TUBES

- A-399 (Type UV-199)
- A-401-A (Type UV-201-A) \$4.10 EACH
- A-12 (Type WD-12)

All the above Tubes guaranteed amplifiers and detectors. Shipped C. O. D., postage prepaid.

ABALENE RADIO, 14 Vesey St., New York, N. Y.

Workman Radio Service

"THE ACCENT IS ON SERVICE"

14-16 Vesey St. NEW YORK
Our appreciation of your orders is expressed in the quality of our merchandise and prompt service.

- VARIOCOUPERS**
- \$3.50 Workrite 180° Silk Wound.....\$2.95
 - 3.00 Mills 180° Silk Wound..... 1.95
 - 3.50 Fisher, Large, 90°..... 2.25
 - 2.75 Fisher, 180°..... 1.75
- VARIOMETERS**
- \$3.50 Workrite.....\$2.95
 - 8.50 Remler, Molded..... 4.45
 - 3.50 Fisher, Large..... 2.65
- CONDENSERS**
- \$2.00 R. C. 11 plate.....\$1.05
 - 2.35 R. C. 23 plate..... 1.35
 - 2.75 R. C. 43 plate..... 1.65
- VERNIER CONDENSERS**
- \$4.00 R. C. 23 pl.....\$2.25
 - 5.00 R. C. 43 pl..... 2.95
- SOCKETS**
- \$1.00 Magnus, Aluminum.....\$0.45
 - .75 Bakelite..... .45
 - 1.00 Bell Panel Mounting Socket..... .75
- PHONES**
- \$6.00 Brandes Superior.....\$5.25
 - 12.00 N. & K., Imported..... 5.50
 - 5.00 Nercio..... 2.50
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Complete Parts for Cockaday Sets
Including 7x14x3/16 panel. Standard tested apparatus furnished throughout..... \$12.75

Mail orders promptly attended to. All orders amounting to \$5.00 or more will be shipped prepaid. Will ship C. O. D. unless remittance accompanies order.

Do you Know why the Mu-Rad sells, Mr. Dealer?

Simply because to hear the Mu-Rad is to buy it! One of Chicago's largest radio stores sells the Mu-Rad entirely by demonstration. Their records show that 8 out of 10 demonstrations result in a sale! That's profitable business!

Write for Mu-Rad Franchise

We are the exclusive distributor of the Mu-Rad Receiver in the states of Illinois, Indiana and southern Wisconsin. If your store is in any one of these three states, Mr. Dealer, write us today for details of our special exclusive territory proposition. Winter's here—there's need for haste!

We also carry a complete stock of
WESTERN ELECTRIC CO.
GENERAL RADIO CO.
parts. Write for details and discounts.

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Natural Re-PRODUCTION

Atlas

AMPLITONE

LOUD SPEAKER

Atlas Loud Speaker re-PRODUCTIONS are absolutely true to the original. The patented "double diaphragm" responds in perfect harmony to every change of vibration intensity. Adjustable to your set and particular receiving conditions as accurately as though built expressly for you. Ask the nearest Atlas dealer to demonstrate the ATLAS Loud Speaker for you.

WRITE FOR BOOKLET "R" \$25
What have you accomplished with your Atlas Amplitone? Tell us about it!

Multiple Electric Products Co. Inc.
ORANGE ST. RADIO DIVISION NEWARK, N. J.

CURRENT WEEK'S PROGRAM OFFER

The Week's Headliners on the Air

IT IS a week crowded with unusual and interesting features and anyone hoping to keep up with all of them will have to tune fast from station to station. Tuesday itself offers the Dutch program by the Dutch consulate of Chicago at WMAQ. Morgan L. Eastman's musical guessing contests at KYW, WJZ's lecture on "Radio as a Career," and an international musical program at KDKA.

Wednesday begin early and sit up late, and if you can do it without an earache, get the Calophone concert at WJZ by the famous Hungarian musician, Gara Guly (don't ask us what a calophone is); the ten best Foster songs at WHAS; the Californian Trio at KHJ; and if you have a strong heart, Nick Harris' detective stories at KFI.

Musicians! Thursday evening the original composition of Louis Victor Saar will be heard at WJAZ. WGY presents the Knights of Columbus Glee Club. Hawaiian music supersedes jazz at KDKA. Tune in for Los Angeles and get the Hollywood Girls' Quartette at KFI.

Ex-soldiers and sailors will enjoy the American Legion Night Friday at WJZ. Knights of Pythias will make their vocal appearance at WBAP. Pretty girls will be heard but not seen at WOS in the musical program given by the Williams Woods College.

Saturday, if the sky is clear, take your radio out of doors and listen to Prof. J. D. Boon at WFAA on "November Heaven's." After seeing this charming picture of Betty Holmes can you refrain from tuning in to WDAP?

Sunday William Z. Nourse will read Goodspeed's translations of the Bible from KYW. WJAZ announces the radio appearance of W. A. Stultz, head of Northwestern University Vesp Department.

Monday is Rensselaer Polytechnic Institute Students' Night at WHAZ. The Liszt Chorus promises an excellent program at WGY. If you want to know what to see in the Movie World listen to James A. Nassau at WDAR.

The following stations have announced their intentions of celebrating the birthday of Theodore Roosevelt Saturday night: KDKA, WJAZ, WJZ, WOC.

Tuesday, October 23

KOKA, E. Pittsburgh, Pa. (Eastern, 326), 6:15 p. m., Dinner concert, Grand Symphony Orchestra, David Broudy, director; 7:45, The Children's Period; 8:15, John Ray Ewers, D. D., on his recent trip to Europe; 8:30, International program, Charles Price, tenor; 8:45, Lloyd second tenor; Charles Drylie, baritone; Charles Loomis, bass; Thomas Lloyd, guitarist; T. J. Castoria, mandolinist; George Colburn, violinist.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Program, Mrs. Emma M. Bartlett, director; 10:00-11:00, Courtesy Dr. Marian T. Whiting.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., Woman's program; Talk, Jeannette P. Cramer; 8:00, "An Agricultural Program for Oregon," Paul V. Maris; 10:00, Dance music, George Olsen and his orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Musical program; 6:45-7:30, The Sandman; 8:00-10:00, Burkman Brothers' Hawaiian Quartet; 10:00-12:00, Art Hickman's Orchestra.

KSD, St. Louis, Mo. (Central, 546), 8:00 p. m., Song recital, Mrs. Carlos Hurd; 11:00, Dance music, Silvertone's Orchestra.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson of Peoples Gas Co.; 2:35 p. m., Studio program; 6:50, Children's Bedtime Story; 8:58, Musical program, Morgan L. Eastman, director. (Send your answers to Station KYW, 1648 Edison Building, Chicago); 9:01, American Farm Bureau Federation; "From Orchard to Table," Charles E. Durst; "A Little Group of Farm Folks at the Crossroads," E. F. Taylor.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, Junior Euterpean Club, Mrs. J. E. Cooley, director; 9:30-10:45, Concert, The Old-Time Orchestra.

WBZ, Springfield, Mass. (Eastern, 337), 7:30 p. m., Twilight tales for the kiddies; Household Management, second lecture, Agnes H. Craig; 8:00, Concert, William Tilton, baritone; Ruby Tilton Kinsley, pianist; Charles Mackaye, pianist; 9:00, Bedtime story for grown-ups, Orison S. Marden.

WCX, Detroit, Mich. (Eastern, 517), 11:00-12:00 mid-night, Red Apple Club, William Collins; Bernice Raeburn.

WOAP, Chicago, Ill. (Central, 360), 1:40 p. m., Concert, Drake Concert Ensemble and Blackstone String Quintet; 7:00, Drake Concert Ensemble and Blackstone String Quintet; 10:00, Frederick W. Agard, tenor; Bob Cougle, pianist; Jack Chapman's Orchestra.

WOPR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Concert Arcadia Cafe Concert Orchestra; Short talks; 4:30-5:55, Song recital; 7:30-7:45, Bedtime stories by Walter Greucough; 7:45-8:00, Dramatic Review by Walter Greucough.

WDT, New York, N. Y. (Eastern, 405), 12:00-1:00 p. m., Songs and monologues, Fred Whitehouse, Jack Stanley.

WFAA, Dallas, Texas (Central, 476), 12:00-1:00 p. m., Address, Dewitt McMurray; 8:30-9:30, Mrs. Otis Holt, singer; William H. McRaven, pianist; 11:00-12:00, Miss B. Mann, lyric soprano; Miss Johnnie Davis, pianist.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m.,



Bernice Helm, above, pupil of Victor Saar, will give a program with Mr. Sarr at WMAQ Thursday



Mary Vogt, circled Radiophans has maker organ, delphia. This world, and rep Miss Vogt can Joe Smith's Ma often in front of "The Wave from experts usually programs from be heard a

Dinner music, Meyer Davis Bellevue Stratford Orchestra; 3:00, Educational Talk; 6:30, Dinner music, Meyer Davis Bellevue Stratford Orchestra; 7:00, Talk by Uncle Safety; 8:00, Song recital; 9:00, Allegorical play in one act by WFI.

WGI, Medford Hillside, Mass. (Eastern, 360), 3:00 p. m., Amrad Women's Club; "Hospitality Talk," Marjorie Drew; Descriptive Musicale; 5:00, "Twilight Tales," Eunice L. Randall; 6:00, Late news flashes; 7:00, Weekly business report, Roger W. Babson; Puritan Quartet.

WGR, Buffalo, N. Y. (Eastern, Standard, 360), 12:30-1:00 p. m., George Albert Bouchard, organist; 4:00, Margaret Blakeslee, violinist; Martha Gompf, harpist; Tea time music, Stalder Palm Room; 6:30-7:00, George Albert Bouchard, organist; 7:00, Digest of the day's news, topics of scientific interest.

WGY, Schenectady, N. Y. (Eastern, 380), 2:00 p. m., Music and household talk, "Menus for the School Lunch," 7:45, "The Bohemian Girl," by the WGY Light Opera Chorus.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra, Harry M. Currie, director; "Just Among Home Folks"; Selections, Rialto Theater Organ; 7:30-9:00, Concert, auspices Henry M. Schilling and his orchestra; Reading: An Interesting Historical Episode.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Organ recital, Karl Bonawitz; 3:00, Artist recital; 7:00, Bedtime stories, by Uncle Wip; 8:00, Dramatic review; 8:15, Concert; 9:15, Song recital.

WIAX, Cleveland, Ohio (Eastern, 390), 7:30 p. m., Program arranged by the Cleveland News-Leader; 7:30-7:45, Bedtime story, E. G. Johnson; 7:45, The Joe Smith-Martha Lee Club Orchestra; The Soprano Trio, Rose Seton, Edith Cannon, Dorothy Maskell.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Neva Near, soprano; Harry Hauge, bass; Jules LaVerne, violinist; Bonnie Krueger's Orchestra.

WJAZ, Chicago, Ill. (Central, 447.7), 10:00-2:00 a. m., Concert, Wanamaker Auditorium; 4:00, Anne B. Lyndall, soprano; 5:00, Evelyn Elwin, violinist; 5:15, "The Girl Who Goes to Business," Rosemary Buchanan; 6:00, "Everyday Mysteries," Charles Abbott; 7:30, Piano recital, Wanda Norman; 8:00, "Broadcasting Broadway," Bertha Brainard; 8:15, Piano recital, Wanda Norman; The Phoenix Quartette; "Etiquette"; Doubletalk; Page Talk; "Radio as a Career—Its Opportunities," Pierce Bouchere; Elizabeth Gibbs, contralto; "Garden Talk"; 10:15, Dance program, Hotel Astor Grill Orchestra.

WLW, Cincinnati, Ohio (Central, 309), 3:00 p. m., Special music, Jennie Keltz; 10:00, Part One; Artistic program arranged by Minnie Tracey, with professional pupils, Sam Morgenstern, pianist; Lorraine Feldkamp, violinist; Ida Blackschleger, Lillian Sherman; Inspirational talk, May Cornell Stoller; Part Two: Circle Orchestra.

WMAQ, Chicago, Ill. (Central, 447.5), 4:30 p. m., Program pupils of Glenn Dillard Gunn School of Music; 7:00, Dutch program, Dutch Consulate of Chicago; 9:00, Dance music, Hotel LaSalle; 9:15, Weekly program, Lyon & Healy.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., Educational program, A. G. Hinricks; 5:45, Chimes concert.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55, Luncheon music, Wanamaker Tea Room Orchestra, Robert Golden, director; 4:45-5:00, Organ recital, Mary E. Vogt; 7:30, Police reports.

WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner," 9:45, "Ironing Day," program, Fred Shaw, Margery Richmond; 3:00 p. m., Detroit News Orchestra; 8:30, Detroit News Orchestra; F. W. Durkee, tenor; Millicent Dickinson, contralto; Bud Peltier, baritone.

Wednesday, October 24

KOKA, E. Pittsburgh, Pa. (Eastern, 326), 6:15 p. m., Dinner concert, Pittsburgh Athletic Association Orchestra; 7:30, Literary program, Marjory Stewart; 7:45, Children's period; 8:15, Address to Boy Scouts; 8:30, Special program.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Nick Harris Detective Stories; 10:00-11:00, Instrumental concert.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., Children's program, Aunt Nell; 8:00, Oswald Serenaders; 9:00, Business talks, Alexander Hamilton Institute; 10:00, Dance music, George Olsen and his orchestra; Florian Stone, harpist.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Musical program; 2:30-3:30, Matinee musical; 6:45-7:30, Bedtime story, "Uncle John"; 8:00-10:00, "California Trio"; 10:00-12:00, midnight, Art Hickman's Orchestra.

KSD, St. Louis, Mo. (Central, 546), 7:00 p. m., Concert, Aberg's Concert Orchestra; 11:00, Dance music, Rodemich's Orchestra.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson of Peoples Gas Co.; 6:50 p. m., Children's Bedtime Story; 8:58, Herbie Mintz, pianist; Sallie Menkes, accompanist; Mary Lee, soprano; A. W. "Sen Kaney" specialty act; 9:05, Reviews of the latest books, Llewellyn Jones.

PWX, Havana, Cuba (Eastern, 400), 9:00-11:00 p. m., Concert, General Staff Band of the Cuban Army, national and foreign music.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, Sam S. Losh, director; 9:30-10:45, Concert, Texas Hotel Orchestra.

WBZ, Springfield, Mass. (Eastern, 337), 6:00 p. m., Dinner concert, WBZ Trio; 7:00, "Waves and Ware Motions," Edward H. Goodrich; 7:30, Twilight tales for the kiddies; "First Aid in Minor Injuries," Dr.

Joseph P. Derby; 8:00, WBZ Trio; Gertrude E. Philbrick, contralto; Cello solos, Mr. LaZazzera; 9:00, Bedtime story for Grown-ups, Orison S. Marden.

WOAP, Chicago, Ill. (Central, 360), 1:40 p. m., Drake Concert Ensemble and Blackstone String Quintet; 7:00, Drake Concert Ensemble and Blackstone String Quintet; 10:00, John Loring Cook, Jack Chapman's orchestra.

WOAR, Philadelphia, Pa. (Eastern, 395), 12:00-1:00 p. m., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Song recital; 4:30-5:55, Piano solos, Edna Finestone; 7:30-7:45, Bedtime stories, Dream Daddy; 7:45-8:00, Salesmanship talk, B. Munchweiler; 8:00, Short talks, song recital; dance music, Howard Lanin's Arcadia Cafe Dance Orchestra. Special WDAR features.

