

Radio Digest

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

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

Vol. VIII

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SATURDAY, MARCH 1, 1924

No. 8

LABOR UNIONS TO RADIO

PLANS AIR TALKS TO HOLD WORKERS

WANTS SET IN HOME OF
EVERY EMPLOYEE

Canadian Rail Chief Has New Method
of Keeping in Personal
Touch

NEW YORK.—After declaring that he did not believe the amalgamation of the larger railroads in the United States would be productive of good, Sir Henry Thornton, chairman and president of the Canadian National Railways, announced recently his plans for obtaining the loyalty and enthusiastic support of the employes on his own 22,000-mile system through Radio, in a speech made here.

Sir Henry proposes that his railroad shall be the first in the world on which every employe will have a Radio receiver in his home, so that over it he will be able to hear the hopes, ambitions and plans of the president at least once a week. In order to give this personal touch, the Canadian National Railways will establish broadcasting stations at certain points on the lines, and provision will be made to sell to the 100,000 employes Radio receiving outfits at cost.

Establish Chain of Stations

"We are establishing a chain of broadcasting stations from the Atlantic to the Pacific at such intervals as will enable headquarters to keep in constant touch with the whole of the property.

"We propose to place at the disposal of our employes Radio sets for a moderate price. The sets can be bought either by paying for the whole thing at once or at the rate of \$1 or \$2 a month. The result of that will be that in a comparatively short time most of our men will have equipped themselves with receiving sets, and we propose, as fast as circumstances may require, to talk to our men in the evenings at their own homes."



For a dancer, whose twinkling toes are her stock in trade, to become a Radio favorite, seems unthinkable, but Mlle. Gambarelli, prima ballerina of the Capitol theater, New York, has done it with her Italian "patter" songs from WEA F, the theater's studio, every Sunday night.

TAKE STEPS TO PURCHASE BROADCASTER

Workers' Heads See Unions at
Disadvantage Without Ether
Propaganda Medium

To Unionize Station Help

Federations Approve Plan to Get
on Air to Counteract "Garbled
Interpretations of Employers"

CHICAGO.—Union labor of the United States, numbering more than 5,000,000 men and women, is likely soon, it was indicated here recently, to take definite steps toward the purchase and operation of Radio broadcasting plants at "strategic points", that is, in large cities and other industrial centers. It may thus incur under certain conditions, it was declared, the ban of the federal government.

The contemplated movement of union labor has been forced on it, it was contended by those speeding it in Illinois especially, by the tactics of "the employing class in alliance with owners of broadcasting stations now in operation who, like the owners and editors of most newspapers

(Continued on page 2)



Station WOR recently presented a most unusual program when a number of scholarship winners, all under the age of sixteen, entertained with song, dance and speech making. The juvenile prodigies are, from left to right, Lillian Kay, Florence Hynes, who performed in songs and recitals; Harold Polk, boy tenor, and Marion Stickel, songstress, all displaying themselves in happy mood on top of the grand piano, and nearest "mike" Elizabeth Mazal-kowics. President Coolidge was among the listeners in, it is said. K. & H. Photo

GOTHAM'S SCHOOLS "TUNE IN" LESSONS

RADIO NOW SCHOOLMA'M IN NEW YORK

Board of Education Broadcast Series of Lectures; on Air Half Hour Daily

NEW YORK.—For the first time in the history of education active use of Radio broadcasting on an extensive and permanent basis as an educational aid was inaugurated here recently when the Board of Education of this city, acting in co-operation with Station WJZ, broadcast the first of a series of daily educational Radio programs which have just been scheduled.

The programs, arranged by the newly created Radio Committee of the Board of Education, will be broadcast from 2 to 2:30 p. m. every school day. A special and permanent microphone line has been installed in the office of Dr. William L. Ettinger, superintendent of schools, and the programs every Tuesday afternoon will be broadcast by WJZ direct from there. On all other school days the programs will be given at the studio of Station WJZ.

Purpose to Educate People

The programs are designed primarily to acquaint the people with the work of the schools, to educate the public as to education. Superintendents of each department of the Board of Education will, in turn, explain exactly what is done in his department, and to what purpose. In addition, the pupils of each school will take part in the later programs with regular recitations, music lessons, glee club and school orchestra concerts, spelling bees, and special exercises for holidays.

New York City is thus the first city in the world to recognize and utilize the extreme value of broadcasting in education, and arrangements already consummated call for the largest municipal broadcasting program ever scheduled.

It is believed the boards of education of other large cities will follow the lead of New York in utilizing Radio in educational service by municipal co-operation with local broadcasting stations.

It is believed the boards of education of other large cities will follow the lead of New York in utilizing Radio in educational work, creating what may possibly become a nation-wide Radio educational service by municipal co-operation with local broadcasting stations.

LABOR UNION RADIO

(Continued from page 1)

and news services, exclude, ban or garble the transmission of organized labor's interpretation of economic problems."

Chicago Labor Favors Radio

During the last six months, as an instance of the growth of the demand for Radio as an agent of propaganda for labor, the Chicago Federation of Labor, the second largest organization of its kind in the United States, has thoroughly considered the feasibility of buying and running a broadcasting station here.

The proposal was recently unanimously approved by the local federation, members of which supported a resolution introduced by a delegate from the Commercial Portrait Artists' union that "one of the greatest problems confronting organized labor is that of reaching the working people with the story of its struggles and battles for uplifting toilers to a higher plane of civilization."

Unions at Disadvantage Without Radio

According to the resolution "Radio has become universal; it is so rapidly being converted into an instrument of propaganda in the interest of the powers that be that unless organized labor is able to use this wonderful means of communication in presenting its message to the working people it will be placed at a disadvantage."

The resolution, which concluded by urging the establishment and control of a Radio broadcasting station by the Chicago Federation of Labor, was said to have been the second of its kind within a short time. It was referred to the executive board, composed of officers of the federation. Discussion of the resolution was featured by the enthusiastic opinions of delegates from the postoffice clerks', lathers', sheet metal workers', cigarmakers', pressmen's, machinists', painters' and other unions.

Labor to Unionize Broadcasters

A member of the executive board afterward declared that efforts would be made to "unionize" all electricians, telegraphers, engineers and other mechanical employees of broadcasting stations throughout the country.

Reports current here recently showed, it was said, that almost every labor council in the United States had considered, within the last few months, the purchase and operation of broadcasting plants. It is considered probable that the Central Trades and Labor Council of New York

City, whose membership numbers hundreds of thousands, will soon determine ways and means to acquire a station. "When I was in New York city a few days ago," said Victor J. Olander, of Chicago, secretary of the Illinois State Federation of Labor (600,000 members), "I heard Radio discussed as an instrument of information very favorably by labor officials."

Question of Stations Hinges on Money

The Illinois labor body, Olander said, is "in a receptive state of mind" as to the use of Radio in the form of a broadcasting plant. "The question has often been discussed," he declared. "It is merely a matter of money." Finances of the Illinois federation of labor are said to be in good condition.

"Labor unions in Illinois," continued Olander, "await the action of the Chicago Federation in relation to the conclusion of its Radio investigating committee. The state labor convention in Peoria in September may make Radio an order of business."

Labor Radio May Be National

Although the advisability of employing Radio as a means of disseminating "its side of the question" has not as yet been considered officially or formally by the American Federation of Labor (headquarters Washington, D. C.), it was deemed probable by high labor executives here recently that the national organization will soon be compelled to consider the use of Radio broadcasting stations either under its ownership and direction or by various large labor bodies throughout the United States.

Organized labor anticipates and is prepared to meet, it was said, the opposition not only of "the employing class" but that of the United States' government. The latter prohibits propaganda only when "the majority of the people seem to

N. Y. Symphony Debut Goes on Ether at WJY

Famous Former Conductor of Berlin Orchestra Leads Musicians

NEW YORK.—The first concert of the season by the New York Symphony Orchestra with Bruno Walters conducting was broadcast by station WJY of the Radio Corporation of America directly from Carnegie Hall Friday, February 15, through the courtesy of George Engles.

Bruno Walters, internationally famous conductor of the former Berlin Symphony Orchestra, has been touring this country as guest conductor of the greatest symphony orchestras here since last season. His appearance with the renowned New York Symphony was his first New York concert since his arrival in America. Last season he conducted the same orchestra on two occasions, but has since then never appeared with them or with any other New York organization.

The program was broadcast in entirety, and included Schubert's "Symphony No. 9 in C," Tschaiikowsky's "Fantasy-Overture, Romeo and Juliet," and "Till Eulenspiegel's Merry Pranks," by Richard Strauss.

be against it," according to E. A. Beane, supervisor of Radio, ninth district, Chicago. "When letters or other forms of communication to directors of broadcasting stations show that the majority of the people oppose certain propaganda it is barred from the air," Mr. Beane said. The government would not interfere with the broadcasting of union labor views, Beane asserted, unless the reaction of such propaganda were bad.

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Looking Ahead

Wave Traps and Their Use—Another article of much interest to the listener in. This is a continuation of the article this week. It is written by the Mystery Man who knows the mystery of the elements.

Every Week Programs—Advance programs for more stations than most sets can tune in. When you want complete advance programs turn to page 15 of Radio Digest, the National Broadcast Authority.

Four-Tube Reflex Neutrodyne—H. J. Marx tells more about this set next issue. Following the circuit and building this set are well worth your time and expenditures for the parts.

A New A-B-C Series—These articles will start March 22 and the title of them will be "15 Minute A-B-C Lessons for Radio Beginners." This series will be in simplified language for the new fan in Radio. It will be written by P. E. Edelman.

Regenerative Receivers—Peter J. M. Clute will next tell the "Peculiarities of Regenerative Receivers." Learn all about regeneration and then you can't possibly interfere with your neighbor.

R. D.-115—This is an old circuit but it is a good single tube outfit.

Simplex Diagram—This hook-up is for a single tube reflex. Those who have used this hook-up have had excellent results.

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Have One Left

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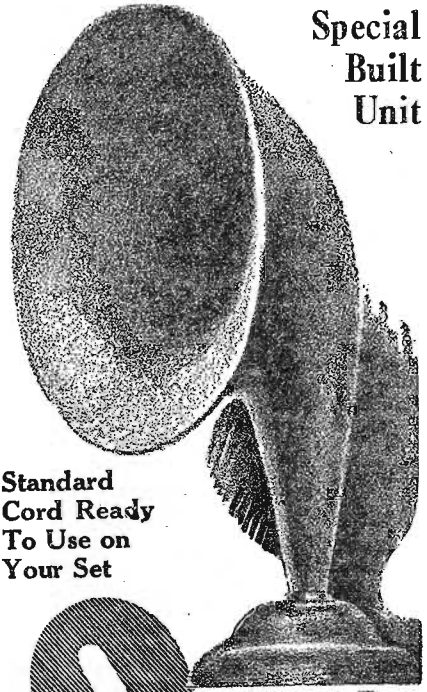
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RADIO INSPECTORS NEED MORE FUNDS

HOPES FOR MONEY TO BUY EFFICIENT TOOLS

Present Appropriations Fail to Provide Receiving Sets for Policing Force

WASHINGTON.—The lives of government Radio supervisors and inspectors in the nine districts of the country are strenuous, exhausting and expensive. Most of these officials, who strive to make ships, land stations, amateurs and broadcasters live up to regulations have, of necessity, become "night owls."

They must be a cross between detectives and mind readers. The varied problems coming up for solution every day, and the medley of technical questions they are asked by amateurs and fans, require the combined wisdom of Sherlock Holmes and Guglielmo Marconi.

Not alone do they inspect all transmitting stations, and examine commercial and amateur operators; they see to it that stations remain on assigned wave lengths, power and time schedules; they try to locate interference from every source to keep the ether clear for commerce and the listeners in.

Work Calls for Late Hours

This requires late hours, since most interference is reported to occur at night, and they are usually on watch until midnight in most districts. First hand information is of the greatest value to them, enabling them to act immediately and not spend time running down rumors and incorrect or inadequate interference reports, which they receive by the hundreds.

Present government appropriations, strange as it may seem, do not provide receiving sets for the governmental Radio policing force; consequently all of the men have to purchase or build their own sets. Good sets are, of course, necessary, and one supervisor is known to have spent seven hundred dollars in equipment for his main office out of his own pocket, but believed necessary for efficient and effective service in his district.

Can't Listen In on Hydrometer

Many other supervisors and inspectors have spent between four and five hundred dollars each in Radio equipment. The Government can only provide its field force with testing and measuring instruments, such as decimeters, wattmeters, ammeters, voltmeters and hydrometers. They cannot listen in with these instruments.

In Baltimore, the Supervisor maintains his own automobile, found essential in running down or locating unidentified stations and radiating receiving sets in the outskirts of his district. Some of the inspectors find Radio compasses, or direction-finding coils, necessary, in locating offending transmitting sets, or amateurs operating without giving their calls or using "fake" calls. It is a "hard life," they all admit and yet they find it fascinating and developing.

With the advent of the new appropriation bill, it is hoped that increased funds will be forthcoming so that the field force of the Radio section of the Bureau of Navigation can be provided with sufficient apparatus of the latest type to cope with the increased traffic in both code and voice.

WAAW Picks Its Slogan

OMAHA.—WAAW—"Where Agriculture Accumulates Wealth," that's the new call-letter slogan of the Omaha grain exchange's Radio station here. It was selected from approximately 1,000 suggestions telegraphed to the station the night the program was broadcast commemorating the 20th anniversary of the founding of the exchange. Harvey C. Kendall, Lincoln, Neb., the author, won \$10 in cash.

1,000,000 In Congregation

BIRMINGHAM, ALA.—The First Baptist church of Birmingham is said to have

MIKE'S EAR CATCHES ODD FELLOW RITUAL

CINCINNATI.—The Independent Order of Odd Fellows held the center of the microphonic stage at WLW, Crosley Radio Corporation, here recently, when for the first time in the history of Radio the installation of officers and other work of the Order was broadcast. Officers of one of the Cincinnati lodges did the ritualistic work in the studio and Radio carried it to the listening world.

DODY HAS A CHIP ON HER SHOULDER

MINNEAPOLIS.—A challenge to all the "jazz" piano players in the world and other nearby points is being broadcast regularly by WLAG, Twin City Radio central, following the announcement that Dody Reimer has won the piano championship of that station. Her rendition of "The Rosary" and other sacred numbers with her own arrangement is one of the persistent requests of fans.

ETHER WAVE MAKES MARCEL WAVE



Milady can now have her hair waved by Radio. This machine produces a Radio frequency current of about 3800 meters wave length, it is claimed. The high frequency current is concentrated upon the subject's hair and used to produce heat. The current is circulated through strands of wire wound on a heating spool. The hair is wound for curling on a tube which is inserted into the spool. There is no heat until this tube is placed within the spool. The apparatus eliminates all possibilities of burning the subject or her hair, it is said. Int. Newsreel Photo

the largest Radio congregation. It consists approximately of 1,000,000 persons. Radio services are conducted in connection with WSY, Birmingham's station which broadcasts the Sunday services of the church.

OBREGON'S SECRET CODE OVER WBAP

USES RADIO TO KEEP IN TOUCH WITH CONSULS

Calls on Fort Worth Station to Broadcast Rush Confidential Messages

FORT WORTH, TEX.—President Obregon of Mexico utilized the Star-Telegram station, WBAP, this morning from 2 to 5 o'clock, to convey a group of rush confidential messages to Mexican consuls located in different parts of the United States.

WBAP has for weeks handled news messages in code on a wave length of 1,250 and 4,000 meters from the chief Mexican air station, XDA, located in Chapultepec Castle at Mexico City. These have been from correspondents of the Associated Press, Chicago Tribune and New York Times.

At the conclusion of the news flings at an early hour Saturday morning, Colonel Romerez, chief of the Mexican Army Air Service, requested WBAP to establish connection if possible with President Obregon's private train, saying the president had some rush messages he wished to get to his American consuls immediately. The location of the train was not disclosed, and while the wave length of the apparatus on the president's train had to be given, secrecy was requested.

Use Secret Code

Connection was quickly made and in a few minutes the dispatches from the train station were being received. The transcript was in Spanish and in secret code. They were relayed promptly by telegraph to destination points. All were signed: "Tren Presidencial, Alvaro Obregon, Presidente Republica."

At the conclusion, Obregon sent a message of "thanks, congratulations and felicitations to the people of Fort Worth and Station WBAP."

During the transmission of many thousands of words of news dispatches, there has been each night a campaign of deliberate interference by the rebel faction. It has not, however, been able to block WBAP and XDA carrier waves, and only on one occasion was communication impossible.

HE COULDN'T PLACE THAT EMELINE GAL

Dusky Tenor Gets Her Praise but Not Her Identity

CLEVELAND.—The musical numbers of a program broadcast recently from a local station were provided by a group of tuneful colored folk and a considerable amount of applause was received by telegraph and telephone. Most of the telegrams were addressed to the station but one came addressed to the tenor of the group and read:

"I am sure pleased to hear your voice again. (Signed) Emeline."

It was from Birmingham, Alabama. The members of the group crowded around to read the message over the tenor's shoulder, and expressed their admiration of the tribute. The tenor scratched his head. "I certainly can't place that Emeline gal; nowhere, nohow. Most doubtless I knowed her, but I just can't recall her personality, a-tall." "Never mind," said a friend, "you can take the message home and frame it; I sure would."

"Who? Me? Me take that message home?" The tenor's voice trembled. "Man, you-all don't understand; if I was to take that there message to my home I wouldn't have no such!"

Something New in Hats

CINCINNATI.—A recent millinery exhibition here had a Radio receiving set fastened to a hat. Next they will be equipping them with transmitters and talking through them.

THE ANTENNA BROTHERS

Spir L. and Lew P.

A Mere Child in Fact



UNIVERSITY TEAMS HOLD AIR DEBATE

JUDGES LISTEN-IN FROM THIRD STATION

Oregon and California "U's" Engage in First Contest of Kind on Record

(See Pictures on Page 15)

PORTLAND, ORE.—A Radio debate between teams representing the University of California and the University of Oregon, with the two teams over 700 miles apart, and the judges probably in a third place equidistant, or with the Radio public judging, is the latest innovation in broadcasting.

Such an event is scheduled to take place on the night of February 29, with Station KGW, the Morning Oregonian, Portland, Ore., and Station KLX, the Oakland Tribune, as the two mediums through which the arguments will be given. So far as is known, this will be the first Radio debate on record to be held in such a manner.

The subject to be debated is the Bok Peace Plan, a topic of much interest over the entire country.

Will Continue Two Hours

Harold Cherniss and Raymond Sanders have been chosen in open competition to represent the University of California, and Joe A. Frazier and Walter D. Malcolm are the debaters of the University of Oregon. Cherniss and Sanders are being coached by Arnold Perstein, coach for California, and the two Oregon men are being prepared by H. E. Rosson.

According to the plans thus far announced, debating will begin at 8 o'clock Pacific time on Friday night, February 29, and will continue for about two hours. The station through which the affirmative will be upheld will make the first announcement and will then close down while the second station makes a similar announcement. The first speaker for the affirmative will then be introduced through his station and he will be allowed 15 minutes in which to present his arguments. The second station will then come on the air and the first negative speaker will be introduced and will present his arguments. In this manner the debate will be conducted just as though the four debaters were facing an audience from a single platform. Each team will be equipped with a receiving set in order to listen to the other's arguments for rebuttal.

