

New Simplified Reflex; Series for Beginners

# Radio Digest

EVERY WEEK

Illustrated

TEN CENTS

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

Vol. VI,

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R. D. F. Co. Inc.

SATURDAY, SEPTEMBER 29, 1923

No. 12

## NEW MILOPLEX CIRCUIT

### PLANT PLAYS HYMN FOR DYING MOTHER

FANS BOW AT "NEARER MY GOD TO THEE"

Thousands Deeply Moved as California Station Fills Request of Failing Woman

By Jeffrey J. Dingman

SAN FRANCISCO.—A request from a dying woman that that immortal hymn "Nearer, My God, To Thee," be played for her over the Radiophone before she died was granted recently by Station KPO, Hale Brothers, here. Just at the close of the regular evening organ recital from KPO, a listener in telephoned the station, saying his mother, herself a Radiophan, was dying and that she wanted to hear "Nearer, My God, To Thee," by Radio before she died. The announcer at KPO, after telling his invisible audience of the cause, immediately had the selection played. Radiophans all over the United States and Canada heard the hymn and the announcement and bowed their heads in reverence at the solemnity of the occasion.

This occurrence is said to have established a precedent in broadcasting. It is believed that this is the first time such has been done.



Finita De Soria, above, is Spanish, if there are doubters who heard her sing a group of Spanish songs recently from WDT, New York. She will be remembered as prima donna of "The O'Brien Girl." Kay Laurell, left, star of "Whispering Wires" at the Princess Theater, Chicago, was heard recently in a sketch from that play from WMAQ, The Daily News

### WIZARD SET WINS HONOR IN RESULTS

Costs Little to Build

Mystery Man Tells of Astounding Circuit—Remarkable Action Unexplained

CHICAGO—The Miloplex, so named by the inventor, a resident of this city who wishes to remain unknown, is with us as the latest and most promising member of the great family of Radio hook-ups. In a nutshell, the Miloplex requires but one tube and the least amount of apparatus possible, its tuning controls number but

(Continued on page 10)

"Midgie" Miller, below, of "The Girl," Garrick Theater, Chicago, made a hit with middle western fans last week when she sang at Station KYW, Westinghouse Company, Chicago, Ill.



### EDISON, JR., BUSY ON ANTI-STATIC DEVICE

WILMINGTON, DEL.—Experiments toward eliminating static interference with Radio reception are being conducted by William L. Edison, son of the noted inventor, in his laboratory at Mendenhall, Pa. Young Edison said recently he believes he can perfect the device in a year. He does not think Radio will displace the phonograph. He said that while Radio makes possible broadcasts of song hits, those who hear them immediately go and buy the record.

### ICELAND OPERATOR GETS WGY'S VOICE

Schenectady Station Is First American Plant Heard So Far North

SCHENECTADY, N. Y.—WGY is the first American broadcasting station to be heard in Iceland. In May, Snorri P. B. Arnar, chief Radio operator at Reykjavik, 2,600 miles from this city, picked up the General Electric Company station regularly, sometimes strong enough to operate a loud speaker, so his letter states.

# COLD BLASTS BRING MORE COUPON FANS

NUMBER OF INQUIRIES CONTINUES TO GROW

Readers Can Turn in More Than One Series for Parts—Answers Question

**SPECIAL REWARD OFFER**  
**Coupon Number 18**  
 This Special Reward Coupon appears each issue in Radio Digest until further notice. When sent in, accompanied by necessary remittance, according to the rules governing same, apparatus can be secured. See apparatus list and rules of offer below.  
**Save Me—I Am Valuable**

Cold weather brings oysters and new Radiophans. And with new Radiophans come more demands for parts under the Radio Digest special reward offer to regular readers. It would surprise most people to see the increased interest in the special offer since Old Sol decided it was time for him to take his static interference down toward Mexico for a season. The question is again asked by some readers whether or not they may save and send in two, duplicate series. Yes, is the answer. Just as long as each series is consecutive, so far as the numbers are concerned, there is absolutely no limit to the number of different series of coupons sent in by any one reader.

