

JAN 30 1925
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How to Make New Push Pull Resistance Coupled Amplifier; Story of WNAC;
Instructions for Operating Hetduogen Set; Winding Low Loss Inductances

Radio Digest

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

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

Vol. XII

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By Radio Digest Publishing Co.

SATURDAY, JANUARY 31, 1925

No. 4

NO FADING IN NEW SET

MC CORMACK SONGS HELP RECORD SALES

BUSINESS PICKUP ASSURED
BY VICTOR COMPANY

Famous Irish Tenor Satisfied with Results—Madame Bori Also Flattered by Response

NEW YORK.—Direct evidence that the McCormack-Bori broadcast on New Year's night caused a tremendous increase in the sales of Victor records, especially those of John McCormack, comes in the form of an announcement by the Victor Talking Machine company.

While no official figures have as yet been compiled, the recording company is happy in the very encouraging results of the broadcasting experiments and will continue indefinitely with the semi-monthly concert.

One of the leading retail music shops here reported a large increase in the sale of records by both Victor artists. Particularly noticeable was the increased popularity of "All Alone," a McCormack record which had sold poorly since listening in became popular and until the New Year's Radio concert.

(Continued on page 7)



ACCOMPLISH NON-CARRIER BROADCASTS

Room for More Stations

H. A. Brown and C. A. Keener
Perfect New Transmission System Giving Improved Radio

CHAMPAIGN, Ill. — Broadcasting without the use of a carrier wave has been accomplished at Station WRM of the University of Illinois in this city. By eliminating the carrier wave, the men responsible for the development of this system claim that all traces of fading are abolished.

The non-carrier system was perfected in the university laboratories by Hugh A. (Continued on page 2)



Left, Polly Willis, incomparable soprano and KYW, Chicago, entertainer. Above, Aline Beshinska, soprano, who is heard with great regularity from Station WEAR, Cleveland. Right, Phyllis Haver, Mack Sennett star, recently heard from Station WOR, Newark.

CONTEST RECEIVERS NOW BEING TESTED

FORTY-NINE SETS WAITING JUDGES' DECISION

Many Manufacturers Have Requested Opportunity to Inspect Sets Submitted—Winners Notified Soon

The Gold Award Set contest is now closed—receivers of all kinds and sizes are lined up for inspection—the judges are studying diagrams and letters. Few contests of interest to the Radio fraternity have created the interest that did this one. Many letters, accompanied by diagrams, came in with the request for an opinion as to whether the idea was worth submitting in set form.

Some of the writers were asked to refrain from going to the expense of sending their sets as nothing seemed to be embodied in their outfits. Others were advised to try for a patent on their apparatus before giving it to the Radio field. Still others wanted more money for divulging their developments and suggested a conference to settle a price. Those that had something that seemed to contain improvements were wired to send their sets immediately.

Forty-nine Receivers on Trial

Forty-nine receivers are therefore awaiting trial. Missouri, Kansas, New Jersey, Tennessee, Virginia, Montreal, Quebec, Pennsylvania—in fact, nearly every state in the Union and province of Canada—are represented in the collection. Whether anything that will warrant the attention of Radio engineers is among the ideas submitted, remains to be seen. If, somewhere between Alaska and the Canal Zone, there is a new departure in Radio receivers by an amateur, Radio Digest has done its best to bring it out.

There have been requests from manufacturers for an opportunity to inspect the sets now in. This matter now awaits decision by the owners of this publication. In all probability representatives from these concerns will be invited to a demonstration of sets at which time all sets can be seen at once by all.

It is hoped that winners can be announced next week. Receivers are complicated, and testing them fairly, under varying conditions, takes time. Winners will, however, be notified by wire when a decision is reached.

NO FADING IN NEW SET

(Continued from page 1)

Brown and C. A. Keener, and by its use, it is asserted, much transmitter noise is done away with and the sharpness of tuning by the receiver is increased.

When Mr. Brown and Mr. Keener first started working on the experiments which led to their non-carrier wave system, they were aware that other investigations had been carried on along similar lines but most of these had been devised for small power outfits. None of the systems were of the exact nature of the University of Illinois arrangement.

These two men simply set about trying out several different methods, first this one and then that, and finally concluded in their own minds what they considered the best and then settled on that. Since that time all their work has been towards the perfection and development of the idea they adopted.

Work Started Year and a Half Ago

Experimental work on the non-carrier system in the university laboratories was started by Mr. Brown about a year and a half ago, in conjunction with Professor Kneipp. It suggested itself when Mr. Brown and Mr. Keener—who later took up the work—were working on a comparison of various modern systems of modulation. The thing suggested itself on account of the large amount of unmodulated energy in all the conventional systems, that is, the amount of lost or wasted energy that was noticed in other systems which wasn't doing any work, but was causing interference with other stations.

Tests made show that it is possible to check the theoretical ratio of power required for the non-carrier system to that required for the carrier system, for the same intensity of signal at a distant receiver.

It was found, for instance, in tests over a considerable distance, that about one-third the power needed for a given signal using constant current modulation was necessary for the same signal strength using the non-carrier system.

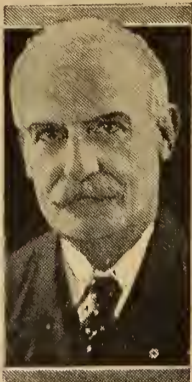
Carrier Produces Interference

In the constant current system of modulation now in general use in broadcasting work, the practical limit of modulation is reached before the carrier wave is completely modulated, and consequently a listener may pick up the carrier or the carrier may produce interference even though the program may be audible. With the non-carrier system the program may be heard if the station can be heard at all. In other words, if your receiver can reach the station, the program can be heard.

In this regard it may be said that the

DR. F. H. VIZETELLY HELPS VOCABULARY

"A WORD a day" is Dr. Vizetelly's idea of increasing the vocabulary of the Radiophans. Station WJZ is the proud dispatcher of this stimulating educational feature, and Dr. Vizetelly has many hundreds of thousands of days ahead of him with his inexhaustible supply of words.



Dr. F. H. Vizetelly

Another feature that Dr. Vizetelly finds very valuable as an education dispenser is the WOR feature—25-minute talks on the origin of the English language.

"There is only one grievance I nurse against the 25-minute talk," said Dr. Vizetelly. "Not enough time. I want to hold my audience, magnetize them. In order to do this, I've got to make my talks interesting. Let me tell you, it is a very difficult thing to do in so short a time. My mail response has been very flattering, however, and I intend to continue with these talks as long as possible."

tuning will be much sharper, and fading eliminated. Fading, according to the developers of the idea, can be traced directly to the carrier wave.

The additional selectivity of this new type of transmission might permit a closer spacing of stations in the broadcasting band without introducing additional heterodyning on account of the greater selectivity or sharpness of tuning possible with the receivers when the non-carrier system is used. However, no positive statement to this effect would be made by either Mr. Brown or Mr. Keener.

WENDELL HALL NOW ON WAY TO LONDON

HAVANA, Cuba. — Wendell Hall, "Red Headed Music Maker," and his wife are here now on their honeymoon tour. They have just completed their trip around the United States and to Hawaii, and will go to London next. The man who made "It Ain't Gonna Rain No Mo'," famous extends his best wishes for the New Year to all of his many friends.

Detroit News Replaces Its Luncheon Musical Program

DETROIT.—The Detroit News station, WWJ, is again broadcasting a luncheon musical program. This was dropped about a year ago, but owing to the many requests from the Radio audience of Detroit, it had to be placed on the schedule again.

The orchestra consists of five pieces. The News now employs three orchestras—Jean Goldkette's Victor recording orchestra, considered as one of the leading orchestras in the Middle West; The Detroit News orchestra, composed of members of the symphony orchestra, and the one named above. WWJ broadcasts on 516 meters.

Burr McIntosh at WAAM

NEWARK, N. J.—Burr McIntosh, the cheerful philosopher, whose voice and splendid stories have won for him a high regard from the Radio audience, is booked for an indefinite period at the I. R. Nelson company station here. Beginning January 9 at 9 o'clock Eastern time, he was on the air for forty-five minutes. He will continue to be on over WAAM every Friday evening at the same hour.

When search was being made for entombed men in the Killan colliery, Wales, Senatore Marconi foretold that the day would come when permanently adjusted sets would enable miners to let searchers know exactly where they were.

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Looking Ahead

Another Series for Newcomers in Radio will start in the next issue. Edward T. Jones will start with the simpler apparatus and circuits, and take the beginner week by week to the long range, strong volume multi-tube outfits. The advice of one of the "old timers" is always worth getting, so fans, both novice and advanced should read this series carefully.

More Detailed Information on the Radio-Theater Controversy. With the numerous artists taking the stand pro and con, this little war may mean the ultimate decision as to whether or not plays may be broadcast. The English producers are now having the same trouble across the Atlantic. Next week we will give the information from both "fronts."

The Do's and Don'ts of Home Construction are gone into in detail by W. S. Standiford. There are so many things that the home builder can do wrong, which are hard to find later, that suggestions by Mr. Standiford should be remembered. The manufacturer can give you high quality parts, but the construction depends on you.

The Knox Reflex Utilizes Plate Tuning and Reverse Feedback, which makes it one of the most selective long range "two tubers" that reflex adherents have yet known. W. H. Knox, the designer, lives in Los Angeles, where conditions are exceptionally trying, and a set that will give one "what you want when you want it" out there, is worth building.

Newsstands Don't Always Have One Left

WHEN YOU WANT

Radio Digest

YOU WANT IT!

BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW

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

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"The Trouble Stoppers"

That is what many radiophans have nicknamed their Meco Tubes. The name gives its own reason. Trouble started. Batteries were tested or changed. New extras were introduced. All to no avail.

Then they standardized on Meco Tubes. The trouble stopped.

A radical improvement in the construction of Meco Tubes gives greater volume without impairing its clear, distinct receptive tone.

All genuine Meco Tubes have Meco stamped on the base.

Look for it. Your dealer has them in both 3 and 5 volt sizes or can get Meco Tubes for you from recognized radio jobbers.

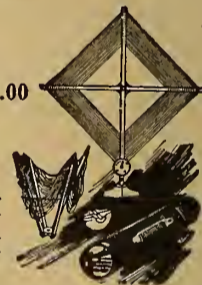
Metropolitan Electric Co. Des Moines, Iowa



Four Point Tapped Loop \$8.00

Center-tapped Loop \$6.50

If your dealer cannot supply you, order direct giving your dealer's name.



Electrically and Mechanically the finest loop ever designed

RADIO engineers designed Lincoln Collapsible Loop Aerials. That is the reason for their remarkable efficiency. They are electrically and mechanically correct. They combine with greater selectivity—volume—and clearness of reception—a graceful beauty which is the result of painstaking manufacturing.

The center-tapped loop can be used on any sets employing radio frequency amplification—particularly fine for use with certain super-heterodynes requiring a center-tap. The 4-point tapped-loop—for any circuit where it is desired to vary the inductance of the loop—most super-heterodynes—neutrodyne receivers where outside aerial is impractical.

A better loop—for less money Lincoln Loops cost less—and do more. Volume production—engineering efficiency—are the reasons. Fully guaranteed—sold by leading dealers.

Write for catalog Send your name and dealer's name for copy of the Lincoln Catalog fully describing Lincoln Radio products.

To Jobbers and Dealers

Lincoln Radio Products are sold only through the legitimate trade. Dealers please write us for the name of the nearest Lincoln jobbers. We will be glad to send our sales' proposition to jobbers.

Lincoln Radio Corporation 224 North Wells St. CHICAGO

NEGRO REVIVAL CAN BE HEARD VIA WBAP

ENTIRE CEREMONY WILL BE BROADCAST

Whole Scale of Human Emotions to Be Run While Awaiting Coming of Holy Ghost

FT. WORTH, Texas.—Did you ever attend a "nigger camp-meeting?" More than likely if your home is way down in Dixie, you have witnessed one of these events in the church life of certain sects of the picturesque colored folk of the sunny South. Just dial WBAP, the Star-Telegram station at midnight, Central time, on Wednesday, February 4, and hear the entire services of the Holiness Church of God in Christ (negro), broadcast direct from the church on the outskirts of the city of Fort Worth.

A short time ago, WBAP broadcast a sermon from a negro church and Radio-phans who had never before heard the characteristic singing and fervent "amens" sent generous applause and requested WBAP to again put the church services on the air.

Expect One Thousand Negroes Present
Worship will commence with approximately one thousand negroes present, many of whom come from great distances and at great personal sacrifices. This number is expected to be greatly decreased by 4 a. m., at which time possibly only four hundred worshippers will be present, the rest having become exhausted and carried out, "under the power of the Spirit."

The Hired Hand will forego his duties in the boiler room and will be in attendance as announcer. Overlooking no detail, WBAP has made provision for a second announcer to be present, as it is expected that the Hired Hand will "get religion" before many hours have elapsed. W. E. Branch will be on hand to make announcements when the popular announcer of WBAP "falls under the power of the Spirit" and is carried out.