Judges May Listen In

No definite plan for deciding the debate has been announced. The committee of arrangements is considering two plans: one to have the judges at a third point and to listen by Radio, and the other is to have the public at large cast votes, all votes to be in within ten days after the debate.

Both Stations KLX and KGW are of 500-watt power capacity with a minimum normal range of at least three times the distance between the two cities in which they are located and the audience will consist of all persons having access to receiving sets capable of picking up both stations. The two wave lengths in use are the highest in the Pacific Coast chain of Class B stations. KLX broadcasts on 509 meters and KGW on 492 meters.

Code "Hams" Bid for Memory Prize

One Got Some Message from Two Points Simultaneously—and Paid Twice

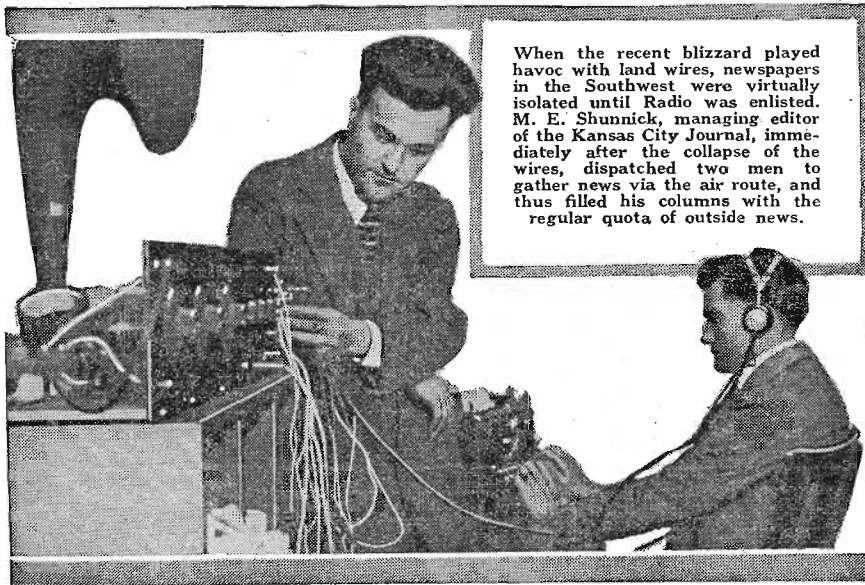
WASHINGTON.—Many old code operators defend the belief that experienced operators can copy or memorize more than one English message at a time, citing one expert in San Francisco, credited with having taken three dispatches at once—all proving to be correct when written out.

There is a former naval operator, now in a high governmental Radio position, who claims that while copying one message, he has often been able to note mentally other messages interfering with the reception of the first, and later write them out. Whenever he was copying some dull and uninteresting report, he says, he always was able to note with accuracy messages pertaining to shore leave, pay or other features in which he was especially interested.

But He Also Paid Twice

Another government official says he once got the same message while aboard ship from two shore stations. An important message for his ship was routed via San Francisco and also via Los Angeles. Both KPJ and KPJ called him at the same time, and when he told San Francisco to go ahead, both began to send simultaneously. He tried to take them both, which proved very easy when he discovered they were identical. The only trouble arose later, when both shore stations billed his ship for the message, each claiming credit.

RADIO VANQUISHES ELEMENTS



When the recent blizzard played havoc with land wires, newspapers in the Southwest were virtually isolated until Radio was enlisted. M. E. Shunnick, managing editor of the Kansas City Journal, immediately after the collapse of the wires, dispatched two men to gather news via the air route, and thus filled his columns with the regular quota of outside news.

New Orleans Operator Dies in Honduras Plane Crash

NEW ORLEANS.—Word has been received here that O. Endsley, Radio operator for the United Fruit Company, was

killed in Honduras in an airplane wreck. The operator was on his way from New Orleans to Tegucigalpa. As the machine was crossing the mountains it was forced to land. A wing was ripped off, Endsley was killed and the pilot injured.

DREAM DADDY OUT ON STATION TOUR

WDAR Bedtime Story Teller Takes "Vacation" by Working All the Harder

PHILADELPHIA.—Everyone knows the answer to the question, "Where does a ball player go when he has a day off?" Yes, that's it, he goes to a ball game.

This same funny spectacle presents itself in the announcement that Harry E. Ehrhart, famous as "Dream Daddy," the bedtime story teller at WDAR, Lit Brothers' station here, is spending his mid-winter vacation this year in a tour of the principal broadcasting stations of the middle west and east. "H. E. E.," as he is known when he announces, will be accompanied by Carl Zoehrs, co-author of the song "Dream Daddy," who will entertain from the stations they visit.

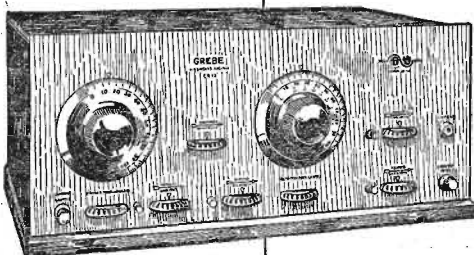
The trip began with the first stop at KDKA, Pittsburgh. From there the following towns were to be visited: Louisville, Cincinnati, Chicago, Detroit, Cleveland, Buffalo, Schenectady, Springfield, Mass., Boston, Medford Hillside, Mass., New York, and Newark, N. J.

Buenos Aires Has 9,000 Sets

WASHINGTON, D. C.—Vice Consul Heulahan estimates that there are about 9,000 amateur Radio sets in use in the city of Buenos Aires. He states that practically all well-known American apparatus have been introduced there.



"Music and beauty make life pleasant."—Yang Chu. The Grebe Broadcast Receiver delights both ear and eye.



Type CR-12—4-tubes Combines Regeneration and Tun- \$175.00 (Accessories extra)

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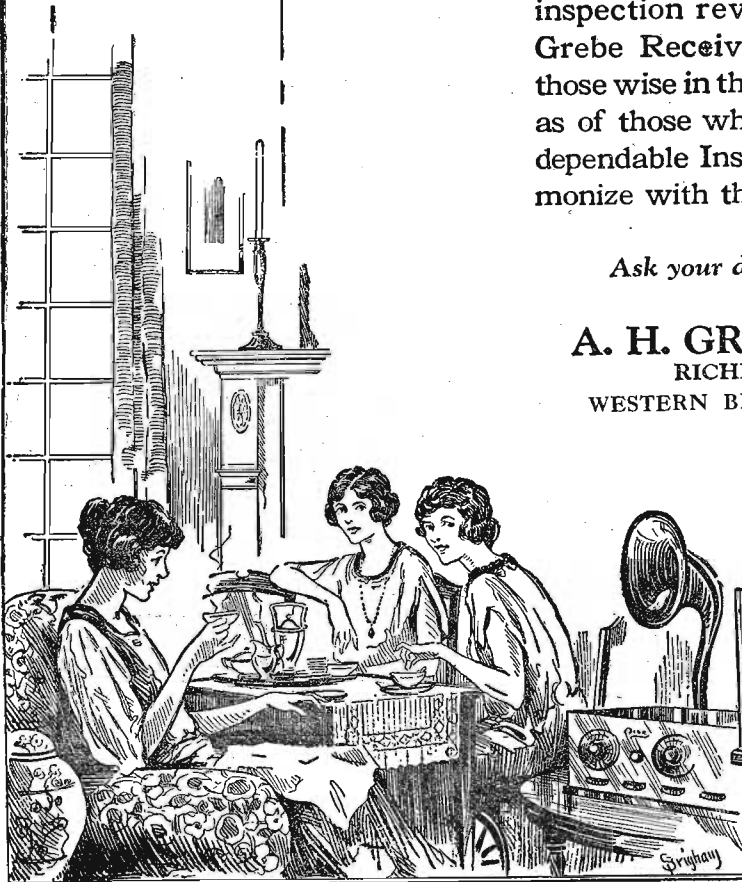
The rich walnut cabinets conceal all necessary dry batteries.

Each detail of craftsmanship bespeaks real efficiency. Even a casual inspection reveals the reason why Grebe Receivers are the choice of those wise in the ways of radio, as well as of those who desire a thoroughly dependable Instrument that will harmonize with their surroundings.

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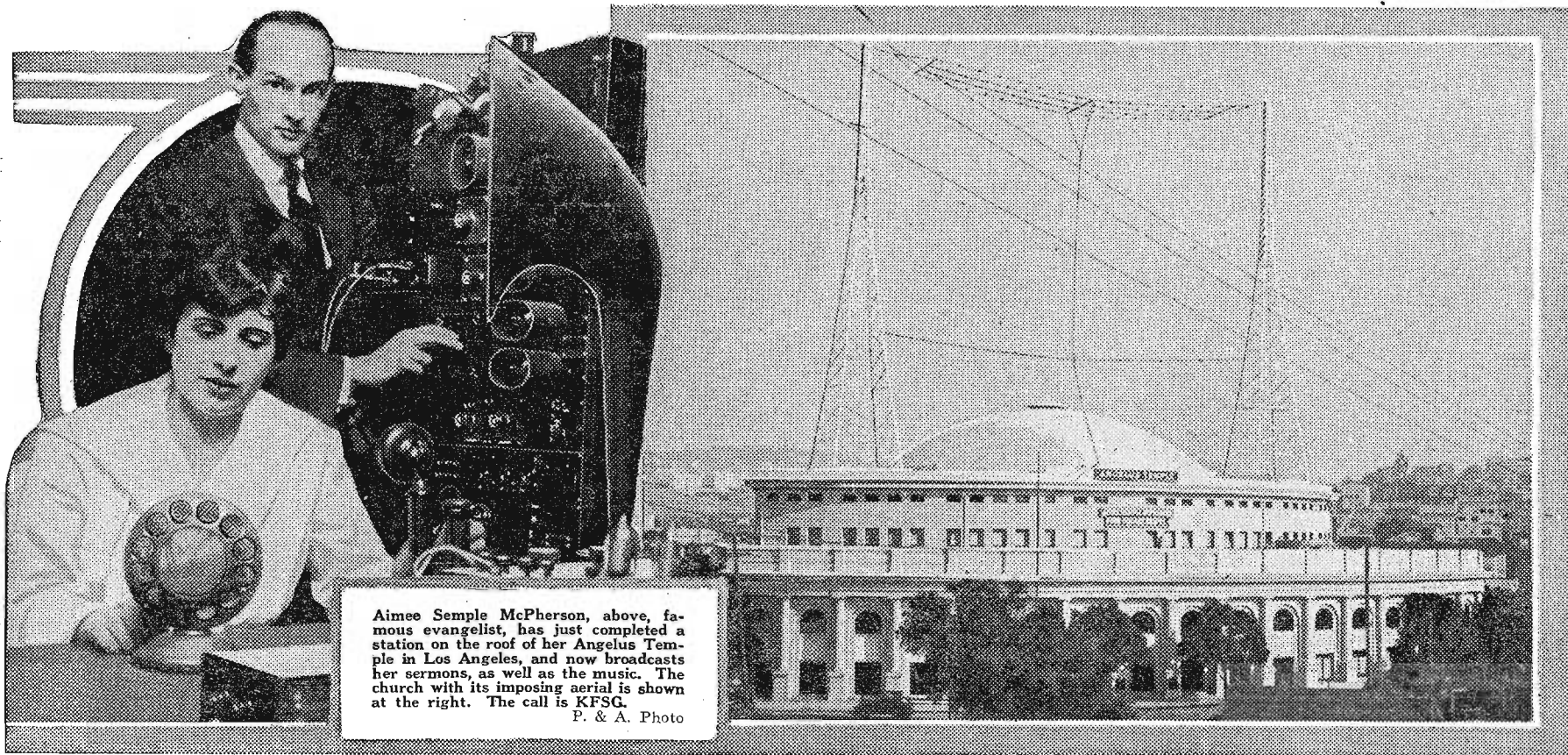
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WOMAN EVANGELIST BUILDS STATION



Aimee Semple McPherson, above, famous evangelist, has just completed a station on the roof of her Angelus Temple in Los Angeles, and now broadcasts her sermons, as well as the music. The church with its imposing aerial is shown at the right. The call is KFSG.
P. & A. Photo

U. S. LINKS CHICAGO PLANTS TO AID RAILS

CHICAGO.—E. A. Beane, federal Radio supervisor for the ninth district, headquarters here, has organized local broadcasters to keep communication open and trains moving during blizzards such as that which recently snarled wires and tied up the midwest. The broadcasters will cooperate with the railroads by transmitting dispatchers' orders.

BRYAN BROADCASTS ELECTION MESSAGE



The "Great Commoner" for the first time confronted "Mike," when recently he delivered an address on "The Election of 1924" from the Hotel Commodore, New York, where Station WJZ had installed an instrument specially for the occasion.
K. & H. Photo

Walter Camp Talks About Young Men and Athletics

NEW YORK.—Walter Camp, world famed athlete, sport writer, and coach of Yale's most famous football teams, recently talked to WEAF's listeners. He dealt with the value of athletic training in the development of young men. His address was under the auspices of the Boy Scout Foundation.

LEGIONARY BRANDS WGY BIASED CRITIC

CUTS ATTACK ON MELLON, CHARGE

Former New York State Chief and Charity Officer Call General Election "Unfair"

SCHENECTADY, N. Y.—WGY, the station of the General Electric company here, is being severely criticised, it is reported, for its policy of censoring broadcasts. One of the most specific criticisms is by Samuel E. Aronowitz, formerly state commander of the American Legion, who charges that the address of John R. Quinn, national commander of the Legion, had been so censored by General Electric company officials that important parts of the talk had been deleted. Quinn spoke at a banquet of world war veterans who are at present members of the state legislature. The dinner was in the Ten Eyck hotel in Albany, whence the speech was broadcast by WGY.

Speech for Bonus Hit Mellon
The national commander's address made a strong plea for a soldier's bonus and attacked Secretary of the Treasury Mellon for his negative stand on the question. Mr. Aronowitz, who listened in, charged, on the day following the broadcast, that the electrical censorial shears had been employed by the General Electric officials. First, Station WGY declared that Mr. Aronowitz' charge was not true.

Then a statement was issued by the great electrical corporation "to clear up the misunderstanding." The second statement "explained" that the station had established a policy of censoring all speeches, that no attacks on the government were permitted, but that Commander Quinn's address had not been received in time to censor it.

Maintains Speech Was Censored
Aronowitz replied to the General Electric "explanation" by declaring that the speech had been censored. His attack on WGY was seconded later by Commissioner of Charities Leo A. Doody of Albany who also scored the General Electric company.

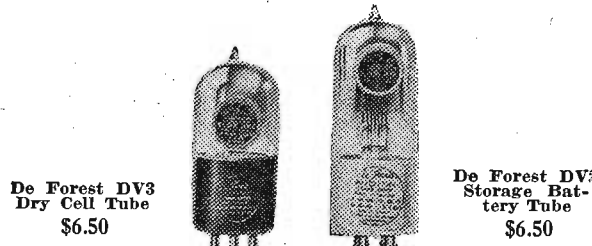
Commissioner Doody is very pointed in his criticism of WGY officials for attempting to dictate what speakers should or should not say, and is quoted with having said:

"It is a very strange thing for a company which is supposed to be rendering an economic service to demand that the views of speakers representing a society agree with the views of the officials of that company."

Manchester, Eng., broadcasting has now been heard in a Wigan coal mine at a depth of 260 yards. This beats the previous record at Lanark, when a Glasgow program was heard 300 feet below the surface.

Engineers Give Talks
NEW YORK.—A special program as to transportation was the subject of a recent series of talks in Philadelphia before the Institute of Electrical Engineers. Several addresses of the program were broadcast by Stations WEAJ of New York, WCAP of Washington, D. C., WIP of Philadelphia, Pa.; KDKA of Pittsburgh, Pa., and WGY of Schenectady, N. Y.

WAAM Talks of Salesmanship
NEWARK, N. J.—Station WAAM has a strong feature in the weekly talks on salesmanship delivered by Joseph G. Wood. His rapid-fire delivery and the humorous business stories he uses to point his addresses have won a large and appreciative audience, according to the number of commendatory telegrams and letters.



De Forest DV3 Dry Cell Tube \$6.50

De Forest DV2 Storage Battery Tube \$6.50

The More You Know About Radio The More You Rely on De Forest

Without Lee De Forest's discovery of the vacuum tube there would be no radio today. All radio broadcasting, all radio receiving by means of tube sets, rests on De Forest patents.

De Forest has been a pioneer in radio since 1900 and De Forest is a pioneer today. That is the reason for the great success of the De Forest Reflex Radiophone. That is the reason for the success of the new De Forest tubes—DV-1 Dry Cell Tube, DV-6-A Universal Tube, DV-2 Wet Cell Power Amplifier Tube.

If you want a radio receiving set with a range on indoor loop of from 1,500 to 3,000 miles, depending on atmospheric conditions; if you want simplicity of control, clear reception without distortion and without extraneous noise; if you want operation on either wet or dry cells—see the De Forest Reflex Radiophones at the De Forest agents today.

The D-7 A Reflex Radiophone is a three-tube set at \$125.00; the D-10 Reflex Radiophone has a drawer in its cabinet for dry batteries and is a four-tube set at \$150.00. No matter what you pay, you can't get greater radio satisfaction.

Whether you buy your set complete, or build your own from the laboratory-tested De Forest parts, you can rely on De Forest, the greatest name in Radio.

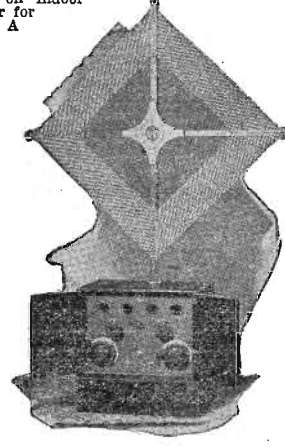
De Forest Radio Tel. & Tel. Co.
Dept. R. D. 7 Jersey City, N. J.

De Forest Portable Reflex Radiophone type D-10, which operates on wet or dry cells, has a reception range of from 1,500 to 3,000 miles on indoor loop; has drawer for all necessary A and B dry cells. Price \$150.00, plus approximately 6% for transportation in territories west of Rocky Mountains.



Radio Catalogs Free
Send a postcard for De Forest's Free Radio Catalog with full details and prices on sets, tubes, and parts.

De Forest products are sold only through exclusive agents direct to the public for your protection. The De Forest Company will be glad to hear from representative dealers in various communities who wish to become exclusive De Forest agents.



MANUFACTURED TRAPS NOW ON THE MARKET

THE number 247W Wavemeter and filter, shown in the illustration, is manufactured by the General Radio Company of Cambridge, Mass. It consists of a wavemeter inductance connected to a .0005-mfd. variable condenser with a vernier control. In order that it may be used as a filter, a coupling coil is placed beneath the wavemeter winding. The number of active turns of this coil may be varied by means of a switch, which also serves to either disconnect or short-circuit the coupling coil.

How to Use the Filter

The filter can be used with any receiving set to improve selectivity; the improvement being more noticeable when used with a single-circuit type than with the inductively coupled type of receiver. When used with a crystal receiver, the operation of the filter is quite simple, but some practice is necessary to get best results when using it with a regenerative tube set, especially when the parallel filter is used.

The Series Filter

When troubled by interference from a nearby broadcasting station, break the antenna lead to your receiver and insert the coupling coil, by connecting it in series in the antenna lead.