WDT, New York, N. Y. (Eastern, 405), 12:00-1:00 p. m., Clarence Williams Blue Five; Eva Taylor, singer; 7:00, Stage and Screen, Charles Reed Jones; Mary Derrell Domin, soprano; George Henninger, accompanist; Joseph C. White, singer; Horace Ruwe, tenor; George Penninger, pianist.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Ross Mason, United States Veterans' Bureau.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Orchestra; 3:00, Song recital; 6:30, Dinner music, Meyer Davis Bellevue Stratford Orchestra; 7:00, Bedtime stories by Cousin Sue.

WGI, Medford Hillside, Mass. (Eastern, 360), 12:00 m., Selections on Edison, Brunswick, Chickering-Ampico; 5:00 p. m., "Twilight Tales," Eunice L. Randall; 6:00, Late news flashes; 6:45, Girls' Hour; "Camp Fire Girls," "Big Smokes"; 7:25, "Science Up to Date," Scientific American; 7:30, "This week's Judge"; Program, Salvation Army Staff Band.

WGR, Buffalo, N. Y. (Eastern, Standard, 360), 12:30-1:00 p. m., George Albert Bouchard, organist; 4:00, Margaret Blakeslee, violinist; Martha Gompf, harpist; Tea time music, Stalder Palm Room; 6:30-7:00, George Albert Bouchard, organist; 7:30, Digest of the day's news; 9:00, Concert, Direction of Ralph Dietterich.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra; "Just Among Home Folks"; Selections, Alamo Theater Organ; 7:30-9:00, The Ten Best Foster Songs, especially arranged and dedicated to WHAS by Zudie Harris Reinecke, sung by the Courier-Journal Quartette, Mrs. Charles Shannon, soprano; Mrs. K. W. Surman, contralto; K. W. Surman, tenor; Alton S. Cornwall, baritone; Mrs. Alton S. Cornwall, accompanist; Reading: An Interesting Historical Episode.

WIP, Philadelphia, Pa. (Eastern, 509), 3:00 p. m., Short talks; Dance music; 6:02, Dinner dance music, Jordan-Lewis Orchestra, direction Bob Lewis; 7:00-7:30, Bedtime stories, Uncle Wip.

WJAZ, Chicago, Ill. (Central, 447.7), 10:00-2:00 a. m., Program, Sherwood School of Music.

WJZ, New York, N. Y. (Eastern, 455), 3:00 p. m., Gill and Paris, blind musicians; 3:30, Dorothy Bradshaw, soprano; 4:30, Tea music, Hotel Commodore Orchestra; 6:00, Peter in Shadowland story, Florence Smith; "Fluents"; 7:30, "Hallowe'en Foods and Faucles"; Anne L. Pierce; 7:45, "The Progress of the World," Review of Reviews talk; 8:00, Recital, Josef Wolfe, baritone; 10:15, Violin recital, Julius Richter; 10:30, Galophone concert, Gara Guly, Hungarian musician; 10:45, Julius Richter, Violinist; 11:00, Galophone concert, Gara Guly.

WLW, Cincinnati, Ohio (Central, 309), 4:00 p. m., Crosley Forum; Piano solos.

WMAQ, Chicago, Ill. (Central, 447.5), 1:00 p. m., Weekly talk, Chicago Ass'n of Commerce, luncheon; 4:30, Program, Cosmopolitan School of Music and Dramatic Art; 7:00, Georgene Faulkner, the Story Lady; 7:30-10:00, Program, Northwestern Alumni Baquet.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., Clyde G. Kern, lecturer; 6:30, Sandman's visit; 7:00, Educational lecture for farmers; 8:00, Pipe Organ recital, Erwin Swindell; Margaret Knid, soprano; 10:00, Artist musical program, Erwin Swindell, director; Ashton Community Band.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55, p. m., Luncheon music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt; 7:45, Dinner music, Adelphia Hotel Orchestra; 8:30, Ralph Bingham, humorist, and song recital.

WOS, Jefferson City, Mo. (Central, 440.9), 8:00-9:30 p. m., Old Time Square Dance or "Hoe Down," by "Fiddlers," A. Bryan Williams, director; Address, faculty member of Missouri College.

WTAM, Cleveland, Ohio (Eastern, 390), 8:00 p. m., Concert program, WTAM Orchestra; Vocal numbers, popular entertainers.

WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner" 3:00 p. m., Detroit News Orchestra; 8:30, Vocal program, pupils of Mrs. Blanche Lyous.

Thursday, October 25

KOKA, E. Pittsburgh, Pa. (Eastern, 326), 6:15 p. m., Dinner concert, Grand Symphony Orchestra, David Broudy, director; 7:30, Concert, "Hilo," "Aitua," "Honolulu," "Kawakani," "Kahola," "Aloha," "Honolulu Hula," "Wailand Waltz," "Kalima Love," Kamika Hawaiian Orchestra, Billy Murray, director.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Courtesy Y. M. C. A.; 10:00-11:00, Hollywood Girls Quartette.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., Wom-

an's program; Child Training; 8:00, Dramatic program, Mrs. Doris Smith; 10:00, Dance music, George Olsen and his orchestra; Inez Chamber, violinist; Blanche Friend, accompanist.

KHJ, Los Angeles, Calif. (Pacific, 395), 8:00-10:00 p. m., Program, Redlands; 10:00-12:00, Art Hickman's Orchestra.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson of Peoples Gas Co.; 2:35 p. m., Studio program; 6:50, Children's bedtime story; 8:58, Musical program, Chicago Musical College, Elena DeLlano, director; Herbie Mintz, pianist; Mary Lee, soprano; Sallie Menkes, accompanist; 9:21, Twenty minutes of Good Reading, Rev. C. J. Perdue.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, R. H. Cornelius, direct; 9:30-10:45, Concert, Will Foster, organist of the First Methodist Church.

WBZ, Springfield, Mass. (Eastern, 337), 7:00 p. m., "Farmer's Night," New England Homestead; 7:30, Twilight tales for the kiddies; "The Use of Setting," Dr. J. Berg Esenwein; 8:00, Concert, Douglas Steade, tenor; Benjamin Buxton, accompanist; 9:00, Bedtime story for Grown-ups, Orison S. Marden.

WOAP, Chicago, Ill. (Central, 360), 1:40 p. m., Drake Concert Ensemble and Blackstone String Quintet; 7:00, Drake Concert Ensemble and Blackstone String Quintet; 10:00, Hugh B. Marshall, tenor; Jack Chapman's Orchestra.

WOAR, Philadelphia, Pa. (Eastern, 395), 12:00-1:00 p. m., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Concert, Arcadia Cafe Concert Orchestra; 4:30-5:55, Short talks and song recital; 7:30-8:00, Bedtime stories by Dream Daddy.

WDT, New York, N. Y. (Eastern, 405), 12:00-1:00 p. m., Songs, Ruby Cowan, Ella Fuller, Bernie Grossman, Willie White.

WFAA, Dallas, Texas, (Central, 476), 12:30-1:00 p. m., "Why Checks and Balances in Government," O. O. Touchstone; 8:30-9:30, Morning Choral Club, Earle D. Behrends, director.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Orchestra; 3:00, Piano solos, Loretta Kerk, bass solos, John Vandersloot; 6:30, Dinner music, Meyer Davis Bellevue Stratford Orchestra; 7:00, Bedtime stories by Cousin Sue; 8:00, Boy Scouts radio Corps; 8:30, Song recital, Dance music.

WGI, Medford Hillside, Mass. (Eastern, 360), 12:00 m., Selections on Edison, Brunswick, Chickering-Ampico; 5:00 p. m., "Twilight Tales," Eunice L. Randall; 6:00, Late news flashes; 7:30, "Bits of Wisdom," dall; 6:00, Late news flashes; 7:30, "Bits of Wisdom," George B. Beal; Concert, Hampic in the Chickering Radio Comedy, Amrad Concert Players, F. Chester McDan.

WGR, Buffalo, N. Y. (Eastern, Standard, 360), 12:30-1:00 p. m., George Albert Bouchard, organist; 4:00, Margaret Blakeslee, violinist; Martha Gompf, harpist; Tea time music, Stalder Palm Room; 6:30-7:00, ist; Tea time music, Stalder Palm Room; 6:30-7:00, Digest of the day's news, Boy Scout Radiogram, Employment Bulletin, story from "The American Boy" magazine.

WGY, Schenectady, N. Y. (Eastern, 380), 7:45 p. m., Program, Knights of Columbus Glee Club.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra; "Just Among Home Folks"; Selections, Rialto Theater Organ; 7:30-9:00, Concert, Carl Zoeller's Melodists; Four-minute digest of International Sunday School lesson, Rev. Paul Zwilling; Four-minute Radio Forum talk.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Organ recital, Karl Bonawitz, Germantown Theater Organ; 3:00, Song recital; 7:00-7:30, Bedtime stories, by Uncle Wip; 8:00, "Where to Go and How to Get There," by Eugene D. Hoels, secretary Automobile Club of Philadelphia; 8:15, Dance music, Ace Bridge and his ten Virginians; 9:00, Organ recital, Karl Bonawitz; 9:30, Short talk.

WIAX, Cleveland, Ohio (Eastern, 390), 8:00 p. m., Concert program, Cleveland Hotel Orchestra; Dance program, N. D. Stannard and his orchestra.

WJAZ, Chicago, Ill. (Central, 447.7), 10:00-2:00 a. m., Program, Louis Victor Saar, pianist.

WJZ, New York, N. Y. (Eastern, 455), 3:00 p. m., Auditorium concert; 4:00, Two one act plays, Threshold Players, the "WJZ Matinee Players"; 4:45-5:45, M. Coleman, violinist, F. Jacob, French tenor; 6:00, "Jack Rabbit Stories," David Coy; 8:45 Evening radio organ recital, 9:00, Edison Concert Orchestra; 10:00, Helen Russ, harpist; Isadore Leezenbaum, violinist; 10:30, Dance program, Hotel Commodore Orchestra.

IS MARKED BY BRILLIANT FEATURES

...anist whom many the great Wana-tion WOO, Phila-the largest in the ly on the Radio. during weekdays. rechestra, below, is of Station WJAX, a group of jazz Cleveland News station, and will at, October 23



Georgene Faulkner, circle at left, is Story Lady at WMAQ. The little tots hear her every Wednesday night. Her delightful narratives have won a place in the hearts of many Chicago babies. Betty Holmes is the charming soprano below. Hear her at WDP Saturday



Arthur Brooks, astrologist; 12:15-1:00, Songs, Mary Perhatch, Mr. Swan; 11:00-12:00, midnight, Vaughn De Leath's Merry Makers.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., "Some Missionary Teachings of the Prophets," Dr. Robert S. Hyer; 8:30-9:30, Paul Skinner's Orchestra, high school musicians.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Orchestra; 3:00, Musical numbers by Caroline Hoffman; 6:30, Dinner music, Meyer Davis Bellevue Stratford Orchestra; 7:30 p. m., Safety Talk, Stanley Cowman.

WGI, Medford Hills, Mass. (Eastern, 360), 12:00-1:00 p. m., Selections on the Edison, Brunswick and Chickering-Ampico; 3:00 p. m., Amrad Women's Club; Talks, Mrs. D. H. Goodwin; Edison Program; 5:00 "Twilight Tales"; 7:30, Selected verses, Charles L. H. Wagner, radio poet; Amrad Concert Company.

WGR, Buffalo, N. Y. (Eastern, Standard, 360), 12:30-1:00 p. m., George Albert Bouchard, organist; 4:00, Margaret Blakeslee, violinist; Martha Gomph, harpist; Tea time music, Stalder Palm Room; 6:30-7:00, George Albert Bouchard, organist; 7:00, Digest of the day's news; Road reports; 9:00, Concert, Direction of J. P. Quinn, tenor.

WGY, Schenectady, N. Y. (Eastern, 380), 2:00 p. m., "How to Choose Becoming Clothes"; 6:30, Children's program; 7:45, Radio play, "The Passing of the Third Floor Back"; WYG Orchestra; 10:30, Jewish melody, Rose Cohn, mezzo-soprano; Edward A. Rice, violinist; WYG Orchestra.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra; "Just Among Home Folks"; Selections, Alamo Theater Organ; 7:30-9:00, Concert, Mrs. Robert Van Pelt; Readings: An Interesting Historical Episode.

WHK, Cleveland, Ohio (Eastern, 283), 8:00 p. m., Concert program, WHK Orchestra.

WIP, Philadelphia, Pa. (Eastern, 509), 3:00 p. m., Artist Recital; 6:45, "Radio Baseball Dope" by Monte Cross, old-time player; 7:00-7:30, Bedtime stories, Uncle Wip.

WJAZ, Chicago, Ill. (Central, 447.7), 10:00-2:00 a. m., Program, Cable Piano Company of Chicago.

WJZ, New York, N. Y. (Eastern, 455), 2:00 p. m., Presentation meeting of the New York City Federation of Women's Clubs; 4:30, Elias Goldberg, pianist; 5:00, J. P. Robertson, bass; Robert Child, accompanist; 6:00, Children's Stories, Marian Fureymf; 8:00, Helen Manning, pianist; William Lockwood, violinist; 8:45, American Legion Night program.

WMAQ, Chicago, Ill. (Central, 447.5), 4:30 p. m., Program, Bush Conservatory of Music; 7:00, "Wide Awake Club," Mrs. Frances Ford; 7:30, Weekly musical lecture, Mrs. Marx E. Oberdorfer; 9:00, Dance music, Hotel LaSalle Orchestra; 9:15 Program, Glenn Dillard Gunn School of Music.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., C. C. Flanagan, lecturer; 5:45, Chimes Concert; 6:30, Sandman's visit; 8:00, Musical program, Erwin Swidell, director; Allotz Council, K. of C. Quartette; Heran Snel, tenor; George Canfield, baritone; Maurice DePaape, bass; John Naab, tenor.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Luncheon music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital; 7:30, Police reports.

WOS, Jefferson City, Mo. (Central, 440.9), 8:00-9:30 p. m., Program, faculty and students of William Woods College.

WUJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner"; 3:30 p. m., Detroit News Orchestra; 8:30, Detroit News Orchestra; Anne Campbell, News poet; Ben J. Karkowski, baritone; Katherine Fishel, soprano.

WAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., "Some Missionary Teachings of the Prophets," Dr. Robert S. Hyer; 8:30-9:30, Paul Skinner's Orchestra, high school musicians.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Orchestra; 3:00, Song recital; 6:30, Dinner music, Meyer Davis Bellevue Stratford Orchestra; 7:00, Bedtime stories by Cousin Sue; 8:00, Dance music; 8:30, Short talks; Song recital.

WGI, Medford Hills, Mass. (Eastern, 360), 6:00 p. m., Late news flashes; 7:30, New England Business Problems, Arthur R. Curmick; Musical program.

WGR, Buffalo, N. Y. (Eastern, Standard, 360), 12:30-1:00 p. m., George Albert Bouchard, organist; 4:00, Margaret Blakeslee, violinist; Martha Gomph, harpist; Tea time music, Stalder Palm Room; 6:30-7:00, George Albert Bouchard, organist.