To Broadcast Entire Service
The entire ceremonials will be broadcast. And while visual communication by Radio is not yet a possibility, listeners may hear the reverent shouting, sermons delivered as they never heard before, chantings, orchestra music, groanings, vociferous hand-clappings and songs of praise—outbursts of fervid worshippers in their emotional religion.

The whole scale of human emotions is run while the coming of the Holy Ghost is awaited. His coming—or rather the feeling of His presence—is the sign for lusty paens; songs of triumph straight from the hearts of the worshippers. Under the influence of His power, manifestations are made known by the resonant shouting of the cleansed. Collections are taken up under the watchful eye of the deacons, and to the accompaniment of hand-clapping.

Canary, "Radio Joy," Wins Prize on Coast

Gets Practice Listening to Artists at Station KHJ

LOS ANGELES.—Who now can gainsay the fact that Radio is educating all of us to a better appreciation of fine music? Many listeners in have appreciated the fact that "Uncle John" at KHJ occasionally stops a program in the middle in order to allow one or more of the triumvirate of canaries, Radio Kindness, Radio Happiness, Radio Joy, to render solos, duets and trios as only well-trained canaries can sing.

Radio Joy, one of the birds, was entered in competition with a brilliant field at the Annual Los Angeles Roller show and received a special prize for an extraordinary fine exhibition of singing what is known as the "water roll."

SHENANDOAH CREW HEARS SHENANDOAH

SHENANDOAH, Ia.—It's a case of Shenandoah listening to Shenandoah when Aviation Chief Machinist Walter Johnson, of the giant dirigible U. S. S. Shenandoah, tunes in KFNF of this city. Mr. Johnson has written the Henry Field Seed company station from Lakehurst, N. J., naval air station that he listens in regularly to the broadcasts from Shenandoah.

MADAME ALDA MAKES BROADCASTING DEBUT

Heard from WEAJ on Victor Talking Machine Program

NEW YORK.—The Radio public had its introduction to another of the world's famous operatic stars, January 15, when Madame Frances Alda, prima donna of the Metropolitan opera, appeared before the microphone for the first time in her career. Madame Alda's recital, given under the auspices of the Victor Talking Machine company, was broadcast from the studio of WEAJ, New York, and relayed by telephone lines through seven other stations, WCAP, WJAR, WFI, WDBH, WGR, WCAE and WEEL.

The practice of sending reproductions of autographed photographs of the principals of the recitals to those who wrote in would be continued, it was stated, and it was announced that reproductions of Madame Alda's autographed photo would be sent upon request to the listeners in.

The recital included selections by Frank La Forge, pianist; the Victor Concert orchestra, Rosario Bourdon, conducting, and the Florentine quartet.

Victor officials say letters are still coming into the office praising the McCormack-Bori broadcasting and that nearly 60,000 such communications have been received by the company and the two artists.

WSB Organist Honored by Fan; Boy Named After Him

ATLANTA.—Dr. Charles A. Sheldon, Atlantic City organist, whose regular Thursday night organ recitals relayed by WSB from the First Presbyterian church are one of the Journal's most popular attractions, was recently accorded a unique honor by a family of his admirers. A letter from Mr. and Mrs. Carey N. Shearer, of Alapaha, Ga., tells Dr. Sheldon that they have a new Radiow! in their home and in appreciation of Dr. Sheldon's music have named him Charles Sheldon Shearer. This is the first time any member outside WSB's staff has been so honored.

RADIO SUPPLIES ARE LISTED AS "SCOTCH"

BUFFALO, N. Y.—Here are a bunch of wild waves! One of those cases where they said it with "Scotch." Cases is right. Federal dry agents in Buffalo recently seized thirty-six cases of Scotch whiskey, so-labeled, at the American Express company's warehouse. It came from Newark, N. J., and was consigned under the billing of "Radio Supplies" and "Dry Goods."

High Prices Secret of Theater Failures

Boston Showman Lauds Radio and Criticises Shows

BOSTON, MASS.—"The American theater will be saved, and Radio and the motion picture are working for its preservation."

Thus speaks E. E. Clive, manager of the Copley theater, at a time when managers are sitting in conclave, in despair over the meagre houses New York successes are experiencing on tour, as well as over the great list of productions Broadway has failed to support this season.

"Lower prices and crowded theaters; that's the answer," says Mr. Clive, "The fault is not with the people; it is with the managers. The majority of our professional classes cannot afford to pay \$5.50 for two seats, and the result is they stay away. (In New York the average price for a good seat has been \$5 per head.)

"They are blaming Radio for the poor attendance on New Year's night at the New York theaters. But why not blame the high prices, too? Radio is no menace to the theater. It is the high prices."

Station KSAC Puts College Into 9,000 Rural Schools

MANHATTAN, Kans.—Opening exercises by Radio for the 9,000 rural country schools in Kansas and a rural Radio Sunday service for the hundreds of communities without pastors are two innovations in Radio activity to be introduced by the extension service of the Kansas State Agricultural college, Sunday, February 1.

An unrivalled popularity for service is the mark of distinction accorded Station KSAC, judging the barometer of public opinion as expressed by a deluge of congratulatory communications received since its dedication December 1.

The British Radio association has instituted a fellowship for the members showing during the year the greatest technical knowledge of the science of Radio.

JOHN GOLDEN SEES RADIO AS SHOW AID

NOTED PRODUCER WRITES ABOUT BROADCASTING

Says He Will Treat New Art of Communication as Useful Ally to Theater

By John Golden

RADIO is not hurting the theater. Instead of opposing Radio, it is my intention to try to find a way to utilize this new power for the benefit of the theater. I made these two statements in a newspaper interview



John Golden

a week or more ago. They seemed commonplace enough, but the response has been electrifying. And still I do not understand WHY people should marvel that Radio has NOT hurt the theater or that I am doing something revolutionary in trying to harness this new force for the benefit of the profession in which I happen to be interested.

It is my candid opinion that Radio does not hurt the theater as much as a rainy night, for instance, or for that matter, petting parties, cross-word puzzles, the cook's night out and the crowded subways. Possibly Radio keeps a few persons away from the theater. But so also do these other things I have mentioned. If your show is not doing business and you are looking for an excuse—cuss the Radio!

Sees Radio as Benefit

On the other hand, why should I not use Radio for the BENEFIT of the theater? In the first instance, Radio is not essentially a means of entertainment, but a means of communication. We must remember that the present free broadcasting may not continue always—in all probability it will not. But Radio, conceived as a means of communication, is here to stay. So the theater manager, who heretofore has reached his audiences solely by the mails and by the printed page, now has another means of communication. There is a reading public and a Radio public, so dramatic reviewers for the broadcasting stations (around New York, at least) will be on my first night lists in the same manner as the reviewers for the newspapers.

It is my present belief that the American theater public is much larger than even we theatrical people imagine. I think the Radio audiences will be deeply interested in the personalities of the theater, the news of the theater, the legends and lore of the theater and even the technique of the theater when they are put on the air.

I am not so certain they will be so deeply interested in the broadcasting of plays. It is the actual physical presence which will always guarantee the existence of the spoken drama. Everyone thought the motion picture, twenty years ago, meant the doom of the spoken drama. But it didn't. The theatrical public is bigger than ever before, and the movies have helped. So Radio is the biggest potential aid to the theater. Instead of attempting to block progress by opposing Radio, I am going to let it help my plays.

Coal Miners Hear Program

MINNEAPOLIS.—Two hundred twenty-five feet below the surface of the earth, coal miners at Lincoln, Ill., recently heard the Gold Medal station, Saint Paul-Minneapolis, WCCO.

PENN STATE THESPIANS ON AIR



"Wooden Shoes," given by the Penn State college Thespians, was broadcast recently by WDAR—and is scheduled to be broadcast from five or six more eastern stations. The famous organization is made up entirely of men. The play may be presented during Easter week at KDKA. Right, "Martha Berry" in the play is really H. A. Pisey—a male student. Below, J. E. Kennedy in a sailor hat, Dutch chorus and C. E. Megargle.



THEATER MANAGERS ALARMED AT RADIO

BLAME NEW SCIENCE FOR
HURTING BOX OFFICE

Madge Kennedy Anticipates Change in
Theatricals Toward Psychological
Element—Makes Radio Debut

NEW YORK.—Theatrical producers are alarmed at the position Radio has taken in the amusement field. Certain producers here blame the failures of this season on Radio, while it is a definitely ascertained fact that several good shows died on the road this year for this reason, the road refusing to accept even a Barrymore.

A leading Radio man has estimated the Radio audiences in New York city alone as more than a million. This represents very nearly the capacity attendance of the leading Broadway movie houses and theaters, and managers of these houses while refusing to comment upon the situation admit that Radio does affect the box office considerably.

With improvement in Radio programs, represented especially in the appearance before the microphone New Year's night of John McCormack and Lucrezia Bori from WEA, Radio seriously threatens to encroach upon the solid position the theater has held. One of those who expresses a frank opinion in the matter is Miss Madge Kennedy, stage and screen star, who is at present co-starring with Gregory Kelly in "Badges" on Broadway. She anticipates a change in theatricals toward the psychological element.

Miss Kennedy will make her Radio debut Saturday, January 31, at 7:00 p. m., Eastern standard time, from WEA. At that time, she will sing a group of songs, including the Viennese waltz.

Chickering Piano Program at WOR

Famous Pianists Play Recitals at Newark
Station—One Given Each
Wednesday

NEWARK, N. J.—The deferred concert program in the "Chickering Artists Series," which is the first of a stellar group of famed musicians who will broadcast through WOR, was given Wednesday evening, January 21. The series promises to develop into one of the outstanding events of broadcasting.

Extensive plans are at the point of completion by the WOR management working in collaboration with the Chickering firm, which will provide the Radio audience with the highest grade musical talent as a regular feature of the Wednesday evening programs. The broadcasting is done from the Chickering hall studio of WOR.

No definite announcement of the names of the participating artists has come from WOR, but a statement is made to the effect that "the quality of the material to be sent over the air has never been excelled."

Ft. Worth Rotary Club Is Host at Big Celebration

FT. WORTH, Texas.—Fans throughout the country heard the special Rotary club program broadcast from Station WBAP on January 6. The program included music, monologue, dialogue and entertainment typical of the popular Rotarians.

Amon G. Carter, president and publisher of the Fort Worth Star-Telegram, was acting as chief announcer.

A. C. Farmer, local manager of the Western Union, wired every Western Union Rotarian in the United States previously about the program. These men in turn passed the good word along to their cities in the manner of true Rotarians. That many of the clubs listened in "100 per cent" was the natural result.

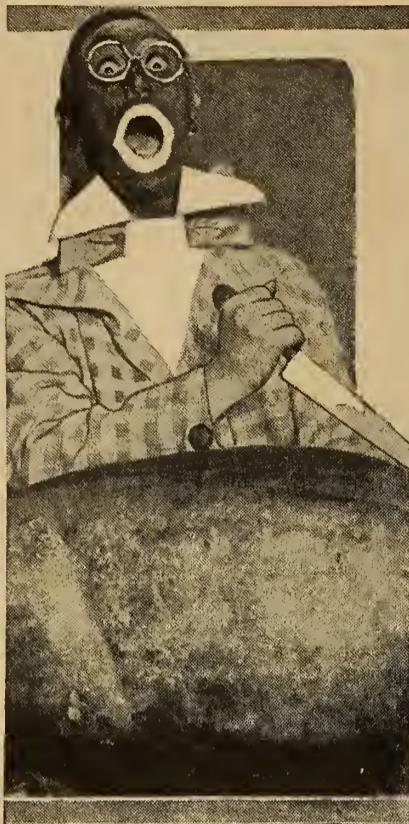
WBAP was deluged with telegrams and messages during and following the program.

Movie Criticism Popular

NEW YORK.—Where to see the best pictures in town and what makes them worth seeing is embodied in the weekly advice to movie fans broadcast every Wednesday afternoon and evening from Station WHN here.

Judging from the mail received from listeners in, this service is proving very satisfactory to the countless number of people who are anxious to follow up the screen output. Movie gossip from the coast about the leading stars and players in the picture world is also included in the WHN talk.

UNCLE REMUS GIVES RADIOPHANS TREAT



AT ONE time or another there have probably been hundreds of Uncle Remus impersonators traveling about the country since the original Brer Rabbit stories came into being, but so far as California is concerned, and particularly so far as California's listening public is concerned, there is one, and only one Uncle Remus.

Say "Uncle Remus" to a Los Angeles Radiophan and he will probably shout back, "KHJ!" Likewise, mention KHJ to the same bug and he will think at once of Uncle John, peerless announcer of that station, and in the next instant of Uncle Remus, for it is only when Uncle John and Uncle Remus get together before the "mike" at KHJ that the fun really starts.

Uncle John together with Uncle Remus spent a couple of weeks last summer in the high Sierras on a fishing trip. Upon their return Uncle John spent the last day of his vacation at Catalina island, off the southern California coast. Major Mott, known to Radio experimenters everywhere, undertook to take Uncle John tuna fishing and it happened that John hooked a whale of a tuna, and after battling with it for nine hours and twenty-five minutes (so the story goes) lost the fish.