Set the switch on tap 8 (8 turns in the coupling coil) and slowly rotate the condenser knob until the desired signal decreases, vanishes and again increases. Using the small knob, pass slowly back and forth over this point until the position for minimum interfering signal is located. The filter is now set for this one interfering station, whose wave length in meters can be read from the condenser scale. Both the interference and the filter may now be forgotten and the receiving set tuned to distant station in the usual manner.

Use of the Switch

Place switch on 0 to entirely cut the filter out of the circuit, on 3 or 5 for moderate interference, and on 8 for strong interference. Do not try to use a series filter to cut out spark stations. The parallel filter is used for this purpose.

The Parallel Filter

The parallel filter is used to reduce interference caused by spark transmitters, static, A.C. hum and similar sources. It will also allow you to tune out several local stations broadcasting simultaneously, and receive from a broadcasting station on a wave length differing by only a few meters from the nearest interfering wave.

Connecting the Parallel Filter

Set the switch on "open," and tune your receiver to the desired station. Then move the filter switch to contact 8 and all signals will disappear until the filter condenser is adjusted to exactly the wave length of the desired station. The wave length markings on the dial are a help if the desired wave length is known. Listen closely for your station while slowly moving filter condenser back and forth over the approximate wave length of the station. Use the small knob and tune carefully, because one-half degree on the condenser dial is enough to tune the desired station in or out. Most people are not accustomed to the highly desirable sharp tuning which is obtained from this Radio filter, and therefore pass over the proper setting without noticing the signal. Practice first on tuning in a loud broadcasting station. After the filter has been carefully adjusted for maximum signal strength, slightly retune the receiver, making a change in the amount of regeneration, if necessary. Place switch on "open" to entirely disconnect filter from receiver, on 8 or 5 for moderate interference and on 3 for strong interference.

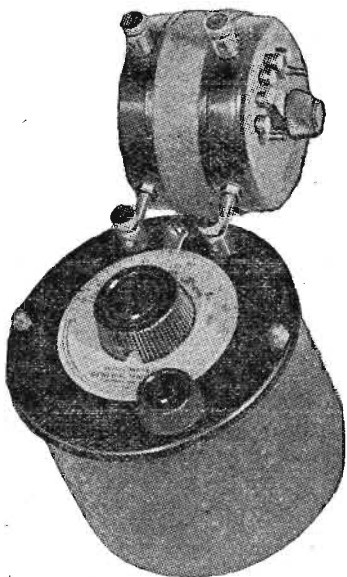
Measuring Wave Lengths

Wave lengths from 150 to 500 meters may be measured within 2 per cent of precision. To measure the wave length of an incoming signal, connect the coupling coil in series with the antenna; set the switch on 3 or 5 and carefully rotate the wavemeter condenser until the signal is filtered out. The wave length is then read from the condenser dial.

Setting for Known Wave Lengths

It is often desirable when listening for a certain broadcasting station to adjust your receiver to the proper wave length before transmission begins. Many experimenters also find it convenient to have their tuning controls calibrated in wave lengths. The wavemeter can be used for this purpose only with regenerative receivers. With the usual single-circuit tuner, the operator should make the detector tube oscillate at approximately the desired wave length. The wavemeter is then brought near the antenna tuning inductance and the condenser slowly rotated until the double click is heard in the telephone receivers. This click is due to a sudden change in current through the telephones.

When the wavemeter is tuned to the wave length of the oscillating tube it withdraws sufficient energy from the tube to momentarily stop its oscillations, and a click in the telephones results; another click is heard when the tube again begins to oscillate. If the two clicks occur 30 or 40 meters apart, the coupling between the wavemeter and the receiver should be loosened by moving the wavemeter coil



farther away until the two clicks merge into one. After a little practice in noting the indication of resonance by the double click method, you are ready to set your receiver to the desired wave length, say 410 meters. Set the wavemeter at 410 meters and slowly vary the wave length of your receiving set while it is oscillat-

ing. Listen for the double click when the receiver is in tune with the wavemeter. Move the wavemeter far enough away so that the two clicks occur very closely together. The receiver is now tuned to 410 meters. If the means for controlling regeneration on the receiver is altered, the wave length will vary slightly, but this variation is usually less than three meters.

Inductively Coupled Receiver

With an inductively coupled receiver, disconnect the antenna and proceed as mentioned in the foregoing paragraph, coupling the wavemeter to the secondary circuit of the receiver. After this circuit is tuned to the proper wave length, the operator should reconnect the aerial and retune the antenna circuit to the secondary circuit by means of the double click method, using only sufficient coupling in the variocoupler to make the double clicks come close together. Incidentally, this easy and accurate method of tuning the primary or secondary wave length is not as widely known, or used, as it should be.

Measuring Wave Length of Transmitter

To measure the wave length of C.W. transmitter with a 247W wavemeter, the operator makes use of the reaction method to indicate resonance. With the C.W. transmitter in operation, the wavemeter is brought near the antenna tuning inductance (about 6 inches away) and the condenser dial is slowly rotated until the wavemeter is brought into resonance with the transmitter, which is indicated by a

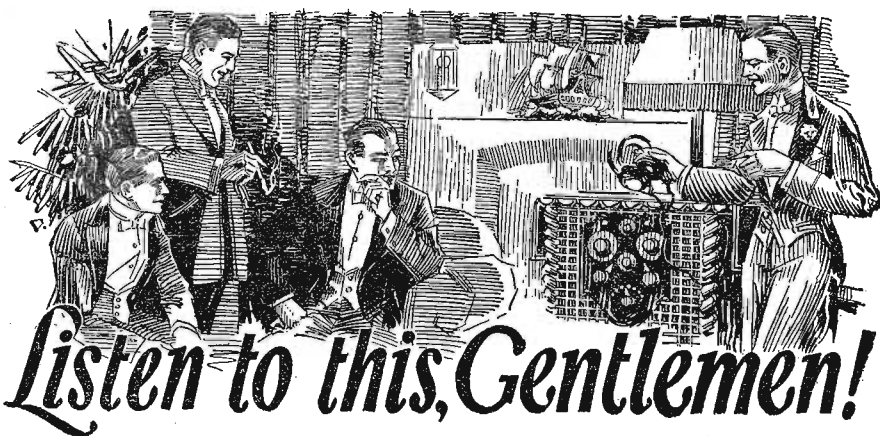
Idle Hours No Longer Dreary for Ranch Men

Texas Ranch Picks Up Joy from Far and Wide

SANDERSON, TEX.—Radio is revolutionizing ranch life in Texas. The long evenings which once were a major argument in inducing youths to desert the cattle industry, have been converted into periods of joy and interest.

An example is the Downie ranch of more than 100 sections of land, 10 miles northwest of Sanderson. One of the largest Radio receiving sets in Texas has been installed on the ranch by Charles Downie, son of the owner. During the last few weeks the ranch house has been headquarters for ranchers in the district who hear programs from all parts of the United States.

sharp reaction on both the plate and antenna ammeters. The plate ammeter, if used, is ordinarily the better indicator to watch, because it is quick-acting. After a downward kick is noted on the indicating meter, the wavemeter condenser is then slowly rotated back and forth by means of the small knob, until the reading of the indicating meter is a minimum. The wave length of the transmitter is then obtained by reading the wavemeter scale. The coupling between the wavemeter and the antenna tuning inductance should be only sufficient to cause the least reaction which can be easily observed on the indicating meter.



Listen to this, Gentlemen!

You wouldn't think it was the same set since I've added All-American Power Amplification

For an astounding roundness, richness, depth and clarity of tone—plus maximum volume wholly without distortion!—just hook up a pair of All-American Power Amplifying Transformers in a "push pull" circuit and add it to your present audio frequency amplifiers.

Use any good loud speaker—you'll be delighted beyond words. "Absolutely the most efficient, most satisfactory 'push-pull' transformers ever put on the market"—this is the verdict of radio enthusiasts everywhere.

All-American Power Amplifiers are as popular as All-American Audio and Radio Frequency Transformers—which is the highest compliment that could be paid them because the latter are the best-liked, most widely used transformers in the world.

Special Offer

Have you the new "All-American" diagram and circular describing Power Amplification; also Book of 22 Tested Hook-ups for getting new thrills out of your radio equipment? Send 4c in stamps to Rauland Mfg. Co., 2650 Coyne St., Chicago.

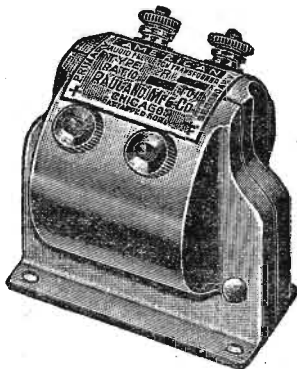
ALL-AMERICAN AMPLIFYING TRANSFORMERS

Largest Selling Transformers in the World

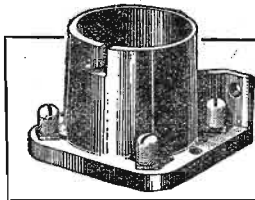
ALL THE BETTER

Dealers recommend

THE "ALL-AMERICAN"

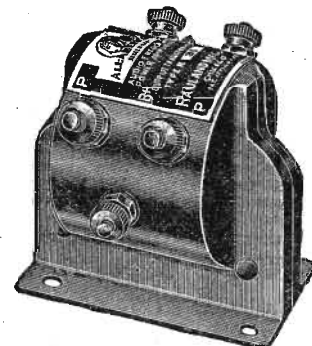


All-American Audio Frequency Transformers lead in the sales: 3:1, 5:1, 10:1, \$4.50 to \$4.75. The best—no need to pay more.



All-American Socket

One-piece molded Bakelite—for panel or base mounting. Finest socket money can buy. Only 75c.



For "Push-Pull" Circuits: The All-American Power Amplifying Transformers, Input and Output Types, \$6.00 each.

And NOW! the new All-American Long Wave Radio Frequency Transformer Suitable for Super-Heterodyne circuits

AIRWAVE GUIDES FOR MAILPLANES

WARN FLYERS OF DANGERS ON THEIR ROUTES

Signals by Etherwave Give Up-to-Minute Reports on Weather Conditions

FAIRFIELD, O.—Tests of new Radio equipment at the Army Air Service Radio station at Wilbur Wright Field here show the practicability of co-operating with Air Mail and Air Service planes, especially in disseminating meteorological information and in keeping track of transcontinental flights over distances up to 1,000 miles.

Station WYD, part of the Army Radio net for some time, has also aided airplane flights, but a complete central weather forecasting and broadcasting station has now been incorporated for the transcontinental airways.

The major duty of this station will be to receive, co-ordinate and broadcast meteorological information to and from various Air Service airdromes via the Model Airways. At present a regular flying schedule is maintained over the Airways between Mitchell Field, N. Y.; Bolling Field, Washington, D. C.; Langley Field, Va.; Langin Field, West Va.; Wilbur Wright Field, Ohio; McCook Field, Ohio; Chanute Field, Ill.; Selfridge Field, Mich., and Scott Field, Ill.

Tell Flyers Weather

Weather reports from each of these stations are received daily at 7:50 a. m. and every two hours thereafter until late in the afternoon. These reports are consolidated and the summary immediately broadcast to all airdromes, where the information is posted on bulletin boards, so that all pilots may have first hand information as to weather conditions over all the routes.

In addition, special items as to local storms and conditions will be relayed to the central station. Arrival and departure of all pilots is broadcast to Airways Headquarters at Bolling Field, together with such information as may be pertinent, thus the location of all pilots can be plotted and their arrival anticipated.

Broadcasting from this station will ordinarily be in code on a 1,500-meter wave length. As the equipment permits of Radiophone broadcasting, it is possible that programs of various kinds may be

ARGENTINE PRESIDENT RADIOPHAN



Argentina's president is the latest famous person to get the Radio habit. President Marcelino Alvear (cane over arm) bought the miniature Radio set he is holding at a recent Buenos Aires exhibition. Photo by United

Famous Detective Tells Some Thrills from WOR

Val O'Farrell, Active in Prominent Cases, Reminisces for Fans

NEWARK, N. J.—Val O'Farrell, who enjoys the distinction of being one of the best beloved and at the same time thoroughly feared men in the annals of crime detection, talked recently from WOR here. His talk included reminiscences gleaned from an unusually active experience which covers close to a quarter of a century and extends to every corner of the civilized world.

Among the famous cases he worked on were: the Schoelkopf robbery, the Ward murder case, the Carmen murder case, the famous Burnet \$50,000 jewelry robbery, and the Garnet robbery.

broadcast later. An emergency set, having a range of 3,000 miles and similar to that now in use by the Shipping Board for communication with its fleet, will also be installed as a precautionary measure.

NO RECEIVER TAX, HOOVER'S POLICY

Secretary of Commerce Opposes Suggestion That Listeners Pay Licenses

WASHINGTON, D. C.—Secretary of Commerce Hoover recently took the definite stand that he would oppose any suggestion that the government collect taxes from Radio fans owning receiving sets.

The question came up at a recent news conference with the secretary when his attention was called to the fact that many foreign governments are collecting license fees as to Radio receivers. He said he was not in favor of such fees in the United States and pointed out how much more advanced the United States is as to Radio. This is due in part, he said, to the fact that no licenses are required.

Hoover said that he was not of the opinion that charges would be made for broadcasting, at least at the present time.

DOCTOR PRESCRIBES HEADPHONE SET

AND NOW HIS PATIENT IS STEADILY IMPROVING

Two Elderly Sisters on Lonely Farm Forget Their Complaints to Enjoy Radio

NEW YORK.—The use of Radio receiving sets in hospitals has become fairly common, but it remained for a Massachusetts doctor to prescribe a set for a patient he was treating in her own home.

For some time he had been physician to two middle-aged women, sisters, living on a lonely farm. One of the sisters had been under his care constantly for an obscure condition which seemed to be growing chronic. A consultation of physicians ended with the opinion that the patient's ailment was more mental than physical.

Doctor Suggests Radio Set

It happened that the doctor was a Radiophan. The thought of a Radio set for the patient suggested itself; he promptly prescribed one.

The price of a complete set seemed prohibitive; so he advised the sisters to build one. They couldn't have been more surprised if he had asked them to build an aeroplane. But the doctor loaned them his own set until he could go to town to buy parts for them.

With a little help from the doctor, they built the set, received excellent results and rapidly became ardent Radiophans. Meanwhile the sick sister forgot to be sick.

WBAP's Hourly Reports on Wilson Win Thanks

FORT WORTH, TEX.—Hundreds of telegrams and letters of appreciation were received by the Star-Telegram for its hourly bulletins on the condition of the late ex-President Woodrow Wilson broadcast over WBAP.

The Star-Telegram broadcast concise bulletins for fifty-five consecutive hours prior to the death of Mr. Wilson at 10:15 (Central Standard time) Sunday. Following his death WBAP was on the air hourly with the information. A leased wire from Washington furnished WBAP with a running story on the illness and death of the wartime president.

FEDERAL HEAD SETS

are used by Radio Experts because they are Federal Standard.

Price **\$7.00**

2200 OHMS

Federal
Standard RADIO Products

“Yes,—But Jim’s set has an—!”

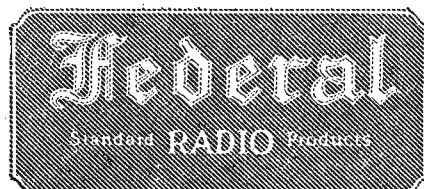
The competition between radio enthusiasts! You can't have helped notice it. Each man is proud of the attainments of his set—eager for its further development.

It is this same, healthy spirit of competition that has contributed largely to the success and leadership which establishes, as positive in its performance, every radio set and every radio part made guaranteed by Federal.

Federal Head Sets are but one of 130 Radio Parts, designed, made and guaranteed by Federal.

Federal Telephone and Telegraph Company
FACTORY: BUFFALO, N. Y.

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



(The Sign of Reliable Radio Dealers)

RADIO SPILLS SOME N'ORLEANS SYRUP

TAKES POST AS EMISSARY OF GOOD EATS

Somebody Broadcast Something About Pancakes and 'Lasses and That Started It

NEW ORLEANS.—Enter Radio as an empire builder and emissary of good things to eat. Empire building sounds big and magnificent, and all that, but those who have visited or lived in Louisiana know the vanity of empire building when compared with good things to eat. However, it is the good things to eat that Louisiana sells that make for empire building, so far as this commonwealth is concerned, and Radio is given credit for a part in helping Louisiana expand. In this manner:

Walter K. Bush, station agent for the Missouri Pacific railroad at Clarks, La., was listening in when the announcer at a broadcasting station at Jefferson City, Mo., expressed a desire for some good old homemade syrup and pancakes. Mr. Bush couldn't send the pancakes, but he sent a can of good old homemade syrup by the next train headed for Missouri.

Illinois and Dakota Mouths Water

The announcer, upon receipt of the syrup, thanked Mr. Bush by Radio. It so happened that Mrs. H. S. Bowen, of Wilmette, Ill., and A. E. Marshall, of Del Rapids, S. D., overheard all that, and it came to pass that their mouths watered at the discussion set up between Missouri and Louisiana upon the subject of eating—a subject that anyone who has ever lived in the pancake and hot biscuit belt will admit being among the most important subjects conceivable.

So Illinois and South Dakota became interested and wrote for prices, and rushed—not merely sent—but rushed checks forward for supplies of good old homemade syrup. Later Wisconsin, Ohio and Minnesota stepped forward with orders, all within a few days.

Thus do good things to eat, empire building and education go hand in hand, even through the ether.

Denmark now has officially licensed 3,109 private Radio receiving sets. School pupils rank first with 473 sets while commerce, shipping, and industry come second with 448.

'BABY' PRIMA DONNA IN REQUEST RECITAL



Though called the "baby" of the Chicago Civic Opera Company, Mary Fabian is that only in size and years. Recently she sang from WJAZ. Previous to her singing at the Zenith-Edgewater Beach hotel station, listeners were asked to express their wishes as to what she should sing. Responses came in by the thousand and a very enjoyable evening program was the result.

"Bridge" Expert Tells His Tricks by Station WEAF

NEW YORK.—Raymond F. Rode, said to be one of the foremost authorities as to auction bridge, recently gave a lesson by Radio through WEAF. It was one of a series acceptable to those who play the game. Rode explained the fine technique of the game in simple terms.



BRISTOL SINGLE CONTROL RADIO RECEIVER

(NON REGENERATIVE)

Using Grimes Inverse Duplex System

ONE CONTROL ONLY Makes It Most Simple to Operate.

SIMPLICITY OF OPERATION is the outstanding feature of this Receiving Set. One Control Dial includes every adjustment. To tune in, turn this Dial. A station once located can always be brought in again at the same setting.

NOT CONFINED TO LOCAL BROADCASTING—this four-tube set has power equal to six. Because the Grimes Inverse Duplex System utilizes the first two tubes for both Radio and Audio Amplification.

ANTENNA OR LOOP—either may be used to suit conditions.

SOLID MAHOGANY CASE with walnut finish encloses the complete Receiving Set. It is a beautiful piece of furniture fully in keeping with the most luxurious room.

The Price

Bristol Single Control Radio Receiver

\$190.00

Ask for copy of Bulletin AY-3013 describing this set.

THE BRISTOL CO.

Waterbury, Connecticut

RADIO TALKS

Do you know that an up to date low loss tuning condenser means no body capacity effects, sharper tuning, no shielding, more long distance work? A real good variable condenser is a safe investment at any reasonable price, because the entire action of your set depends so much upon this item.