**Rules to Remember**

One point must be emphasized to those contemplating taking advantage of the special offer; that is, that the coupons turned in for any item must be numbered consecutively, as for example, 1, 2, 3, and 4 or 3, 4, 5 and 6. The number of coupons necessary and the cash remittance, of course, depend on the item sought by the reader. There is no limit to the number of series turned in by any one reader.

Another point to remember is that cash, checks and money orders but no postage stamps will be accepted. To make selection more simple, the items have been divided into eight classes, each class depending on the number of consecutive coupons and amount of cash remittance necessary. The eight classes of items follow:

**Class A Articles**

For two consecutively-numbered coupons and thirty cents (\$0.30) any one of the following articles will be sent: 1 Carter Imp Jack and Plug; 1 Carter 15-Ohm Resistance Unit; 1 Schindler .00025 mfd. Build-up Mica Condenser; 1 Schindler .0005 mfd. Build-up Mica Condenser; 1 Schindler .001 mfd. Build-up Mica Condenser; 1 Schindler .002 mfd. Build-up Mica Condenser; 1 Schindler .0025 mfd. Build-up Mica Condenser; 1 Schindler .005 mfd. Build-up Mica Condenser; 1 Martin-Copeland Sta Put Plug; Walnut Standard Tube Socket; Walnut UV-199 Socket; Dubilier Micadons Type 601 (.0001, .00025, .0005, .001, .002, .0025, .003 or .004 mfd.); Premier Grid Condenser (.00025 or .0005 mfd.); Premier Variable Resistance; 1 Carter 25-ohm Resistance Unit; Standard Socket Adapter for Delta Midget Tube; Electrad Grid Leak (1, 1.5 and 2 megohms, with clips); Ameco 3-inch Dial; Ameco Inductance Switch; Freshman Micon Condensers, (.00005, .00025, .00035, .0005, .001, .0015, .002, .0025, or .003 mfd.); Teleradio V. T. Socket; B Metal Mounted Crystal; Aerovox Lightning Switch; Aerovox Series Parallel Switch; Aerovox Contact Lever; Na-Ald Small Space Socket; Se-Ar-De Vernier Adjuster; 3" Radion Dial, black; 2 1/4" Radion Dial, black; 3" x 1" Radion knob with shafts, 3/4" or 1/2", black, 3" Radion Dial, ribbed surface.

**Class B Articles**

For four consecutively numbered coupons and sixty cents (\$0.60) any one of the following articles will be sent: 1 Carter .04 mfd. Special Fixed Condenser; 1 Carter Jack Switch; 1 Carter Hold-Tite Jack, One Spring Open Circuit; 1 Carter Hold-Tite Jack, Two Spring Closed Circuit; 1 Carter Hold-Tite Jack, Three Spring Filament Control; 1 Carter Hold-Tite Jack, Four Spring Closed Circuit; 1 Carter Hold-Tite Jack, Five Spring Filament Control; 1 Federal Universal Phone Plug; 1 Federal Open Circuit Jack; 1 Federal Closed Circuit Jack; 1 Federal Double Circuit Jack; 1 Martin-Copeland Shur Grip Plug; 1 Martin-Copeland WD-11 Socket; 1 Martin-Copeland WD-11 Adapter; 1 Martin-Copeland UV-199 Socket; 1 Martin-Copeland UV-199 Adapter; 1 Martin-Copeland Pull Switch; 1 Martin-Copeland 5-point Inductance Switch; 1 Martin-Copeland Variable Grid Leak; 1 Martin-Copeland SPST Knife Switch; 1 Martin-Copeland SPDT Knife Switch; 1 Martin-Copeland DPST Knife Switch; 1 Martin-Copeland DPDT Knife Switch; Walnut Variable Grid Leak; Walnut Inductance Switch; Dubilier Micadons Type 600 (.0001, .00025, .0005, .001, .002, .0025, .003, .004, or .005 mfd.); Dubilier Micadons Type 610 (.001, .002, .0025, .003, .004, or .005 mfd.); Dubilier Micadon Type 601 (.006 mfd.); Dubilier By-Pass Condenser (.1, .25, or .5 mfd.); Premier Universal Tube Socket; Premier Radio Dial (3/16, 1/4, or 5/16 in. black or white face); Premier Universal Radio Jack, Open Circuit; Premier Universal Radio Jack, Two-Circuit Three Spring; Premier Universal Radio Jack, Filament Control Three Spring; Premier Switch Lever and 10 Points; Turney Spider Web Coil (SW-10 with .038 milhenry inductance, SW-15 with .066 MH., or SW-20 with .300 MH.); Ameco 6-Ohm Rheostat; Freshman Fix-O Grid Leak and Condenser; Freshman Variable Resistance Leak (with or without condenser); Freshman Micon Condensers (.006 or .005 mfd.); Teleradio 6-Ohm Rheostat; Teleradio 30-Ohm Rheostat; Teleradio Lightning Arrestor; B-Metal Crystal Tube Detector Type A; B-Metal Adjustable Detector Type D; Aerovox Rheostat; Se-Ar-De Vacuum Tube Socket; Basco Crystal Detector Assembly; Basco Rheostat, 3-ohm or 6-ohm; 3 1/4" Radion Dial, black; 4" Radion Dial, black; 4" Radion Dial, black, ribbed surface.