It was a terrible blow, and in true sportsman's spirit Uncle John confided to Uncle Remus of the loss of the magnificent tuna. It was too much for Uncle Remus to withstand and for days afterward Radioland rocked with laughter whenever Uncle Remus got Uncle John in front of the microphone to tell his story of the tuna.

Uncle Remus comes by his title honestly. For over twenty years he traveled with a minstrel show as blackface comedian, later going into the musical business. To hear Uncle Remus play old plantation melodies on the celeste from KHJ is enough to make a Connecticut Yankee vote bonds to erect a statue of Jefferson Davis.

Broadcast Series of Talks on Income Tax Preparation

SPRINGFIELD, Mass. — A series of talks on the preparation of individual Federal income tax returns by Thomas McCarry, public accountant, will be broadcast from Station WGY. The first talk was on January 15. The last will be on March 12.

These talks should be of special interest to the public in view of the fact that the correct preparation of a return this year will require the interpretation of a new tax law.

Mr. McCarry is well known to many Radiophans as he gave a similar series of talks from this station in 1923 and last year. He is well qualified to explain the tax law, having been employed for five years by the bureau of internal revenue, preparing and auditing the Federal income tax returns.

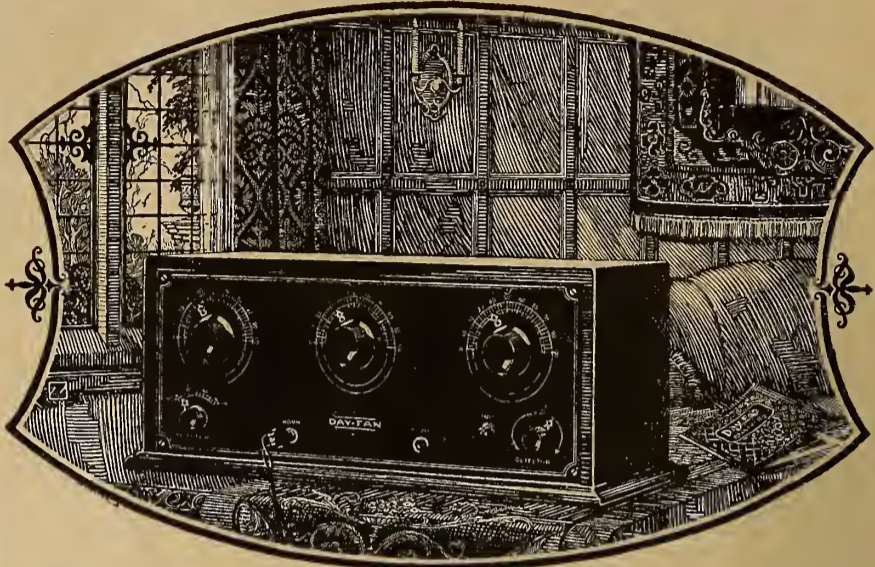
Lafayette Offers Radio Course

EASTON, Pa.—Radio will be added next semester to the curriculum at Lafayette college here. A. W. Parkes, instructor in physics, who served as a Radio operator with the aviation division of the Navy during the war, will instruct.

Day Fan

RADIO

A YEAR AHEAD



Amazing Simplicity The Set That Is Already Logged

CAN you imagine anything more simple—more practical—than a radio set with all the dial settings exactly identical for any station—regardless of where you live or what antenna you use?

The entire DAY-FAN line, comprising six models ranging in price from \$90 to \$285, is distinguished by this feature.

APPEARANCE. Every DAY-FAN set is a splendid example of the cabinet maker's art. Made of the finest materials, they have a finish and design which harmonize with the surroundings of the most tastefully furnished homes.

VALUE. In everything that you want—long range, selectivity, purity of tone, volume—there is no greater value.

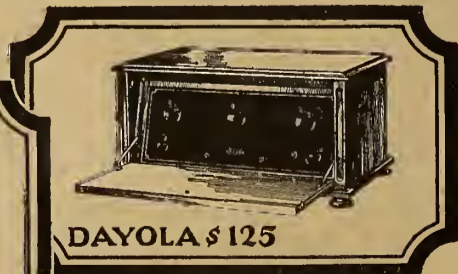
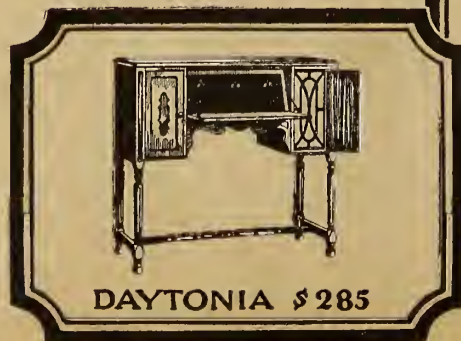
PERFORMANCE. The age of technical discussion and experimenting in radio is past. Today a set must do certain definite things. You may want entertainment, business information, or an educational program. Whatever your desires, a DAY-FAN will get it for you, quickly and easily.

Sold by Leading Radio Dealers Almost Everywhere

The Dayton Fan & Motor Co.

Dayton, Ohio

For 36 Years Manufacturers of High-Grade
Electrical Apparatus.

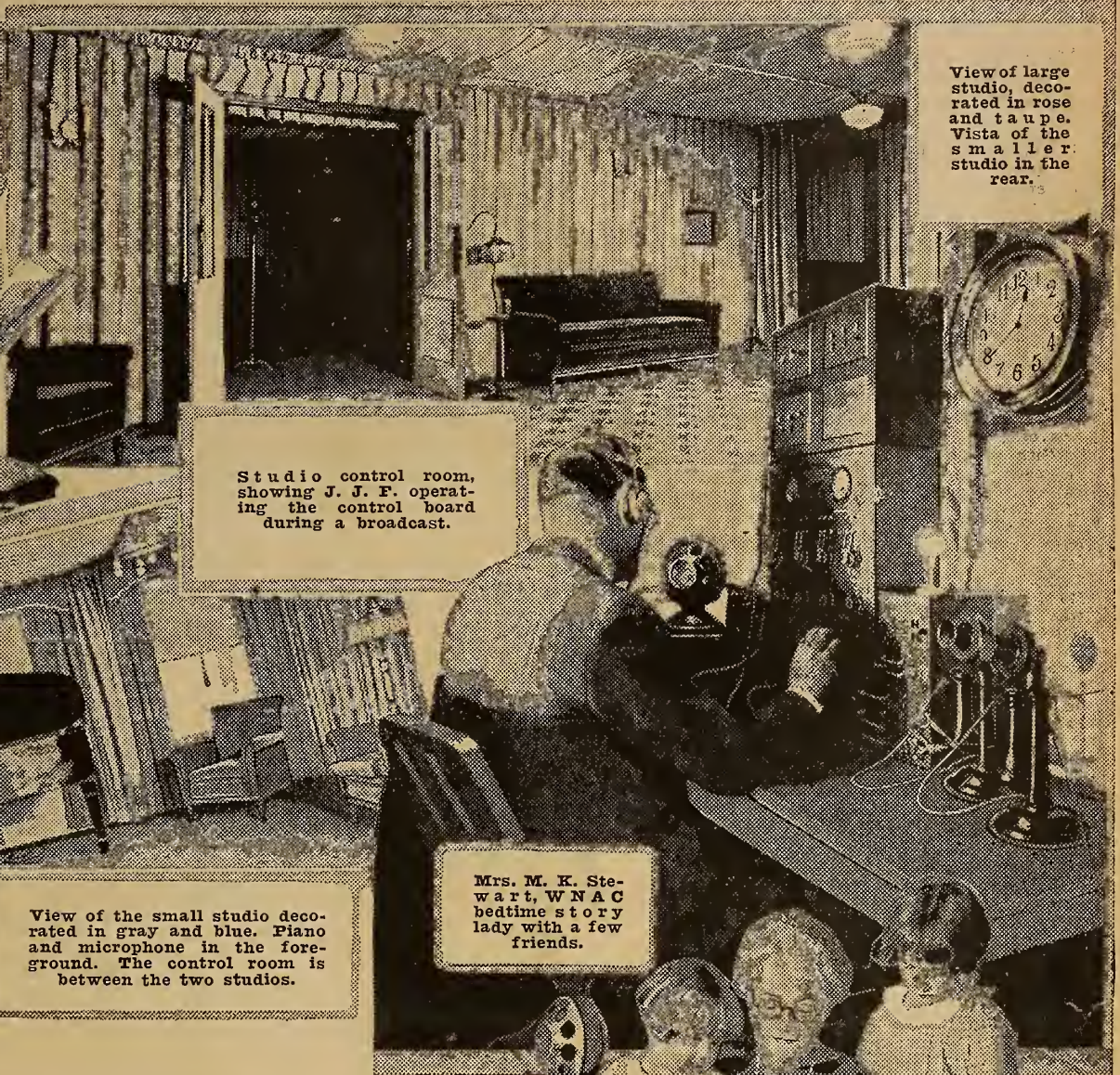


~and other
models~

WNAC, Shepard Stores, in the Hub City



Major J. J. Fanning, director of The Shepard Stores broadcast station, WNAC.



View of large studio, decorated in rose and taupe. Vista of the smaller studio in the rear.

Studio control room, showing J. J. F. operating the control board during a broadcast.

View of the small studio decorated in gray and blue. Piano and microphone in the foreground. The control room is between the two studios.

Mrs. M. K. Stewart, WNAC bedtime story lady with a few friends.

STATION WNAC, owned by the Shepard Stores of Boston, Mass., came into existence in July, 1922, and was originally a 100-watt station. November 22, 1924, they went on the air as a 500-watt station and the first broadcast with increased power was the Harvard-Yale football game relayed from New Haven to Boston.

During the installation of the 500-watt station, they did not shut down a minute, carrying through their daily program without interruptions during the installation, an accomplishment that required no small amount of skill.

The quality of the programs that have been put on the air by this station are such that they have been instrumental in building up a great amount of good-will for the store through the splendid programs offered. It is more or less amusing for those who are connected with the broadcasting station to learn that strangers coming to town invariably seek the store if they require merchandise.

The idea behind WNAC is for the purpose of entertainment, education, and amusement, and to create a good-will feeling toward The Shepard Stores and the owner of The Shepard Stores, Mr. John Shepard, Jr.

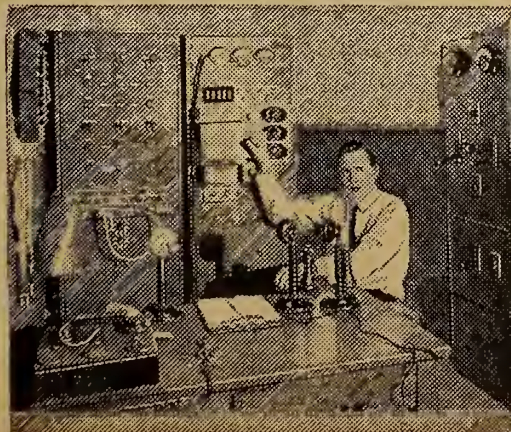
John Shepard, III, vice-president of The Shepard Stores, can honestly be called the father of Station WNAC. He became interested in Radio and installed a very small department in the men's department of The Shepard Stores. The business that came in increased with such rapidity that an entire section of the fourth floor of the Winter street

store was given over to the Radio sales department and the Radio studio was on this same floor. To say that he is admired—and liked—by the Radiophans—would be putting it mildly.

Major John J. Fanning has been director of broadcasting since the station was installed and J.J.F.'s well modulated business-like tones are well known to Radiophans everywhere. He has directed the programs for the station and has used a very keen foresight in knowing just what would please most.

Irving B. Robinson, who is chief operator of Station WNAC, is not only an experienced Radio operator, but has a real experience as a Radio engineer. He has handled the installation of the new 500-watt station, and it was through his personal efforts that WNAC was not off the air during its installation. His ability is attested to by the quality of the transmission and the fact that the station has operated without interruption, since he assumed charge of it in 1923.

(Continued on page 7)



Operating room, with Irving B. Robinson at control panel. Reception room with Jean Sargent at her desk.



John Shepard, third vice-president of The Shepard Stores and "Father" of WNAC.