E. J. Flewelling

Genuine— E. J. Flewelling Radio Apparatus De Luxe

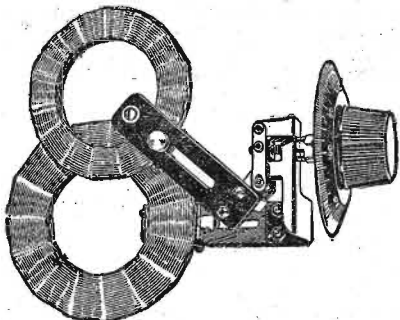
Satisfaction comes only with results. And there are loads of both in the Flewelling Tuner. By results we mean "first class" reception; we mean strictly high performance; we mean ability to do everything a good tuner should do—and a lot more. What we mean by satisfaction can only be experienced by the user of the Flewelling Tuner. It is "genuine" if it is manufactured by

BUELL MANUFACTURING COMPANY

2977 Cottage Grove Ave.
CHICAGO

Flewelling
TUNERS
\$8.00

Flewelling
SOCKETS
\$1.00



FEDERAL COMPLAINT AGAINST R.C.A.

How R.C.A. Ties up with Postal Telegraph, A. T. & T., Japan and South America

R.C.A. Conspired; Claim

Commission Names Seven Means Used to Create Monopoly and Restrain Competition

(Believing that Radiophans in general are interested in the recent complaint against the Radio Corporation of America filed by the Federal Trade Commission, Radio Digest has undertaken the complete reprinting of the material contained in the report of the commission. While the complaint is in true legal form and is not easily read by Radiophans other than lawyers, the direct reprint is undertaken because it is believed no other publication will give the information in so complete a form.—Editor's Note.)

Part III (Conclusion)

PARAGRAPH TWENTY-TWO: On or about September, 1922, the Radio Corporation of America entered into an agreement with the Federal Telegraph Company of California to incorporate the Federal Telegraph Company of Delaware for the purpose of carrying out certain agreements between the Federal Telegraph Company of California and the Government of China, executed on or about January 8 and September 20, 1921, for the construction, installing and operation in China of a radio system for communication between this country and China; said agreement between the Radio Corporation of America and the Federal Telegraph Company of California was for the term of ten years and provided for the taking over by the Federal Telegraph Company of Delaware of said contracts of January 8 and September 20, 1921, and the participation of the Radio Corporation of America in the carrying out of the agreement with the Federal Telegraph Company of California with the Chinese Government on the basis of an equal share of the profits.

The Radio Corporation was to name the chairman of the board of directors, on which the Radio Corporation of America and the Federal Telegraph Company of California were to have equal representations in number; the president of the Federal Telegraph Company of California to be president of the Delaware corporation. By said

agreement of September, 1922, the Radio Corporation granted to the Delaware corporation, for the purpose of construction and communication under the Federal company-China contracts, a non-exclusive license under all its patents in the United States to use in China for Radio telegraphing purposes, but not to make or sell, and the Federal Telegraph Company of California granted to the Delaware corporation a similar license under its patents, all of which more fully appears from said agreements.

R.C.A. Ties Up with Land Telegraph

PARAGRAPH TWENTY-THREE: On or about July 10, 1922, the Radio Corporation of America and the Postal Telegraph Company, a New York corporation, entered into an agreement by which the Postal Company agreed to accept for and receive from the Radio Corporation messages, each to pay the other for its respective service tolls; the Radio Corporation agreed to tender the Postal Company, to be forwarded over its lines, all trans-Atlantic Radio messages received by it or its connections destined to points in the United States reached by the Postal Company, except where the Radio Corporation has its own facilities; it being provided that no traffic arrangement should be made with any company where the Postal Company has facilities except for ship-to-shore and ship-to-ship traffic, the Postal Company agreeing to receive Radiograms only of and from the Radio Corporation and not otherwise to be the forwarder of trans-Atlantic radio messages under any agreement for through Radiotelegraph service, all of which more fully appears from said agreement.

A.T. & T. Lends R.C.A. Land Lines

PARAGRAPH TWENTY-FOUR: On or about September 25, 1920, the Radio Corporation of America and the American Telephone and Telegraph Company entered into an agreement for extra-continental Radio traffic, which recites that the latter company in connection with its telephone system maintains some telegraph terminals and that the Radio Corporation purposes to establish transfer offices for the transfer of extra-continental Radiotelegrams between land lines and its Radio stations; said agreement provides that the Radio Corporation may attach wires connecting its transfer offices with Radio

stations to poles of the American Telephone and Telegraph Company at the same rates as commercial telegraph companies for use only for the transmission of the Radio Corporation's extra-continental Radiotelegraph messages, and transmission of its telegraph service and other messages at the Radio Corporation's expense, on the condition that the Radio Corporation shall not direct elsewhere a material part of its extra-continental traffic, all of which more fully appears from said agreement.

How R.C.A. Gets All Jap Business

PARAGRAPH TWENTY-FIVE: Among the assets of the Marconi Wireless Telegraph Company of America, acquired as hereinbefore alleged by the Radio Corporation of America, by an assignment dated on or about March 27, 1920, was an agreement entered into on or about August 22, 1918, between the Marconi Company and the Imperial Japanese Government, which provided for a mutual exclusive contract for the handling of traffic unless specially ordered otherwise by senders, and provided that rates are as cheap as elsewhere, and subject to the terms of the International Telegraph Convention of St. Petersburg so far as compatible with said agreement, all of which more fully appears from said agreement.

PARAGRAPH TWENTY-SIX: By various agreements by assignment from the Marconi Wireless Telegraph Company of America, or directly with the governments and/or companies having exclusive rights for the operation of Radio communication from said governments, respectively, of Germany, France, Sweden, Norway and Poland, the Radio Corporation of America has acquired in the year 1920, and thereafter, exclusive and/or preferential traffic arrangements and/or exclusive or preferential arrangements for the exchange of patents and patent rights, relating to Radio communication and the operation of same, respectively, as more fully appears from said agreements.

South American Trust Created

PARAGRAPH TWENTY-SEVEN: By an agreement entered into on or about October 14, 1921, between the Radio Corporation of America and representatives of British, French and German interests owning or controlling rights for the operation of Radio communication in

and with various territories of Central and South America, a trust was created of which the chairman was to be named by the Radio Corporation with power of veto, by which the parties agreed to communicate exclusively with the stations of the other parties and their affiliated companies in their respective territories and for traffic in the territory of the other parties with the consent of the respective parties, as more fully appears from said agreement.

Four Companies Sit on R.C.A. Board

PARAGRAPH TWENTY-EIGHT: Since the organization of the Radio Corporation of America, the following respondents have been represented on the board of directors:

- General Electric Company
- Westinghouse Electric and Manufacturing Company
- American Telephone and Telegraph Company
- United Fruit Company

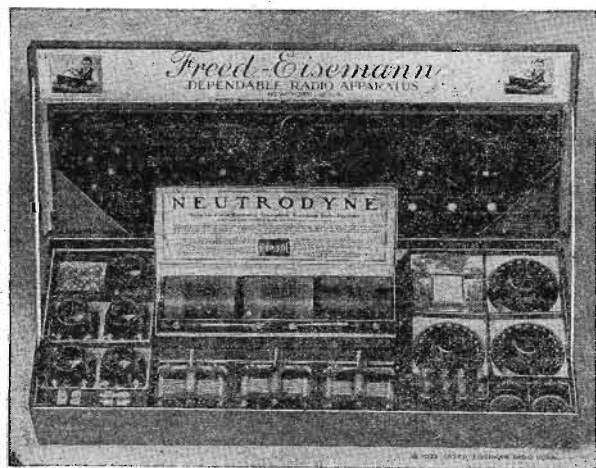
and on December 31, 1922, the respondents named, with the exception of the American Telephone & Telegraph Company, were so represented.

R.C.A. Puts "Obstacles" in Front of "Non-Licensees"

PARAGRAPH TWENTY-NINE: The Radio Corporation of America has, by appropriate action of its board of directors, caused to be published in connection with its Radio apparatus offered for sale a so-called "patent license" containing restrictions as to the use thereof by purchasers, viz., to amateur and experimental purposes only and not for commercial purposes or sale, and not for use in circuits or sets made or assembled for commercial purposes; and has also provided that transmitting apparatus, not exceeding two kilowatts antenna input, and receiving apparatus may be leased to competing companies and others for communication only between ship and shore and vice versa, also for private use and not for tolls and not to resell, on condition that other things being equal, the Radio Corporation should

(Continued on page 10)

A Freed-Eisemann KNOCKDOWN NEUTRODYNE RECEIVER



Unassembled Model KD-50, Freed-Eisemann Neutrodyne Receiver

NOW the opportunity is presented to obtain a complete set of parts, recommended by the manufacturer, to work with each other in building your Neutrodyne set. An illustrated 32-page book on how to build the Neutrodyne with full-sized diagrams and templates included.

Complete with Full Instructions

\$80

Dealers Write for Name of Nearest Distributer



Front View KD-50, Neutrodyne Being Assembled

NEUTRODYNE has taken the country by storm. It is the remarkable distance getting, powerful, non-oscillating and non-whistling receiver.

A 32-page book answers every question. The panel is accurately drilled. A baseboard is furnished; in fact, everything down to the very last screw and nut, including all necessary parts excepting the cabinet.

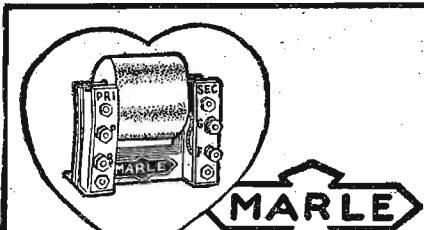
Besides the book there is furnished schematic blueprints and template for drilling the baseboard, also full-size pictorial perspective wiring diagram, so that it will hardly be possible for the amateur with ordinary care and skill to make an error.

Remember that here are licensed parts—not a collection of apparatus trusting to luck that they will assemble properly. Each part is designed and fitted to work with each other part in this particular set. The instructions are so complete and the parts so accurately matched that you will be grateful for the manner in which we have eliminated guesswork in the amateur construction of this receiver.

For sale by dealers of the better class throughout the country, for amateur and experimental building. Builders are cautioned against attempting to build a Neutrodyne Set with parts which are not recommended and designed by the manufacturer to work with each other.



32-page illustrated book of instructions on "How to Build the Neutrodyne" with full size pictorial wiring diagram and full-size panel and baseboard templates, \$1. At your Radio Dealers.



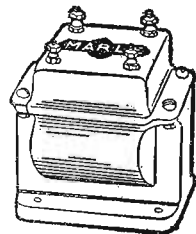
Radio & Audio Frequency TRANSFORMERS

"The Heart of a Good Receiver"

PERFECT amplification is the boon you secure when you buy a Marle Transformer. Radio impulses are magnified to the uttermost limit without a sign of distortion. True over the widest range of frequencies. Special folders, showing the hookups for standard circuits, sent upon request.

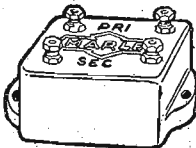
Write for Hookups and Illustrated Folder TODAY!

Your Dealer Sells Marle Transformers, or Write to Us for the Names of the Nearest Marle Dealers.



MARLE Engineering Company ORANGE New Jersey

Audio F Type A7 Ratio of 3 3/4 to 1



Radio F Types R1 and R2

Freed-Eisemann Radio Corporation

SPERRY BUILDING MANHATTAN BRIDGE PLAZA BROOKLYN, N. Y.

COMPLAINT ON R.C.A.

(Continued from page 9)

be given preference in routing business transmitted by such apparatus; also that apparatus not for external international communication purposes may be sold or leased, provided transmitting apparatus shall not exceed two kilowatts per antenna input; also that whenever possible, an agreement should be secured giving exclusive traffic connections to stations of the corporation and its affiliated companies; and that no licenses of whatsoever nature are to be granted for the manufacture and sale of vacuum tubes; also, its policy, as recommended by its board of directors, has been that apparatus sold for amateur, entertainment and experimental purposes differ as widely as practicable from the designs of the apparatus sold or leased for other purposes, as "the best way in which to protect our licensees and enforce our restrictions" and to offer "just one more obstacle that non-licensees will have to overcome."

"R.C.A. Combined, Conspired and Created Monopoly"

PARAGRAPH THIRTY: By reason of the facts and acts of the respondents set forth in the preceding paragraphs numbered 8 to 29, inclusive, the respondents have combined and conspired for the purpose and with the effect of restraining competition and creating a monopoly in the manufacture, purchase and sale, in interstate commerce, of Radio devices and apparatus, and other electrical devices and apparatus, and in domestic and trans-oceanic Radio communication and broadcasting by the following means:

(1) Acquiring collectively, directly and indirectly, patents and patent rights covering all devices and apparatus known to and used in any and all branches of the practice of the art of Radio, and combining and pooling, by assignment and licensing, rights thereunder to manufacture and use and/or sell such devices and apparatus, competing and non-competing, and allotting certain of such rights exclusively to certain respondents;

Restricted Competition, Claim

(2) Granting to the Radio Corporation of America the exclusive right to sell such devices and apparatus manufactured under said patents and patent rights and restricting purchases by the Radio Corporation of America of devices and apparatus useful in the art of Radio to certain respondents and apportioning such purchases among them;

(3) Restricting the competition of certain respondents in the respective fields of manufacture and commerce of other respondents;

(4) Attempting to restrict and restricting the use of Radio communication and/or broadcasting of articles manufactured and sold under said patents and patent rights;

(5) Acquiring the equipment heretofore existing in this country essential for trans-oceanic Radio communication and perpetuating the monopoly thereof by refusing to supply to others apparatus and devices necessary for the equipment and operation of such service;

(6) Entering into exclusive contracts and preferential agreements for the handling of trans-oceanic Radio traffic, and thereby excluding others from the necessary facilities for the transmission of Radio traffic.

(7) Agreeing and contracting among themselves to co-operate in the development of new inventions relating to Radio and to exchange patents covering the results of the research and experiment of their employees and devices which they may obtain in the future, seeking thereby to perpetuate their control and monopoly of the various means of Radio communication and broadcasting beyond the time covered by existing patents owned by them or under which they are licensed.

Acts Are to Prejudice of Public

PARAGRAPH THIRTY-ONE: The above alleged acts and practices of respondents are all to the prejudice of

the public and of respondents' competitors and constitute unfair methods of competition in commerce within the intent and meaning of Section 5 of an Act of Congress, entitled, "An Act to create a Federal Trade Commission, to define its powers and duties, and for other purposes," approved September 26, 1914.

WHEREFORE, THE PREMISES CONSIDERED, the Federal Trade Commission, on this 24th day of January, A. D., 1924, now here issues this its complaint against said respondents.

Must Answer by March 14

NOTICE: Notice is hereby given you, and each of you, General Electric Company, American Telephone & Telegraph Company, Western Electric Company, Inc., Westinghouse Electric & Manufacturing Company, The International Radio Telegraph Company, United Fruit Company, Wireless Specialty Apparatus Company and the

Radio Corporation of America, respondents herein, that the 14th day of March, 1924, at 10:30 o'clock in the forenoon, is hereby fixed as the time, and the office of the Federal Trade Commission, in the City of Washington, D. C., as the place, when and where a hearing will be had on the charges set forth in this complaint, at which time and place you shall have the right, under said Act, to appear and show why an order should not be entered by said commission requiring you to cease and desist from the violation of the law charged in this complaint.

IN WITNESS WHEREOF, The Federal Trade Commission has caused this complaint to be signed by its secretary, and its official seal to be hereto affixed at Washington, D. C., this 26th day of January, 1924.

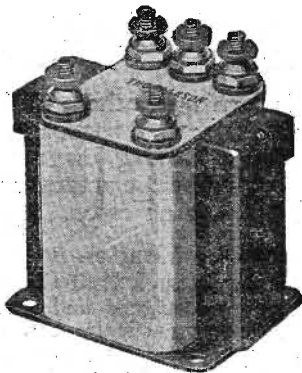
By the Commission: Commissioner Vernon W. Van Fleet, dissenting. OTIS B. JOHNSON, Secretary.

Fannie Hurst Greets Her Readers via Station WOR

NEWARK, N. J.—Fannie Hurst, beloved American authoress, whose latest book, "LummoX," has proved one of the most popular of the year, made a return appearance at WOR last Saturday afternoon. Her reappearance provided an opportunity for thousands of her readers and admirers to see her personally; Miss Hurst broadcast from the improvised studio on the sixth floor of the Bamberger building as a feature of a Radio show.

Advertisement for Perfection Radio Outlet. Features a large stylized 'P' logo at the top. Text: 'MAKE PERFECTION YOUR SELECTION PERFECTION New York City's Greatest Radio Outlet'. Lists various radio sets and components: NEUTRODYNE 5 TUBE SET, COCKADAY 3 TUBE SET, ERLA ONE TUBE SET, REINARTZ 3 TUBE SET, COCKADAY ONE TUBE SET, NEW REINARTZ ONE TUBE SET, ULTRA AUDION SET, 2-STEP AMPLIFIER, FROST FONES, PHONES, and LOUD SPEAKERS. Includes prices and values for each item.

THORDARSON



POWER AMPLIFYING TRANSFORMERS

Price per pair, \$13.00

The new Thordarson Power Amplifying Transformers (push pull) are designed for use as third stage audio frequency amplifiers, to provide high power amplification for operating loud speaking devices.

With power amplification, not only is it possible to increase volume, but, since two tubes replace the usual one, the distortion and howling which usually accompany the overloading of a single tube on the third stage is done away with entirely.

The Thordarson Power Amplifying Transformers are well constructed electrically and are capable of indefinitely carrying the additional load without breaking down.

In tonal purity these transformers equal the Thordarson Super Audio Frequency transformer whose rich quality and even amplification has made it the popular transformer of the day.

THORDARSON ELECT. MFG. CO.

500 W. Huron St. CHICAGO

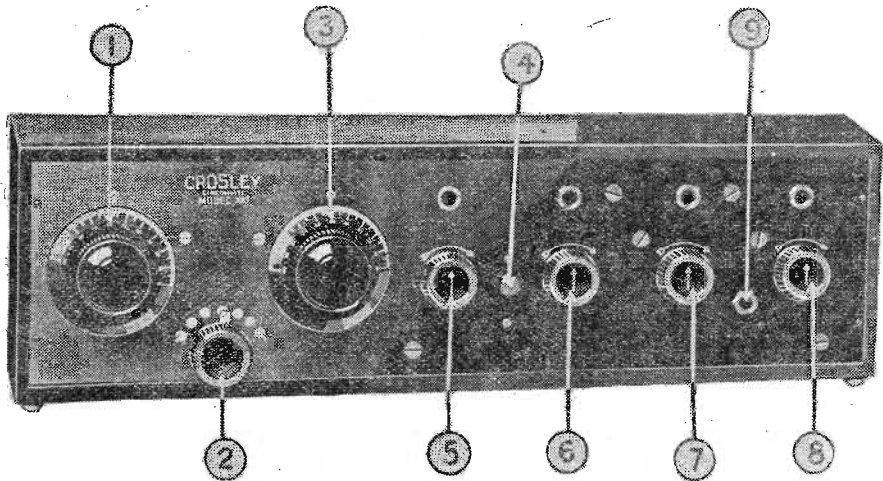
OPERATING AND TROUBLE SHOOTING

For the Owner of a



Model XJ Receiver

THE Crosley model XJ receiver combines one-stage of tuned Radio frequency amplification, detector and two stages of audio frequency amplification. The tuning is quite simple and is done by means of the knobs 1, 2 and 3. The first is the antenna condenser, the second is the tap switch, while the third is the tuned Radio frequency amplification.