**Class C Articles**

For six consecutively numbered coupons and ninety cents (\$0.90) any one of the following articles will be sent: 1 Carter 6-Ohm Vernier Control Rheostat; 1 Carter "Tu-Vay" Plug; 1 Federal Panel Mount Socket; 1 Federal 6-Ohm Rheostat; 1 Federal 3-Ohm (Power) Rheostat; 1 Amperite Automatic Filament Control (with mounting); 1 Martin-Copeland Marco Rheostat; 1 Martin-Copeland Series Parallel Switch; 1 Martin-Cope-

land DPDT Panel Switch; 1 Martin-Copeland 7-Point Inductance Switch; 1 Martin-Copeland 9-Point Inductance Switch; 1 Martin-Copeland 11-Point Inductance Switch; Walnut Variable Grid Leak with .00025 mfd. Condenser; Walnut Variable Condenser (3-plate .0006 mfd.); Dubilier Ducon; Dubilier Micadon Type 600 (.005 mfd.); Dubilier Micadon Type 610 (.01 or .02 mfd.); Dubilier By-Pass Condenser (1 mfd.); Premier Universal Radio Jack Filament Control Five Spring; CRL Variable Grid Leak, without condenser; Premier No. 250 Variable Resistance, panel mounting; Thordarson Vernier Rheostat; Ritter Loop Aerial; Martin Copeland Variable Grid Leak; Ameco Multiple Point Inductance Switch; Ameco 20-Ohm Rheostat; Ameco 50-Ohm Rheostat; Freshman Antenna; Freshman Micon Condenser, .01 mfd.; Teleradio Variable Condensers, (3-plate or 11-plate); Set "Read EM" Binding Posts (9); B-Metal Crystal Tube Detector Type B; Illinois Cusbton Resilient Socket; Aerovox Antenna Plug; Aerovox Potentiometer; Aerovox Crystal Detector; Se-Ar-De Adjustable Vernier Condenser; Radion Panel 3 1/2" x 7" x 18", black or mahogany; Radion Panel 3 1/2" x 7" x 12", black.

**Class D Articles**

For eight consecutively coupons and one dollar and twenty cents (\$1.20) any one of the following articles will be sent: 1 Carter 20-Ohm Vernier Control Rheostat; 1 Schindler Radio Frequency Transformer; 1 Martin-Copeland 13-Point Inductance Switch; 1 Martin-Copeland 15-Point Inductance Switch; 1 Martin-Copeland 19-Point Inductance Switch; Walnut Variable Condenser (5-Plate .0001 mfd.); Electrad Variom, with mica condenser; Dubilier By-Pass Condenser (2 mfd.); CRL Variable Grid Leak with Condenser; Resistometer (Type A or 2A); Thordarson Variable Condenser, .00025 mfd.; Ameco 300-Ohm Potentiometer; Freshman Micon Condenser, .015 mfd.; Teleradio Variable Condenser, 23-plate; Aerovox Crystal Detector and Condenser, mounted; Se-Ar-De Variable Grid Leak, with condenser mounting; Fil-Ko-Stat; R. S. C. Vernier Condenser, 3-plate; Radion Panel 3 1/2" x 7" x 12", mahogany; Radion Panel 3 1/2" x 7" x 18", black; Radion Panel 3 1/2" x 9" x 14", black; Radion Panel 3 1/2" x 10" x 12", black.