ASSIGN NEW WAVES TO MANY STATIONS

LESS INTERFERENCE HOPE OF RADIO OFFICIALS

Thirty-Five Broadcasters on Different Lengths—List Showing Many Changes Is Given

WASHINGTON.—To make room for more class B stations, and give more exclusive wave lengths with less interference, a number of wave assignments have been altered. So that listeners may have a record of the old and new waves, both are listed below for the thirty-five stations making the changes:

	Old	New
KOKA, East Pittsburgh	326	309.1
KFDM, Beaumont, Texas	306	315.6
KFKX, Hastings, Neb.	291	288.3
KFOA, Seattle, Wash.	405	455
KFUO, St. Louis, Mo.	546	549.1
KGW, Portland, Ore.	492	485.1
KOB, State College, N. M.	360	348.6
KSO, St. Louis, Mo.	516	519.1
KYW, Chicago	536	535.4
WBAP, Fort Worth, Texas	476	472.9
WBAV, Columbus	423	293.9
WCX, Detroit, Mich.	517	516
WEAR, Cleveland, Ohio	390	364.3
WFAA, Dallas, Texas	476	472.9
WHA, Madison, Wis.	536	535.4
WHAA, Iowa City, Iowa	484	498
WHK, Cleveland, Ohio	283	273
WHN, New York, N. Y.	360	360.4
WHO, Des Moines, Iowa	526	522.3
WIP, Philadelphia	509	509.9
WJJD, Meoshoart, Ill.	278	302.8
WMC, Memphis, Tenn.	500	503.9
WMH, Cincinnati, Ohio	309	325.9
WNAC, Boston	278	280.2
WNYC, New York	526	528.8
WOAI, San Antonio, Texas	385	394.5
WOAW, Omaha, Neb.	526	522.3
WOC, Davenport, Iowa	484	498
WOL, Ames, Iowa	360	270
WOO, Philadelphia	509	509.9
WRO, Lansing, Mich.	288	288.5
WSAI, Cincinnati, Ohio	309	325.9
WTAM, Cleveland, Ohio	390	364
WTAS, Elgin	286	302.8
WWJ, Detroit, Mich.	517	516

Terrell Authority on Rules

WASHINGTON, D. C.—W. J. Terrell, chief of the Radio section of the department of commerce, has been asked for information concerning Radio inspection and administration in the United States by the government of New Zealand, which it is understood is just organizing its Radio work.

RECORDS BROADCAST SPEECHES



Further advance in the science of Radio broadcasting is inevitable—it is also inevitable that broadcasting as we know it will eventually be discarded as too crude. And so, the device shown above has been perfected to record broadcasts on wax records so that they can be stored away for future use.

Radio trade in Australia is experiencing a boom, following the adoption of new regulations permitting any type of set to be used.

Pierre Hemardinquer of France has completed a new diagram card for a standard hook-up in which certain parts are changeable.

Will Open Catholic Station in New York

Paulist Fathers Plan Others in Chicago and San Francisco

NEW YORK.—The Paulist Fathers, propagandizing organization of the Roman Catholic church, have completed plans for and are erecting a 500-watt broadcaster here for the purpose of "acquainting the public with the Catholic viewpoint on current affairs."

The station will be known as WPL and will use a wave length of 405 meters. Plans of the Paulist Fathers also call for similar stations in Chicago and San Francisco.

Speaking of the new station, the Very Rev. Joseph MacSorley, superior general, has said: "Our station will be the official mouthpiece of everything catholic. We want especially to reach isolated communities where there is no Catholic church. We want owners of Radio sets everywhere to be in a position to understand Catholicism and the Catholic viewpoint."

Saves \$50,000 Necklace

NEW YORK.—A pearl necklace valued at \$50,000 was saved by Radio recently when the Marquise d'Orgeix of Paris, suddenly remembered while aboard ship bound for France, that she had left the jewels hidden under a pillow in her former apartments here. A Radiogram from her located the mere bauble which was then put in safe keeping.



You secure Marvelous Reception with these Scientifically Designed, New KARAS HARMONIK Audio Frequency Amplifying Transformers.

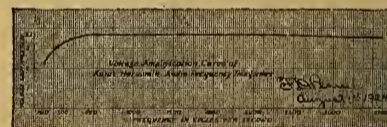
What Karas Harmoniks Do That Other Transformers Cannot Do

They amplify with GREAT VOLUME the extremely low frequency tones that other transformers fail to amplify at all—KARAS HARMONIKS also amplify EQUALLY all of the many vital harmonics and rich overtones that combine to form musical sounds.

With KARAS HARMONIKS there is no muffling of sounds—no fuzz on the edges of words—no thin, squeaky distorted tones. Instead, EVERY tone is clean-cut, separate and distinct from every other tone—natural.

The Results of Karas Harmoniks

The result from any radio set of any and all efficient circuits is an outpouring from the loud speaker of soft, rich, round, full, mellow tones such as you have never before heard from any radio—a surprising volume of REAL MUSIC to which it is a delightful pleasure to listen.



Scientific Evidence of Actual Performance

The secret of the strikingly wonderful reception of Karas Harmonik Transformers is disclosed by this Scientific Laboratory CURVE of their actual performance.

Low frequencies represent low notes—high frequencies represent high notes and the harmonics of low notes. All musical sounds are composed of a fundamental harmonic and many other harmonics and overtones of varying and successively higher frequencies.

Equal Amplification

It is the combination of these many harmonics and overtones forming a single note that makes it a beautiful, pleasing, musical sound. The inability of ordinary transformers to fully and equally amplify all of these many harmonics and overtones is the cause of distorted and unnatural sounding tones in the loud speaker.

This Scientific Laboratory CURVE shows that Karas Harmonik Transformers amplify all sounds and all harmonics and overtones of all sounds equally—delivering to the loud speaker a pure, natural sounding musical reception.

Structural Factors That Produce the Flat Curve

LARGE COILS of many thousands of turns of wire giving a very high inductance; LARGE IRON CORE offering an easy path for the lines of magnetic force to influence the secondary windings; VERY HIGH IMPEDENCE to retain the full amplification delivered by the amplifier tubes; CONTROLLED AIR GAP insuring high amplification of low frequencies; volume-carrying, fundamental harmonics—this factor enables Karas Harmoniks to deliver more total amplification with a low ratio than cheap transformers do with a high ratio; LOW DISTRIBUTED CAPACITY insuring full amplification of high audio frequency harmonics and overtones; LOW HYSTERESIS LOSS insuring a maximum amount of energy for amplification of all frequencies; SCIENTIFICALLY SHIELDED against intercoupling of electrostatic and electromagnetic fields; PERFECTLY MATCHED insuring the same values of amplification in both first and second stages.

Price \$7 Each

If your dealer has not yet been able to secure a supply they will be sent direct upon receipt of price.

Karas Electric Company
4042 N. Rockwell St. Chicago, Ill.

Herald MODEL B

NOW \$12



The Big, Clear Voice of Radio!

THE same speaker that won nationwide popularity at \$18, in competition with the most expensive speakers built. At the new price of \$12, the Herald-B is the greatest value ever offered in Radio. The only speaker in its class with full-sized, gooseneck fibre horn, 25 inches high over all, 12 inch bell, art metal base. Clear, loud and delightfully mellow! Hear the Herald before you buy!

Herald Electric Co., Inc., 113 Fourth Ave., New York

Gee! I've got 'em



Loud and Clear with the
Howe Radio Receiver

\$1.75

DO you know that you can listen to every radio broadcasting station in and around your city with a Howe Radio Receiver costing only \$1.75? Thousands of folks—young and old—all over the country are having many hours of solid enjoyment listening to the wonderful and varied programs—music, talks, sport and church services. The Howe Radio Receiver is not a toy but a very sensitive, practical, radio set made of the best materials and furnished in a strong, steel case finished in a beautiful dark olive antique verde. It is fool and trouble proof. No Batteries to Buy. Guaranteed you can hear any broadcasting stations within 25 miles. One or more persons can "listen in" at the same time.

For perfect local reception use a Howe Radio Receiver crystal set.

For Sale by All Dealers

Howe Auto Products Co
Radio Division
Chicago, Illinois

RADIO TEACHES ART IN PUBLIC SCHOOLS

CALIFORNIA CHILDREN GET INSTRUCTIONS VIA ETHER

Judges Surprised at Quality of Work Turned in by the Pupils— Immediate Response

OAKLAND, Calif.—Successful drawing lessons by Radio is the latest development in the experiment to use broadcasting for classroom instruction being conducted by the Oakland public schools, co-operating with KGO, General Electric station here.

Children assembled under normal classroom conditions in eight different schools in the city have just completed a course of six drawing lessons. The problem assigned was to create an original design for a Christmas card, using the Christmas tree for a decorative motive and actually produce individual work in response to suggestions issuing from loud speakers. Examination of the papers turned in reveals the fact that by Radio greater originality is accomplished than when lessons are conducted in person by the teacher before the class.

Collect and Judge Response

In sharp contrast to other lessons broadcast by KGO, when children only listened to lectures without responding, the course just completed was designed to bring a type of response which could afterward be collected and judged.

In the studio of KGO, miles away from the schools, the Radio teacher spoke her instructions before the microphone. She began by briefly suggesting the Christmas spirit and the beauty of its expression in art. Then, she proposed to her invisible pupils that they set about creating Christmas greeting cards for their friends.

In the minds of the examining judges, "the experiment revealed not only the latent emotional qualities of young people as artists, but offered a lesson on methods of teaching as to secure intellectual criticism and balance in children's creative art without bringing about the destruction of originality." By Radio lessons the children received suggestions through their ears, and sent out the response to create through eager busy fingers. No model was offered to the eye. "In the child's heart and mind alone took place that transmutation which makes out of spoken word the created image."

STATION OWNER IS POPULAR ON COAST



Earle C. Anthony, owner of the new KFI super station. Mr. Anthony is a pioneer in Radio on the Pacific coast.

OPERA HELPS SALES

(Continued from page 1)

That the famous Irish tenor was satisfied with the acclaim which greeted his Radio appearance was voiced by his secretary, who said:

"Mr. McCormack approves heartily of Radio broadcasting, entirely because it is such a pleasure-spreading medium. As to the commercial value effected, it is very difficult to venture an authentic reply so soon after the trial. The mail response was tremendous.

"The concert crowds have increased somewhat, but it is not fair to attribute it to Radio yet. When Mr. McCormack returns in March from his tour he shall be able to answer more definitely."

Mme. Bori also is in favor of Radio and says that the mail response has been very flattering.

Plans are now being laid for a broadcasting station in Bouzarria, Algeria, the studio being located in Algiers and connected to the station by ground wire.

PRODUCER BACKS UP STATEMENTS

John Golden Proves to Public When He Says a Thing, It Goes

NEWARK, N. J.—As though translating into action his spoken and written approval of Radio as an ally of the modern theatrical showmen, John Golden, producer of "Pigs," was a headline attraction of the WOR afternoon program last Friday, when he presented to the Radio audience, Anne Morrison and Patterson McNutt, co-authors.

In company with them were Lydia Westman and Wallace Ford, featured players in the successful laugh hit which is attracting capacity crowds to the Little theater, New York.

"Pigs" has done much to make theatrical history in New York. The unusual comedy has flourished throughout the present lean theatrical season and Mr. Golden, rated one of the most clever and discriminating American producers, has another hit to his credit. A feature of the performances at the Little theater is the Radio concert, tuned in between acts to enable confirmed Radiophans to get an earful during the evening.

Present World's Greatest Accompanist in Recital

NEWARK, N. J.—Frank La Forge, composer-pianist and the artist to whom goes credit for being the greatest accompanist in the world, was presented in recital under his direction at WOR last Saturday evening, January 24, with Ernesto Berumen, pianist; Frances Fattmann, soprano; Valeriano Gill, tenor; Grace Demms, soprano; Zelina Bartholomew, soprano, and Madeleine Hulsizer, soprano. The latter artist will sing a complete program of the songs of Mr. La Forge with the composer at the piano.

WNAC—THE HUB CITY

(Continued from page 5)

Jean Sargent, who is secretary of WNAC, and has charge of all of the detail work in connection with the station, is one of the few women announcers who have a complete program in their care. For some time Jean Sargent was known by the pen name only, before her first announcement came over the air and to the utter confusion of some of the masculine fans who had invited her to smokers, and on fishing and hunting trips, it was proclaimed that Jean was a woman and not a man.

Mrs. M. K. Stewart, the bedtime story lady, is hostess of the Little Folks' store, of the Shepard stores and is a Southern woman, whose interest in, and love for children, made her an ideal person to tell the kiddies their good-night stories.

Some of the unique features of WNAC were the broadcasting of a circus, taking the microphone to the tent, and going so far as to taking the microphone in to the part of the circus where the animals were being displayed so that the public might hear them as they were transferred from cage to cage. The broadcast of plays, direct from the theaters with the amplifier in an upper stage box so that the operator might catch each portion of the drama or musical comedy, is another feature that has made WNAC popular. It has broadcast grand operas each season since its existence and one of the popular weekly features is the concert by the Boston American orchestra.

Dick Long Makes Record

MINNEAPOLIS.—The first Minneapolis orchestra to broadcast by remote control, and the first local orchestra to make Victor records are distinctions now held by Dick Long and his Nankin Cafe musicians.

Recently they were selected to record for the Victor company. The records were released last week when the Gold Medal station, WCCO, broadcast four special programs by Dick Long and his orchestra.

GOLDEN-LEUTZ



TRADE MARK REG.