Wave Length Range

The wave length in this receiver is between 200 and 600 meters. Sharp tuning to any wave length between 200 and 600 meters is possible with this set and as all popular broadcasting falls within this band, the set will cover the full range.

Amplification

In addition to Radio frequency amplification, a two-stage audio frequency amplifier is incorporated in the receiver. The filament circuits of the amplifying tubes are controlled by the knobs 7 and 8. The former controls the first stage and the latter the second stage. When headphones are plugged into the jack 9, only the first stage of amplification is used. When the phones are removed, the loud speaker, connected to the binding posts marked 27 and 28, is automatically connected, utilizing both stages of amplification.

Antenna

Any type of antenna may be used with the Crosley receiver, but the best is of the outdoor variety. In erecting an antenna, it is important that the ends of the wires be insulated with a standard porcelain or other insulator. All splices or joining of wires, unless made with clamps, should be soldered. The antenna should be erected according to the Na-

tional Electric Code, 1923 edition, Rule Number 86.

The Lead-In

The lead-in should be of copper or copper-clad steel, which will not corrode excessively and should not be smaller than number 14, except that number 17 copper-clad may be used. Do not allow the lead-in wire to come nearer than 4 inches to electric light or power wires. Where the wire passes through the building, the simplest arrangement is to have made a small board equal in length to the width of the window and about 2 inches wide. One or more holes may be drilled in this board to accommodate porcelain tubes through which the wire is passed.

Protective Device

It is necessary to equip the lead-in with some sort of approved protective device properly connected and located as near as possible to the point where the wire enters the building. It may be either inside or outside of the building. One terminal (the insulated one) is connected to the lead-in 18, and the other terminal to the

protective ground. Follow the directions given with the protective device and you may rest assured that there is no danger whatever connected with the installation.

Protective Ground Wire

This may be either a bare or insulated copper, number 14 B. & S. gauge, or a number 17 copper-clad steel wire. It must be run in as straight a line as possible to a good ground, preferably water piping. There are other grounds, such as grounded steel frames of buildings, or other grounded metal work in the building; artificial grounds, such as pipes driven into moist earth, or buried metal, or a wire in a well, and the like.

Ground Wire for Receiving Equipment

The same ground as mentioned above may be used for receiving equipment. It is also possible to use steam radiators, hot water heating systems or water piping.

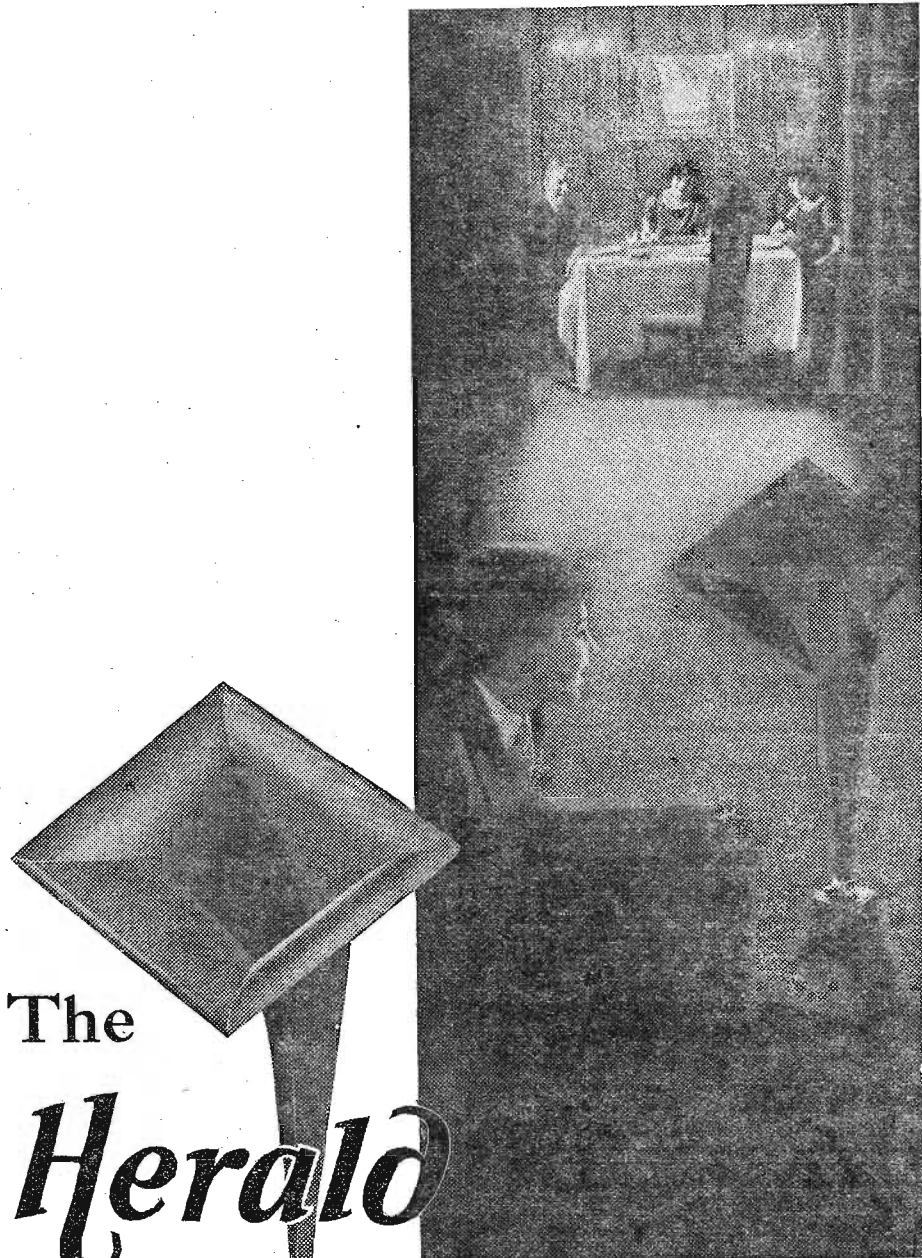
Poor grounds and poor ground connections probably cause more trouble to the operators of Radio sets than any other one factor. A large Radio service company in New York City recently made an investigation and found that, in over nine-tenths of all the cases in which trouble was experienced, the difficulty was due to a poor ground. A careful study of grounds

“OPERATING and Trouble Shooting” is a Radio Digest feature whose purpose is to study the late models of various standard receiving sets and to show the newly initiated broadcast listener, who has purchased such a set, how he can operate it to get the best there is in it and how he can overcome minor difficulties which may be causing some trouble. On pages 11, 12 and 13 this week the Crosley Model XJ Receiver is described. Radiophans with other sets will also find these articles worth reading, particularly the notes on trouble finding.

was made throughout the state of Ohio in connection with electrical power transmission. It was found that the average good ground was 90 feet below the surface.

To insure proper operation, the Radio

set must first be grounded to an object of the proper type, and second, the ground connection must be made in the proper manner. In city installation, perhaps the best object to use for a ground is a water (Continued on page 12)



The Herald

Loud Speaker is CLEAR!

DINE out—at home! A famous restaurant, a great orchestra playing, and you there—in the life, the thrill, the glorious music—because the clear Herald brings it all right into your own dining room.

So real because it's so clear! No blast, no blurr, no blare. But every tone of every program—pure, strong and satisfying.

THE Herald, like other good musical instruments, improves with age because of its laminated core, mica diaphragm and permanent magnet. It stands up under power without rattling. The adjustable diaphragm makes it possible to get the most out of a weak set. Height, 30 inches. 6-foot cord. Price, \$30. Slightly more on Pacific Coast and in Canada. Write for folder and enclose your dealer's name.

Herald Electric Co., Inc., 113 Fourth Ave., N. Y.

PACIFIC COAST BRANCH:
329 Union League Bldg.
LOS ANGELES

The Superlative Inductance

Four years of careful attention to the details of manufacture of this type of inductance unit has yielded a product of unquestioned superiority. And with increased efficiency in manufacturing methods, moderate prices prevail for all sizes

Ask Your Dealer

Cotoco

"Built First to Last"

COTO-COIL CO. PROVIDENCE

OPERATING AND T

(Continued from page 12)

as amplifiers; *one C-300 as detector with three C-301A as amplifiers; *one UV-200 as detector with three UV-201 as amplifiers; four C-301A; four UV-201A; four DV-6 (De Forest); *four WD-12; *four C-12; four WD-11; four UV-199; four C-299. Combinations marked with (*) are recommended. There are also other combinations that may be used.

A and B Batteries

For economical service an 80 ampere-hour storage battery is required as A battery (20 and 23) for tubes, except where loud speaker requiring exciting current from the A battery is used. In this case we advise the use of a 120 ampere-hour battery. The A tubes use low filament current. For this reason the rheostats controlling these tubes should be operated at the halfway position and should never be turned on full when using the 6-volt A battery. A B battery of at least 45 volts is required, and for maximum volume use 90 volts. If only 45 volts of B battery is used, connect the binding post (26) marked B 40-100 to the same B battery terminal as the binding post marked B 45. Some UV-200 and C-300 detector tubes operate best on less than 22½ volts. Make the B 22½ connection to various terminals of the first block of B battery, that is, between 16½ to 22½ volts, to determine the voltage for best operation. No grid leak is required. No C battery is required.

Headphones and Plug

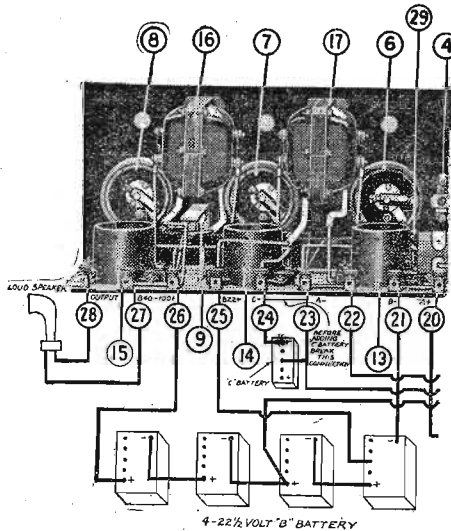
A pair of sensitive headphones are necessary. A phone plug is required in order to make use of the jack.

Loud Speaker

A loud speaker should be used where it is desired to furnish entertainment for a large number of persons.

Controls

Antenna condenser: This unit is controlled by the large knob and dial 1 on the left-hand side of the panel. Antenna inductance: This is varied by the tap switch 2 at the bottom of the panel at the right of the first knob and dial. Radio frequency tuner: This unit is controlled by the large knob and dial 3 to the right of the tap switch. Radio frequency amplifier tube: The knob marked with the white arrow nearest the Radio frequency



tuner 5 operates the rheostat controlling the filament of the Radio frequency amplifier tube. Detector tube: The second rheostat knob from the left (6) controls the detector tube filament. First audio frequency amplifier tube: The third knob from the left (7) controls the filament of this tube. Second audio frequency amplifier tube: The fourth knob or the one on the extreme right (8) controls the filament of the second stage audio frequency amplifier tube. Filament switch: The small knob located between the first and second rheostat (4) controls, operates a line battery switch which turns on and off the filament current of all the tubes in the receiver. When this switch is pulled out, the tubes are lighted. This switch makes it possible to turn off the tubes and leave the set tuned. Phone jack: The phone jack 9 is located between the third and fourth rheostat knobs. When the phones are connected to the phone plug and the plug inserted in the jack, only the first stage of audio frequency amplification is used. The second amplifier tube may then be tuned out. The phones may be connected to the binding posts on the subpanel marked "Out

1c SALE

One of Six Large New York Stores

The RADIO-SHACK

58 Dey Street - New York City
Goods shipped C.O.D.
Just pay the postman

EVERY ARTICLE SOLD ON WRITTEN MONEY-BACK GUARANTEE

Send No Money. We'll Ship Anything C. O. D.

1c SALE

They Won't Let Us Stop

Letters are pouring in from all over the United States asking us for more 1c sale items. Many requests have been made for more time in which to buy. We feel obligated to our many friends and are happy to announce that the prices in the Feb. 9th issue of the RADIO DIGEST will be good for one more week.

<p>SUPERTRON TUBES Just received a new shipment. Oh boy, what an amplifier! Better than ever. At this price they'll go fast. The 201 A's are 6 volt, dry cell or storage battery operated, and the W. D. 12 type uses 1½ volt dry cell. Better get your order in now. Both types, 1 for \$6.49. 2 FOR \$6.50</p>
<p>VARIABLE CONDENSERS Just get these points! 1. Heavy moulded end plates. 2. Phosphor-bronze contacts to heavy binding posts. 3. Processed aluminum plates that retain their alignment. 4. And the list price is double what we ask. 11 plate 1 for \$1.99 23 plate 1 for \$2.49 43 plate 1 for \$2.99 VERNIER CONDENSER with dial. Same as above. 11 plate vernier..... \$4.99 23 plate vernier..... 5.69 43 plate vernier..... 5.99 2 FOR 1c MORE</p>
<p>VARIOMETER Let's tell you about the new variometer! First of all, it's moulded. Of course, it has pigtail connections for efficiency. And a positive stop. Split? Oh, yes. Can be split for any circuit. Green silk windings and takes 600 meters. 1 for \$5.49. 2 FOR \$5.50</p>
<p>SOCKETS A new process enables us to offer an unheard of value. By this new method a nickel tube is forced into a moulded base under heavy pressure. This assures perfect contact with the phosphor bronze springs. Easily worth 75c each. 1 for 69c. 2 FOR 70c</p>
<p>PHONES For this sale we are going to let you have TURNEY 3,000 ohms phones for a very low figure. 1 pair for \$5.89. 2 FOR \$5.90</p>
<p>DIALS Mahogany colored dials with exceptionally heavy brass bushing. Will dress up your set. Change your dials and make your friends think you have a new set. List \$1.00. 1 for 69c. 2 FOR 70c</p>
<p>The following "hard to get" apparatus in stock at special prices. Eria Transformers, Hilo Couplers, Eria Crystals, Rathbun Condensers, Premier Jacks, Eria Blueprints, Eria Sockets, Lavite resistances 48,000 ohm, Amplex Gridensers, All-American Push-Pull Trans., Amso Condensers and rheostats.</p>

INDEPENDENT LICENSED BY RADIO MANUFACTURERS INC.

NEUTRODYNE

UNDER HAZELTINE PATENT NO. 1,456,000
OTHER PATENTS PENDING
REG. U.S. PAT. OFF.

The Shack Neutrodyne! That is all the fans seem to be talking about. The wonderful distance-getting power of the Neutrodyne and the low price of the genuine Neutrodyne parts at the Radio Shack. Licensed under the original Hazelitine patents. Licensed parts are your protection. They always work.
Complete list of parts for building five tube set. \$25.97

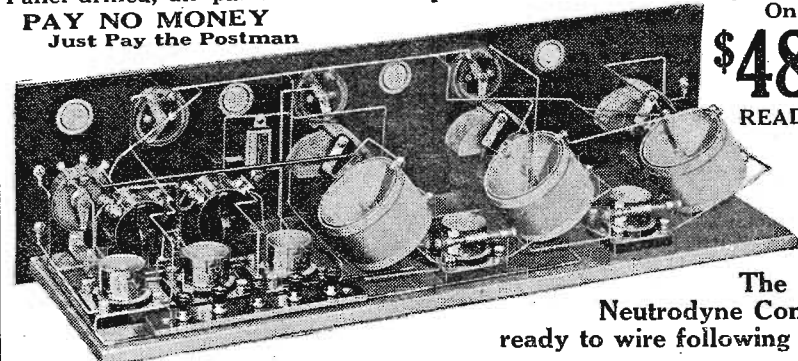
A Special Dial Screwdriver Free With Every \$2.00 Purchase

<p>D. L. COILS 35-50-75-100 Just the size for Three Circuit. 1 FOR 69c.</p>	<p>2 For 70c</p>	<p>GOLD BUS BAR Most Efficient. Allows high frequency currents least resistance. Used in finest sets. Reg. 15c. 1 FOR 15c.</p>	<p>2 For 16c</p>
<p>VERNIER CONTROL For any Dial. Makes a Vernier out of any make condenser. Very efficient. Reg. 75c. 1 FOR 49c.</p>	<p>2 For 50c</p>	<p>TRANSFORMERS Audio Frequency well known standard make. Ratio 4-1. Reg. \$5.50. 1 FOR \$5.49.</p>	<p>2 For 5.50</p>
<p>DIALS DeForest Type Remarkable value. Knurled knob with heavy brass bushing. ¼ and ⅜ shafts. 2 inch..... 39c 2½ inch..... 44c 3 inch..... 54c 4 inch..... 74c</p>	<p>2 FOR 1c MORE</p>	<p>LITZ WIRE Most Efficient. A double silk covered wire with 37 strands of No. 38 wire, each strand enameled. Wonderful for Coils, Loops, etc. 1 FT. FOR 4c.</p>	<p>2 For 5c</p>
<p>AERIAL WIRE 7 Strand Tinned copper wire gives excellent results on DX work. Reg. \$1.00. 100 ft. 99c.</p>	<p>200 For 1.00</p>	<p>VERNIER RHEOSTATS The famous TECO. Needed for your detector tube. 1 FOR 89c</p>	<p>2 For 90c</p>
<p>HYDRMETERS Very Accurate. Packed in wooden moisture proof box. Reg. 75c. 1 FOR 59c.</p>	<p>2 For 60c</p>	<p>VARIOCOUPERS 180 Degree Wound on Genuine Bakelite tubing with green silk wire. Reads 600 meters. Reg. \$5.00. 1 FOR \$3.89.</p>	<p>2 For 3.90</p>
<p>JACKS Single or Double Heavy Springs—German Silver Contacts. Nickel finish. Reg. 90c. 1 FOR 59c.</p>	<p>2 For 60c</p>	<p>TUBE PROTECTORS Impossible to blow your tubes if you attach these to end of socket for ¼ or 1 amp. tubes. 1 FOR 49c.</p>	<p>2 For 50c</p>

BRINGS IN EVERYTHING

BEAUTIFUL MAHOGANY NEUTRODYNE

WHEN you get this magnificent looking set wired and hooked up, you will be able to hear all stations without interference. All parts are same as illustrated in Radio Digest, Feb. 2nd. Panel is mahogany with beautiful mahogany dials—a set fitted for the most exclusive home. Panel drilled, all parts mounted on panel and baseboard ready for wiring. **PAY NO MONEY** Only Just Pay the Postman



\$48.50
READY TO WIRE

FREE
BLUE
PRINT

The above
Neutrodyne Complete
ready to wire following parts:

5 Genuine DX Iron Tubes.....	\$25.00	2 22½ Volt B Batteries.....	\$ 6.00
1 110 Ampere Storage Battery.....	18.00		
1 DeLuxe Homecharger.....	18.00		
1 Genuine Baldwin Headset.....	12.00	1 Futone Loud Speaker.....	9.50
1 Complete Aerial Equipment.....	1.50		
1 45 Volt B Battery.....	5.50	TOTAL.....	\$95.70

The above parts and equipment complete would cost you \$144.00! **Our Price \$125.00**

It Works—NEUTRODYNE—All Standard Parts

3 Rheostats, 30 ohms.....	\$ 2.00	2 Transformers.....	\$ 9.50
1 Rheostat, 6 ohms.....	.90	9 Readem Binding Posts.....	.85
3 Air Core R. F. Transformers, mounted on condensers, and 2 balancing condensers.....	20.00	1 8x26 Mahogany Panel.....	3.84
1 Potentiometer, 600 ohms.....	1.85	4 Bezels.....	.80
3 Jacks.....	2.70	3 Dials.....	4.50
1 Condenser.....	.40	1 Baseboard.....	.50
1 Grid Leak.....	.65	24 ft. Square Brass Bus Wire.....	.60
5 Sockets.....	5.00	Total.....	\$53.89

Only \$45.50 with blue prints FREE.