WGY, Schenectady, N. Y. (Eastern, 380), 9:00 p. m., Kenmore Hotel Orchestra.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater; "Just Among Home Folks"; Selections, Bialto Theater Organ; 7:30-9:00, Concert, E. J. Raque, Orchestra; Navy Day talk, Dr. C. F. Haltegel, medical corps, U. S. Navy; Readings, Katherine A. Hannan.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Organ recital, Karl Bonawitz, Germantown Theater Organ; 3:00, Dance music, Jordan-Lewis Dance Orchestra; Bob Lewis, director; 7:00, Bedtime stories, Uncle Wip; 8:00, Short talk; 8:15, Artist recital; 9:00, Program of popular songs.

WJAZ, Chicago, Ill. (Central, 447.7), 10:00-2:00 a. m., Merka S. Barovits, mezzo-soprano; Verna McCombs, contralto; Dean Remick, pianist; Bennie Krueger's Orchestra; Addresses, commemorating birthday of Theodore Roosevelt.

WJZ, New York, N. Y. (Eastern, 455), 3:00 p. m., Football game, U. of West Virginia vs. Penn State; 6:00, "Uncle Wigly's Stories," Howard Garis; 8:00, Ralph Barber, bass; 9:00, Navy Day, Theodore Roosevelt birthday celebration.

WMAQ, Chicago, Ill. (Central, 447.5), 8:00-10:00 p. m., Musical program, Corydon Smith, director; Dance music, Hotel La Salle Orchestra; Music Chicago Theater.

WOC, Davenport, Iowa (Central, 484), 12:00 a. m., Chimes concert; 3:30 p. m., C. C. Hall, lecturer; 5:45, Chimes concert; 6:30, Sandman's visit; 7:00, "Life and Character of Theodore Roosevelt," Charles Grik; 9:00, Dance program, P. S. C. Orchestra; Y. B. Bochte, baritone.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Luncheon music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital; Band concert.

WTAM, Cleveland, Ohio (Eastern, 390), 9:00-11:30 p. m., Dance program.

WUJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner"; 3:30 p. m., Detroit News Orchestra; 8:30, Detroit News Orchestra; Anne Campbell, News poet; Ben J. Karkowski, baritone; Katherine Fishel, soprano.

WAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., "Some Missionary Teachings of the Prophets," Dr. Robert S. Hyer; 8:30-9:30, Paul Skinner's Orchestra, high school musicians.

p. m., Review of the interdenominational Sunday School lesson and Radio Bible Class, Mrs. W. F. Barnum, leader.

WAZ, Springfield, Mass. (Eastern, 337), 7:00 p. m., Dinner concert, Hotel Kimball Trio, Jan Geerts, director; 7:30, Twilight tales for the kiddies; "Bringing the World to America," prepared by "Our World" magazine; "This Week's Judge"; 8:00, Concert, Gertrude Clifford, soprano; Mrs. Eleanor Turner LaZazzera, accompanist; Mrs. Miriam M. Thomson, pianist; 9:00, Bedtime story for grown-ups, Orison S. Marden.

WDAP, Chicago, Ill. (Central, 360), 1:40 p. m., Drake Concert Ensemble and Blackstone String Quintet; 7:00, Drake Concert Ensemble and Blackstone String Quintet; 10:00, Harmony Girls; Betty Holmes, soprano; Bob Brown and his ukulele; Fred Rose and his songs.

WOAR, Philadelphia, Pa. (Eastern, 395), 12:00-1:00 p. m., Organ recital, Stanley Theater; Dinner music Arcadia Cafe Concert Orchestra; 2:00-3:00, Concert of popular classical selections, Arcadia Cafe Concert Orchestra; 4:30-5:55, Short talks, Song recital; 7:30-8:00, Bedtime stories, Dream Daddy.

WOAR, Philadelphia, Pa. (Eastern, 395), 2:00-4:00 p. m., Program of all request numbers, Arcadia Cafe Concert Orchestra; Peri Sarkoz, director.

WDT, New York, N. Y. (Eastern, 405), 12:00-1:00 p. m., Edith J. Crane, Tinkerman and the Winged Taxi; Mulligan's Orchestra; Songs, Victor Oliver and Eli Dawson; May Singh Breen, banjoist.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., "How to Choose Becoming Clothes"; 6:30, Children's program; 7:45, Radio play, "The Passing of the Third Floor Back"; WYG Orchestra; 10:30, Jewish melody, Rose Cohn, mezzo-soprano; Edward A. Rice, violinist; WYG Orchestra.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra; "Just Among Home Folks"; Selections, Alamo Theater Organ; 7:30-9:00, Concert, Mrs. Robert Van Pelt; Readings: An Interesting Historical Episode.

WHK, Cleveland, Ohio (Eastern, 283), 8:00 p. m., Concert program, WHK Orchestra.

WIP, Philadelphia, Pa. (Eastern, 509), 3:00 p. m., Artist Recital; 6:45, "Radio Baseball Dope" by Monte Cross, old-time player; 7:00-7:30, Bedtime stories, Uncle Wip.

WJAZ, Chicago, Ill. (Central, 447.7), 10:00-2:00 a. m., Program, Cable Piano Company of Chicago.

WJZ, New York, N. Y. (Eastern, 455), 2:00 p. m., Presentation meeting of the New York City Federation of Women's Clubs; 4:30, Elias Goldberg, pianist; 5:00, J. P. Robertson, bass; Robert Child, accompanist; 6:00, Children's Stories, Marian Fureymf; 8:00, Helen Manning, pianist; William Lockwood, violinist; 8:45, American Legion Night program.

WMAQ, Chicago, Ill. (Central, 447.5), 4:30 p. m., Program, Bush Conservatory of Music; 7:00, "Wide Awake Club," Mrs. Frances Ford; 7:30, Weekly musical lecture, Mrs. Marx E. Oberdorfer; 9:00, Dance music, Hotel LaSalle Orchestra; 9:15 Program, Glenn Dillard Gunn School of Music.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., C. C. Flanagan, lecturer; 5:45, Chimes Concert; 6:30, Sandman's visit; 8:00, Musical program, Erwin Swidell, director; Allotz Council, K. of C. Quartette; Heran Snel, tenor; George Canfield, baritone; Maurice DePaape, bass; John Naab, tenor.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Luncheon music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital; 7:30, Police reports.

WOS, Jefferson City, Mo. (Central, 440.9), 8:00-9:30 p. m., Program, faculty and students of William Woods College.

WUJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner"; 3:30 p. m., Detroit News Orchestra; 8:30, Detroit News Orchestra; Anne Campbell, News poet; Ben J. Karkowski, baritone; Katherine Fishel, soprano.

WAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., "Some Missionary Teachings of the Prophets," Dr. Robert S. Hyer; 8:30-9:30, Paul Skinner's Orchestra, high school musicians.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Orchestra; 3:00, Song recital; 6:30, Dinner music, Meyer Davis Bellevue Stratford Orchestra; 7:00, Bedtime stories by Cousin Sue; 8:00, Dance music; 8:30, Short talks; Song recital.

WGI, Medford Hills, Mass. (Eastern, 360), 6:00 p. m., Late news flashes; 7:30, New England Business Problems, Arthur R. Curmick; Musical program.

WGR, Buffalo, N. Y. (Eastern, Standard, 360), 12:30-1:00 p. m., George Albert Bouchard, organist; 4:00, Margaret Blakeslee, violinist; Martha Gomph, harpist; Tea time music, Stalder Palm Room; 6:30-7:00, George Albert Bouchard, organist.

WGY, Schenectady, N. Y. (Eastern, 380), 9:00 p. m., Kenmore Hotel Orchestra.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater; "Just Among Home Folks"; Selections, Bialto Theater Organ; 7:30-9:00, Concert, E. J. Raque, Orchestra; Navy Day talk, Dr. C. F. Haltegel, medical corps, U. S. Navy; Readings, Katherine A. Hannan.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Organ recital, Karl Bonawitz, Germantown Theater Organ; 3:00, Dance music, Jordan-Lewis Dance Orchestra; Bob Lewis, director; 7:00, Bedtime stories, Uncle Wip; 8:00, Short talk; 8:15, Artist recital; 9:00, Program of popular songs.

WJAZ, Chicago, Ill. (Central, 447.7), 10:00-2:00 a. m., Merka S. Barovits, mezzo-soprano; Verna McCombs, contralto; Dean Remick, pianist; Bennie Krueger's Orchestra; Addresses, commemorating birthday of Theodore Roosevelt.

WJZ, New York, N. Y. (Eastern, 455), 3:00 p. m., Football game, U. of West Virginia vs. Penn State; 6:00, "Uncle Wigly's Stories," Howard Garis; 8:00, Ralph Barber, bass; 9:00, Navy Day, Theodore Roosevelt birthday celebration.

WMAQ, Chicago, Ill. (Central, 447.5), 8:00-10:00 p. m., Musical program, Corydon Smith, director; Dance music, Hotel La Salle Orchestra; Music Chicago Theater.

WOC, Davenport, Iowa (Central, 484), 12:00 a. m., Chimes concert; 3:30 p. m., C. C. Hall, lecturer; 5:45, Chimes concert; 6:30, Sandman's visit; 7:00, "Life and Character of Theodore Roosevelt," Charles Grik; 9:00, Dance program, P. S. C. Orchestra; Y. B. Bochte, baritone.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Luncheon music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital; Band concert.

WTAM, Cleveland, Ohio (Eastern, 390), 9:00-11:30 p. m., Dance program.

WUJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner"; 3:30 p. m., Detroit News Orchestra; 8:30, Detroit News Orchestra; Anne Campbell, News poet; Ben J. Karkowski, baritone; Katherine Fishel, soprano.

"World Unity," Mass. Federation of Churches; Musical program, Leo Fenway and Eric...

WGY, Schenectady, N. Y. (Eastern, 380), 11:00 a. m., Church services, St. George's Episcopal Church, Rev. B. W. H. Taylor, pastor; 3:30, p. m., Concert, WGY Symphony Orchestra.

WHAS, Louisville, Ky. (Central, 400), 9:57 a. m., Organ music; 10:00, Church services, Trinity Lutheran Church, Rev. Dr. Ira B. Ladd, pastor; 4:00-5:00 p. m., Concert, auspices of Hazel M. Clever.

WHK, Cleveland, Ohio (Eastern, 283), 8:00 p. m., Concert program, WHK Orchestra; Sunday evening sermon, Glensville Presbyterian Church, Rev. A. H. Lamouze, pastor.

WJAZ, Chicago, Ill. (Central, 447.7), 8:00-9:00 p. m., Third program of Artias' series, W. A. Smitz, head of Voice Department at Northwestern University; Elsie Barge, pianist.

WUJ, Detroit, Mich. (Eastern, 517), 11:00 a. m., Services, St. Paul's Episcopal Cathedral; 4:00 p. m., Detroit News Orchestra.

Monday, October 29

WOAR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; Dinner music Arcadia Cafe Concert Orchestra; 2:00-3:00, Concert of popular classical selections, Arcadia Cafe Concert Orchestra; 4:30-5:55, Piano solos; Short talks, 7:30-7:45, Bedtime stories by the Dream Daddy; 7:45-8:00, Morning picture review by James A. Nassau; 8:00-9:00, Dance music; Short talks; 10:10, Dance music, Howard Lanin and his Arcadia Cafe Orchestra.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Concert, Loretta Kerk, pianist; 6:30, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 7:00, Bedtime stories, by Cousin Sue.

WGY, Schenectady, N. Y. (Eastern, 380), 2:00 p. m., "Romance of Sterling Silver," Imita Egge; 7:45, Musical program, Liszt Chorus; Howard A. J. Jr., pianist.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra; "Just Among Home Folks"; Selections, Alamo Theater organ.

WHAZ, Troy, N. Y. (Eastern, 386), 9:00 p. m., Henschelae Polytechnic Institute Night.

WIP, Philadelphia, Pa. (Eastern, 509), 3:00 p. m., Short talk; 6:45, "Radio Baseball Dope" by Monte Cross, old-time player; 7:00-7:30, Bedtime stories, Uncle Wip.

WLW, Cincinnati, Ohio (Central, 309), 3:00 p. m., Special music, Jennie Kehrt; 8:00, Part One: Program, auspices of the Editorial Staff of Methodist Book Concern; Cincinnati String Quartet; Part Two: Gladys Woors, soprano; Crosley Theatrical Review; Roger Hill Dance Orchestra.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Luncheon music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt; 7:45, Dinner music, Hotel Adelphi Concert Orchestra; 8:30, Ralph Bingham, humorist; WOO Orchestra, Robert E. Golden, director; Song recital; 9:30, Organ recital, Mary E. Vogt.

WOS, Jefferson City, Mo. (Central, 440.9), 8:00-9:30 p. m., Missouri State Prison Dance Orchestra, Hugh C. French.

Broadcast Music Is No Nuisance, Judge Finds

"Popularity Contest" Causes Phonograph to Lose to Radio

RIDGEFIELD PARK, N. J.—History repeats itself in the vindication recently of Radio, which was declared not to be a nuisance by Justice of the Peace Fleischmann of this city. The courts were called on years ago to establish the status of the phonograph, and also decided it was not a nuisance.

The decision of Justice Fleischmann came as a sequel to a spirited battle between a Radio set and a phonograph. Audley Walsh has a Radio set equipped with a loud speaker. He entertained the neighborhood, including scores who gathered in the vacant lot across the street, with all the best that could be plucked from the air.

Louis Vander Pyl, living across the street, was not convincing in his assertion that the Radio was a nuisance, so he set up on his front porch in opposition a phonograph that is alleged to have played the sextette from "Lucia" for eight hours one night.

But Walsh's Radio continued in popular favor and Pyl finally appealed to the Board of Health. Failing to get relief there he went to the Justice of the Peace and asked him to silence the Walsh Radio as a nuisance. Testimony was heard, speeches made by lawyers and everything, and the Justice decided for Radio. It is the phonograph that is silent now.

ROB PAY TELEPHONES TO SUPPLY AMATEURS

Clip Receivers But Quit When Found No Good

BOSTON.—Another brand of thief has arisen in Greater Boston through the wave of popular interest in Radio. Many telephone receivers from public pay stations of the New England Telephone and Telegraph Company have been ripped from their attachments to provide ear pieces for Radio listeners.

The thieves, however, are believed to be inexperienced persons, for, the telephone officials say, the type of receiver in use for telephone sets is practically unfit for Radio use.

"It was very seldom, in the days before Radio became so common," said a telephone company official, "that telephones were tampered with in the pay stations, other than the coin boxes. But probably some enthusiastic but inexperienced Radiophans or else thieves who hoped to profit by their sale to Radiophans, have cut off the receivers, only to be disappointed. Apparently the word has been passed around among Radio enthusiasts that these receivers will not work, as the thieving has died down."

Saturday, October 27

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 1:30 p. m., Concert, Dougherty's Orchestra; 3:00, Pitt-Tech football game; 6:15, Dinner concert, Westinghouse Band; 7:30, Concert for children, Richard Murphy, pianist, Frank Sykes, reader; 8:15, "Navy Day" program, celebrating the birthday of the late Col. Roosevelt; 8:30, Concert, Westinghouse Band; Jack Smalley, baritone; Ruth Clark, pianist.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Eunice Ross, contralto; 8:00-9:00, Filipino String Orchestra; 10:00-11:00, Marta Oatman School.

KGW, Portland, Ore. (Pacific, 492), 8:30 p. m., Children's program, Aunt Nell; 10:00, Dance music, George Olson and his orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Musical program; 2:30-3:30, Matinee musicale; 6:45-7:00, Bedtime story, "Uncle John"; 8:00-10:00, De Luxe program; 10:00-12:00, Art Hickman's Orchestra.