**Class E Articles**

For ten consecutively numbered coupons and one dollar and fifty cents (\$1.50) any one of the following articles will be sent: 1 Carter 6-Ohm Automatic Control Rheostat; 1 Carter 20 Ohm Automatic Control Rheostat; 1 Demcal 3-Plate Variable Condenser; Walnut Variable Condenser (13-Plate, .00025 mfd.); Turney Genuine Reinartz Coil; Dubilier Variadon (.0004 or .0006 mfd.); Resistometer (Type B); Delta Midget Tube and Socket; Thordarson Variable Condenser, .0005 mfd.; Freshman Micon Condenser, .02 mfd.; B-Metal Crystal Tube Detector Type C; Aerovox 3-Gang Socket; Aerovox Double Slide Tuning Coil; Na-Ald 3-Plate Vernier Condenser, with dial; Radion Panel 3 1/2" x 7" x 18" mahogany; Radion Panel 3 1/2" x 7" x 21", black.

**Class F Articles**

For twelve consecutively numbered coupons and one

dollar and eighty cents (\$1.80), any one of the following articles will be sent: 1 Acme Pot-Rheo (potentiometer and rheostat); Walnut Variable Condenser (23-Plate .0005 mfd.); Dubilier By-Pass Condenser (3 mfd.); Premier Variable Condenser without dial (.00039 mfd.); Thordarson Variable Condenser, .001 mfd.; Ameco Compensating Grid Condenser; Freshman Micon Condenser, .025 mfd.; Teleradio Variable Condenser, 43-plate; Se-Ar-De 3-Plate Condenser; Radion Panel 3 1/2" x 7" x 24", mahogany; Radion Panel 3 1/2" x 10" x 12", black; Radion Panel 3 1/2" x 9" x 14", mahogany; Radion Panel 3 1/2" x 10" x 12", mahogany.

**Class G Articles**

For fourteen consecutively numbered coupons and two dollars and forty cents (\$2.40), any one of the following articles will be sent: 1 Federal 7-Plate Variable Condenser; 1 Federal 11-Plate Variable Condenser; 1 Federal 21-Plate Variable Condenser; 1 Federal Anticapacity Switch; 1 Demcal Variable Condenser 11-Plate Walnut Variable Condenser (43-Plate .001 mfd.); Dubilier Variadon (.001 mfd.); Dubilier By-Pass Condenser (4 mfd.); Premier Variable Condenser with dial (.00078 mfd.); Premier Hegehog A. F. Transformer, 4 to 1 Ratio; Thordarson A. F. Transformer, 3.5 to 1 Ratio; Thordarson Variable Condenser, with vernier, knob and dial (.0005 mfd.); Thordarson Variable Condenser, with vernier, knob and dial (.00025 mfd.); Ritter Grand Crystal Set; Ameco Double H. C. Coil Mounting; Na-Ald 13-Plate Precision Condenser, with dial (.000297 mfd.); Na-Ald 23-Plate Precision Condenser, with dial (.000523 mfd.); Se-Ar-De 9-Plate Condenser; Se-Ar-De 17-Plate Condenser; R. S. C. Variable Condenser, 23-plate; Radion Panel 3 1/2" x 7" x 24", mahogany; Radion Panel 3 1/2" x 10" x 12", mahogany; Radion Panel 3 1/2" x 9" x 14", black; Radion Panel 3 1/2" x 10" x 12", black.