"The Perfect Broadcast Receiver"

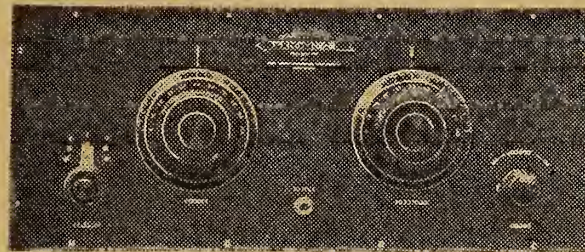
A New Superior Broadcast Receiver

Simple—Long Range—Highest Quality
Non Radiating — Non Regenerative

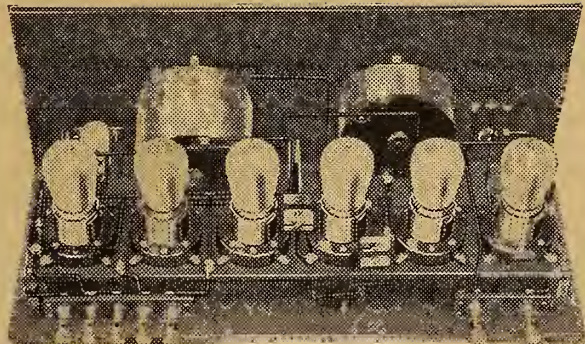
Two Stages Tuned Radio Frequency,
Detector and Three Stages of Audio
Frequency Amplification

\$60⁰⁰

Completely
Constructed
Without Accessories



PLIODYNE 6
Front View Showing
Simplicity of
Control



PLIODYNE 6
Interior View Showing
Compact and
Efficient Design

Sold Direct
from
Manufacturer
to Consumer
Only
Sent C. O. D. Subject
to Examination

OUR GUARANTEE

We guarantee every Golden-Leutz "Pliodyne 6" to be the finest broadcast receiver that can be manufactured using 6 tubes or less and to be satisfactory to you in every way and to reach you in perfect condition.

You take no risk whatever in sending us your order for unless you are completely satisfied with the receiver and with your saving you may return the receiver to us and we will refund your money.

GOLDEN-LEUTZ, Inc.

476 BROADWAY

NEW YORK CITY

Licensed under Farrand Agreement and Hogan Patent No. 1,014,002



Each Instrument of the Orchestra in Perfect Tune

IT MAKES all the difference in the world with the enjoyment you get out of radio whether the high notes of voice and orchestra are in tune or just a little "off."

A big point of the Bristol Audiophone is that each instrument, and each vocal note, comes in in proper pitch. You will love your Audiophone for its pure harmony of reception.

There are five Bristol Audiophones, priced from \$12.50 to \$30.00. If not at your dealer's, write for Bulletins AY-3011, 3017 and 3022.

The Bristol Company, Waterbury, Conn.



Cabinet Model \$30.00

Beautifully finished mahogany. Full floating wooden horn. Cast metal throat. Size 17x10x10 3/4".

Model S Audiophone \$25.00
Rubber horn, 14 1/2" in diameter. Cast metal throat. Velvet mat finished, mottled bronze and gold.

BRISTOL AUDIOPHONE Loud Speaker

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

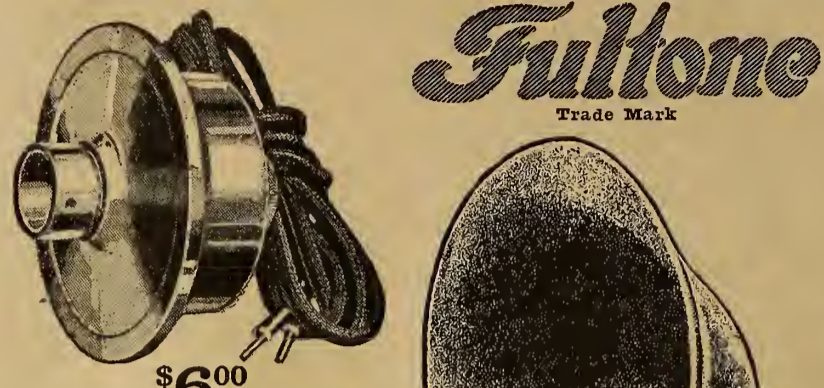
Table with columns: Station and City, Met., Saturday, Sunday, Monday, Tuesday, Wednesday, Thursday, Friday. Lists radio stations and their broadcast times.

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

STATIONS IN ORDER OF WAVE LENGTHS USED

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

Make a Loud Speaker of Your Phonograph



With Fultone Speaker Unit, any standard make of talking machine can quickly be converted into a loud speaker of unsurpassed clearness and tone quality. Adjustable to any "B" battery voltage and strength of signal, this heavily constructed unit reproduces without blur or rattle.

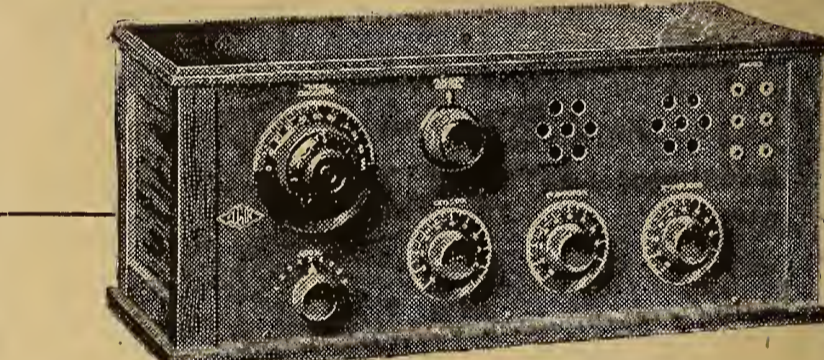
THE FORD of LOUD SPEAKERS

No better reproduction can be had at any price than that obtainable from Fultone Loud Speaker. The solid, composition horn is non-ringing and designed especially for the unit in the base. Because of its small size Fultone Speaker is hardly noticeable in a living room or parlor, yet it is as powerful as much larger competitors.

Either speaker or unit will be shipped on a satisfaction or money back basis on receipt of price in money order or currency. The coupon is provided for your convenience in ordering if your dealer cannot supply you.

- Phonograph Adapter Units: Edison .25c, Columbia or Pathe .20c, Brunswick .30c

HALL & WELLS, Inc. 128 N. Wells St. Chicago, Ill.



You Can Build This Set Without Soldering. Save Fifty-Dollars!

Don't pay the other fellow for doing what you can do yourself. Build your own Radio set—and have the fun of building it! The Elgin Super-Reinartz is supplied "knocked down." But it is different from the average so-called knocked down set.

Every thing is drilled, the panel is engraved—and there is absolutely nothing to solder. The parts assemble just like building blocks, all wires "clip" into place and the panel slides in the grooved cabinet and fits! Nothing to do but drive a few screws! If you can use a screw driver you can build this highly efficient receiving set in an hour or so. Then call in your friends and show them the set you built yourself! Show them how easy it is to tune in the stations they have been unable to get with ordinary sets.

The Elgin Super-Reinartz is the set that has repeatedly tuned in 2LO, the hard-to-get London station. This same set has logged every worthwhile station in the United States, Canada, Mexico and Cuba. The parts supplied you are exact duplicates of the parts we used in the original model, the hook-up is the same and an exact simplified working drawing is supplied. You can't go wrong! We guarantee every part in the Elgin Super-Reinartz to be the utmost in efficiency. We guarantee the drawings furnished you to be duplicates of the same set that heard London. We guarantee reception that is only possible on other sets twice the size and price, providing our drawings are followed and the set is properly constructed as we direct! Read our FREE offer to you.

ELGIN Super-Reinartz "The Ford of Radio" Elgin Radio Supply Company, Suite A, 207 E. Chicago St., ELGIN, ILL. Includes a coupon for a free set.

WCAU, 7:10, 7:20, 8:30, WEMC; 9, KHJ; 10,

s, Fred Jacobson, m., entertainment; 43, Georgia Tech. 6 p. m., Philip Cleveland Plain Spitalny's Music 6:30-7:30 p. m., Parthenon theater; Xylophone Har- W. P. Zimmer, gan. 8 a. m., setting-up it's dinner; 12 m., Detroit News or the Detroit News; E. B. Curtis,

ary 5

KFAE, KFDM, DB, KSD, PWX, WCAU, WEAQ, ID, WLBL, WNI,

35), 8 p. m., Ma- garet Cotton, con- Mr. Sheets, bass; enry Spears, pian- 25), 4:45 p. m., al Railways using 7:30 p. m., lesson ; 8, Canadian Na- y hotel. 69.1), 12:20 p. m., er concert, RDKA idren's period; 8, rner studio; 8:30, studio. 9), 5-5:30 p. m., 5:30-6, Examiner, on orchestra; 7:20- vocal recital; 8-9, California present- r, pupils of Louis ental. 275), 6:50 p. m., 7:15, "The Child stry," Prof. F. W. New," Dr. H. M. lesson V, Dean 3), 9:30-11 p. m., ademy. 266), 6:30 p. m., G. Bliss, director. 9), 4-5:15 p. m., ay's recipo. 278), 10:30-11:30 a., afternoon organ s, auditorium serv- temple McPherson, nd, G. N. Nichols, her Fricke Green. 10:40 a. m., class- ools; 4-5:30 p. m., 8, farce, "Mrs. 9-1 a. m., Honry

12:30 p. m., con- program. 12:30-1:30 p. m., nged by J. Howard more hotel concert or; 6:30-7:30, little Brandon and Jane Orlis Art Institute, talk on Body," Dr. Philip M. Lovell; 8-9:30, program, West Coast theaters; 9:30-10, Hatch Graham, banjoist and singer; 10-11, Early Burnett's Blitmore hotel dance orchestra. KIS, Los Angeles, Calif. (Pacific, 252), 8-9:30 p. m., vocal recital with piano and organ numbers of classical nature. KNX, Hollywood, Calif. (Pacific, 337), 8 a. m., morning prayer; 9, Hired Hand, news; 10, Hired Hand's morn- ing message; 10:30, Mrs. Kato Brew Vaughn, homo economics; 5:30, Town Crier and Village Urchins; 6, sports talk; 6:30-7:30, dinner hour music; 8-9, pro- gram, Globe Ice Cream company; 9-10, program, Carson-Baruch company; 10-11, Abe Lyman's Coconut Grove dance orchestra from Ambassador hotel. KOA, Denver, Colo. (Mountain, 322.4), 3 p. m., matinee for housewives, "Danny Boy," "Friend O' Mine," "Beloved, It Is Mom," Mrs. Irving Green; "Essen- tials of the Group Mind," Mrs. Kuskulis; "Whims," "Photos Revels," "Etudo Mignonne," Mable Garvin Baber. KPO, San Francisco, Calif. (Pacific, 423), 7 a. m., daily dozen; 10, town crier; 10:15, "What Is Playing at the Various Theaters;" 1-2 p. m., Rudy Selger's Fairmont hotel orchestra; 2:30-3:30, matinee program, Johnnie Bulck's Amphians; 4:30-5:30, Rudy Selger's Fairmont hotel orchestra; 5:30-6:30, children's hour stor- ies; Marianne De Smet, pianist; 6:30, "What Is Playing at the Various Theaters;" 7-7:30, Rudy Selger's Fair- mont hotel orchestra; 8-11, E. Max Bradfield's Versatile band; Gertrude Martin, pianist. KSAC, Manhattan, Kans. (Central, 340.7), 9 a. m., march; 9:02, music lesson; 9:07, music for singing exercises; 9:15, inspirational talk; 9:20, callsthenics; 10, backyard gossip; 10:05, all around the house; 10:10, questions and answers; 10:20, "Suggestions for Today's Meals," Amy Kelly; 12:30 p. m., readings, Osceola Hall Burr; "Farrowing Houses for the Spring Liters," Walter G. Ward; "How to Make a Germi- nation Test," H. R. Sumner; 7:20, college bell and music; 7:30, "Financing State Road Work," L. E. Conrad; 7:40, vocal solos, Harold Flamm; 7:50, farm home, W. G. Ward; 8-9, classical musical program, Dept. of Music.