KSD, St. Louis, Mo. (Central, 546), 8:00 p. m., Program, Choir of Central Presbyterian Church, Mrs. Katherine Cowan, soprano; Mrs. Charles H. Austin, contralto; Wadko Finke, tenor; Frank Ingalls, bass; Mrs. Frank A. Neal, accompanist.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson of Peoples Gas Co.; 6:50 p. m., Children's Bedtime story; 10:00-11:30, Herbie Mintz, pianist; Mary Lee, soprano; Sallie Menkes, accompanist; A. W. "Sen" Kaney, specialty act; 9:05, "Under the Breuing Lamp," Youth's Corporation.

PWX, Havana, Cuba (Eastern, 400), 9:00-11:30 p. m., Cuban concert, Virginia O-Siel, Dora O-Siel, accompanied by Estrella Herrera, accompanist, and a string quartet.

WBAP, Fort Worth, Texas (Central, 476), 7:00-7:30 p. m., Concert, William Cameron & Co. Band; 9:30-10:45, Concert, Knights of Pythias Orchestra.

WBZ, Springfield, Mass. (Eastern, 337), 6:00 p. m., Dinner concert, WBZ Trio; 7:30, Twilight tales for the Kiddies; Current Book Review, R. A. MacDonald; 8:00, Concert, WBZ Trio; Melva Holmes, soprano; Mrs. Eleanor Turner LaZazzera, accompanist; 9:00, Bedtime story for Grown-ups, Orison S. Marden.

WOAP, Chicago, Ill. (Central, 360), 1:40 p. m., Drake Concert Ensemble and Blackstone String Quintet; 7:00, Drake Concert Ensemble and Blackstone String Quintet; 10:00 Program, Madame Jean Young; Rosemary Hughes, soprano; George H. Hill, Jr., baritone; Jack Chapman's.

WOAR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Concert, Arcadia Cafe Concert Orchestra; 4:30-5:55, Piano recital, Edna Finestone; 7:30-7:45, Bedtime stories by Dream Daddy; 7:45-8:00, Book review by Doris Hyder; 8:00-10:00, Radio play by the Walter Greenough Players; 10:10 p. m., Dance music, Howard Lanin and his Arcadia Cafe Dance Orchestra; Special, "Morning Glory Club" features; Song recital, musical comedy stars.

Sunday, October 28

KHJ, Los Angeles, Calif. (Pacific, 395), 10:00 a. m., Church services, First Episcopal Church; 7:00-7:30 p. m., Organ recital, Arthur Blakeley; 8:00-10:00, De Luxe concert recital.

KYW, Chicago, Ill. (Central, 536), 11:00 a. m., Central Church services, E. F. Shannon, pastor; 6:30 p. m., Readings, Goodspeed's Version of Bible, William Ziegler Nourse; 7:00, Sunday Evening Club, Orchestra Hall, Chicago; Special musical program, Choir of one hundred; Edgar Nelson, director.

WFAA, Dallas, Texas (Central, 476), 2:30-3:30 p. m., Radio Chapel Bible Class, Dr. William M. Anderson Jr., pastor; 9:30-10:00, Choristers, Oak Lawn Methodist Church; 10:00-11:00, Dizzy Four Orchestra.

WFI, Philadelphia, Pa. (Eastern, 395), 7:30 p. m., Services Arch Street Presbyterian Church, sermon by Dr. Edward Macartney, D. D. Organ recital.

WGI, Medford Hills, Mass. (Eastern, 360), 4:00 p. m., Twilight program: "Adventure Hour," Youth's Companion; Kenneth W. Houghton, baritone; 8:30,

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; 12:00-12:55 p.
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The thieves, however, are believed to be
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"It was very seldom, in the days before
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WDT, New York N. Y. (Eastern, 405), 12:00 m., Dr.

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KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15
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KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table
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p. m., Children's bedtime story; 8:00-8:58, Herbie
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prano; Sallie Menkes, accompanist; A. W. "Sen"
Kaney, specialty act; 9:05, "Under the Evening Lamp,"
Youth's Companion.
PWX, Havana, Cuba (Eastern, 400), 9:00-11:30 p. m.,
Cuban concert, Virginia O-Siel, Dora O-Siel, accom-
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WBAP, Fort Worth, Texas (Central, 476), 7:00-7:30

Luncheon music, Wanamaker Tea Room Orchestra;
4:45-5:00, Organ recital; Band concert.
WTAM, Cleveland, Ohio (Eastern, 390), 9:00-11:30 p.
m., Dance program.
WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "To-
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WGI, Medford Hillside, Mass. (Eastern, 360), 4:00
p. m., Twilight program: "Adventure Hour," Youth's
Companion; Kenneth W. Houghton, baritone; 8:30,

NEW MILOPLEX CIRCUIT

(Continued from page 11)

enough feet of wire to kill its desire to talk and sing for you. So do some figuring first; drilling the panel isn't a hurry up job.

One of the nicest looking and best performing sets I ever saw or heard didn't have much more wire on it than would make two grown-up hairpins. Wireless, me eye, said the wireman, you're all wires. So do some scheming, fellows, every inch of wire saved may mean another 100 miles of DX. Ground the cores of your transformers. Certainly it helps, and I am not so sure but that grounding your metal socket shells would tickle the general circuit. Read the connection hook-up furnished with most good transformers. P-1 and S-1 don't always go to plate and grid, watch your step, give the transformer a chance, why choke it? Supposing you're now ready to go; may be you're not, but s'posin' anyhow; ten to one, she will start off with a couple of thousand squeaks and scratches that will be bad stuff; I hope she does. Mine did for so long I came near seeking a patent on the idea. And if she does, fixed condensers will save your life. Not any old make, in fact very few makes will do. It's so easy to fake something that looks like a fixed condenser, more people should be in the game, capacities as printed and capacities "as is"—well measure a few; anyway, pay more and get better, more accurate ones.

It's a sure fussy job to tell you just what capacities to use, as every make of transformer requires a separate value, but I can tell you where to place them—then, "let your conscience be your guide."

Shunt the first audio primary with a fixed condenser having a value anywhere from .002 to .006 and the primary of the second with one around .001, at times shunting the secondary of the second audio rather than the primary; suit yourself—Lot's wife did.

After having passed through the bitter, expensive experiences of "Who's Who" in audio frequency transformers, my list of real ones is mighty small. Mercy, how I would like to broadcast from Station BLAH and tell names, but I haven't got a license at any rate to say do this, and don't do that. Use low ratios in both the first and second stages, put a high ratio in the first stage if you want to, only remember, I told you not to.

Ratios in an audio frequency transformer are meaningless. High ratios mean absolutely nothing except that other factors entering into the essentials of transformer design back up or support the contention, and if you can keep a high ratio transformer from distorting—well if you can; but why get fussy, use ratios not exceeding four or five to one and be happy, and don't think you can kid Plexy by using a copy of a real one. Spend your money for transformers as you would for a chicken dinner or should I say chicken's dinner (it's hard to write it without the "s"). Shall you use a grid biasing battery on your amplifiers? Sometimes yes! Sometimes no! The tube you are using determines this point. It's a real helper very often, while again, not so good.

Pooling around with by-passing condensers is not—oh yes, it is too, just about as much fun as listening to a minute man's speech upon "The Saturation Point of the Volstead Act." Sometimes he perks and again without apparent design, provocation or malice afore-

Special Sets Made to Order

Let us quote you on any circuit.

Send for Miloplex Price List

FORBES RADIO CO.
127 N. Dearborn St. Chicago, Ill.

What About It?

Isn't it about time to stop experimenting with multiple control circuits and build one that, combining ease of assembly and operation, loudness, clarity and selectivity of signals, as well as beautiful appearance, is excelled by none?

THE ELGIN SUPER-REINARTZ RADIO RECEIVING SET

Embodies all the advantages of the well known Elgin Reinartz (the set which was largely responsible for the popularity of this wonderful circuit) and many others. It is much louder, more selective, requires no storage battery, and can be used with excellent results on a short or loop aerial. It has brought in California stations two thousand miles from Elgin, clearly and without interference on a loud speaker with only one tube, and that while our powerful local station was broadcasting three miles away.

Could you ask for more? Write for circular giving one, two and three bulb hook-ups of this remarkable circuit. IT IS FREE.

ELGIN RADIO SUPPLY CO.
207 East Chicago Street ELGIN, ILLINOIS

thought his arguments are as dead as King Tut. By-pass just right, and Plexy talks on like a babbling brook. Do it wrong, and it goes as dead as a school-house on Saturday. Then begins the post mortem and the "Cut and Try" team puts on a howling farce. It's sure a wonderful life to live. I fear few of us will get out of it alive.

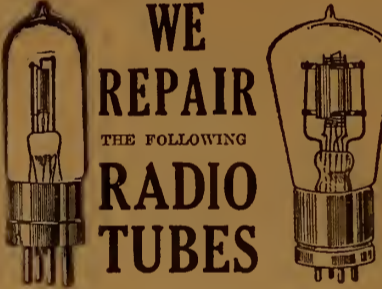
Do a good job; don't parallel grid or plate wiring and keep your wiring short. "How short?" Well, shorter than that, and never mind square corners on your wiring. The shortest distance between two points is a straight line. Quite so, quite so, but a crooked run in a Radio set, particularly if it crosses another, is mighty good practice; it helps to shunt out capacity effects.

Incidentally, a new location for the phones on the amplifier is being experimented with; may be I'll tell you the story, because discussions by the engineers (or what I think they said) will show up next week.

Who said I lost my cook? I'm still eating, but the present title holder who promised and swore and kladded me into thinking she'd like me for her second husband, if reincarnated, just filed a protest relative and pertaining to my calling her Maggie. Hain't wimmin the fussy cats? I say she filed a protest; as soon as the swelling goes down, I'll probably see the light and use that rolling pin for an inductance form. Therefore, Maggie, the cook, appears for the last time in the "Fadeout" while the "Closeup" introduces the heroine, my good wife. Her counsel has ever been "Forget it and come to bed." Her sacrifices (that I might pay "Nite owl" lighting bills) are many and often. In my darkest hour of research she has refused to turn on the light, she, my wife, who said she would obey when I coughed up two bucks, a promise and swore. I owe her everything and want to be her second husband. You know it was either write the above or not another word about the King Miloplex. So I saved your life and hope you give me credit (none of the grocery stores will). Well, let's all slap on the two extra tubes and see who's in the air. Next week, the engineers' story, just as 'twas told to me, theories galore and good ones. Let's eat!

(TO BE CONTINUED.)

A steady hum in the headphones is not always caused by "alternating currents." It is often due to an open circuit somewhere.



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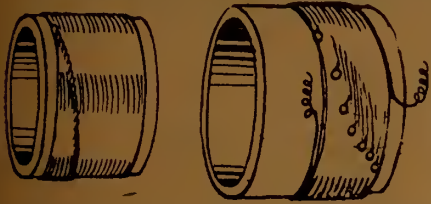
Chapter IV, Part I—Inductances—Fixed and Variable

By M. W. Thompson

THE following article is the fifth of a series for Radio beginners, written by Marvin W. Thompson, well known in air-phone circles for his understandable style of approaching his subject, and his ability as a radio engineer. Mr. Thompson is now an associate editor on the staff of Radio Digest. A preliminary outline of the Chapters to follow is:

- Chapter V—Condensers—Fixed and Variable.
- Chapter VI—Vacuum Tubes.
- Chapter VII—Antennas and Grounds.
- Chapter VIII—Regeneration.
- Chapter IX—Audio Frequency Amplification.
- Chapter X—Loud Speakers.

WHEN considering inductances we must, first of all, divide them into two groups—those used in circuits in which the current alternates or oscil-



Figures 15 and 16—Bank-wound inductance, showing how turns overlap, and single-layer inductance tapped and wound on solid tube

lates at Radio frequencies, and those in which the current varies at audible frequencies. Taking up the coils used to handle Radio frequencies, we must again subdivide and consider these inductances as those used to provide inductance in a circuit and those used to transfer energy from one circuit to another.

The end toward which all manufacturers of coils are striving is to produce a unit that will provide the greatest inductance in the smallest possible space. At first thought this sounds very simple—merely use fine wire, a small core and wind the wire compactly—but there are several factors which make this method impossible. Opposing the passage of Radio frequency currents through a coil of wire is the element known as "effective Radio frequency resistance."

Skin Effect

This element is made up of the ohmic resistance of the wire and the "distributed capacity" of the coil. Every piece of wire offers ohmic resistance to the passage of a simple direct current; if alternating current passes through it, the resistance increases as the frequency is raised due to "skin effect," a term used to indicate

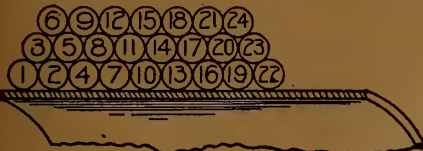


Figure 17—Correct or bank-wound method of making inductances

the fact that the current travels on or near the outside surface of the wire. Since at very high Radio frequencies the current utilizes only a small fraction of the total cross-sectional area of the wire and disregards the center, it is equivalent to having a wire of small diameter. Because

the Radio frequency current will travel only near the circumference, as great a circumference as possible should be provided to keep down resistance. To provide more surface or "skin," braided or stranded wire is frequently used and in labora-



Figure 18—Incorrect method of winding inductances of more than one layer

tory apparatus a type of wire called "litzendraht" is employed. Litzendraht is made up of many fine individually insulated wires twisted into a cable. At wave lengths between 150 and 600 meters, however, the difference in efficiency between a coil wound with solid wire and one wound with "litz" is so small that the average experimenter may disregard it and use solid wire on his inductances.

Distributed Capacity

We come now to "distributed capacity," which is the second detrimental factor to be reduced to a minimum. When winding a coil it is intended that the currents travel in at one end, follow the wire around and around the coil, and out at the opposite end. Could a coil be made in which the high frequency current would do this, many problems would be solved. As stated in a previous chapter, any two



Figure 19—Bank-wound coil divided into sections

conductive surfaces placed close together but not touching, form a condenser. Any two turns of a coil which are close to-

gether constitute a condenser and, because there is a difference in voltage or electrical pressure between turns, we actually have current flowing across from turn to turn all along a coil. Thus, much of the efficiency is lost, as our coil provides inductance only because of the current traveling around and around. That current which jumps across does no work and is lost.

Since every inductance and capacity form a circuit which has a "natural period" or frequency at which it oscillates easily, our distributed capacity, in conjunction with the inductance of the coil forms such a circuit. This unintended circuit absorbs energy from the incoming signals, wastes it and adds to the "effective frequency resistance." Miniature condensers are formed not only by the

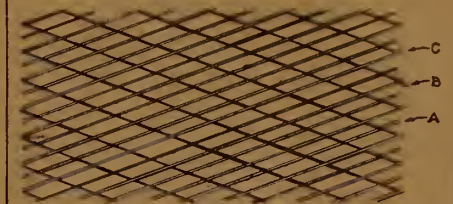


Figure 20—Honeycomb duo-lateral winding, in which A is bottom, B middle and C top layer

insulation between turns but by the material on which the coil is wound; so, to reduce resistance as much as possible, three things should be done: First, the wire used should be as large in diameter as possible, compatible with compactness; second, turns should be spaced, and turns with a large difference of pressure (potential) should not lie close to one another; third, as little solid material such as wood, bakelite, formica or other compound, as possible should be used to support the wire.