Complete Parts—MILOPLEX—2-Step Amplifier

Mounted on baseboard and panel. LIST \$21.06 OUR PRICE ONLY \$16.50			
1 Panel 7x9x¾".....	\$1.26	2 Sockets.....	\$2.00
2 Webster's 4-1 Trans-formers.....	9.50	1 Set Readem Engraved Binding Posts.....	.75
2 30 Ohm Rheostats.....	2.00	1 Cabinet Mahogany Finish.....	3.50

The above mentioned parts will include any Ohm Rheostat and All-American Transformers if desired.

Complete Parts—MILOPLEX—Cabinet FREE

1 .0005 Variable Condenser, Vernier.....	\$6.00	1 Socket Bakelite Base.....	\$9.90
1 ESTRU Variometer.....	5.00	1 Bakelite Panel, 9x14x¾".....	2.50
1 .0025 Variable Condenser.....	2.00	1 WD-12 Tube.....	6.50
1 Variable Grid Leak.....	.75	1 B Battery, large, 22½ volt.....	3.00
1 .00025 Mica Fixed Condenser.....	.40	3 Dry Cells.....	1.35
2 .002 Phone Condensers.....	.80	12 ft. sq. brass Bus wire.....	.30
3 ¾-inch Dials, each 75c.....	2.25	1 Set Readem Binding Posts.....	.75
1 Potentiometer, 1850 ohms.....	2.20	TOTAL.....	\$35.70
1 Rheostat.....	1.00		

ONLY \$28.50
Blue print FREE only with order for complete parts.

We Are Responsible Folks, Money Promptly and Cheerfully Refunded If You Are Not Satisfied. All Orders Mailed Promptly. Parcel Post Prepaid on \$5.00 or Over. No Stamps Accepted.

Economical Radio House
4600 LINCOLN AVENUE, CHICAGO

SUPER VALUES

NEW COCKADAY FOUR CIRCUIT RECEIVER
ALL PARTS As specified by Mr. COCKADAY **OUR PRICE \$59.00**
LIST PRICE, \$75.00
Mahogany Cabinet for above set, \$7.50 Extra

GENUINE **Fada-Hazeltine Neutrodyne Parts** FOR 5 TUBE SET
List Price \$65.60
Our Price **\$50.15**
You Save \$15.45 by Buying Through Us

FREED-EISEMANN
LIST PRICE **\$80.00** **Knocked Down** **OUR PRICE**
Neutrodyne Receiver **\$65.00**

NAZELEYS-PORTENA
FOLDING LOOP
List Price..... **\$7.00** Our Price..... **\$5.35**
LIMITED SUPPLY WHILE THEY LAST

REINARTZ CIRCUIT Complete

	List Price	OUR Price		List Price	OUR Price
Reinartz Coil.....	\$2.50	\$2.00	3 Switch Levers with Knobs.....	\$.75	\$.35
One 7x10x¾ Radion Panel.....	1.25	1.00	One Baseboard for Mounting.....	.75	.40
National Bakelite Socket.....	1.00	.40	One Fixed Phone Condenser.....	.40	.25
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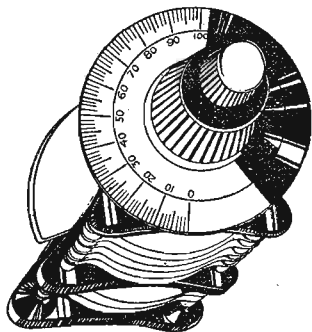
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U DEBATE BY AIR FEATURES WEEK

Tuesday, February 26

Headliners of the Week

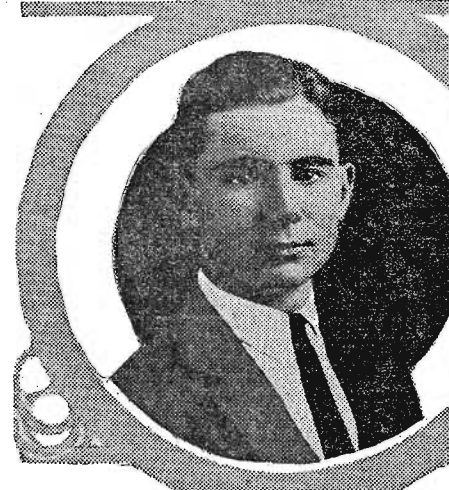
CKAC, Montreal, Que., Can. (Eastern, 425), 4:30 p. m., Talks; 7:00, Kiddies' stories in French and English; 7:30, Mount Royal Concert Orchestra; 8:30, Studio entertainment; 10:30, Dance program, Mount Royal Hotel, Red Bluffs, xylophonists.

TWO STATIONS are celebrating special occasions in their Radio lives Tuesday night. WJAX of Cleveland is giving a housewarming in a nice new studio, consisting of two plays, dance music, and popular artists. WGY is three years old this same day. This station is quite an antique as Radio stations go.

debate through the two stations KLX and KGW. Notice the contestants below. This is without doubt the most unusual debate thus far in history. Listen in and help be a judge. WGI of the eastern coast is strangely enough scheduling a debate for this same evening, but no doubt the opponents will, at least, see each other. All spinsters should try for WBAP the same night. This station promises a Novelty Leap Year Concert. Let us hope there will be some useful hints on how it is really done.

6:00-6:15, "Bird Dogs," E. E. Simmons; 6:15-7:00, Dinner concert by Minneapolis Athletic Club Orchestra; 7:30-8:15, Farm lectures, "Building and Loan Association," A. S. Dean; "Relation of Chemistry to Agriculture and Forestry," Dr. B. A. Gortler, University of Minnesota.

Wednesday, February 27



Above, Walter D. Malcolm, debater for the University of Oregon.



Right, Raymond Sanders, the other member of the California team of debaters.



Above, Joe A. Frazer, Walter D. Malcolm's team-mate for the Oregon University.

As told in detail on page 4 of this issue, the first debate ever staged between two universities by Radio will be broadcast from Station KGW, The Morning Oregonian, Portland, Oregon, and Station KLX, The Oakland Tribune, Oakland, California, on Friday night, February 29. The debate will be between the University of California and the University of Oregon. Of the two debaters for the University of California Harold Cherniss is presented at the left.

Al Novins, tenor, and Clinton Sommer, pianist, in popular numbers; 10:00-10:15, Lucille Wilson, society entertainer, in humorous readings; 10:15-10:30, Gloria Marshall, soprano; 10:30-10:45, Dickland Serenaders' jazz band with Harry Romaine and Dorothy Mack.

Phonograph Co.; 9:45-10:30, Coney Island Chamber of Commerce; 10:30-11:00, Ruth Bodell, lyric soprano. WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Meyer Davis Bellevue Stratford Concert Orchestra; 3:30, Loretta Kerr, pianist; 5:00, Bedtime stories; 6:30, Meyer Davis Bellevue Stratford Orchestra; 10:10, Charlie Kerr's Hotel Majestic Orchestra.

Symphony Orchestra; 7:00, Uncle Wip's bedtime stories; 8:00, Dramatic review by Elliott Lester; 10:15, Ted Weems and his Cafe L'Aiglon Orchestra. WJAX, Cleveland, Ohio (Eastern, 399), 7:30 p. m., Bedtime story; E. G. Johnson; 7:45, Special program arranged by the Cleveland News-Leader; Dance numbers and popular selections by Hughie Thow's Syncopators; Tenor solo, Peter Glueckman; Soprano solo, Miss Carrabelle Johnson; Monolog, Roy Lewis; Quartette selections, Harmonic Male Quartette; Instrumental numbers, Trio from Cleveland Institute of Music; Baritone solo, Francis J. Sadtler; Piano solo, Edward McMullen; Dance and popular selections, Vitale's Park Theatre Orchestra; Scene from "Abie's Irish Rose," Martha Lee Mandolin Club; Dance and popular selections, Lombardo Royal Canadian Orchestra; Ten-minute play "Flanders' Keepers," Martha Lee Club Players; Baritone solos, L. R. Schroeder; Dance and popular selections, Joe Smith-Martha Lee Club Orchestra; Solos and duets with orchestra accompaniment, June Farley and Ruth Sponseller; Quartette numbers, The American Harmony Four; Bagpipe selections, James Stevens; Piano solos, Eddie Persell.

Hollywoodland Community Orchestra. KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m., Music and readings for "shut-ins"; 7:00-7:30, Bedtime stories for children; 8:00-9:00, Sermon with musical numbers by Aimee Semple McPherson. KGW, Portland, Ore. (Pacific, 492), 11:15 a. m., Window Shopping; 12:30 p. m., Darby's Orchestra; 3:30, Children's program; 8:00, Columbia Theater All-Artist Orchestra; 9:00, Alexander Hamilton Institute Business talk, James Albert; 10:00, Dance music, George Olsen's Metropolitan Orchestra; Adolaine Rudy, soprano; Mrs. Stanley Juco, pianist. KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Concert; 2:30-3:30, Matinee Musicale presenting L. H. LaLeavito, tenor; Charles H. Deppe, President, Savings Division of the United States, will speak on "A Review of the Savings Banks of the United States"; 6:45-7:30, Program arranged by Harry James Beardsley, baritone; Frisclida Moran, screen juvenile; Bedtime story by "Uncle John"; 8:00-10:00, Program presenting Claire Forbes Crane, pianist; Tannis Freeman, soprano; Dr. Mars F. Baumgard, lecturer; 10:00-10:20, Art Hickman's Orchestra. KPO, San Francisco, Calif. (Pacific, 423), 1:00-2:00 p. m., Rudy Seiger, Fairmont Hotel Orchestra; 2:30-3:30, Jack Pail's Entella Cafe Orchestra; 4:30-5:30, Rudy Seiger's Fairmont Hotel Orchestra; 5:30-6:30, Children's hour, stories for children by "Big Brother" of KPO, from Book of Knowledge; 7:00-8:00, Rudy Seiger's Fairmont Hotel Orchestra; 8:00-11:00, E. Max Bradford's Band; "Your Body and Mind," William T. Eizenga; Arnold C. Maguire, tenor; Everett Mason, soloist; Grace Morris, pianist. KSD, St. Louis, Mo. (Central, 546), 7:00 p. m., Abergh's Concert Ensemble; Arne Arnesen, violinist. KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson; 6:50 p. m., Children's bedtime story; 7:00-7:30, Dinner concert, DeBabary's orchestra; Clyde Doerr's Orchestra; 8:00-8:58, Bethany Bible School, Cora B. Stahley, director; Prof. O. G. Davis, of Public Speaking; 9:05, Book reviews, Elwell Jones; 10:00-2:00 a. m., Midnight review. WAAM, Newark, N. J. (Eastern, 263), 8:00-8:30 p. m., "Star Spangled Banner," Mulford Bawden's Collegiate Dance Orchestra of Bayonne in popular selections; 8:45-9:15, Walter Brown's Singing Entertainers with Edward Meeker, Joseph Woodruff and Edward Reese; 9:15-9:30, "Current Book Reviews," by Andrew McRae; 9:30-9:45, Times Square Entertainers

KING MILOPLEX

(Continued from page 19)

bulky finished product. As number 22 wire averages approximately 29 turns to the inch, a tube 3 inches long will be ample for our purpose.

Wind this coil as you would any inductance, securely fastening the start and finish ends (a neat method is to drill the tube at start and finish positions and use machine screws with nut, locknut and washer). Be certain not to use varnish or shellac to hold the winding in place; in fact, if you wind your coil carefully no loosening of it can occur. When finished with the winding, our next step is the fastening of or anchoring the variable condenser on the inside of the coil. No definite directions can be given for this operation, yet the constructor can readily work out so simple a problem.

When mounted, the start winding connection should be connected to the rotor connection on the variable condenser, while the finished winding should connect to the fixed plates of the variable condenser. (See Figure 2.)

The trap is now complete and may be

mounted by means of the condenser upon your panel, or, if you prefer, installed in a small cabinet where it is available whenever desired.

This type of wave trap, as simplified, is most efficient when connected in series with your antenna, and is quite effective toward eliminating broadcasting stations whose wave length is near that of the station wanted. But it is not capable of eliminating spark stations.

Connecting the Wave Trap

In making a series connection of the wave trap to the antenna, it is only essential that the antenna wire be removed from the receiving set and connected to the starting winding of your coil, which is connected also to the rotor of the condenser, while to complete the installation, a connection is also run from the antenna binding post on your receiving set to the finish winding on the coil, which connects also to the fixed plates on the condenser.

Tuning Out Interference

In order to tune out an interfering station, no attempt should be made to tune the receiving set beyond lighting the tubes

and inserting the phone plug. When this has been done, you should tune the set, by using only the wave trap, to the wave length of the interfering station, adjusting both the trap and filament controls until the loudest reception is heard. This accomplished, you tune in the station desired, using only the tuning devices on the receiving set. It sometimes happens that a very slight readjustment of the wave trap condenser—often its first adjustment—will improve reception of the desired station.

More Trap Designs to Follow

By golly. I just re-read the above, and it sounds so dead like, I could well pass it off on a chinaman for six collars. You know I can say do it this way or that way, but when it comes to writing "how-to-build" specifications, I have no chin—you know what I mean. But stick, you know the general idea and I'll follow with sev-

eral other trap designs that will keep the home fires burning and father late to bed.

Why, certainly, I'm going to give you one that will cut out spark stations also, but if you don't start now you will possibly miss the big idea and then have to do a lot of letter writing to me. Build this one, get it all ready and next week I'll show you how to put a dooflicker on this week's trap that will cut out both phone and spark, and they tell me cutting out spark is a hard trick. I used to cut it out with a hickey so simple you'll laugh, and if they are not too hot I'll do so again next week. I say if they are not too hot; you know sometimes they are at such a white heat they cause what is known as coil excitation, which, I suppose, means the coil gets so excited it says, "Forget it!" Let's eat.

(TO BE CONTINUED.)

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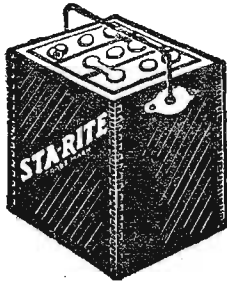
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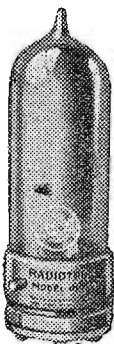
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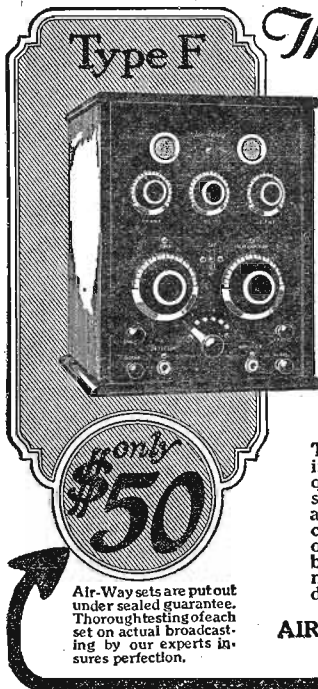
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Simple Explanation of Radio for Everybody

Chapter XI—Radio Frequency Amplification

By M. W. Thompson

THE following article is the twenty-third of a series for Radio beginners, written by Marvin W. Thompson, well known in air-phone circles for his understandable style of approaching his subject. The remaining chapters will be:

- Chapter XIII—The Neutrodyne Receiver.
- Chapter XIV—The Reflex Circuit.

RADIO receivers at present seem to be featuring two things—tuning and amplification. Increased efficiency in the tuners means greater selectivity and less difficulty in finding desired stations. Increased amplification assures greater range and increased volume. The word "amplification," whenever mentioned, must be qualified with a phrase to determine which of two types of amplification it is, for in Radio there are two kinds.

In a previous chapter we discussed audio frequency amplification which is inserted in the circuit after the signals have passed

the "threshold value" necessary to actuate the detector. For every detector, whether crystal or tube, there is a certain minimum amount of energy essential to the passing of signals. Very weak signals do not affect the detector and are never heard. If they could be strengthened before they were impressed on the detector, the range would be greatly increased. That is the purpose of Radio frequency amplifiers and it is surprising to consider the number of methods of coupling tubes that have been devised to accomplish this.

Neutrodyne, superdyne, Radiodyne, sun-set, Abele, phusiform, Rice, CR-12, transformer-coupled, impedance-coupled, resistance-coupled, capacity-coupled, super-heterodyne—each is a method of hooking up vacuum tubes to get efficiency from them as Radio frequency amplifiers. Every one of these methods has something in its favor; also, every one of them has some more or less important drawback. Neutrodyne and super-heterodyne will be taken up as separate chapters, but the rest can be discussed here.

in the matter of coupling units do these Radio frequency (R. F.) amplifiers differ. In Figure 89 we have a circuit showing

the frequency of the incoming signal, at which setting it offers 100 per cent opposition (known as "infinite impedance") to

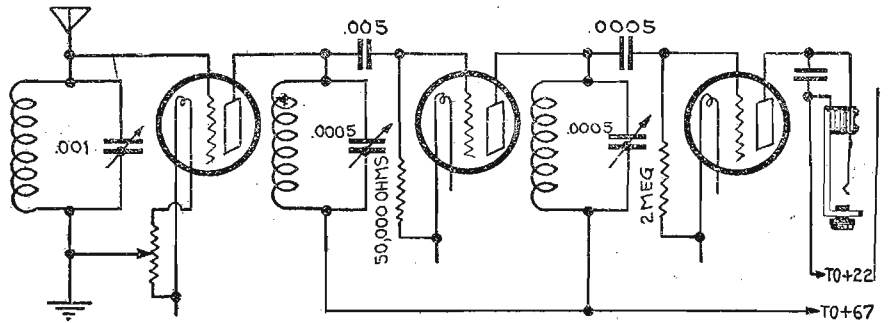


Figure 90—Two stages of tuned impedance coupled Radio frequency amplification.

Four-Tube Circuit

four vacuum tubes, the fourth being the detector. The first three tubes, it will be seen, are connected together by inductances. These inductances are wound so they offer sufficient opposition (impedance) to currents oscillating at frequencies between 50,000 and 4,000,000 per second, to prevent these currents from passing through them; yet, the direct unvarying current from the B battery readily passes to the plate. The principle is that the variations in the plate current of the first tube, since they are at Radio frequencies cannot pass through the inductance A and choose what is, to them, an easier path and go through the .002 condenser to the grid of the next tube. This continues through each tube until, when signals have reached the detector, they have tremendous volume and a powerful signal will be heard.