KOB, State College, N. M. (Mountain, 348.6), 7:30-8:30 p. m., international code course, lesson 5, Dean R. W. Goddard. KPO, San Francisco, Calif. (Pacific, 423), 7 a. m., daily dozen; 10, town crier; 10:15, "What Is Playing at the Various Theaters;" 1-2 p. m., Rudy Selger's Fairmont hotel orchestra; 2:30-3:30, matinee program, Johnnie Bulck's Amphians; 4:30-5:30, Rudy Selger's Fairmont hotel orchestra; 5:30-6:30, children's hour stor- ies; Marianne De Smet, pianist; 6:30, "What Is Playing at the Various Theaters;" 7-7:30, Rudy Selger's Fair- mont hotel orchestra; 8-11, E. Max Bradfield's Versatile band; Gertrude Martin, pianist. KSAC, Manhattan, Kans. (Central, 340.7), 9 a. m., march; 9:02, music lesson; 9:07, music for singing exercises; 9:15, inspirational talk; 9:20, callsthenics; 10, backyard gossip; 10:05, all around the house; 10:10, questions and answers; 10:20, "Suggestions for Today's Meals," Amy Kelly; 12:30 p. m., readings, Osceola Hall Burr; "Farrowing Houses for the Spring Liters," Walter G. Ward; "How to Make a Germi- nation Test," H. R. Sumner; 7:20, college bell and music; 7:30, "Financing State Road Work," L. E. Conrad; 7:40, vocal solos, Harold Flamm; 7:50, farm home, W. G. Ward; 8-9, classical musical program, Dept. of Music.

concert orchestra; 10, musicale; 11, Fenway theater organ recital, Lloyd G. Del Castillo. WEMC, Berrien Springs, Mich. (Central, 286), 8:15- 9:15 p. m., Radio Lighthouse Music Makers, "Our Favorite Regiment," "You Can't Drive My Dreams Away," "At Sunset," "Three Quotations," "I'm For- ever Thinking of You," "Miss Liberty," "Spanish Waltz," "Stars and Stripes Forever." WFAA, Dallas, Texas (Central, 472.9), 12:30-1 p. m., musical features, Dallas theater performers. WFI, Philadelphia, Pa. (Eastern, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 3:05, read- ing, Walter Gray; 6:30, Meyer Davis Bellevue Strat- ford concert orchestra; 7, Sunny Jim. WGN, Chicago, Ill. (Central, 370), 1:40 p. m., luncheon concert, Drake concert ensemble, Blackstone string quintet; 2:30, artist series, Lyon & Healy; 3, rocking chair time; 5:30, Skeezix time for the children; 6, organ recital, Lyon & Healy; 6:30-7, dinner concert, Drake concert ensemble, Blackstone string quintet; 6-9, classical concert, Lyon & Healy artists. WGR, Buffalo, N. Y. (Eastern, 319), 10:45 a. m., Gold Medal home service talk by Betty Crocker; 12:30-1 p. m., Hotel Statler concert ensemble; 2:30-4:30, Radio Dealers' program; 4:30, lecture, "What the Honey Bee Does for Agriculture," E. F. Phillips; 6:30-7:30, dinner music, Vincent Lopez Hotel Statler dance or-

WOL, Ames, Iowa (Central, 270), 12:30 p. m., college chimes. WOO, Philadelphia, Pa. (Eastern, 509.9), 11 a. m., or- gan recital, Mary E. Vogt; 12:02 p. m., Wanamaker crystal tea room orchestra, Robert E. Golden, director; 4:45, organ recital, Mary E. Vogt; 7:30, A. Candelori's ensemble, Hotel Adelphi; 8:30, recital, Harlette G. Ridley; 9, WOO orchestra, Robert E. Golden, director; 10:03, William Bove's Royal Palm orchestra; 10:30, Vincent Rizzo's Hotel Sylvania dance orchestra. WOR, Newark, N. J. (Eastern, 405), 3-4 p. m., Ken- neth Kitchen's club orchestra; 6:15-6:30, Albert E. Sonn, technical editor, Newark Sunday Call; 6:30-7:30, "Music While You Dine," Jimmy Lent's orchestra. WQJ, Chicago, Ill. (Central, 448), 11-12 m., home eco- nomics, Helen H. Downing; "Preparing for Valentine," Mary Martin; "Short Cuts in Spring Sewing," Mrs. W. E. Fribley; "California," Mrs. E. T. East; 3-4 p. m., domestic science course, "Helping a Child Through School," Clara Sommerville; 7-8, concert, Ralph Williams and his Rainbo Garden orchestra; Adelaide Steeg, contralto; Howard Hanks, pianist; 10-2 a. m., Ralph Williams and his Rainbo skylarks; soprano; James Mitchell, baritone; Rogers boys, Clar- once Theders, tenor; Alfred Tweed, harmonica and

8-9:30, program, West Coast theaters; 9:30-10, Hatch Graham, banjoist and singer; 10-11, Early Burnett's Blitmore hotel dance orchestra. KIS, Los Angeles, Calif. (Pacific, 252), 8-9:30 p. m., vocal recital with piano and organ numbers of classical nature. KNX, Hollywood, Calif. (Pacific, 337), 8 a. m., morning prayer; 9, Hired Hand, news; 10, Hired Hand's morn- ing message; 10:30, Mrs. Kato Brew Vaughn, homo economics; 5:30, Town Crier and Village Urchins; 6, sports talk; 6:30-7:30, dinner hour music; 8-9, pro- gram, Globe Ice Cream company; 9-10, program, Carson-Baruch company; 10-11, Abe Lyman's Coconut Grove dance orchestra from Ambassador hotel. KOA, Denver, Colo. (Mountain, 322.4), 3 p. m., matinee for housewives, "Danny Boy," "Friend O' Mine," "Beloved, It Is Mom," Mrs. Irving Green; "Essen- tials of the Group Mind," Mrs. Kuskulis; "Whims," "Photos Revels," "Etudo Mignonne," Mable Garvin Baber. KPO, San Francisco, Calif. (Pacific, 423), 7 a. m., daily dozen; 10, town crier; 10:15, "What Is Playing at the Various Theaters;" 1-2 p. m., Rudy Selger's Fairmont hotel orchestra; 2:30-3:30, matinee program, Johnnie Bulck's Amphians; 4:30-5:30, Rudy Selger's Fairmont hotel orchestra; 5:30-6:30, children's hour stor- ies; 6:30,

(Continued on page 14)

Winding Low Loss Tuned R. F. Inductances

Radiophan Can Make Own Transformers

By Jacques Fournier

IN THE Radio Digest of November 22, the writer described a low loss inductance of the basket weave type for use in a three circuit regenerative receiver. There have been many requests from readers since then for a low loss inductance of this type that might be used in tuned Radio frequency receivers. In this article the writer will therefore give the complete data for the construction of such a unit.

The Winding Form

The form for winding this transformer is shown clearly in figures 1 and 2. As

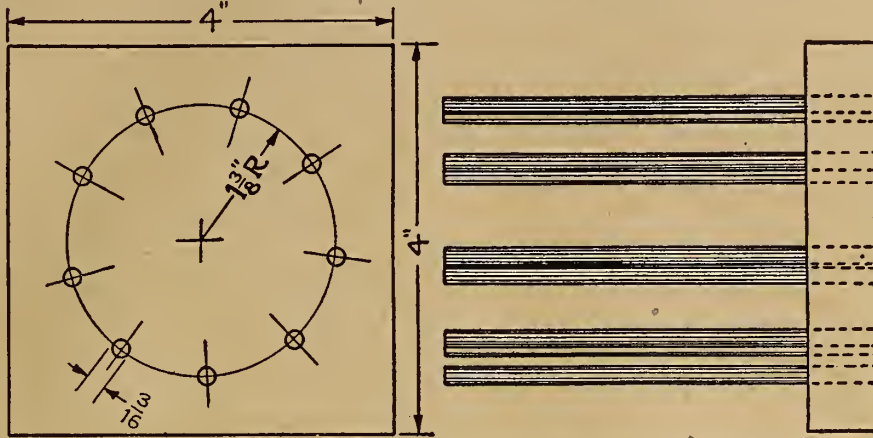


Figure 1

used. The rods on which the wire is wound may be either large nails or wood dowel pins as shown, and should be $\frac{3}{8}$ inch in diameter and $4\frac{1}{2}$ inches long. If metal pins are used they can be soldered to the metal block which forms the base; if wood pins are used they can be glued to the wooden base; or, if metal pins are used with a bakelite or hard rubber base, they can be put in by making the holes a little smaller and driving the pins through.

One-Over, One-Under

The method of winding is shown in figures 3 and 4, although figure 4 shows the two-over, two-under system. As will be seen in figure 3, the wire goes under pin 1, over 2, under 3 and over 4. Since there are an odd number of pins, the second turn will go over the pins that the first turn went under. Twelve turns are wound in this way and these form the primary of our transformer. At the twelfth turn make a large loop in the wire about 6 inches long and twist this loop so it will not loosen. Resume winding

and add 68 more turns, which will be correct for use with a .0005 mfd. (500 mmfd.) condenser.

The wire used is to be number 20 double cotton covered, hard drawn, as the soft copper has not enough resiliency to it to hold its shape well after the coil is completed. Using this number 20 wire wound as shown, the length of the coil will be 3 inches and you will have a coil such as is shown in figure 5. This coil is to be held together with heavy thread, preferably waxed, and the method of holding the wires in place with one continuous piece of thread is shown in figure 6.

Securing with Thread

The alternate turns cross each other diagonally at 9 points around the coils and it is at these 9 points that the thread holds the turns together. Following the thread in figure 6, it will be noted that it goes across to the left under the odd turns, around the end of the wires, and then under the even turns and over the odd turns to the opposite end of the coil where it goes around the last turn and

comes back under the odd turns and over the even turns. Thus the thread forms one complete loop and is carried across, as denoted by arrows 7 and 8, to the next intersection, where a loop is wound in the opposite direction as shown by arrows 9, 10, 11, 12 and 13. When the thread has been carried clear around the coil in this way and the ends tied together the coil can be slipped from the form either by removing the pins one at a time or slightly squeezing them together at the free ends and slowly sliding the coils from the pins. A strip of bakelite or hard rubber is

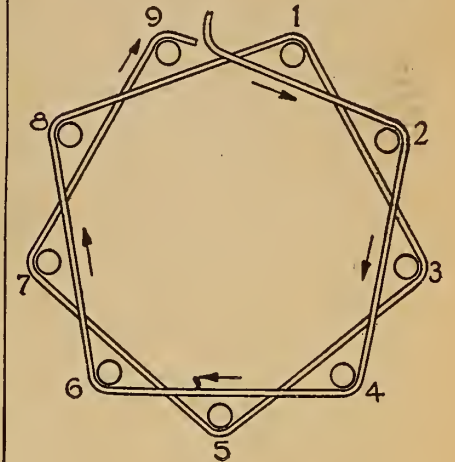


Figure 3

now cut as shown in figure 6 and measures 4 inches long, $\frac{1}{2}$ inch wide and $\frac{3}{8}$ inch thick. Holes are drilled $\frac{1}{4}$ inch from each end large enough so that the coil can be mounted on the rear end plate of variable condensers. Before slipping this piece of bakelite through one of the points of our 9 pointed star coil, it would be well to smooth off the corners with a file so

(Continued on page 18)

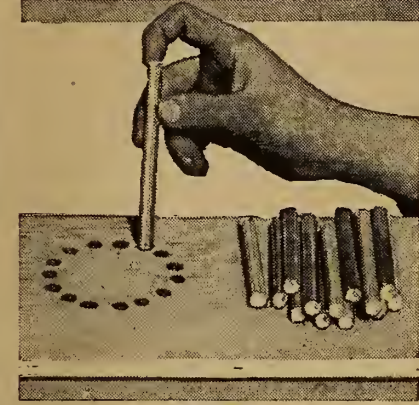


Figure 2

will be seen in figure 1, a square block of wood, bakelite, hard rubber or metal is necessary, 4 inches on a side and from $\frac{3}{8}$ to 1 inch thick. A circle is drawn in the center of this $2\frac{3}{4}$ inches in diameter and divided into nine parts so that holes will be drilled 40 degrees apart around the circle. The form shown in figure 2 is not the one used for this inductance, but the construction is similar; the form shown has more pins and the two-over, two-under method of winding is used. In the inductance which we are going to build the one-over, one-under method is

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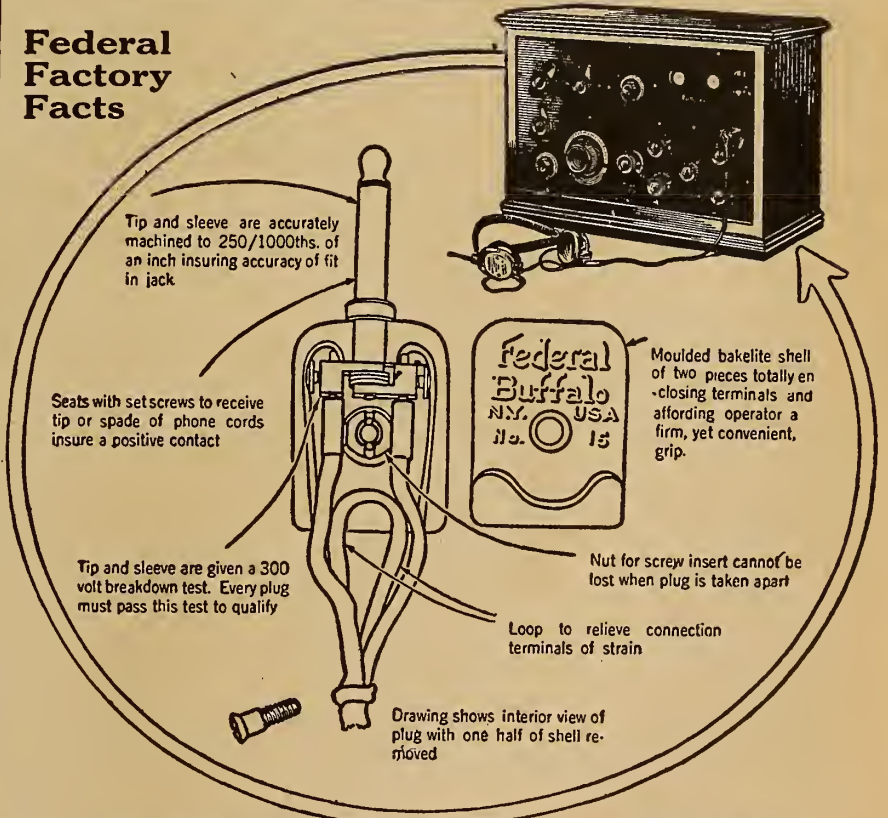
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Demonstrating Radio Principles at Home