Single-Layer Coils

The simplest form of inductance is the short single-layer coil. Such a coil is shown in Figure 15. In this coil all turns are parallel and close together and the distributed capacity between turns is high, but as there are few turns, the total ca-

capacity is not very great and such a coil may be used for short wave work (175 to 500 meters). Distributed capacity only becomes a serious factor when many turns



Figure 21—The Glibin-Remler winding in which A is bottom, B middle and C top layer

are necessary for the reception of signals on wave lengths over 500 meters. It will be noticed on this coil that taps are taken off every few turns. Taps are bad practice. If we are using only that amount of turns between one end and the fourth tap, there will be absorption of energy by that part of the coil between the fourth tap and the other end of the coil, due to the oscillating circuit formed by distributed capacity and inductance. Whenever possible, only those turns necessary to reception should be wound on a coil. In everyday practice, this loss of energy in unused turns is accepted as a necessary evil.

Distributed capacity may be kept down and inductance kept high by winding a coil so that the diameter is greater than the length of the winding. The best ratio is 2.5 to 1; that is the diameter should be two and one-half times the length of the coil for maximum efficiency, but there (Continued on page 18)

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These genuine Western Electric 5-watt "E" tubes, type CW-931, or commonly known as VT-2 tubes were designed and built specially to conform to the specifications of the U. S. Signal Corps. They are built to be used both for Radio and Audio Frequency Amplification and for CW and phone transmitting. The characteristics of the tube are as follows:

- Filament: 4.8 to 7 volts
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Vol. VII Chicago, Saturday, October 27, 1923 No. 3

Are We Coming to This?

Heat, Light and Power May Be Plucked from the Air
AN ENIGMA that has been a scientific dream for years is the transmission of power through the medium of the ether. This means that the electric light wires and long distance high tension systems eventually will be done away with and the subscriber will be able to take his lighting current directly from the air. We may be very near that time or very far from it, but should this happen there will be a considerable saving for most of us.

Hydroelectric power may thus be developed in any part of the country and sent by Radio to any other part. The first cost of the generation of the power will be comparatively small, and with the upkeep of an expensive transmission line eliminated, electricity may be furnished for almost nothing.

Some experimental trials have been made with pleasing results. Power was sent through the air for a short distance. This shows that the scheme has, at least, the earmarks of possibility.

Give Your Applause by Letter

Comments on Broadcast Programs Appreciated

THE BIG season for Radio reception is now with us and in making up programs for those who listen the directors of various stations are largely influenced by the letters they receive commenting on the artists and their programs.

If those who listen in nightly to the various stations would only take the time to write to the manager or artist and tell their wishes and desires, it would guide and enable the manager to give them the kind of programs and the kind of artists they are eager to hear. It would also help in varying the programs. Telephone calls are appreciated, but it is the written word that is passed on to the artists who perform over the Radio that helps most. This written applause is tangible evidence to them of the Radio audience's appreciation of their efforts.

It is not easy for an artist to stand before a microphone and give the best he has to an unseen audience, knowing that when he has finished there is not forthcoming a welcome applause that he would receive from an audience visible to him. Artists who come to a station and give their services and their talent are affording pleasure to millions of people. It would seem little enough to ask of those who are enjoying this entertainment, with no cost whatever, to write and state their pleasure at what they have heard.

Drama for Broadcasting

Who Are the Greatest American Playwrights?

WHAT is the greatest American drama? What are the ideals of America, and what is Americanism?

The great play of any age is that play which crystallizes most artistically the dominant ideas of its time. The soul of a nation is revealed in its art. A poem, a novel, a painting, a drama becomes popular because it touches sympathetic emotions. In spite of Nietzsche the great test for value remains with the popular voice. Not that momentary applause of the mob—which lasts but a day, to be sure—but that perpetual approval of well balanced human intelligence is to be considered as the popular voice. Many and many a monumental work of art did not become popular overnight.

There is a form of patriotism which is more heroic than that displayed on the battlefield. It is that form which endeavors to create from the noblest sentiments of a nation's soul a living philosophy of every day existence. And when an artist is able to portray in his work characters actuated by such worthy aspirations, he has caught the spirit of his times and placed his name amongst the very rare, but nevertheless true historians. Who, then, are the great American playwrights, and what are their best works? Radio may bring the unknown to the front and into the limelight.

RADIO INDI-GEST

The Rhyme of the Rabid Radiot

(In two parts. Part Two will appear next week.)

The snow was falling, flake by flake,
The hour was half-past eight,
And I was trying hard to make
My crystal oscillate.

No sound disturbed the wintry air
Except the ticking clock,
I tore my locks in deep despair,
When—Hark! I heard a knock!

Then quickly to my door I ran,
I opened it, and lo!
In came an aged, aged man—
His gait was stiff and slow.

"Old man," cried I, "What brings you here?"
He answered slowly, "Pate!"
I started, and he said "Draw near,
I've something to relate.

"Long years ago I bought some wire—"
He smiled, "I'll not forget—"
Drawing his chair before my fire—
"My home-made crystal set.

"At first—it's best to take down notes—
I wound my coil—now hush!
Upon a box of Quaker Oats,
But all I got was mush.

"And every night and every day
I toiled at it in vain—
At last I threw my junk away,
And started in again.

"This time I bought a vacuum light,
Some dials, condensers three,
A socket too, but still each night
Was silent night to me.

"I bought a variometer
And wired it to the plate,
And then I was quite certain, sir,
It would regenerate."

ANN TENNA.

(To be concluded.)

A-B-C Lessons for Indigest Beginners

Chapter XVIII—We Always (?) Get Passes

BY GOSH

SIS for the shows
You never go to see,
But hear them all by Radio,
Because the seat is free.

Our Own A. & Q. Dept.

Dear Indi: What mesh screen do you use in the Stebbins Souper Degenerative?

Answer: With the Stebbins Souper Degenerative we personally use a smoke screen. LOTTA MOSS.

Witty Sir: What to do when my B battery goes dead?

Answer: Inform the lodge it belongs to and hold a funeral. VERA GOOD.

Dear Indi: How much change should I get back out of a fifty dollar bill after purchasing a two step amplifier?

Answer: None after you get the loud speaker, extra tubes and batteries to go with it. RAY D. O.

Honorable Sir: One of the ladies living in my apartment building hangs her washing on my antenna just when I want to listen in. How can I overcome this trouble?

Answer: That's easy. Move into another building. IVA DIAL.

"Gone But Not Forgotten"

Loud the wailings and deep the moans,
For the departed one in the House of Jones.
Into the corner of every room,
Seemed to creep the terrible gloom.
On the table the casket lay,
The spirit gone, forsaken, away.
'Twas no wonder the family could but weep,
When they found their "A" was fast asleep.
H. K. C.

INDI-GEST KINKS? SEND A DOLLAR—

THERE are many little Indi-Gest kinks worked out in the home that would hamper your fellow Radioknut and cause him much worry. Indi-Gest is very much interested in securing such material and is willing to accept a dollar for each kink printed. Send a stamped envelope so rejected copy may be returned. Under no circumstances will the dollar be sent back.

INDI-GEST KINKS DEPARTMENT

No Grid Leak

My girl keeps a Radio pinned to her pinny,
With a high wire clothes line she calls her Aunt Tinney,
A screw-driver shoved in the top of her boot,
And a brace of drill bits with the brace that they suit.

When she talks it's of aeriels, fivvers and coils,
Of feed-backs, inductances, static that spoils,
Of shunts, microfarads, of meters and dials,
Of hook-ups and circuits, and Radio trials.

By day she's too busy with solder and wires,
At evening so quiet her company tires.
She meets my advances with unfeigned reluctance
And likes all her loving by distant inductance.

Oh! woe unto me while this Radio lasts.
My heart for companionship hungers and fasts.
For once when I asked her if she'd be my bride,
She answered, "My Honey—comb coil beats the slide."
STEP-DOWN BILL.

A PIONEER SET



Condensed

By DIELECTRIC

Members of the A. R. R. L. decided to contest with Old Sol recently in getting from the east to the west coast of the United States, with the gratifying result of beating the sun to it. This is quite a feat when you stop to consider that the average daylight range for amateur transmitting stations is hardly more than one hundred miles. D. McR. Parsley, operator of station 4FT, at Wilmington, N. C., made an early start with the rising sun, reaching Los Angeles with his message just one hour and twenty-five minutes later. It was only necessary to relay the message twice on its trip across the continent.

The longest Radio circuit in existence is now in operation and it is said to be more efficient than many circuits covering much less distance. It is more than one-sixth the way around the world between the New York station and that in Warsaw, Poland, yet communication is had direct via Radio. To Poland this means much, as she is now freed of relying on messages relayed through other European countries; politically advantageous as well. We are in direct touch with most of the civilized world through the use of this modern medium, bringing with it a feeling of closer contact, socially and commercially.

It really begins to seem like old times when you can move the dials and bring in speeches and music from some banqueting hall where noted speakers are addressing groups of men and women. The other evening WEAF broadcast Lehigh University's alumni meeting in New York City, which included addresses by Schwab, Wickersham and others and a splendid musical program, giving it also to Radio audiences of WOO, KDKA and KYW. This feature of relaying a broadcast program is one of the very great attractions to Radiophony. It enables thousands who cannot attend, to hear what is said by prominent leaders in letters, science and industry. Think of the educational value of that.

Tests of remote control of airplanes and autos by Radio are made every little while with complete success in practically every instance. One of the latest demonstrations was made at St. Louis during the army, navy and marine flying contest, at which time an auto, built to resemble a bug, was made to move all over the field at the will of the Radio operator. The importance of this amusing exhibition is easily seen when its application to army maneuvers is considered. Without a pilot and directed solely by Radio, an army plane was made to fly over a field at Dayton, O., being brought safely to earth again when the test was over. If the same thing could be applied to small boys, we would not have to lose half a program hunting up our lost progeny.

What has been suggested in these columns as a possibility for the future appears to be drawing nearer all the time. We all know that certain stations are able to reach listeners in at some distance nightly and in a very satisfactory manner. Many smaller stations are less reliable in this respect. The first mentioned may consider that Radio audiences will wish to depend on them for entertainment, so build other powerful stations to cover adjacent territory.

Scores in the world series have been given us by several stations so that we could follow the progress of this exciting sporting event, for millions are interested who never actually attended a single one of these contests. Station KYW, in addition to giving this feature and the city baseball series, will broadcast from Stagg Field, University of Chicago, the results of each football game played there and announce the outcome of contests on other gridirons. I can always depend on a call from a friend of mine Saturday evenings to get the report of football games. One more season and he'll have a set of his own.

Comparing Efficiency of Various Transformers

How to Make a Test to Determine Value in Set

By H. J. Marx

THE rapid development of the Radio industry has been the main factor in the collection of haphazard apparatus that is being sold over the counter. The prospect of getting rich quick has lured

the others. The uneducated public, judging largely on the price basis, more often got the inefficient and poorly designed apparatus than the quality type. With the inauguration of this season,

is not so likely to try to construct himself, making the question of proper selection of greater importance.

Transformer Problem

Tube analysis has been demanded and described—the next step has been the transformer problem. Few fans are anxious to sit down and make audio frequency transformers. The prospect of having to count the required number of turns in the primaries and secondaries, running from 10,000 to 60,000 and over, is not an attractive one, leaving alone consideration of the requirements of proper winding for minimum capacity reactions; and selection and construction of laminated steel for cores doesn't improve the situation.

For these reasons, fans buy their transformers but want to know which ones are the best. In order to try them out for comparison, they require a test that will not lead them into a series of calculations in advanced mathematics and a technical knowledge possessed only by electrical engineers. The test must be fair and give a comparative value of efficiency under operating conditions. It is not intended as a laboratory analysis, but a sufficient guide to give the fan an idea as to what results he may expect from various types.

Test Circuit

An effective circuit for a test outfit for transformers is shown in Figure 1. It will be noticed that the circuit makes use of the transformer in a normal stage of audio frequency amplification. The test consists of impressing an oscillating current on the main circuit through a fixed condenser and a potentiometer. By means of a double pole, double throw switch this current is thrown into a pair of receivers direct or forced to pass through the stage of amplification first. By increasing the resistance (500 ohm calibrated) the tone through the amplifier is reduced until it matches the tone direct. Under these conditions, the voltage amplification of the

(Continued on page 20)

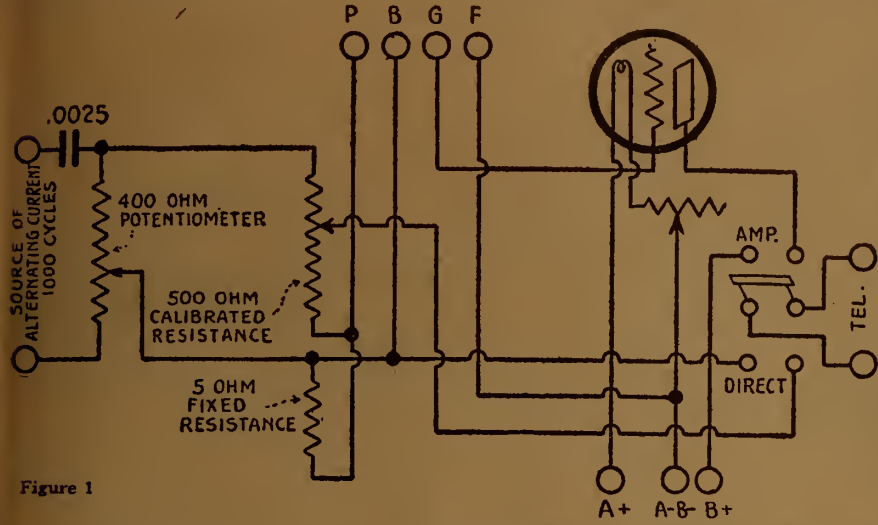


Figure 1

men from all fields into the making of Radio apparatus of all types and descriptions. Some were wise and employed designers that knew something of the subject; others copied the designs of established makes, while still another class just made up stuff to sell. As might be expected, the old line manufacturers in related industries that took up Radio as a side line, thought too highly of their reputation, and therefore placed the design of apparatus in the hands of competent engineers.

The ultimate results showed an assortment of all types, qualities and prices in apparatus. Naturally, the carefully designed apparatus was higher-priced than

the tendency toward discrimination has become more apparent. Not only is the question of cost losing much of the fan's consideration, but he is displaying a decided "show me" tendency. Even the high-priced apparatus must undergo sharp scrutiny and test before approval is vouchsafed.

The effect of all this is illustrated in the increasing demand for methods of testing and comparing of apparatus. This is especially true of any parts that the fan

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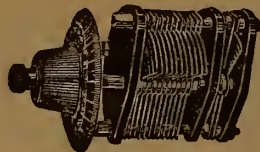
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RADIO FOR EVERYBODY

(Continued from page 15)

is no serious harm done if this ratio approaches 1 to 1.