**Class H Articles**

For sixteen consecutively numbered coupons and three dollars (\$3.00) any one of the following articles will be sent: 1 Federal Audio Frequency Transformer No. 228 W; 1 Demcal 23-Plate Variable Condenser; 1 Acme Audio Frequency Transformer; 1 Acme Radio Frequency Transformer (R-2, R-3, or R-4); Walnut Variable Condenser (13-Plate vernier; Walnut Variable Condenser (23-Plate vernier); Dubilier Duratron (R. F. Transformer); Premier Micrometer Variocoupler with dial; Premier Variable Condenser with dial (.0015 mfd.); Premier Variable Condenser with vernier (.0004 mfd.); Premier Hegehog A. F. Transformer, 10 to 1 Ratio; Premier Hegehog A. F. Transformer, Tube Socket Type, 4 to 1 Ratio; Thordarson A. F. Transformer, 6 to 1 Ratio; Thordarson Variable Condenser, with vernier, knob and dial (.001 mfd.); T. B. H. Radio Head Set, 2,000 ohms; Tulip Loud Speaker, 15-inch, white; Teleradio Vernier Condenser 23-plate; Teleradio 2,000-Ohm Head Set; Na-Ald Tuned R. F. Transformer, one stage; Na-Ald 43-Plate Precision Condenser with dial (.001 mfd.); Se-Ar-De 35-Plate Condenser; R. S. C. Variable Condenser, 43-plate; Radion Panel 3 1/2" x 12" x 21", mahogany; Radion Panel 3 1/2" x 14" x 18", mahogany.

Station WFI, Philadelphia, advocates every broadcast listener to fly the American flag from his aerial pole as a mark of patriotism.

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## Looking Ahead

What Kind of a Rheostat to Use and When—Some real information about tubes, rheostats and batteries, by H. J. Marx next week. You may wonder when you should or shouldn't use a twenty-ohm rheostat. Read Mr. Marx' next article and get all the facts clear in your mind.

A Bearcat Circuit Is the Ultra Audion—But the new Radiophans don't always get their wiring just right. Next issue will show it in the form of a Simplex Diagram, and just to make sure the set builders won't go wrong there will be a rear view of an assembled set.

Hook-Up R.D.-100 Looked So Good that it was decided to give the photograph of the constructed set to show more clearly just how to put it together. Build this set from next week's details, hook it onto a loud speaker, and then let the set shout for itself!

Trouble Shooting Your Outfit—The subject Thomas W. Benson will discuss in Chapter XIX of his beginner's series next issue. He tells of testing instruments on page seventeen of this issue. Get the rest of the story next week, and keep both copies on file.

Everyone Learns Something New when they start reading all over again the underlying principles of Radio. Marvin W. Thompson starts such a series this week. Read about electrical and Radio terms in his second chapter.

Tricks of the Trade in the Kinks from Readers—Your fellow fan does something a little different than it has ever been done before. One such kink next week tells how five different capacity values are possible from one condenser simply by using a double switch control.

**Newsstands Don't Always Have One Left WHEN YOU WANT**

**Radio Digest YOU WANT IT!**

**BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW**

**SEND IN THE BLANK TODAY**

Publisher Radio Digest, 123 West Madison St., Chicago, Illinois.

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

Name .....

Address .....

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

# ASK GREATER RANGE FOR CAVALRY'S SETS

OFFICERS' BOARD ADVOCATE IMPROVEMENTS

Motor Equipment for Larger Brigades Recommended to Replace Horse Pack, Report

FORT BLISS, TEX.—A report on the requirements of Radio equipment for the cavalry has just been completed by a board of cavalry and signal corps officers which met here recently. While the recommendations of the board have not as yet been made public, it is known that they contain considerable data as to improvements on existing army Radio sets, together with suggestions for the signal corps in designing new apparatus for the use of the cavalry in the field.