Figure 90 also shows an impedance-coupled outfit, but in this case the impedance is tuned. Such a circuit gives much greater amplification per tube, but, since each circuit must be tuned with great care, it is difficult to control. It is also likely to be very unstable and to oscillate at any moment. The theory here, is that each circuit is tuned exactly to

the signals and, as in the case of the untuned impedance hook-up, the signals choose the easier path and go to the grid of the next tube.

The Rice System

The Rice system, shown in Figure 91, while remarkably simple and easy to build, came after many of the more complicated circuits. Fans will do well to experiment with this system, although the writer cannot say just how many stages would prove practical. The writer's set contained a 100-turn honeycomb in the aerial connected in series to a 5-plate variable condenser. The secondary circuit contained a 50-turn honeycomb shunted by a .001 vernier variable condenser. A large variocoupler could be substituted for the honeycombs. The inductance in the plate circuit is a 100-turn honeycomb, spider web, G-R or other coil. Both tubes are hard tubes, either 199, 299, 201A or 301A. Careful initial adjustment of the grid leak is necessary, although it is said that the action here is not that of a grid leak.

A very interesting circuit is the one employed by French amateurs and shown in Figure 92. This is a combination of tuned Radio frequency amplification and regen-

(Continued on page 24)

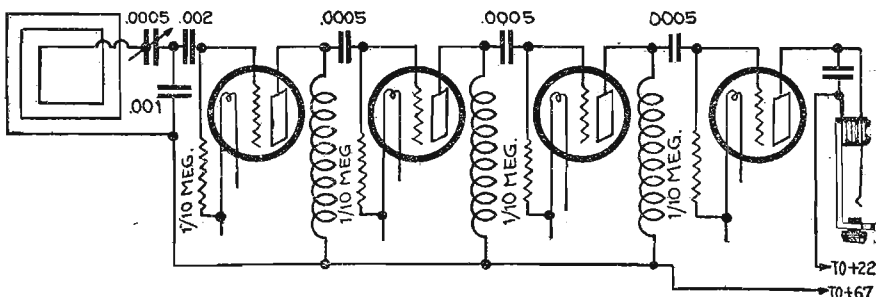


Figure 89—Three stages of untuned impedance coupled Radio frequency amplification.

through the detector and are in the form of impulses occurring at audible frequencies. Such amplifiers, properly designed, will increase the volume of programs, clearly and faithfully, up to tremendous strength; they do not, on the other hand, increase the range of the outfit.

Increasing Range

The range of a receiver is governed by

The filament circuits of tubes connected as Radio frequency amplifiers are identical with the filament connections of those used for audio frequency work. The plates of all tubes connect to the plus B battery terminal. The grids must be connected to a coupling device and then to the filament circuit as in the case of audio frequency amplifying tubes. Only

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7 x 14	3.84	7.12
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(Continued from page 23)

coil B have been set, it will be found perfectly feasible to calibrate the scale of condenser C2 in wave lengths. For the

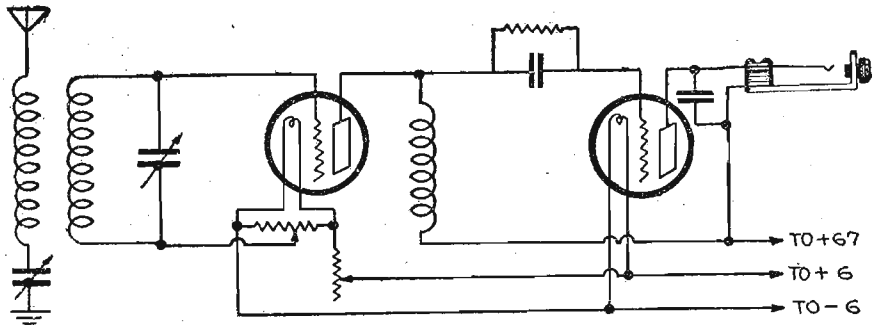


Figure 91—The Rice system seems to present little difficulty in either construction or control.

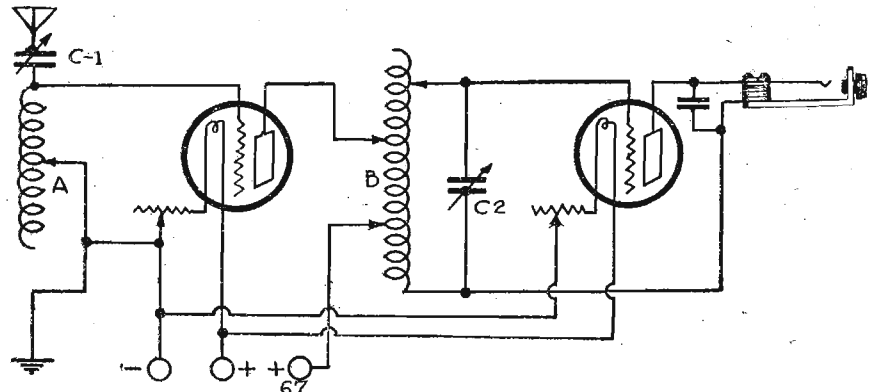


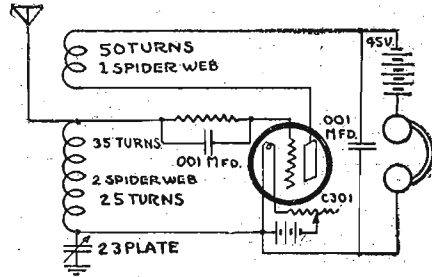
Figure 92—The French amateur's equivalent of the American "ham's" Reinartz—the Abelé receptor. eration; more important, it cannot radiate. Once the taps on the coupling fan who would like to try this, the following suggestions are made: Use two hard

tubes; coil A is about 70 turns with an average diameter of 3 1/2 inches; C1 is either .0005 or .001, depending on the antenna used; coil B is 40 turns wound single layer on a 3 1/2-inch tube, tapped every two turns and set at right angles to A; C2 is .0008 or .001 mfd. Once the three taps on coil B have been set, they require no more adjustment and tuning is chiefly a matter of swinging the calibrated condenser C2. Keep the two plate circuit taps between the grid tap and the lower end of the coil.

(TO BE CONTINUED.)

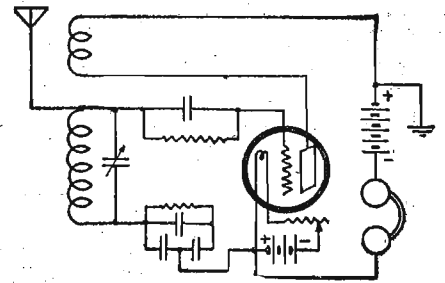
Grounding Positive Side B Battery in Flewelling

As an electrician and student of Radio when a boy, I have today some Radio



knowledge. I find that many fans who try the Flewelling circuit without success are satisfied with results obtained from

grounding the positive side of the B battery and run the aerial to the grid to decrease the resistance until suited to the circuit. This also reduces body capacity.



I have tuned in KHJ on one amplifier tube, using 45 volts on the plate. The coils, as shown on the second diagram have a variometer effect in the circuit.—W. J. P., Detroit, Mich. (By mistake, this article was published in the February 26 issue without the illustrations.—Editor.)

A variocoupler could be used in the Miloplex circuit, but is not recommended because it will not give results comparable with a variometer.

Advertisement for TRI-COIL Radio Frequency Transformers, featuring a product image and text: "DISTANCE on ALL wave lengths", "REACH OUT!", "Use TRI-COIL Radio Frequency Transformers and get those distant stations you've been fishing for!"

Advertisement for Columbia Moulded Variometer, featuring a product image and text: "The New All-Circuit Columbia Moulded Variometer", "This variometer, moulded in genuine black bakelite, represents the latest advance in construction for reason that it permits ALL of the new hook-ups of present and future."

Advertisement for RADECO Safety Fuses, featuring a product image and text: "RADECO Safety Fuses", "Are protecting countless Radio Tubes", "DEALERS", "Radio Equipment Co., Boston, Mass."

Advertisement for Marvel Radio Co., featuring a product image and a list of items: "Dealers! We offer you merchandise at prices below competition! Write now for our amazing offer!", "Westinghouse Storage B Batteries... \$6.39", "TRANSFORMERS", "PHONES", "REMITTANCES MUST INCLUDE POSTAGE"

Advertisement for Valley Radio Supply Co., featuring a list of products and prices: "Radio Supplies at Cut Prices", "BATTERY CHARGERS", "CONDENSERS", "VARIOCOUPERS & VARIOMETERS", "LOUD SPEAKERS", "NEUTRODYNE PARTS", "TRANSFORMERS", "PHONES", "SETS"

Advertisement for Twitchell Auxiliary Tuner, featuring a product image and text: "Why JUNK YOUR SET?", "The new TWITCHELL AUXILIARY TUNER connected to your present set will enable you to bring in the long and short wave stations which your present set cannot get."

Advertisement for Miller-B-Metal Crystal, featuring a product image and text: "Genuine Miller-B-Metal Crystal", "Offer Extraordinary", "Two extra pieces of Genuine Miller-B-Metal will be included with each interchangeable container."

Advertisement for Nazeley's Portena Folding Loop, featuring a product image and text: "NAZELEY'S PORTENA Folding Loop", "Patent Pending", "Folds up like an umbrella—Works like a charm.", "List \$7 each", "J. NAZELEY CO., New York City"

Construction of a Four Tube Reflex Neutrodyne

Part II—Panel Layouts

By H. J. Marx

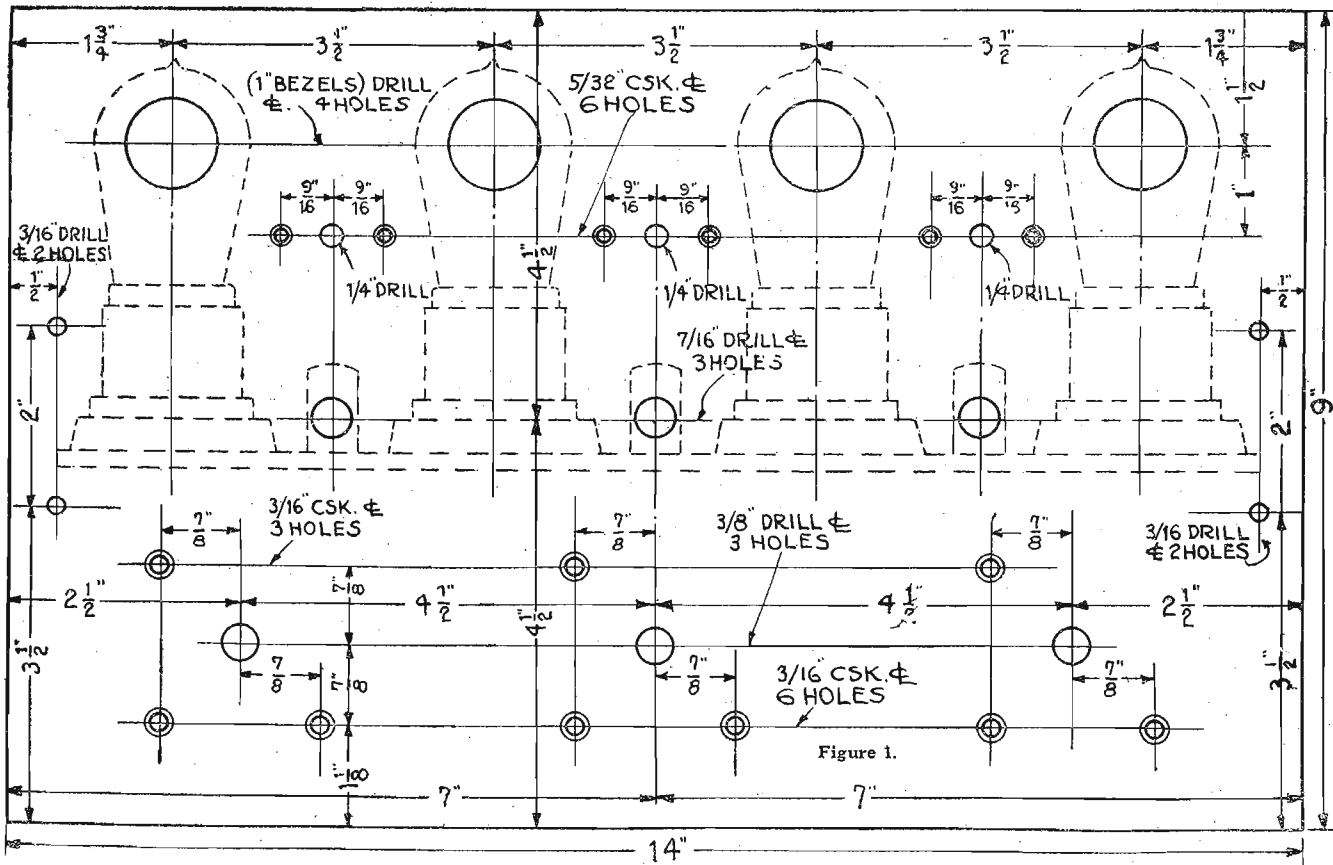


Figure 1.

AFTER the hook-up has been decided upon and the list of parts required are on hand, the laying out of the panel naturally follows. In the case of this receiver it was decided to make the set as compact as possible, without disregarding the problem of interference. For this reason the layout of brass shielding, the use of which is optional, has been included. This shielding brass is of 1/8-inch stock, fairly hard and should be well straightened so as to lie flat against the panel. The question of clearance for holes in the mounting of the apparatus will be taken up later.

Panel Layout

In Figure 1 the layout of the main panel (9 by 14 inches) is given. It is logical that the three rheostats are the least used in tuning and are therefore placed in the upper part of the panel. The location of the three jacks is optional. That is, either

along the center as shown, or along the lower part of the panel. If placed in the latter position, there will, of course, be no trailing phone cords across the condenser dials. The disadvantage, however, is that long leads are required between the sockets on the shelf and the jacks underneath. For this reason the jacks are located along the center line and also because the jacks will be used merely for

tuning in with headsets, since permanent loud speaker connections can be made to the two right-hand binding posts. The small subpanel is supported by means of these jacks, as indicated by dotted outline. The three condensers run along the end of the panel, spaced at 4 1/2-inch centers. If the standard form of air core trans-

former coils were used, this spacing would be too close. The procedure in this set was varied somewhat, as will be noticed in the rear arrangement which will be described and illustrated in the next article. Since condenser mounting holes have not been standardized, it will be necessary to order each set of three countersunk holes to conform to the requirements of the particular condenser used. It is advisable to make the shaft hole 3/8 inch even though the shaft may only be 1/4 inch in diameter, inasmuch as this will provide plenty of clearance so that, if the mounting holes are not sufficiently true, there will be no possibility of the shaft rubbing against the panel and making the rotation of the dial difficult.

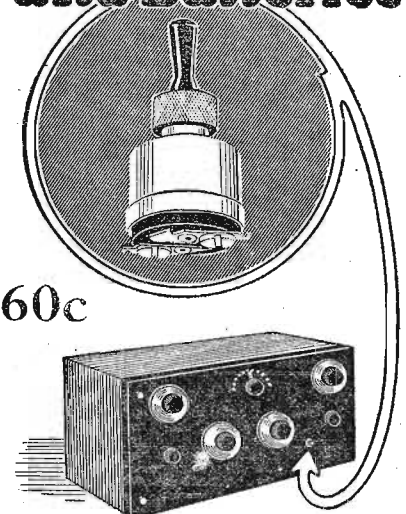
Main Panel Shield

The layout for shielding the main panel is shown in Figure 2. By examination of the hook-up diagram given in Part I, it will be noticed that the negative A battery and the rotating plates of the second condenser are both grounded to the ground binding post on the main panel. This brass shielding on the main panel only covers the lower half, since no capacity effects should be experienced with the upper controls. It does come up far enough, however, to take in the ground binding post, and in this way the shield is automatically grounded without further connections. No clearance is made for this hole, so that the head of the post screw makes electrical contact with the brass.

The first condenser doesn't have the rotary plates grounded direct and for this reason, in mounting, no part of the condenser should come in contact with the shield. If bosses or spacing washers are used, the clearance of the 1/2-inch holes is sufficient to take care of this. In some cases, however, it may be necessary to use small fiber washers similar to those that plumbers use for kitchen faucets. These are placed on the mounting screw between the shield and condenser and prevent contact with the parts. Most variable condensers of the higher quality have the end plates in electrical con-

(Continued on page 26)

Saves Tubes and Batteries



The UV-199 Tubes, and other low-current radio tubes, need to be protected with a Bradleyswitch. It is almost impossible to tell if the tubes are burning, especially in a well-lighted room. With a Bradleyswitch, you can open the filament circuits and positively prevent accidental discharge of the batteries, overnight. The Bradleyswitch is inexpensive insurance. Sold by leading dealers and jobbers.

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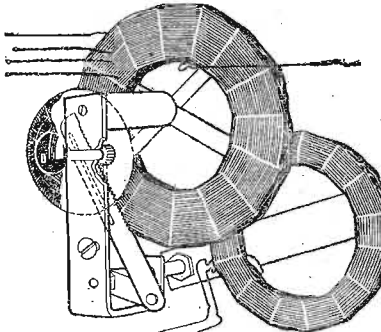
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FOUR-TUBE NEUTRODYNE

(Continued from page 25)

nection with the rotary plates, and by keeping these end plates in contact

frequency transformers and the five battery binding posts. The three sets of two holes between the socket location are for the mounting of the subpanel on the three jacks in order to provide for the

trodyne coils is the direct cause of distorted reception. For this reason care must be taken to arrange the apparatus as indicated. The shielding layout shown in Figure 4

grounded, no clearance is provided for this binding post. The remaining binding post must not touch the parts shielding, so 1/2-inch holes are drilled in this shielding to provide proper clearance around the post. The same clearance is to be provided for the holes used in mounting the subpanel on the jacks. In mounting the sockets and transformers on this subpanel round-head brass machine screws are used. The brass nuts should be on the shield side of the subpanel, and after they have been tightened up, the projecting length of the brass screws should be cut off and filed even with the face of the nut, or the rotating plates of the condenser may strike against them. In case large condensers are used it may be necessary to first check up this point before final assembly.

(TO BE CONTINUED.)

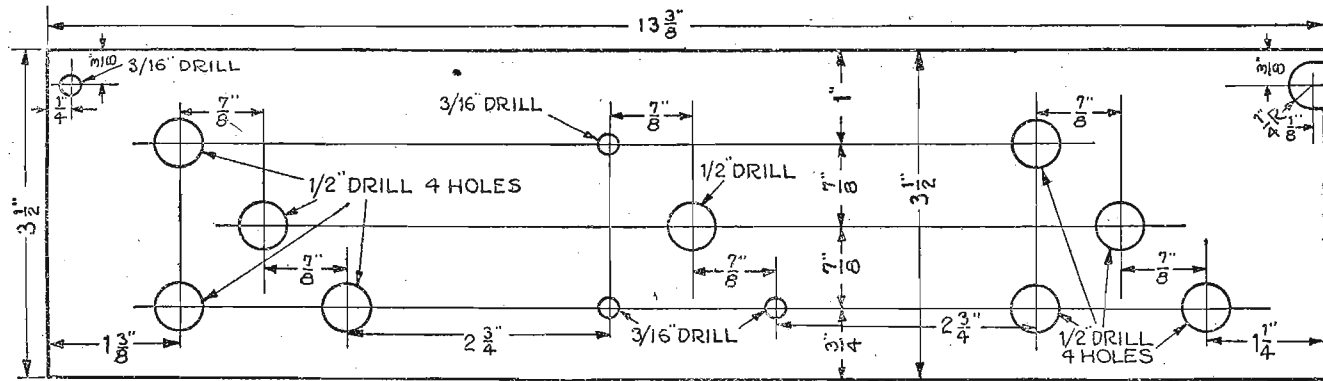


Figure 2.