Chapter VIII—Experimenting with Push Pull Amplifiers

By J. E. Owen

RADIO has suffered because of a lack of satisfactory audio frequency amplification. Until recently, the public has been obliged to content itself with either of two forms of amplifiers, namely, transformer or resistance coupled. These were both straight cascade. The advent of the push pull amplifier was heralded with much joy and the general standing of audio frequency amplification was raised considerably, it being possible to obtain greater volumes with less distortion. Sadly

success to a marked degree, yet transformers still distort at the upper and lower limits of sound frequencies. Within these limits, however, distortion is negligible unless more than two stages of amplification are used. When a push pull amplifier is added to a two stage amplifier of the straight type, distortion of the first two stages is not lessened, but is amplified in the same proportion that the desired signal is. This is evidently, then, a poor practice.

isfactory results than it is possible to obtain from one using the same number of tubes including two stages of straight amplification and one of push pull. No loud speaker the writer has ever tried can handle all this amplifier can put into it when only moderately strong signals are in the input circuit. Most loud speakers will rattle on strong signals. Others may only buzz. Strong signals, regardless of their purity, may make any loud speaker distort.

from storage cell tubes stage for stage and is proportionately less when more than one stage is employed. Dry cell tubes cannot handle plate currents so large as those commonly used in storage battery tubes. Figure 2 is a modification of the circuit of figure 1 in which dry cell tubes of the 299 and 399 type are paralleled in the second stage. This requires the use of six tubes in a two stage amplifier. At first, it might appear that this is a rather extravagant method of handling the audio fre-

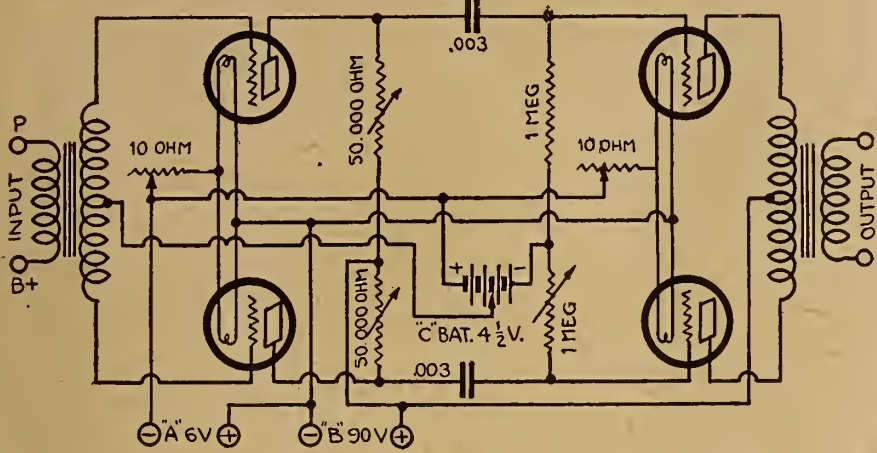


Figure 1

Two Stage Amplifier

An arrangement that will give excellent volume with a minimum of distortion is shown in figure 1. This is a two stage amplifier of the push pull type using transformer coupling between the input and the tubes, and also between the tubes and the output. Between the stages a push pull resistance coupling is used. Any standard brand transformers may be used. The writer suggests that variable resistance be used in this circuit and there are several good makes of variable resistances on the market. This amplifier will give much more sat-

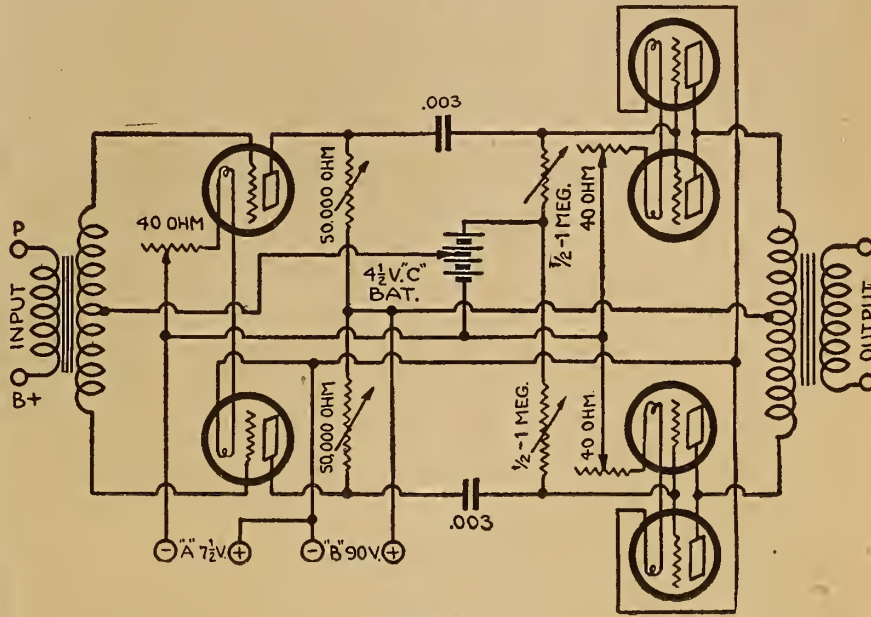


Figure 2

Storage Battery Tubes

The circuit of figure 1 is intended primarily for tubes of the storage battery type. However, dry cell tubes may be used. The amplification resulting from dry cell tube arrangements is not equal to that

frequency amplifier, but it is not unusual to see a nine tube set, five tubes of which are used directly or indirectly as Radio frequency amplifiers. The British almost ridicule the attitude of American Radio- (Continued on page 20)

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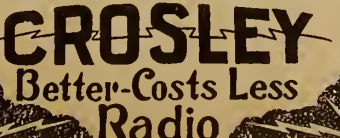
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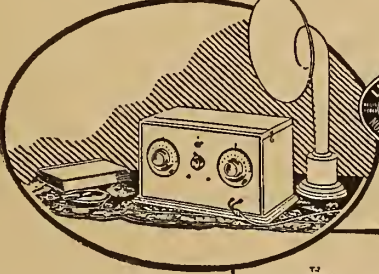
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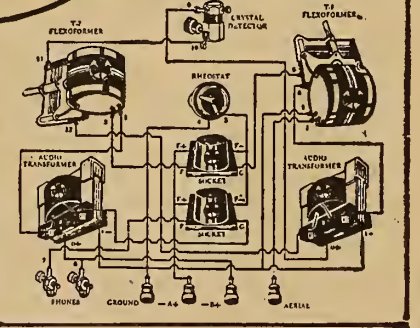


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We Agree with Mr. Hoover



LOW LOSS INDUCTANCES

(Continued from page 15)

that the insulation on the coil will not be injured. After slipping this piece of bakelite into the coil the loop made at the twelfth turn can be untwisted and cut at its middle point. We will then have two separate windings, one of 12 turns and one of 68 turns.

The method of mounting this coil on condensers cannot be shown, as this will vary with every type of condenser used. It is suggested, however, that small right



Figure 4 © K. & H.

angle brackets be made of heavy brass or aluminum, to be attached to the bakelite or hard rubber strip at the ends and to the rear end plate of the condenser. The condenser will then have to be mounted on the panel in such a way that the coil just described will be at an angle of 57.4 degrees with the baseboard. In the near future the writer hopes to give full details for the construction of a receiver utilizing these inductances. Tuning with these inductances, and a good low loss

condenser in shunt to the secondary, is a real pleasure, as the selectivity is remark-

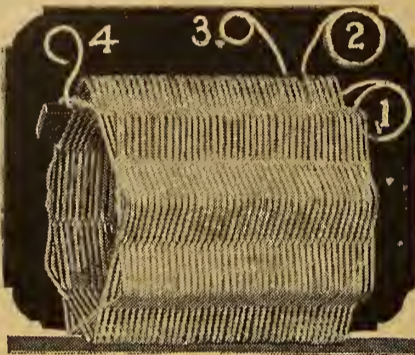


Figure 5

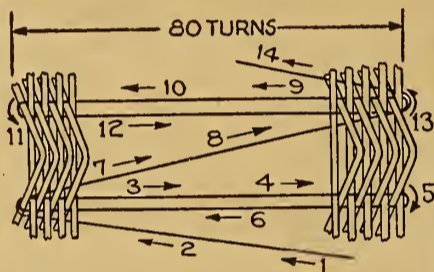


Figure 6

ably good and stations that were formerly found over 10 or 15 degrees on the dial will then be found on only 2 or 3 degrees

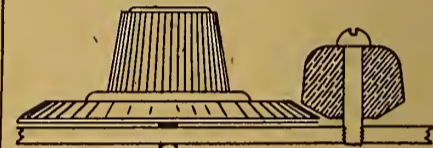
of the dial and a vernier adjustment is necessary to get on the very sharp resonance peak.

This unit, as described above, can be used as the antenna coupler and the air core transformer in a receiver comprising one stage of tuned Radio frequency detector and audio frequency. If more than one stage of tuned Radio frequency is utilized, and three of these units must be built into the set, care should be taken to see that they are well spaced and all at exactly the same angle to the baseboard. It may prove necessary also to remove from one to four turns of the primary of the second or third unit to prevent oscillation on low wave lengths. Another method of preventing oscillation might be that shown by the writer in the issue of December 20, utilizing three neutrons.

Vernier Attachment

A plumber's fitting called the Fuller ball when mounted on a screw with some play to touch the edge of the dial makes a very desirable vernier attachment. When used for a vernier it is pushed toward the panel front so that it will come in contact with the edge of the

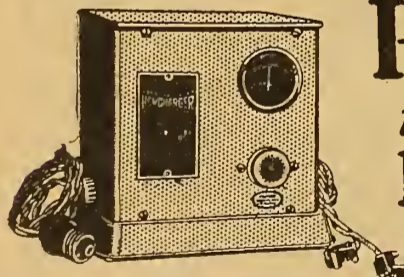
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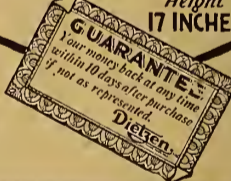
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Part VI—Adjusting and Operating

By C. E. Brush

ON looking over the preceding article of this series the writer notes that a very important item was omitted both from the list of parts and figures 10 and 11, the wiring layouts. This is unfortunate for those in rural districts who have some difficulty in obtaining parts locally as it takes several days to secure parts by mail.

The item in question is a .5 mfd. fixed condenser indicated in figure 2, and connected across the oscillator B+ lead and A+ lead. We are indebted to Mr. Michael Diller of Buffalo, N. Y., for calling this to our attention in his letter of January 15, in time to be included in this concluding article.

As to placing it, refer to figure 11. Just to the right of holes 4 and 5, and above binding post Z, is a space on the underside of the baseboard. The condenser can be secured there with its terminals to the left. One terminal connects to post Z, the other to the +A bus where it goes up through hole 8.

We can all feel indebted to M. Joseph Murry, of Titusville, Pa., for a first-class suggestion on soldering tinfoil. To quote his letter of January 12, "I find the operation is simplified by having the foil pressed against a cold metal surface, when, after a little practice, a drop of solder may be applied from the point of the iron without melting the tinfoil." The writer tried this today and it facilitates the operation greatly. Try it first on some foil scraps and then on the foil segment of your filter condenser.

We have left to this chapter two points which some might say more rightly belong to the wiring explanation. These are the use of two extra binding posts shown, and the high resistance unit at the right of the sub-panel.

The two binding posts are shown so that the builder may use C battery grid bias on the audio amplifier tubes, if it should be found to be of benefit. As to whether the C battery is a necessity or not depends a great deal upon the particular transformers used and, while it is considered good practice to use the C battery, the writer has found that, when using certain transformers, the third stage of audio amplification has been more easily controlled without it. The use of three stages of audio has usually been the occasion for the insertion of some method of doing away with the howl which is almost invariably produced in the third stage bulb. Several methods of connecting-in condensers and high resistance leaks are prescribed for this condition, any one of which may produce the desired result.

Controlling Three Stages

The method we will recommend in this instance is to connect the variable high resistance directly across the grid and plate of the third audio tube. One side of the unit is to be connected to the grid post of the socket, and the other side of the unit should go to the plate post of the socket.

Referring back to the use of the C battery, it has been found that with some transformers, this method will not produce as good a result as if the C battery is not used. Therefore, we advise leaving out the C battery for the initial try-out, and if it can be found to be of advantage during later trials you may make, the C battery can be connected in.