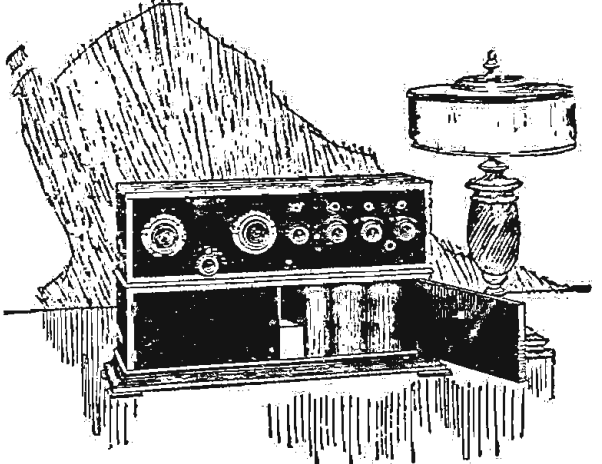
Both cavalry squadrons and regiments are now equipped with pack Radio telegraph sets known as SCR-127, a tube set capable of about sixty miles transmission. The apparatus, weighing 200 pounds, is divided when transported between three horses or mules, one pack holds the generator, another the batteries and aerial, and the third the set itself with spares and auxiliary equipment.

**Will Recommend Motor Equipment**

Brigade headquarters troops are outfitted with more powerful sets, designated as SCR-130, having a slightly longer range. This set is transported on a light spring wagon.

Recommendations of the board include methods of transportation, whether horse pack, by motor or by wagon, power plant, extent of wave band, range, weight and other specification for the new issue of Radio equipment for cavalry. It is believed that motor equipment for the larger units such as brigades will be recommended, and that the range of the sets will be extended over their present reach of sixty miles. Radio telephone equipment will not be assigned, since these sets are of greater weight than is practical for field transportation and Radio telegraph seems to serve the needs of the cavalry.

The signal corps is understood to be awaiting the report of the board before undertaking improvements on old sets or developing new equipment.



## Abroad at Home with a Crosley Model X-J Price \$65

Wonderful opera from New York, dance music from Chicago, stock quotations, current speeches, amusing stories from where you will—all these are brought to your home and fireside if you own a Crosley Model X-J.

This beautiful new Model, similar in construction to the famous Crosley Model X but with greater refinement of detail, is the last word in perfection among radio sets. Its low price—\$65—the battery cabinet pictured above costs \$16 extra—makes it doubly attractive and it more than lives up to the Crosley slogan—Better—Cost Less.

**FOR SALE BY GOOD DEALERS EVERYWHERE**

Write today for free Catalog which shows the complete Crosley Line

**Crosley Manufacturing Co.**  
 9495 Alfred Street Cincinnati, O.

# GIVE SCHEDULE FOR FREQUENCY SIGNALS

OCTOBER, NOVEMBER AND DECEMBER LISTED

Department of Commerce Announces New Opportunities for Check-up and Adjustment of Wavemeters

By L. M. Lamm

WASHINGTON, D. C.—The Department of Commerce has announced the schedule of standard frequency radio signals to be transmitted by the Bureau of Standards for the months of October, November and December. These signals are of interest to all transmitting station operators in checking wavemeters and adjusting transmitting and receiving apparatus. Their accuracy is better than three-tenths of one percent.

Commercial and ship operators should be especially interested in the transmission of October 20. The signals of November 20 cover approximately the same band as those of October 20. The signals of November 5 cover the frequency band used by Class B broadcasting stations. The frequencies transmitted on December 5 cover those used by all broadcasting stations as well as some used by amateurs.

### Some Plants Of Assigned Waves

Measurements made at the bureau of the frequencies on which broadcasting stations are operated indicate that some stations are not remaining on their assigned frequencies, and hence are causing interference with programs from their own as well as other broadcasting stations.

The schedule followed in these transmissions will be slightly different from that followed in the past. All transmissions will be by unmodulated continuous wave telegraphy and no announcement will be made by voice. This considerably reduces the time of transmitting any one frequency. The signals will in other respects be similar to those transmitted in the past. A complete frequency transmission will include a "general call," a "standard frequency signal," and "announcements." The "general call" will be given at the beginning of the eight-minute period and will continue for about two minutes. This will include a statement of the frequency. The "standard frequency signal" will be a series of very long dashes with the call letters WWV intervening. This signal will continue for about four minutes. The "announcements" will be on the same frequency as the "standard frequency signal" just transmitted, and will contain a statement of the measured frequency. An announcement of the next frequency to be transmitted will then be given. There will then be a four-minute interval while the transmitting set is adjusted for the next frequency.