Bank Winding

In their efforts to reduce distributed capacity and effective resistance, manufacturers and engineers have developed some remarkable methods of winding, a few of which are shown in our illustrations. Figure 16 shows a "bank-wound" coil and Figure 17 gives a cross-sectional view to make clear how the turns are laid on. Let us say there are to be 24 turns. If our coil is wound in two layers as shown in Figure 18, it not only is longer, but the potential or pressure difference between adjacent turns is high and there is tremendous loss through distributed capacity. Between turns 1 and 24 there is the potential difference developed by 24 turns. If, however, we wind our coil as shown in Figure 17, it is shorter, and between any two adjacent turns there is only the potential difference developed by four turns, as between 5 and 9 or 20 and 24. Bank-winding is not at all difficult, is far more efficient than a long single layer or the double layer of Figure 18. As stated before, tapping is bad because of the energy absorption by unused turns

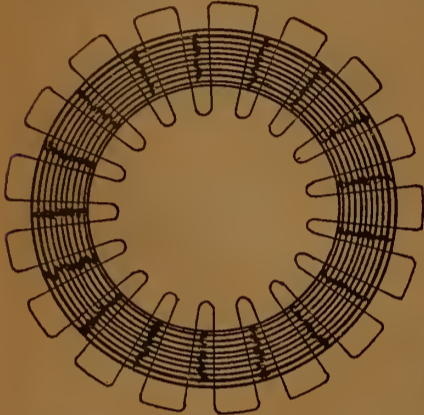


Figure 22—Spider-web coils are wound on a slotted disk; the wire is laid in the slots, crossing itself from one side to another

which is known as "dead end effect." To reduce this, it has been found good practice to wind bank-wound inductances as shown in Figure 19, and throw the sections entirely in or out of the circuit by switches. Thus, when the right-hand section is in use it is not connected in any way to the remaining sections and, as they are some distance away, they absorb little energy.

Honeycomb "Duo-Laterals"

Honeycomb coils are an excellent means of obtaining inductance with low loss. A close-up of a section of a "honeycomb duo-lateral" coil is shown in Figure 20. The word "honeycomb" refers, of course, to the little cells formed by the criss-crossing wires; the word "duo-lateral," however, needs some explanation. In our drawing, three layers are shown with A as the lower layer, B the middle and C the outermost layer. The turns of layers

A and C are parallel and separated by turns B. In the ordinary honeycomb, the turns of layer A would be directly under the turns of layer C. To get them further apart, the C turns are wound to come between the turns of layer A, which innovation is known as "duo-lateral" winding. This coil is excellent because the turns of the adjacent layers A and B cross at a considerable angle, resulting in small distributed capacity; turns in the same layer as well as turns in parallel layers are well separated by the duo-lateral winding.

The Giblin-Remler

Figure 21 shows the Giblin-Remler method of winding. It was developed after the honeycomb appeared in the belief that greater inductance could be obtained without materially increasing the distributed capacity. Between the honeycomb and the Giblin-Remler coils there is practically no difference in efficiency and the average of ten samples of one would probably be the same as the average of ten samples of the other.

In Figure 21, the diagonal lines represent yarn, while the horizontal lines show turns of wire. Five turns are wound as shown by A; then the parallel groups of yarn numbered 1, then the five turns B; then the groups of yarn numbered 2; then wire we call C. On top of C would be another layer of yarn, the turns running parallel to the two turns, and this alternate laying on of diagonally wound yarn and horizontal turns of wire can be continued to make a compact coil of considerable inductance with low losses. The inductance is increased by winding the wire in groups of five turns and keeping all groups parallel, and the yarn separates wire groups, keeping down the distributed capacity losses.

Spider Webs

A fourth method of winding is the "spider web," as shown by Figure 22. Here, the paralleling and close proximity of turns has been kept down, but solid material is introduced. Solid matter, which separates two metal surfaces or wires between which there is condenser effect, is known as the "dielectric" and there is more or less dielectric loss depending upon the material of which it is composed. Glass and rubber are excel-

lent insulators and have low dielectric losses; bakelite, formica and other compositions are also excellent insulators, but their dielectric losses are comparatively high. Wood is a poor insulator and its dielectric losses are high. But to get back to our "spider web"; a circular form of thin material is utilized and radial slots are cut from the circumference inward to provide fan-shaped sectors. An uneven number of sectors are provided so that after the first layer of wire is wound on

and it, in turn, introduces distributed capacity, but probably not as much as would solid dielectric. An edge view of a Sickles coil is shown in Figure 23. At points A, B, C, etc., there were wooden spokes; the lowest layer, number 4, comes in from the left above spoke A, passes below both A and B, then across and above C and D, then across and below E and F. Turns 3, 2 and 1, when laid on, follow this same practice (above two spokes, across, below two spokes), but do not all cross at the

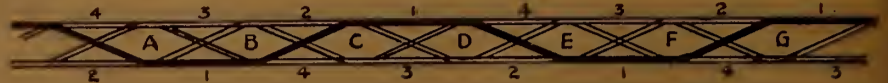


Figure 23—Sickles winding looking at the edge. Air is the only dielectric and the distributed capacity is low

the form, the wire of the second layer will cross the wire of the first in the slots, and the straight portions of this second layer will be on the opposite sides of sectors to the nearest portions of the first layer. When the third layer is placed on the form, its straight portions will be on the same sides of sectors as are the straight portions of the first, but they will be separated by a distance which is the diameter of the wire used. Such a coil has an excellent ratio between inductance and loss but seems limited to use on shorter wave lengths, as a coil of many turns would have an impractical diameter and be unwieldy.

"Sickles" Coils

Another form of winding these flat or "pancake" coils is the Sickles method. This coil is wound on a form consisting of a hub with radiating spokes which are later removed leaving only the wire. While the losses due to solid dielectric are eliminated, an adhesive, such as collodion, must be used to bind the turns together

same places nor pass around the same adjacent pairs of spokes. The result is an excellent low-loss coil but one which may be used only on the shorter wave lengths because of the impossibility of winding coils of large diameter with such mechanical strength as to be practical.

Summing Up

There are other methods of winding (Continued on page 21)

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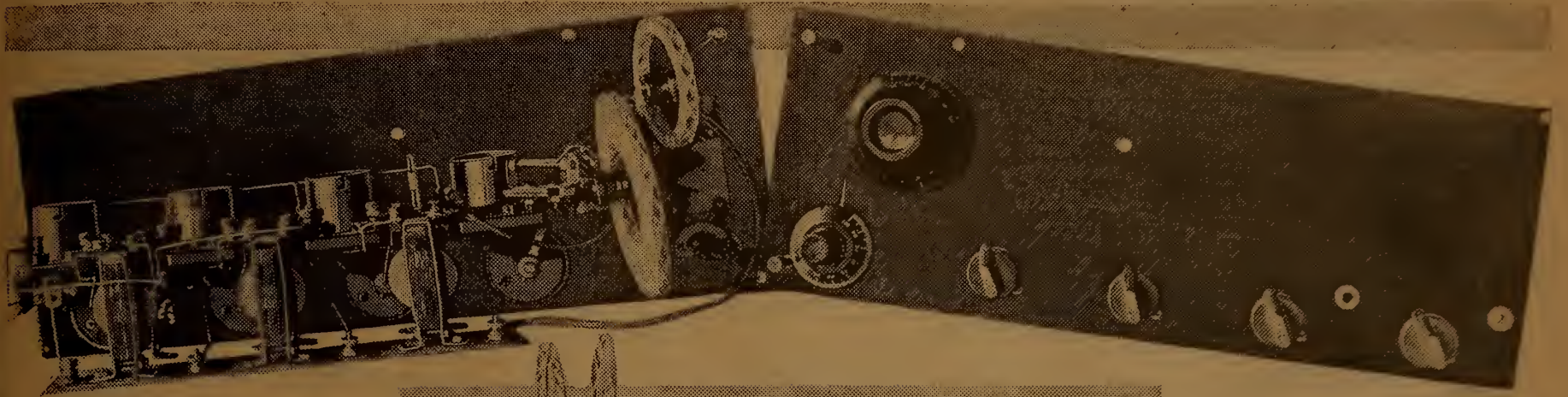
By E. T. Flewelling

WHILE it is the purpose of this article to describe how a suitable audio amplifier for the Flewelling circuit may be built, I believe that our readers will find that most of the notes will be entirely applicable to audio amplification for any Radio set.

tone will immediately become very blurred; if indeed one can hear it at all through the various squeaks and howls. A three step set was built under just such conditions as this and the reception was such that if we had good luck, we could understand what was said by the announcer. To this set was added jacks to

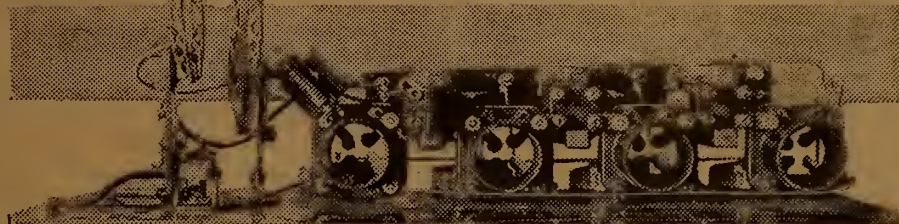
far more exactness in the building, it was decided to construct these experimental amplifiers in three stages, knowing that if three stages were successful, then two stages would also be correct. We found that an amplifier could be made or ruined as an amplifier simply by the arrangement of the parts or the wiring.

can take the necessary parts and build a Radio set complete with three stages of audio amplification and obtain very much greater volume and much cleaner-cut reception than we have often seen in two stage amplifiers, these matters are worthy of observance. It is surprising how short the leads between parts can be made if we



into consideration in this subject that it is hard to decide where to commence. The writer has been so impressed during very exhaustive tests with audio amplification by the effects caused by arrangement of wiring and particular parts used, that perhaps this end of the subject should be taken up first. Let us consider first the type of transformer to use. Of course, we cannot name any specific types of apparatus, so that I will be unable to be of any assistance to our readers on this point. It was quite well demonstrated during the tests spoken of above that satisfactory operation of an amplifier was not in general obtained with transformers of a high ratio, that is, transformers in the 10 to 1 or 6 to 1 class. Better results can be obtained with transformers of a ratio of 5 to 1 or less. The reason is that the high ratio transformer has so many turns of wire on its coils that its impedance and resistance value are such as to unfavorably affect the grid and feedback conditions. There are so many Radio sets using amplifiers that show traces of this trouble that it might be well here to show how it may be recognized.

Correct Amplification.
An amplifier operating with transformers of the high ratio type will quite often sound furry or have the "tin horn" sound that is so objectionable. Almost invariably the clear-cut sharp resonant note amplifier will be one using transformers of low ratio, or at least transformers that are wound with larger size wire than is ordinarily used on a high ratio transformer. That the above is so is easily demonstrated by adding a third step to the usual two step amplifier, when the



control the filament, that is, we could plug in on the second step or the third step, lighting the filaments by the insertion of the jack or putting them out upon its withdrawal. The addition of these jacks demonstrated that they were not a success, because after their installation we were unable to understand anything that was said.
These notes regarding the ratio of the transformers the writer believes to be extremely important to heed in constructing an amplifier; and the above might be summed up by the simple statement that in general low ratio audio frequency transformers are preferable and recommended, while the use of filament control jacks is not advisable.

Wiring the Set
Another extremely interesting thing, and really of vital importance in the construction of an amplifier, is the matter of wiring the set. During our tests, probably fifty amplifiers were built, and because three stages of amplification demanded

We have always been strong advocates of short leads and the elimination of all unnecessary parts and wiring in dealing with Radio sets, and we find that invariably the best operating amplifiers are those that followed along those lines. By the use of reconstructed sockets, transformers, terminals and home-made tuners, condensers, etc., the writer has been able to make amplifiers that are so free from feedback conditions that any amateur builder might follow this rule with every assurance of success.

Short Leads in Set
The foregoing, as we said, is so important that great care should be taken that the points given be considered. It does seem that, if an inexperienced amateur

really go about it with this thought in mind, and I think that those who build their amplifiers as here advised will thoroughly

(Continued on page 20)

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\$6.00 BRANDES.....	\$5.25	\$1.80 3 PLATE VERNIER.....	\$1.90	5.00 23 PLATE VERNIER.....	2.50	5.50 43 PLATE VERNIER.....	2.75
8.00 N&K GERMAN.....	5.75	3.00 23 PLATE PLAIN.....	1.50	2.80 43 PLATE PLAIN.....	1.90		
7.00 FEDERAL.....	5.50						

TUBES				AUDIO TRANSFORMERS			
List Price	Our Price	List Price	Our Price	List Price	Our Price	List Price	Our Price
\$5.00 RADIOTRON U. V. 200.....	\$3.95	\$4.50 ALL AMERICAN, 3 to 1 Ratio.....	\$3.95	7.00 AMERTRAN.....	5.55	7.00 FEDERAL No. 65.....	5.55
5.00 CUNNINGHAM C. 300.....	3.95	4.75 ALL AMERICAN, 5 to 1 Ratio.....	4.10				
6.50 RADIOTRON U. V. 201-A.....	5.75	4.75 ALL AMERICAN, 10 to 1 Ratio.....	4.10				
6.50 CUNNINGHAM C. 301-A.....	5.75						
6.50 RADIOTRON W. D. II.....	5.75						
6.50 CUNNINGHAM C. II.....	5.75						
6.50 RADIOTRON W. D. I2.....	5.75						
6.50 CUNNINGHAM C. I2.....	5.75						
6.50 RADIOTRON U. V. 199.....	5.75						
6.50 CUNNINGHAM C. 299.....	5.75						

ALL Mail Orders Shipped Promptly. Send Money Order, including Postage
Write for Our Catalogue

HANES-ZENER CO., 3 West 29th Street, New York City
The RADIO MAIL ORDER HOUSE—Known for Low Prices

TESTING TRANSFORMERS

(Continued from page 17.)
transformer and tube becomes approximately a factor of the ratio of the 5-ohm resistance to the total amplifier resistance, which includes the 5-ohm fixed. For example, if the calibrated resistance, when the tone is balanced, reads 295 ohms, the voltage amplification is $295 \div 5 = 60$.
The purpose of the potentiometer is to

If chromel "C" 29 gauge resistance wire is used at 5 ohms per foot, 500 feet will be required. Don't use this wire for any other connections, however. In connecting from the end of the winding to any binding post copper wire should be used. A slide and bar is then added. The slot in the tube permits contact with the resistance wire, which lies under the outside surface of the tube.
This calibrated resistance will come in

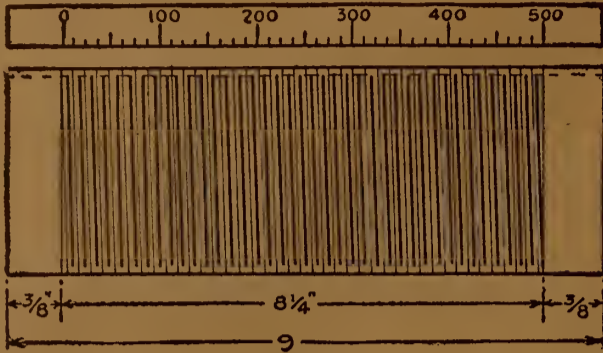
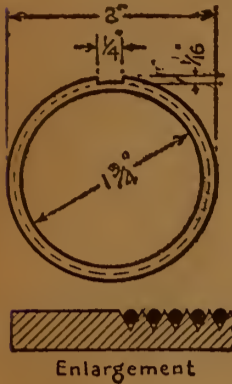


Figure 2

control the initial volume when connected directly to the phones. This direct tone must not be too loud, or adjustment is difficult. In comparing two transformers, the tubes must be taken in consideration as they will vary with different tubes.

The Source of Current

The oscillating current can be a buzzer circuit or where more critical tests are desired the frequency should be controlled and determined in order to make tests for values at various frequencies and thus determine whether the amplification factor remains constant. A variation for different frequencies indicates distortion will result in reception.

Parts Required

The parts required are all standard, with the exception of the calibrated 500-ohm variable resistance. The 5-ohm fixed resistance can be made by winding 1 foot of Number 29 gauge Chromel "C" resistance wire on a small spool, taking care that adjacent turns do not touch. This wire has a resistance of 5 ohms per foot.