Now assuming that the set is completely wired, and ready for the first try-out, the first thing to be done is to connect

up the batteries, aerial and ground. Reading from left to right, the binding posts at the rear edge of the sub-panel are as follows: Aerial, ground, A battery negative, A battery positive and B battery negative, B positive 45 volts, B positive 90 volts, last two for C battery.

The aerial recommended for this set is a single wire 50 to 75 feet long, exclusive of lead-in. The ground should be the usual water pipes, radiator pipe, or rod driven into moist earth.

Hook up aerial, ground and batteries as above and with the loud speaker plugged in at the second stage jack, and the filter coil primary as close to the secondary as possible, we are ready to pull the filament switch and get into operation. It is assumed that no errors have been made in wiring, and that from the mechanical point of view we are actually ready to adjust and tune the set.

Pull the battery switch, and turn the rheostats full on. The dials are assumed to have been placed in position such that when the condenser plates are entirely out, the dials are at zero.

First Regeneration

Starting with the center dial, we find that as we rotate this dial there is no noticeable result until it is turned in to about 15 to 20, when a change is noted in the sound coming from the horn. If followed closely, this change will be noted to take place with a distinct thud, produced when the dial reaches a certain position. This thud denotes the fact that the first detector has been thrown into the oscillating condition, by result of over-sufficient feedback or regeneration. This is as it should be, and shows that we will be able to control the amount of regeneration (and volume) with this 3-plate condenser.

Now with the 3-plate condenser turned in far enough to produce the oscillating condition in the first detector, if we turn either of the other two dials we will note a series of distinct clicks as the dial is rotated, which in slow motion are noted to be individual whistles. These whistles are the result of the oscillations from the oscillator tube mixing with those present in either or both of the detectors, by reason of over sufficient feedback, or regeneration, in either of the detectors. These are not carrier wave whistles and cannot be tuned in, and before any station can be tuned in, it will be necessary to adjust at least the second detector feedback to a point just below the oscillating condition.

The special condenser built into the filter coil is for controlling the feedback or regeneration in the second detector, and the adjustment of this condenser is the next thing to be explained. By setting the center dial on the panel at zero, we know that we are not producing oscillations in the first detector, and in this position we can make the adjustment on the regeneration in the second detector.

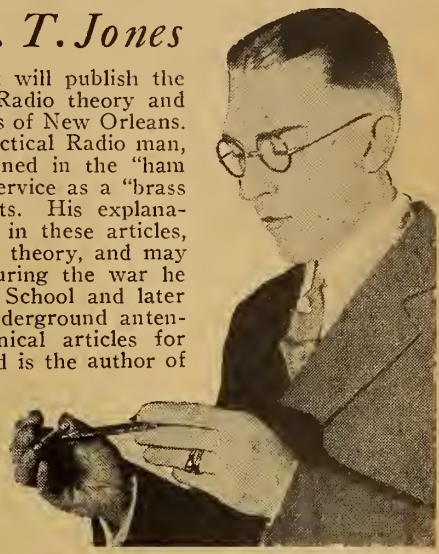
Adjusting Second Regeneration

Move the copper plate section of the special condenser until the copper plate is covering the tinfoil plate completely. This is the maximum capacity position, and the amount of regeneration produced by this setting of the condenser has brought the second detector to the oscillating point, which is evidenced by the series of whistles noted when the right hand dial on the panel is rotated. We must reduce the feedback in the second detector until we get the tube just out of the oscillating position. By adjusting the special condenser a little at a time towards the mini-

Introducing Mr. E. T. Jones

IN THE next issue, Radio Digest will publish the first of a series of articles on Radio theory and practice, written by Edward T. Jones of New Orleans.

The author of this series is a practical Radio man, much of whose knowledge was gained in the "ham amateur" days before 1912 and in service as a "brass pounder" on the United Fruit boats. His explanations and suggestions, as contained in these articles, can therefore be taken as facts, not theory, and may be followed without hesitation. During the war he was in charge of the Naval Radio School and later transferred to research work on underground antennas. Mr. Jones has written technical articles for nearly all the Radio publications and is the author of several books on Radio. Like other old timers, his favorite sport is experimental work. Among the many attributes attached to Mr. Jones we might mention that Leatrice Joy, well-known motion picture star, is a cousin, and has set a high goal for Mr. Jones to live up to.



imum capacity position, we gradually reduce the regeneration, until at a certain point the tube will cease oscillating, which condition can be known by the loss of the whistles which were found when turning the oscillator condenser dial, and which are now absent.

Having adjusted the feedback in the second detector to the point where the tube stops oscillating (a few trials will show the point of best operation for this setting), we can forget this particular part of the apparatus and the rest of the tuning will be done with the dials on the panel.

Dials Tune Together

As is the case with other regenerative sets, the feedback control should always

be kept at a position just below the point where the oscillating condition is produced. We are now referring to the center dial on the panel. With this dial set at a point near to the oscillating point of the tube, we begin our hunt for stations on the other two dials. These two dials run approximately even (or together) for a particular wave length or station, and should be rotated slowly in unison until a station is heard. If you are within a few miles of a broadcasting station, you will have no trouble in tuning it in, but even on the nearby stations you will note immediately the sharpness of the tuning.

(Continued on page 20)

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510 North Dearborn St., Chicago

regenerative (Armstrong) and most of them use speech improvements with which cost prevents the mere novice from experimenting. This hook-up can be made by any one familiar with the common regenerative hook-up and can use a few tools.

For quiet operation, clarity of music and speech, ease in construction, small first cost and up-keep, the pinkeddyne cannot be exceeded for distances on loud speaker reception up to 1,500 miles.

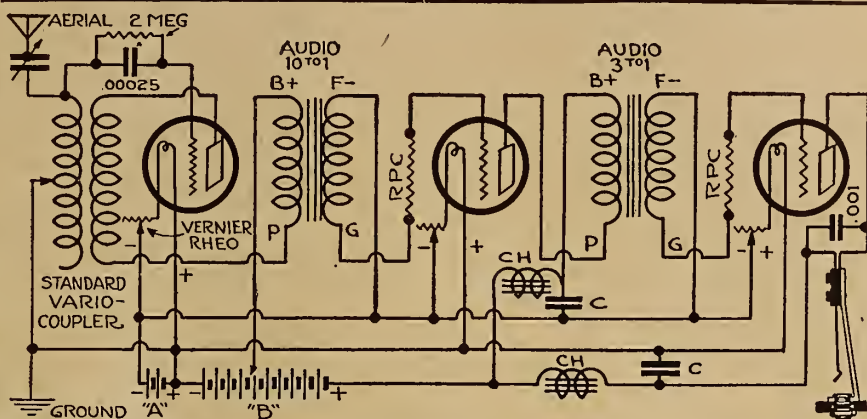
After the feed back that may be encountered by too close placing of transformers, tubes, sockets, etc., in a set, the next most troublesome source is the B battery. When it is considered that the plate circuits meet at the B battery it is indeed not very difficult to understand that inter-action between stages is a frequent occurrence. If it were not for the cost it would be indeed better to use separate B batteries for each stage and tube.

The arrangement of chokes and condensers, as shown in the pinkeddyne, will to a great extent solve this problem and is well worth trying by both the novice and DX hound. The chokes may be the ordinary primaries of the bell-ringing transformers. The condensers should be two mfd. capacity.

The main function of the chokes CH is to prevent the audio-frequency currents from flowing into the B batteries, while they allow the direct current from the B battery to flow to the plate.

The condensers C, by-pass the audio

PINKEDDYNE FEED BACK HOOK-UP



frequencies that are choked by the chokes CH and allow them to reach the filament but without having to pass through the B battery to do so.

The very small coils RFC are merely very small radio-frequency chokes placed in the grid circuits of the two amplifying tubes to block stray radio frequency currents that may reach the amplifier. These chokes are constructed by winding eighteen turns of number 26 wire on a lead pencil and attaching to a piece of cardboard or bakelite for mounting on base-board or in center of lead concerned.

A standard variocoupler has been used with wonderful results. Also a standard low loss 23-plate condenser is used in the aerial circuit. A .00025 grid condenser is used with about a 2 meg. leak. It is worth the using of a vernier rheostat for the detector tube, while one rheostat may be used for the two amplifier tubes if desired with about as good results. One 10 to 1 audio transformer is used in the first stage and a 3 to 1 in the second. Any standard wet battery tube may be used which will detect in detector circuit and amplify in the amplifying circuits. From 18 to 22½ volts B battery for detector and 45 to 67½ in amplifying circuit is used, according of course to the kind of tubes used. This can be easily arrived at by trial. Six-volt wet battery is always preferred in this kind of a hook-up.—M. C. Williams, Rantoul, Illinois.

Remove Moisture in Coils

Broad tuning and weak signals are often the result of moisture collecting in the insulation of the tuning coils. They may

not feel moist to the hands, but the dampness is there just the same. You will be surprised at the improvement that follows a good drying out in the sunlight or by placing the apparatus near the stove.

Adjustable Grid Leak Is Made from Rheostat

A very efficient grid leak can be made from a discarded rheostat by removing the resistance wire and putting a heavy



pencil mark in place of it. The arm will make a contact on the pencil mark as it rotates, thus varying the resistance.—G. Ross, Houston, Texas.

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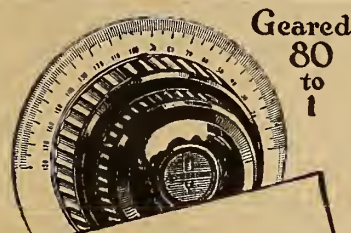
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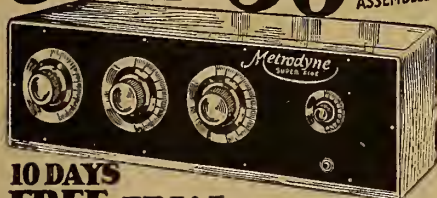
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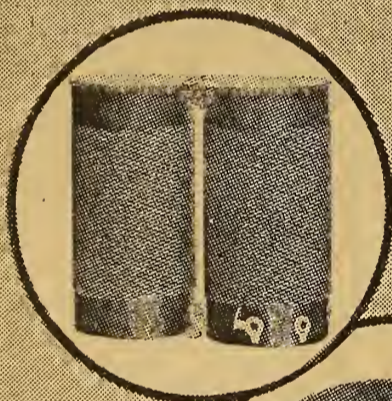
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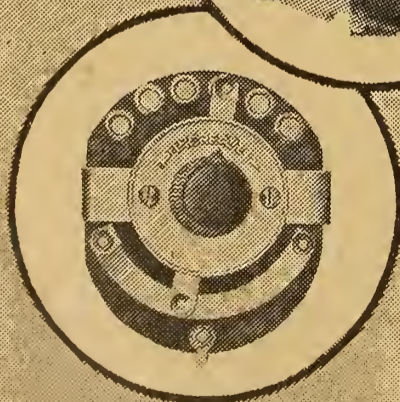
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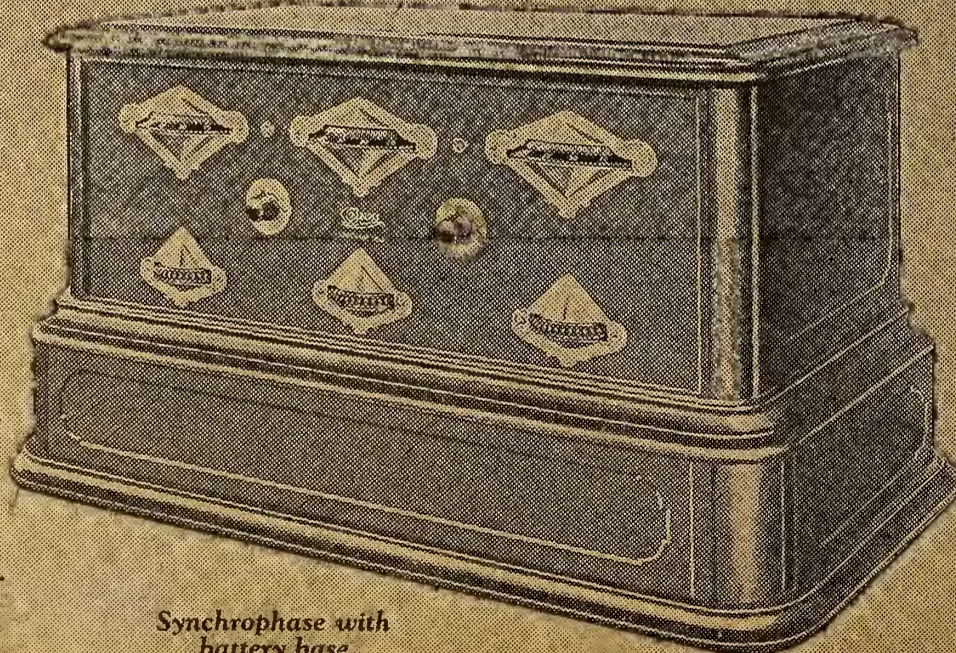
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