### Can Calibrate Wavemeter

The complete schedule has been so planned that a wavemeter may be accurately calibrated over a range from 150 to 1,700 kilocycles, if all of the transmissions are received. With sensitive receiving apparatus it should be possible to receive these signals anywhere east of the Mississippi River.

The complete schedule of standard frequency signals to be transmitted follows:

Eastern Time	Oct. 20	Nov. 5	Nov. 20	Dec. 5
	KILOCYCLES			
11:00-11:08 p. m.	166.5 (1800)*	500 (600)	150 (1999)	500 (600)
	220 (1363)	580 (517)	190 (1578)	700 (438)
11:12-11:20 p. m.	275 (1090)	640 (468)	240 (1249)	900 (333)
	315 (952)	700 (428)	290 (1034)	1100 (273)
11:36-11:44 p. m.	375 (952)	760 (394)	340 (833)	1300 (231)
11:48-11:56 p. m.	425 (705)	833 (360)	430 (697)	1500 (200)
12:00-12:08 a. m.	500 (600)	920 (328)	500 (600)	1600 (187)
12:12-12:20 a. m.	666 (450)	1000 (300)	570 (526)	1700 (176)

### Oil Fleet Uses Radio Compass

PORTLAND, ORE.—Radio compasses are to be installed on all vessels of the Standard Oil Company's tanker fleet, according to word received here recently by the local agency of the Federal Telegraph Company. Orders for twelve compasses for the purpose have been given, it is said.

## "PERSONAL" BY RADIO FINDS VET'S BUDDY

SALEM, MASS.—R. V. Griffin, sergeant in the World War, recently was amazed to hear his own name come from Station WGI. The Boston Red Cross was anxious to get in touch with him in behalf of a former comrade, Roy Van Steenburge of Portland, Ore. As a result of the broadcast Van Steenburge secured affidavits needed to obtain compensation for an injury received during the war.

## OFFERS BLOOD ON BROADCAST APPEAL

LONDON.—A broadcast appeal for a subject for blood transfusion has resulted in a woman volunteer giving half a pint of her blood to another woman in a hospital here. The operation was successful. Appeals of this kind are no longer unique in England. One for volunteers for transfusion to a patient in King's College hospital was answered by over a score of people willing to give blood.

# FANS BUSY ON PLAYS FOR \$500 CONTEST

WGY LISTS RULES FOR AIR DRAMA WRITERS

Announcement of Prize Awards Brings Hundreds of Letters from Listeners In

SCHENECTADY, N. Y.—The announcement by WGY, the General Electric Company station here, of a prize offer of \$500 for the best Radio drama submitted during the three months' period ending November 30, has brought hundreds of letters of inquiry and there is every evidence that many contributions will be received.

Additional prizes in varying sums up to \$100 will be awarded for other plays deemed suitable for Radio production. The offer of WGY is made for the purpose of stimulating interest in the writing and the development of a new form of drama, a play which reaches its fullest appreciation through the ear, the mind and the imagination.

Plays will be considered that fall under any of the following classes: drama, melodrama, comedy drama, comedy and farce comedy. Manuscripts must be original and accompanied by the written permission of the author (or, if copyrighted, by the person or persons controlling the copyright, giving the General Electric Company exclusive right to produce the play by Radio. Rights for use other than Radio may be reserved by the author. Two copies of each play must be forwarded and should be sent by registered mail. The author should retain a complete copy.

### More Conditions of Contest

The author's name must not appear on any manuscript offered in competition. Instead, the manuscript should be signed with a nom de plume which must also be written on a sealed envelope containing the contestant's real name, address and permission granting exclusive right to produce the play by Radio. This envelope should be enclosed with the manuscript and will not be opened until the award has been made. A synopsis of the play must be attached to each manuscript.

A play requiring one and a half hours for performance is desirable. In any case the time should not exceed two hours. Small cast plays, employing five or six characters are best adapted to Radio, as they permit quick comprehension of the plot and give rise to no confusion in distinguishing characters. Plots must be clean with no attempt at questionable situations.