The Calibrated Resistance

The calibrated resistance can be constructed by any fan. A suggested plan is indicated in Figure 2. A hard rubber tube (bakelite or fiber may also be used), 2 inches in outside diameter, 1/8-inch wall, and 9 inches long. It is threaded in a lathe (24 threads to the inch) to within 3/8 inch from each end. A slot, 1/4 inch wide and 1/8 inch deep, is cut along the full length.

The wire is wound in the threads. The diameter at which the wire is wound will be about 1 1/8 inches. Each turn has a resistance of 2.536 ohms. Then 197 turns are required. Whether the turns required measure 8 1/4 inches in length, as shown, is not important, but the calibration guide should be made on the basis of the actual length of the winding from start to finish.

very handy for other uses, which will be discussed later.

Radio Boosts Wire Industry

Radiophans have opened a lucrative field for wire manufacturers. One firm turns out 7,500,000 feet of stranded wire for aerials a month. Seven strands of hard drawn copper, supplied from as many spools and one strand of cotton from another are fed into the automatic strander machine. A cotton string center often is used as a base for the winding to make the wire rounder, so that it presents more surface for picking up the Radio waves, and stands greater stress.

This wire came on the market quite some time after the solid copper wire, owing to the fact that the government absorbed about all that was manufactured. Airplanes during the war used stranded wire about 500 to 600 feet long trailing behind for an aerial. At each landing a new wire was usually secured before the next flight as it usually became tangled in the air or in landing. More than 20,000,000 feet or 200,000 one-hundred foot aerials were thus utilized during the war. Stranded wire was utilized because of its greater efficiency and flexibility.

AUDIO AMPLIFICATION

(Continued from page 19)

oughly agree with me that the idea is a correct one.

We have taken photographs of a three stage set that has been taken apart, built and re-built so many times that it is indeed a veteran, but it is believed that these photographs, shown with this article, will be of value to the fans, as they show what can be done with ordinary apparatus and a few tools. It might also be of interest to state that this set can be entirely taken down and reassembled in a little over half an hour; that its volume is attested to by the fact that with a Chicago station thirty miles away on an ordinary loud speaker, we are able to understand every word spoken 200 yards away.

By referring to the photograph, you will notice that the grid plate leads of the tube sockets to the transformers are simply short pieces of strap brass that have been drilled to take the binding posts, and if it were possible, we would have mounted the socket directly on the transformer posts and done away with any kind of a lead. We were unable to secure transformers that had a long enough binding post for this, however.

We have in the set filament control jacks so that by using them or cutting them out, we could note the effect upon the set. It is sufficient to say that their use makes the set practically worthless, whereas with them cut out, the set operates as stated above.

THE UNITROL (One Control) Broadcast Receiver

A Real One Tube Set. Made of best material throughout. In a Real Cabinet, with hinged top. High grade mahogany finish, hand rubbed. At a Real price. Will ship C. O. D.

Postage paid east of Rocky Mountains \$11.90

Set is Fully Guaranteed. Wonderful Distance Reported by Enthusiastic Users.

Dealers: Write for our proposition. Some territories still open for bona fide Radio Dealers.

To the Experimenter and the Man Who Builds His Own: Write for Our Bulletin of Parts at Bargain Prices. Standard Merchandise Only.

Abalone Radio 105 Audubon Ave. New York, N. Y.

Checking Summer Static

The following are a few things which may be done to reduce the effect of static on a receiving set:

- Use a low, short single wire antenna.
- Employ an indoor aerial which in most cases brings in the local stations clearly and distinctly.
- Use a crystal detector instead of a vacuum tube. This is particularly recommended where one or two stages of Radio frequency amplification precede the detector.

Covered wire is considered better than bare wire for an aerial, for the reason that the latter is subject to corrosion and in that state offers a certain amount of resistance to Radio frequency currents.

Cockaday Coil Set \$2.50

Including full size blue prints of panel layout, complete picture hookup, and fully illustrated instructions for construction and operation.

Coils are fully assembled, made exactly as specified by Mr. Cockaday, D coil bank wound. Far more efficient than any home made coils.

Standard parts for this sensational circuit—panel, coils, condensers, verniers, variable resistance, vernier rheostat, socket, double jack, dials, switch, contact points, posts, busbar wire, spagetti, etc. (no tubes or phones).

Complete for \$11.65

Postage additional on all shipments
Send No Money. PAY THE POSTMAN
All Goods Shipped Parcel Post C. O. D.

RADIO SURPLUS STORES
HELENA, MONTANA

Another Scoop Miloplex

Genuine parts as recommended by the inventor including the now

Famous SPLIT VARIOMETER

DEALERS ONLY
Write for Dope

We are the largest exclusive radio jobbers in the middle west.

HUDSON-ROSS
174 N. Dearborn St., Chicago

The "A" Battery's Power in Your Radio Receiving Set

THIS IS NUMBER TWO OF A SERIES

THE sole purpose of the "A" Battery in your Radio Receiving Set is to furnish current to heat the filaments of the tubes.

And this can be done satisfactorily only by an "A" Battery that supplies an adequate steady current.

Anticipating the popularity of the dry cell tube in Radio, and realizing that it required a Dry Cell capable of standing up under service conditions differing from what dry cells are called upon to meet in other fields, the National Carbon Company developed the Eveready Radio Dry Cell specifically for this new use.

A dry cell gives its maximum service only when designed especially for the work it is intended to perform. There are for dry cells several uses which are so alike that one type of cell serves for all. This is the field covered by the ignition or general purpose dry cell.

The conditions encountered in Radio are different from the conditions grouped together under the term "general purpose." And while the general purpose dry cell performs well as an "A" Battery, it was found possible to produce a Dry Cell "A" Battery capable of delivering more service on Radio loads.

Thirty years of dry cell experience and an immense research organization resulted in the superior Eveready Radio Dry Cell. One of the outstanding features of this special cell is that while it will last much longer when used as an "A" Battery, it is no larger than the standard dry cell.

The increased service life of the Eveready Dry Cell "A" Battery greatly offsets the slight increase in cost; so this battery is not only the best, but it is the most economical you can buy. "The Story of Eveready Dry Cell Radio 'A' Batteries," which tells how to use Dry Cells to the greatest advantage with the various dry cell tubes now available, will be sent to you free on request.

The "A" Battery gives power to your Radio Receiving Set. Eveready Batteries—especially made for Radio—serve better, last longer, give better results.

Note: This is number 2 of a series of informative advertisements which will appear in this magazine. They are designed to help users get the most out of their Batteries and their Radio Sets. If you have any battery problem, write to G. C. Furness, Manager Radio Division, National Carbon Company, Inc., Thompson Avenue and Orton Street, Long Island City, N. Y.



POWER

for Your Radio Set

Eveready Dry Cell
Radio "A" Battery
(No. 7111)

Directions and wiring diagrams on the jacket tell just how to use this battery with the different dry cell tubes.

This special Radio Cell is also available in two and four cell multiple batteries for receiving sets employing from two to four WD-11 or WD-12 tubes.

Other Radio Batteries

Eveready Storage "A" Batteries—best suited for filament heating of all Radio Tubes not especially designed for dry cells. The quality storage battery with the long life plates, \$15 to \$20.

Eveready "B" Batteries—the life of your Radio.

Eveready "Three" Battery—3 cells, 3 purposes.

Manufactured and guaranteed by
NATIONAL CARBON COMPANY, Inc.

EVEREADY

Radio Batteries

—they last longer

Simple Hook-Up Brings in Distance

Tuned Regeneration Is Made by the Variometer

After experimenting with the different hook-ups for some time I have selected the one shown in the illustration to give the best results. I have tested it thoroughly and found it to be a winner. Sum-

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,
123 W. Madison St., Chicago

merit reception of the DX stations WSE, WHAS, WSAI, WCAE, KDKA, WLW, WGY, WBAP and WFAA, show its ability along that line. It combines great selectivity with ease of control, extraordinary signal strength, and low cost due to small number of parts required.

The hook-up may need some explanation, but a little study will show it to be much simpler than it appears at first glance. L-1 is a 60-turn tapped inductance, wound on a tube of such diameter that the rotor of the variometer will turn into it. The coil is tapped every 5 turns starting with the tenth. The variometer should have a wood frame, but otherwise its construction is of no importance providing it is of reliable make. L-1 is fastened close to the side of the variometer so the rotor will act as a tickler feedback. This arrangement provides double regeneration, tuned regeneration being accomplished by the variometer with its rotor also functioning as a feedback to L-1. The variable condenser should not be much larger than an 11 plate and should be vernier equipped; in fact, it would be best to have all the controls so equipped. The value of the constants is not important and those shown are optional.—Newell N. Jones, Griswold, Iowa.

Stranded Aerials

As we all know, stranded wire cables are more efficient than the solid copper wire aerials.

The wind blowing a stranded wire cable causes the strands to grit together and short-circuit themselves upon one another constantly changing the resistance and also capacity of the wire.

If the fan will take the trouble, upon installing a stranded wire aerial, to solder it every 2 feet (a good big drop of solder firmly binding each strand together) his difficulties when tuning a station will be overcome. Stations will not squeal and howl on a critical adjustment so easily, or die down until they are hardly audible.

My aerial is 100 feet of stranded wire stretched between two trees, and I find this method of soldering every 2 feet increases its efficiency on critically adjusted stations 1,000 percent.—A. L. Krauth, Quincy, Ill.

PATENT ATTORNEYS

PATENTS. Booklet free. Highest references. Best results. WATSON E. COLEMAN, Patent Lawyer, 624 F Street, Washington, D. C.

TWO SUPERSENSITIVE CIRCUITS

(Both Copyrighted)

My Highly Improved Rehnartz brings in all important stations on both coasts and Mexican border, loud, clear and without distortion. We dance to music from Atlanta received on one loud Baldwin unit. Build one of these wonderful sets from my blueprints and specifications, price 50c, or with a perfect and complete double wound spiderweb coil, \$3.00 by mail. No other windings used. Photo of my set on a glass panel with every order.

This copyrighted circuit is the most successful of any Rehnartz modification yet produced, and is imitated the most. Thousands are in use.

My W. D. 11 Circuit is especially designed for use with the "Pickle" tube and brings out the full value of that little tube as no other circuit can. Stations 1000 miles away come in clearly on one tube. This set is small, complete, portable. For the man who wishes the highest efficiency, this is the set to build. Price of blueprint and specifications, 50c, or with complete and perfect windings, \$3.00. Photo of set with every order.

Sets built from these plans will receive all broadcasting stations operating under the new laws. Their wave length range is from 170 to 800 meters.

AUXILIARY TUNER

This new instrument connected to your present receiving set with one wire enables you to easily bring in both the long and short wave stations which you cannot get with your present equipment. It also enables you to eliminate that local interference so you may listen to distant stations.

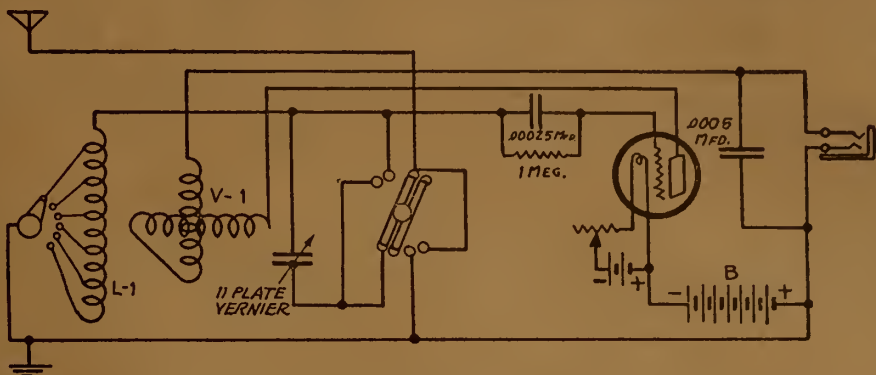
Copyrighted diagram and complete instructions for building and operating this instrument, 50c, or with all parts, including Condenser, Coils, Switches, and Panel, \$3.50. Complete instrument, \$15. All goods prepaid.

These instruments are easy to build, easy to operate. Everything clearly shown.

S. A. TWITCHELL

1925 Western Avenue, Minneapolis, Minn.

SELECTIVITY WITH EASE OF CONTROL



RADIO FOR EVERYBODY

(Continued from page 18)

coils; in fact, a new one seems at this time to be brought out weekly, but the five discussed are distinctive and each is a departure from other previously used methods. Summing up this discussion, then, we are trying to keep inductance high and effective Radio frequency losses low; we try to make coils whose diameter is greater than the length; we keep turns with large differences of potential as far away from each other as possible; we space turns and separate layers; we avoid parallelism.

For the wave lengths used by amateurs and broadcasting stations then, we have five types of coils, four of which are probably of equal efficiency and one of which, the single-layer coil, is easy to wind but of slightly lower efficiency. For the higher wave lengths such as are used by ships, commercial and government stations, there are the three types—bank-wound, Giblin-Remler and duo-lateral honeycomb. For short waves, one uses either honeycomb or Giblin-Remler coils of 25, 35, 50 or 75 turns; for medium wave lengths there are coils of 100, 150, 200, 250, 300, 400 and 500 turns; for wave lengths from 12,000 meters to 21,000 meters there are coils of 750, 1,000, 1,250 and 1,500 turns.

In the second half of this chapter on inductances we will see how coils are combined to form units known as variocouplers, variometers, transformers, etc., and will consider there, also, coils used to handle currents varying in strength at audible frequencies.

(TO BE CONTINUED.)

WE REPAIR All Standard RADIO TUBES

Makes of



- Including
- W.D.11 or W.D.12.....\$3.50
- U.V.200 or C.300.....2.50
- U.V.201 or C.301.....3.00
- U.V.201A or C.301A.....3.50
- U.V.199 or C.299.....3.50
- U.V.202 or C.202.....3.50
- A. & P. or Moorehead Det.....2.75
- A. & P. or Moorehead Amp.....3.00
- D.V.5.....\$3.00 D.V.6A.....3.75

Broken glass shells replaced—No extra charge. Eight Hour Service.

All tubes guaranteed and returned Parcel Post, C. O. D.

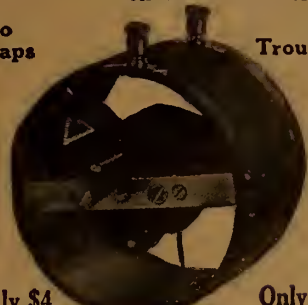
RADIO TUBE REPAIRING CO.
Hudson Terminal Bldg., 30 Church St.
Room 327-E, New York City, N. Y.

Latest Radio Sensation

Has Become Indispensable

3 IN 1 PRIMARY SECONDARY AND CONDENSER

No Taps No Trouble



Only \$4 Only \$4

VERNI-TUNER

(Trade Mark)

Saves Space - Labor - Money

HANDSOME APPEARANCE
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For all regenerative circuits, for Horne Combined Tuned Radio Frequency and Reflex, also Rehnartz, Flewelling, Cockaday, etc.

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At your dealer or postpaid on receipt of purchase price. Write for leaflet.

HORNE ELECTRIC & MFG. CO.

Mercer & Colgate Sts. Jersey City, N. J.