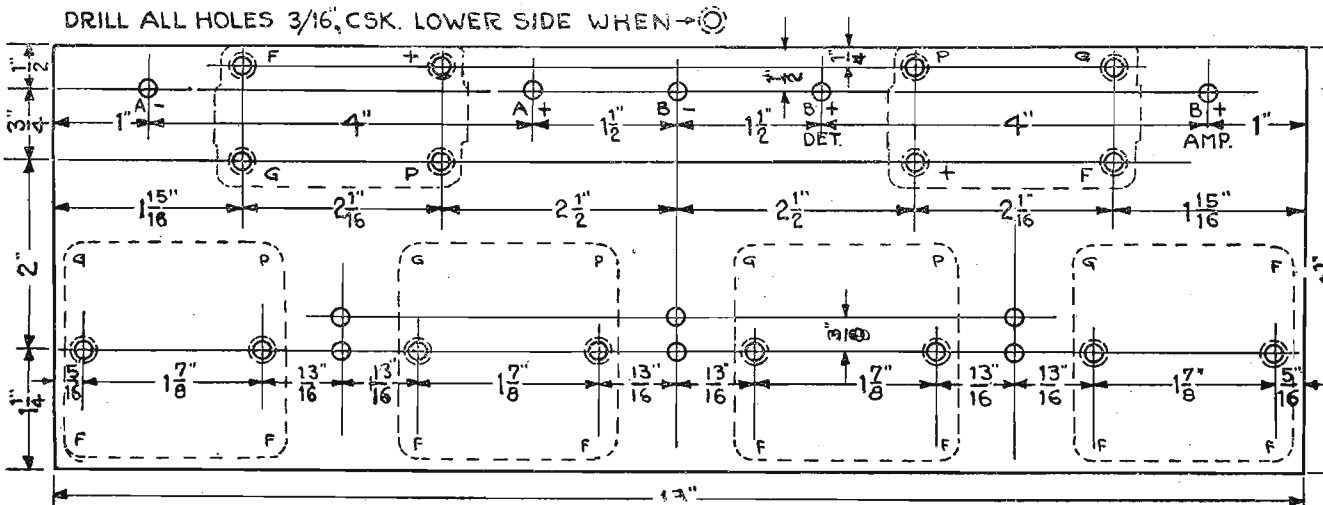


Figure 3.

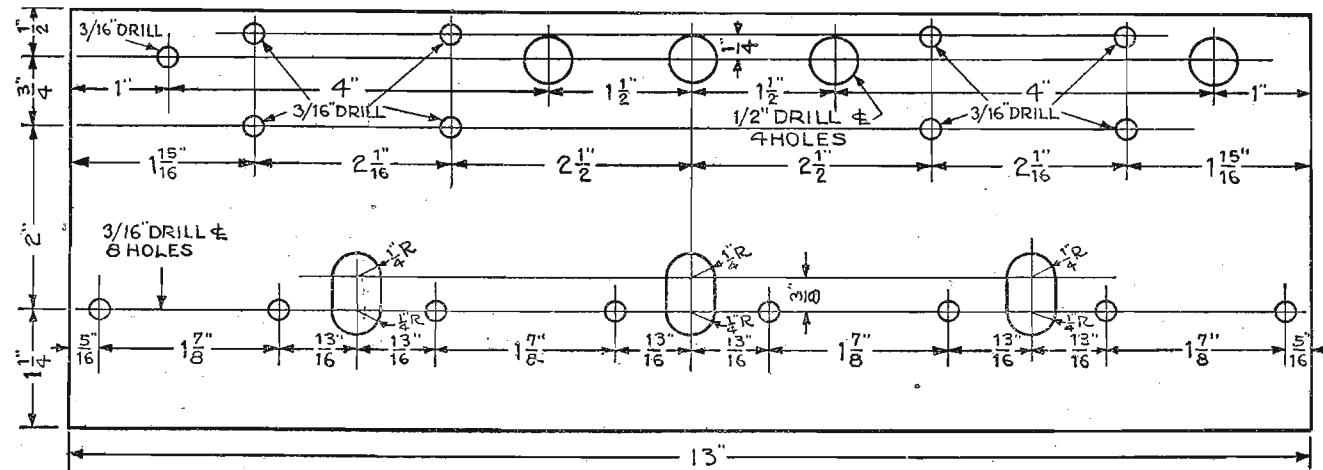


Figure 4.

with the shield, the grounding of the rotary plates on this second condenser will be automatically taken care of. For this reason no clearance is provided for the three mounting holes in this condenser. In the case of the third condenser, the procedure of that of the first is followed. No special arrangements are required for fastening the shielding to the panel provided it lies sufficiently flat. The condenser mounting and the ground binding post will hold it in position.

The Subpanel

The subpanel in this case is very small, only 13 by 4 1/4 inches, and is merely used to support the four sockets, the two audio

shortest possible leads. The audio frequency transformers and the sockets should be set in such a position that the terminals are arranged as indicated by the letters in this subpanel layout (Figure 3). The holes drilled for mounting the transformers and sockets are indicated as countersunk on the underside. This countersink should be omitted if the subpanel shield (Figure 4) is used.

Subpanel Shield

The writer has found that where this double-deck layout of the panel is utilized for neutrodyne circuits the interference between the magnetic field of the audio transformers and that of the neu-

takes care of automatically grounding the frames of the two audio transformers, and where metal sockets are used, the frames of the sockets are also grounded. Inasmuch as the negative A battery is

Headset Troubles

If there is a rattle in one of the phones, carefully remove the shell cap and the diaphragm, and see that there is no dust or filings between the magnet and the diaphragm. Filings will "stick" to the magnet sometimes, and as the diaphragm vibrates, will cause noise. In putting in the phones, see that the colored cord goes to the positive terminal of the B battery and the other to the plate of the last tube.

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On some crystals, only a light contact of the cat's whisker is needed. Galena and silicon are of this kind. Iron pyrites take a firm heavy contact, while in using carborundum the point of the cat's whisker even can be jabbed under the surface of the crystal. Phonograph needles are excellent for use with this kind of detector.

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Crystal Hook-Up with Split Variometer

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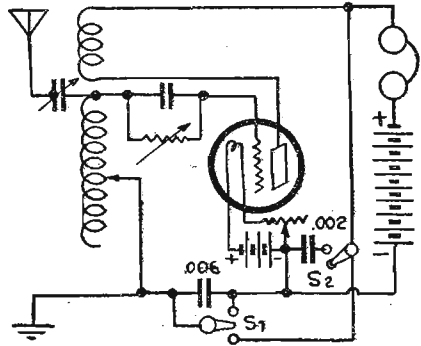
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been so successful in tube circuits. The hook-up is simple and will cause no difficulty for the experimenter to build. There are only two controls, the rotor of the split variometer and the 11-plate condenser. These together with a .001 fixed condenser, and a good crystal are the parts used in the circuit. I have heard distant stations clear and loud and have tuned out locals."—Chas. P. Lee, 153 Holmes Street, Frankfort, Ky.

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The enclosed kink applied to the Flewelling set makes it possible to have three good sets in one, changes from



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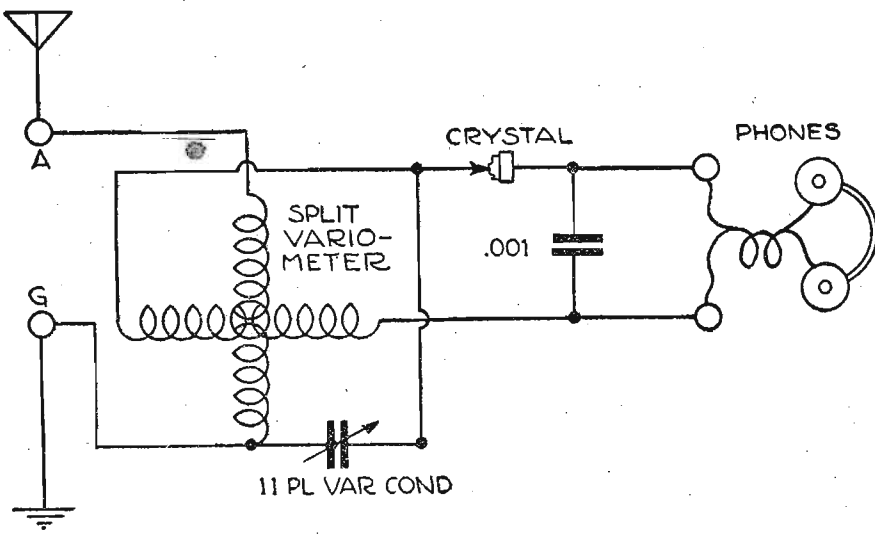
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and a straight regenerative set are possible.

As shown in the diagram, the only addition is one .002 condenser and an extra switch. The condenser is connected from the special plate lead through the switch to the negative filament lead.

By cutting out the .002 and shorting the .006 by means of the switches, the set is a plain regenerative set; when the .002 is placed in the circuit we have the super described in the July 14, 1923, issue of Radio Digest, with the one exception, that the tickler coil is not tapped. This circuit gives good results with an untapped tickler, so the Flewelling fans will not need to make any other change in their sets. Cutting the .002 out and the .006, the circuit is again a straight Flewelling.

This method provides an easy and economical method of changing from one set to another so that the action of the three circuits may be studied.

It should be noted that with the switching arrangement used no damage can be done to the set by careless manipulation of the switches if the precaution of separating the two points on S1 is observed.—Bemis & Floyd, Springfield, Mass.

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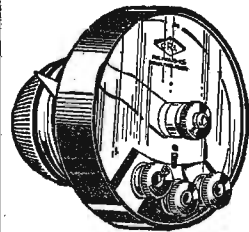
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Gives complete control of plate potential or grid bias without the choking effect of wire resistors. This feature of the C R L Potentiometer alone (freedom from inductance) entitles it to your most careful consideration. And when you see

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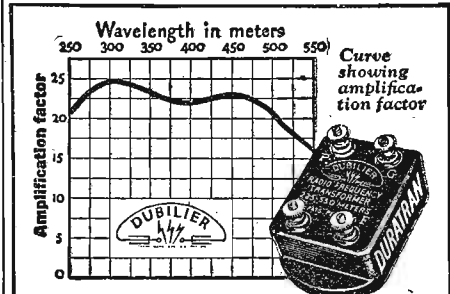
C R L POTENTIOMETER

Troubles with Tubes May Be Easily Fixed

Certain types of gassy vacuum tubes used as detectors will give rise to noises which sound very much like static unless the filament battery voltage is adjusted up to the proper value.

It is desirable with all tubes to examine the contact pins in their base occasionally to make sure that these have not corroded. In cases where these tips have been tipped with solder, corrosion or oxidation may take place. The pins may be cleaned with very fine sandpaper.

The word "kilocycle" is taking the place of a "wave length" and is a Radio term used to designate more accurately the operating conditions of a broadcasting station.



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The radio frequency transformer that amplifies uniformly over all broadcasting wave lengths. Price \$5.00 at good dealers.

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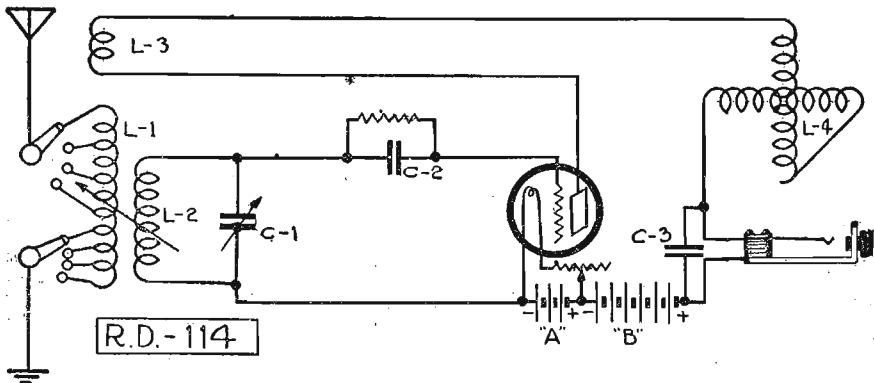
This book can be used with ANY SET, contains illustration and instructions HOW TO RECORD STATIONS. No Radio Set complete without one. 50¢ per copy, postpaid. For your convenience, send a one dollar bill for two copies, a bank check or P. O. money order—no stamps.

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THEY say the sunny South isn't very sunny when it comes to Radio receiving, but here's Mr. G. H. Fischer of Jacksonville, Florida, who says his circuit is bringing in more volume than any set he ever used. He also emphasizes its unusual simplicity of operation and selectivity in tuning.

A paragraph from his letter says: "At first glance you recognize the old Paragon or three-circuit tuner, but I have taken the plate circuit and inserted a coil of 8 turns number 22, wound directly over the primary winding. By setting the coupling to the degree of selectivity de-

sired, the plate variometer can be set for its best point of regeneration and all tuning done with the vernier condenser and taps. The volume is surprising, and I am able to cut out 100-watt C. W. stations located within four blocks of my home."

The key letters shown in the diagram can be identified as follows: L-1, primary of 180 degree coupler; L-2, secondary of same; L-3, 8 turns number 22 wound immediately on top of L-1; L-4, variometer; C-1, vernier condenser, .0007; C-2, .00025 condenser with 10-meg. leak, and C-3, .0025 by-pass.

Review of Books

222 Radio Circuit Diagrams. A complete and up-to-date collection of modern receiving and transmitting hook-ups. The book includes 284 diagrams and illustrations. Price, \$1.00.

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Vacuum Tube Receivers. By Q. F. Heslar. A book that tells how to make a simple set. How to make the cabinet. It includes a 27 by 36-inch layout blueprint. Price, 75 cents.

The Armstrong Super-Regenerative Circuit. By George J. Eltz, Jr., E. E. This is a De Luxe edition of this famous circuit. Profusely illustrated and fully explained. Fifty-two pages. Price, \$1.00.

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The Reader's View

Interference by Hams

In January 5 issue of the Radio Digest, on page 14, there is an article written by G. W. Weston of Kansas City, Mo., on code interference, and he seems to think that the hams are the only ones who do this code work. I would suggest that he read the article on page 16, which is headed "Learn the Code," and may be he would find out some interesting facts.

In our town there are three transmitters—2CW and I have a spark set. None of these transmitters have been on the air since July 1, 1923, and yet every little while some one hops us about tearing up the air. How could we with our sets not going? That is the mistake made by many a B. C. L. They don't know their onions.—W. H. Sullivan, Macomb, Ill.

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First Aid and Helpful Hints for Listeners In Chapter I—Operating the Regenerative Receiver

By Peter J. M. Clute

IN SINGLE circuit and double circuit vacuum tube receiving sets, the energy of the incoming Radio frequency oscillations is impressed directly upon the detector, rectified, and then passed to the phones. If part of this latter energy is fed back again into the grid circuit of the tube, the grid potential is greatly increased. This regenerative effect produces an increased value of plate current, allowing a greater amount of energy to flow through the receivers which results in much louder signals.

Two methods of feedback reception are in common use for producing this regenerative effect, namely, the circuit employing a tickler coil and the so-called "tuned plate" circuit.

Tickler Coil Feedback

The diagram in Figure 1 shows a regenerative receiver making use of a tickler coil, which is connected in series in the plate circuit and so arranged as to be inductively coupled to the secondary of the tuning element. In this type of circuit when the incoming oscillations are impressed upon the circuit, the current in the plate circuit is composed of pulsations of both audio and Radio frequency.

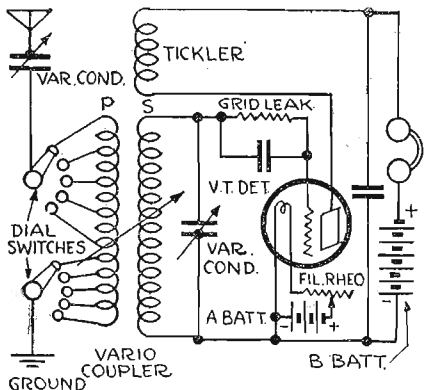


Figure 1.

The Radio frequency component of this current, flowing through the tickler coil, causes Radio frequency oscillations to be induced in the secondary. The resultant increased oscillation in the grid circuit is then amplified in the detector tube, the additional effect of this regeneration greatly augmenting the signal audibility.

If the tickler coil does not have the correct polarity with respect to the secondary, the oscillations will be weakened instead of strengthened. Obviously, the proper polarity is obtained by simply reversing the tickler coil connections. Care-

ful adjustment of the tickler is quite essential in order to avoid any distortion of the incoming oscillations, the latter condition existing whenever the coupling between grid and plate circuits is too great.

Tuned Plate Hook-Up

In addition to receivers with tickler coils in the plate circuits, regeneration may also be obtained by resorting to the tuned plate hook-up. In place of the tickler coil there is substituted a variometer, which, having an adjustable and continuously variable inductance, does not require inductive coupling with the secondary coil.—Figure 2 illustrates a circuit of this type.

In the tuned plate circuit, the capacity existing between the grid and plate is utilized for coupling purposes, the variometer serving to tune and feed back into the grid circuit the added plate circuit potential. The degree of regeneration may be varied by regulating the plate variometer only, the primary and secondary variable condensers being used for fine tuning.

Figure 3 shows a variation of the regular tuned plate receiver with variometers connected in both grid and plate circuits. After tuning the variocoupler to approximately the desired wave length, the grid and plate variometers are varied together until a plucking sound is heard, indicating that the circuits are in resonance. If a slight howling follows, it is a sure indication that the tube is in a state of oscillation, which condition may be remedied by careful adjustment of the filament current, fine plate voltage regulation and careful tuning.

Use of Honeycomb Coils

The use of three honeycomb coils, as in Figure 4, produces quite a flexible regen-

erative receiver. Two of the coils are connected as primary and secondary of

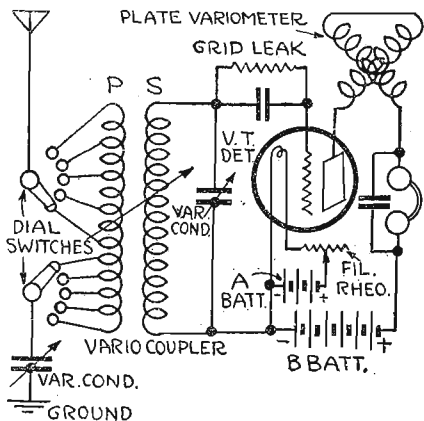


Figure 2.

a variocoupler and the third is used in the plate circuit as a tickler coil. This

arrangement permits inductive regenerative coupling between grid and plate circuits, tuning and coupling being effected by moving the primary coil, and signal strength being regulated by adjusting the tickler, that is, by changing its position relative to the secondary. Accommodation of any desired wave length is easily accomplished by proper selection of other combinations of honeycomb coils with different numbers of turns.

The necessity of careful regulation of the various elements in any regenerative receiver in order to obtain increased signal audibility, cannot be overestimated. Circuits of this nature are generally quite sensitive and selective and the adjustment of the amount of regeneration is extremely critical. Hence, it is necessary to thoroughly comprehend the various details in the operation of such circuits so

(Continued on page 31)

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