Tubes and Their Care

Amplifier tubes become "soft" with use. This means that they lose their original vacuum, and become less effective as amplifiers. Detectors that are already soft absorb air and lose their natural sensitiveness. But these changes come about gradually. The four contact prongs on the base of the tubes should be brushed occasionally with fine sandpaper. The same effect can be produced by twisting the sockets while they are in position. This movement sweeps the prongs back and forth on the spring clips and wears away any corrosive film present.



ON APPROVAL FOR 30¢
ZOBEL-STEIN LABORATORIES
322 9TH ST. BROOKLYN, N.Y. SOUTH 2650

Ratio of Transformers Used in Amplification

When employing two stages of audio-frequency amplification it is advisable in the first stage to use an amplifying transformer having a high ratio of secondary to primary turns, such as 9 to 1. For the second stage, however, a lower ratio is best suited for satisfactory reception; in this instance the ratio of secondary to primary should be about 4 to 1. The adjustment of a third stage of amplification is so critical that it is not recommended for general use.—Peter J. M. Clute, Schenectady, N. Y.

Coating for Coils

After wire is wound in spider web form, or on tuners, in cylinder shape, a good coating of collodion applied on the wire by painting or dipping will protect the insulation from absorbing moisture, which would cause leakage. Spider web coils should not be dipped in paraffin or painted with shellac, because such covering decreases the efficiency of the set.

MARVEL

AT THE MERCHANDISE AT THE PRICES QUOTED AT THE GUARANTEE

List Price	Our Price
\$18.00 WESTINGHOUSE RECTIGON CHARGER	\$14.63
STORAGE BATTERIES, Guaranteed for 2 Years	
\$17.00 6 V. 60 AMP.	9.25
\$21.00 6 V. 80 AMP.	11.75
ADVANCE B BATTERIES	
\$1.75 22½ V. SMALL	.75
\$3.00 22½ V. LARGE	1.45
\$4.25 45 V. SMALL	2.00
\$5.50 45 V. LARGE	2.90

AERIAL WIRE, 7 Strand	
TINNEO COPPER, 100 FT. COILS	.60
\$6.00 BRANDES SUPERIOR PHONES	5.25
\$5.00 CAMCO GRANO PHONES	4.00
NERCO PHONES	3.00
\$3.00 SOLOERING IRON, GUARANTEED	2.50
\$30.00 MUSIC MASTER LOUD SPEAKER, GENUINE	27.00

FREE with every purchase of \$10.00 and over, a small 22½ volt B Battery. Merchandise absolutely guaranteed by manufacturers. Remittance must include postage. Send for free monthly price list.

MARVEL RADIO SPECIALTY CO.
132 Nassau Street, Dept. R. D., NEW YORK

Announcement

TURNEY'S FAMOUS Spider Web Plex Tuner

is now available for mounting in the cabinet with two Dial Vernier control on the panel.

Three genuine Turney Spider Web Coils with

their wonderful tuning value in absolutely practical shape
**ELIMINATES VARIOCOUPLER AND VARIOMETER
CLOSEST APPROACH TO ZERO TUNING
EXTREME SELECTIVITY
COVERS ALL BROADCASTING WAVE LENGTHS**

Spider Web Coils have the approval of EVERY RADIO ENGINEER, U. S. Bureau of Lighthouses, Millions of Radio Fans, Every Magazine Published.

\$6.00

Stand 25c extra

Packed with 4 Hookups—3 for Tube and 1 for Crystal Sets

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Walter I. Ferguson & Co.,
208 Baltimore Bldg.,
Kansas City, Mo.

J. H. Lyte
65 North 63d St.,
Philadelphia, Pa.

C. L. S. Holmes Co.,
601 Boston Block,
Minneapolis, Minn.

Questions and Answers

Feature Circuits

(4913) OAG, Mechanicsville, N. Y.

I think you will admire my frank statement that lately I find nothing in your paper. What is the matter?

I have taken practically every single issue of your paper since you started publishing, and have liked it very much, and have preserved these copies for future

who find great interest and service in those circuits which to the more advanced and experienced are classed as "passé."

However that may be, Radio Digest in the intent to be truly helpful and worthy of the confidence of its readers has no disposition to impose upon them untried and unproven "new circuits." It is, in gen-

tion of trade sets and apparatus it is not our policy to elaborate. We do not consider such within the spirit of our service. It does not to Radio Digest seem ethical in view of the heavy advertising campaign entailed in placing an article on the market that it should encroach upon the legitimate rights of the manufacturer. There is not the least animus in us in this matter and we are after all confident that we do continue to merit your interest.

is a decided drop in the effectiveness of the set. Would not recommend it.

The Hazeltine Neurodyne principle may be applied to any circuit but it is of doubtful advantage to the Reinartz.

Loud Speakers

(4798) T.J., Estewau, Sask., Canada.

I am putting on a stage of audio frequency and would like a little information.

Can I operate a loud speaker 4,000 ohms resistance on a one stage circuit, or will a 1,500 ohms be enough to operate my set satisfactorily?

A.—Answering your inquiry we are advising that a loud speaker of either 4,000 or 1,500 ohms will operate on a one stage circuit, although the latter will afford the greater volume. It is, however, found necessary usually to use two stages for best results.

The Questions and Answers department is purely a service department and the publishers would like to have your assistance in helping to keep it up to the highest standard; therefore when asking questions please make out your queries on a separate piece of paper and write on one side only. Do not mix your questions with other material; write that on a separate piece of paper. Each one must go to a different department. Then, too, we have so many who fail to put their name and address on each sheet. Please remember this when you write your letters, and also to enclose a stamped self-addressed envelope. Unsigned letters are not answered. The Radio Digest does not consider it good business ethics to furnish hook-up diagrams of any standard manufactured receiving sets.

reference, but since you finished up with Flewelling, you haven't anything of any value in the hook-up line. How come?

I take every Radio weekly, and monthly publication on the market, and until lately have enjoyed yours as well as any, but not lately, so spruce up. I prefer now to any.

I take —, and can get more value out of their paper than out of yours, and that should not be.

Why don't you give us a write up complete, constants and all of the Grebe CR-12, the Sleeper Monotrol, the Melco Supreme with the Telos Variotransformers, and such stuff of some value. The regenerative 1, 2 and 3 circuits are passé now that we are developing into 6 and 8 tube sets, and would appreciate some good tuned Radio frequency hook-ups.

Grimes inverse duplex is interesting, too, in preference to the ordinary reflex, but what we are all most interested in is the Grebe CR-12 as divulged by the —. I happened to miss a couple of the series and am out of luck and shall depend on Radio Digest to do something for us in that respect. Push-pull amplifiers with the — matched split transformers is good stuff, too; let's hear something on these developments.

A.—That you find "nothing" in our publication is a broad statement. We do admire your frank assertion of what you may consider to be a truth. We like constructive criticism. However, we are certain that your expression is individual and not in accord with the general testimony from our readers.

In your demand for the more complicated circuits you must not forget that Radio Digest has not ceased to cater to a constantly increasing number of readers

eral, our purpose not to make public through our service any circuit which will not bear favorable comparison with the standard American receiver. When a new circuit can take the same number of tubes and show equal results, we consider that it is then time to proceed to investigate it further. Miracles do not happen overnight. And the science of Radio reception is not revolutionized in a day. The miracle, after all is said and done, is the patience of any service which is willing to bear upon its surface the nonsense of believing so.

Too much is being published at the present time for the sole purpose of advancing particular manufacturing interests. This is not our policy; we strive to be impartial.

Further, in the matter of detail descrip-

HAVE YOU SEARCHED FOR

- Aerials Sr. Style Tuner Unit, 150-600 Meters
 - Hi-Power Transformer with Split Tapped Winding Neutralizing and Tuned R. F. Cir. Transformers
 - Reinartz Coils "New Static Reduced Winding"
 - Resonance Wave Coils for Static Elimination
 - Wavemeter and Wave Trap, Combined 150-600 Meter
 - Edison (Signal Corps) Batteries and Elements
 - New "Handy" Chargers for Any Voltage Battery
 - 30 Henry Power Amplifier Chokes with 4 Valves
 - Hi-Power Transformer with Variable Ratio
 - "B" Bat. Protectors, Prevent Filament Burnout
 - "B" Battery Voltmeters, 0-50 Volts
 - Nathaniel Baldwin New Loud Speakers and Phones
 - 200-300-400-600-800 Ohm Potentiometers
 - 6-10-30-50 Ohm and "Universal" Rheostats
 - Rheostat and Potentiometer Resistance Windings
 - Bishop "Phantom Super" Tuner Units
 - Variable Condenser Plate Cleaner
 - Liquid Copper for Shielding Panels
 - Quality Precision Var. Grid Leak, 0-10 Meg's
 - Rosin Core Solder (Never Use Acid or Paste)
 - Hi-Quality Mica Fixed Condensers, Best Made
 - Outfits of Parts for Any Circuit You Desire
- SEND FOR NEW DEALERS' LIST
QUALITY RADIO SHOP, Richmond, Ind.

Reinartz Coils

(4743) CHM, Jackson, Mich.

Will you be so kind as to answer the following questions—would there be any advantage in winding the primary and grid circuit of a Reinartz coil on a separate spider web coil from the plate circuit and arrange them so that the coupling could be loosened or closed (as they do with honeycomb coils)? Would it be any advantage to wind all three circuits on separate coils?

Can the Hazeltine Neurodyne Radio frequency be applied to the Reinartz circuit?

A.—While greater selectivity may be obtained in the method you suggest there

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I enclose One Dollar. Please send me —postpaid—the 514-page I. C. S. Radio Handbook. It is understood that if I am not entirely satisfied I may return this book within five days and you will refund my money.

Name.....
Address.....



ALWAYS on the red hot spot and ready for use—without adjusting.

Approved by Jack Binns

Radio Editor N. Y. Tribune

Radio News says, "We found this detector very sensitive and also found that it holds its adjustments."

For Sale at All Reliable Dealers or Direct \$2.00

Ask Your Dealer for Booklet with New Reflex Hookups

RANDEL WIRELESS CO.

8 Central Avenue, Newark, N. J.

IF YOU CAN'T BUY THEM AT YOUR DEALER'S SEND DIRECT TO US

"Red-Heads" are guaranteed radio phones. You run no risk when you buy them. Money back if, after 7 days' trial, you're not satisfied that they're the best receivers on the market at the price. Why not act right now and get a pair? It'll mean getting the maximum from broadcasting from the day you put them into use.

RED-HEAD RADIO RECEIVERS

These remarkable head-sets are made by The Newman-Stern Co., one of the pioneer radio manufacturing houses in America.

JUST OUT

The new 1924 Model F

\$6.50 PER PAIR Complete

This is the standard 3,000 ohm "Red-Head." The 1924 Model F has eleven improved features. Sensitive and fine-toned; aluminum case; famous brown-red ear caps; military headband; high-grade cord.

"Red-Heads" sent prepaid on receipt of price if you are unable to get them at your dealer's.
THE NEWMAN-STERN COMPANY
Dept. RD Newman-Stern Bldg. Cleveland

The new 1924 "Red-Head" Jr.

\$5.00 PER PAIR Complete

The Junior Model has most of the quality features of the standard Model F here described. The resistance is 2,000 ohms per set instead of 3,000 ohms. A remarkable value.



Unequaled Clearness Thru a New Magnetic Principle of Construction

Distant and local broadcasting reproduced without distortion. Endorsed by Radio Experts—Lieut. Commander Reason, U. S. Navy says: "I use your headset in preference to others in experimental work."

Trial Offer If your dealer is out of "Repeaters" send \$5.00 and dealer's name for complete set subject to refund in full within 10 days if not perfectly satisfactory.

Moss-Schury Mfg. Co., Inc.

Radio Division
2011-2015 Franklin Street, Detroit, U. S. A.
Manufacturers of precision electrical devices

PERFECTION

MAKE PERFECTION YOUR SELECTION

2-Step Amplifier

Will operate a loud speaker on any set. Will increase range and distance of set and will produce volume without distortion.

- 1 Formica Panel 7x10
 - 2 Transformers—you can select Franco, All American—Marlee—Thordarson—W. D. J2 or Eria Audio or Radio Transformers
 - 2 Cutler Hammer or Klossner Rheostats
 - 2 Bakelite Sockets
 - 3 Acme Jacks
 - 6 Hard Rubber Binding Posts
 - 10 ft. Tinned Copper Wire No. 14
- Complete for \$12.25
Parts for \$12.25

Will make a real power Amplifier and give same volume of any power amplifier made. All above parts with a pair of Como Push Pull Duplex Transformers. \$22.75

If you want an Amplifier ready made then order our Type F 500 completely mounted, 2-step Amplifier ready to use. Specially priced at \$11.00

Guaranteed to give excellent results.

CROSLEY Model X

Hit of the Radio World \$55



A4 tube Radio Frequency Set.

Crosley sets are superior in workmanship and results. They bring in distant stations on a loud speaker under any or all conditions. Every set sold on an absolute money back guarantee. If you are not entirely satisfied after a week's trial then return at our expense and your money will be refunded. All sets sent express paid.

CROSLEY MODELS

- Model X Tuned Radio Frequency 4 tube Set... \$55
- Model XJ Tuned Radio Frequency 4 tube Set... 65
- Model 3B Regenerative 3 tube Set... 50
- Model V Regenerating 1 tube Set... 19
- Crosley 2 step Amplifier... 18

Write for special combination price with tubes, batteries and loud speaker.

REINARTZ

We have complete parts for new Reinartz circuit as approved by Mr. John L. Reinartz and featuring the new approved Reinartz Coil. This new Reinartz circuit is supreme for distance and volume.

Price for complete parts including drilled Bakelite Panel \$25.00

Neurodyne 5 TUBE SET

The Neurodyne Circuit is the last word in Radio and is the best set that can be made today.

- Drilled Formica Panel 7x24x3/16
 - 5 Bakelite Sockets
 - 3 Neuroformers
 - 2 Neurodons
 - 2 Franco Audio Transformers
 - 1 "A" Battery Switch
 - 3 Dials, 4 inch
 - 1 Klossner Rheostat
 - 1 Amco Power Rheostat
 - 3 Binding Posts with Names
 - 3 Jacks
 - 27 Feet Spaghetti
 - 23 Feet No. 14 Tinned Copper Wire
 - 2 Condensers, .006 Dubilier
 - 1 Grid Leak and Condenser. Freshman
 - 1 Dubilier Condenser, .002
- Special price for complete parts for 5 tube set

\$32.50

PERFECTION RADIO CORP.

Mail Order Dept. 59 Cortland St., New York City Add Parcel Post Do Not Send Stamps

N. Y. RETAIL STORES
78 Cortland St. 119 West 23rd St. 128 Chambers 368 Livingston St., Brooklyn
208 page complete Radio catalogue free with order of \$5.00 on request. Otherwise prepaid for 25 cents

Radio Illustrated



Here is one New Yorker who didn't care a rap whether the news printers were striking or not. She is Margie Ford, and with her "Radiolette" on a park bench she got as much news and entertainment out of the invisible word as from the printed
Keystone Photo

The Radio room and Operator P. N. Ritter of the "Radio Doctor Ship," otherwise U. S. S. President Polk. She has gained that sobriquet by sending much medical advice to sister vessels in her trans-Atlantic service. She has a powerful outfit
Fotograms Photo



This girl can listen to her beau's sweet nonsense at her desk. He has made her a "private line" airphone and the typewriter is the aerial
Swastika Photo
Daddy told the kids (below) there were birds in the Radio set—and see what followed! Leo and Heien Eismann are the "investigators" with Dolly bossing the job. Question: What'll father do? K. & H. Photo