# SEATTLE PLANTS ON BOOM WITH AUTUMN

Pioneer in Washington State Still Retains Lead with Four Stations

SEATTLE, WASH.—Radio is on the boom in Seattle again. This city was the pioneer in the State of Washington in broadcasting, beginning early in 1922, and still retains the lead. There are four large stations in operation in the city, all but one of which have been put into commission within the past two weeks.

KFJC, under the auspices of the Seattle Post-Intelligencer, opened a splendid Class A station with an auspicious program recently. The Post-Intelligencer operated the first broadcasting station in the state, KFC, but this was discontinued in January, after a long run of service. The service has been resumed, however, on a much larger scale than before. KFJC operates on a 233-meter wave length.

KDZE recently opened a 500-watt broadcasting station under the direction of the Rhodes Company, local department store, and the Kilbourne-Clarke Company, Radio manufacturers. They are operating a splendid Class B station with good results.

KFIY is the call of the Star Electric Company broadcasting station, another recent addition to the Seattle broadcasters.

## MILADY AND HER BOUDOIR SET



Miss Jean Tolley has ideas about how a lady's set should appear, especially if placed in one's boudoir. The receivers resemble a morning bandeau, wrapped with purple and orchid velvet flowers. The other disguise hides a loud speaker. © K. & H.

## LAKES SERVICE TAKEN UP BY INTER-CITY FIRM

Concern Plans to Open New Shore Stations

CLEVELAND.—The Radio service on the Great Lakes handled recently by the United States Navy Department stations has been taken over by the Intercity Radio Telegraph Company, of No. 949 Broadway, New York. The Cleveland station, WTK, is located in Hotel Cleveland. It uses a two-kilowatt quenched spark navy type set, built by Emil J. Simon, and operates continuously during the twenty-four hours on a 1,800-meter wave, under license of the Department of Commerce.

Other shore stations will shortly be opened by this company, to extend the service to the most important lake cities, and the stations will also be used for ordinary telegrams between cities.

The intercity stations at Chicago, Detroit and Cleveland have a wide range and hold several records for distance transmission. This development of a point-to-point Radio telegraph system in conjunction with the lake service is believed to be an important factor in U. S. internal communications.

### New Radio Station for Mexico

WASHINGTON.—The General Electric Company has representatives at Caracas, Mexico, who are preparing a contract for the construction of a large Radio transmitting station there, it is understood.

## THE ANTENNA BROTHERS

Spir L. and Lew P.

An Easy Way to Get There



# ENTERTAINERS LAND JOBS BY BROADCAST

ENGAGEMENTS OFFERED ON RADIO ABILITY

Singers and Even Entire Orchestra Win Permanent Position Through Airphone Concerts

By A. K. Chenoweth

COLUMBUS, O.—Broadcasting stations doing regular duty in Columbus not only are filling the role of impressario, but also are proving to be high grade booking agencies for musical talent, according to reports from the owners and managers. They have dozens of cases on file of Radio performers who have secured temporary or permanent engagements through the medium of playing or singing on programs given to the keeping of the air.

One of the notable examples was when a short program was broadcast by the signal corps station at Ohio State university, Columbus, with the Columbus Dispatch acting as impressario. One of the women singers on the program promptly was engaged for a group of songs in a neighboring town.

**Has Long List of Similar Cases**

It is a long list of such cases which Mrs. C. A. Entekin, studio manager for Station WCAH, the Entekin Electric Company, can cite to the questioning artists. Off-hand Mrs. Entekin names two woman singers who were benefited by broadcast performances. One of these immediately was elevated to a better position in church singing and another secured an engagement carrying with it substantial pay.

Two orchestras were hired to play shortly after they played their music in front of the microphone at Station WCAH. In each of these cases they were engaged by telephone and the contracts later verified by writing. There are many examples of music teachers obtaining pupils, and one young male singer soon will be given the opportunity of having his voice recorded for the phonograph. At least one juvenile singer has secured a choir tryout as a result of his Radio performance.

**Music Teachers Laud Radio**

Teachers of music as a rule are very desirous of having their proteges sing or play before the microphone. "Clothes and general appearance have no effect whatsoever when the pupils appear on a Radio program," one of them states. "Quality alone counts, and that is what we are working for in the training of youthful voices or hands."

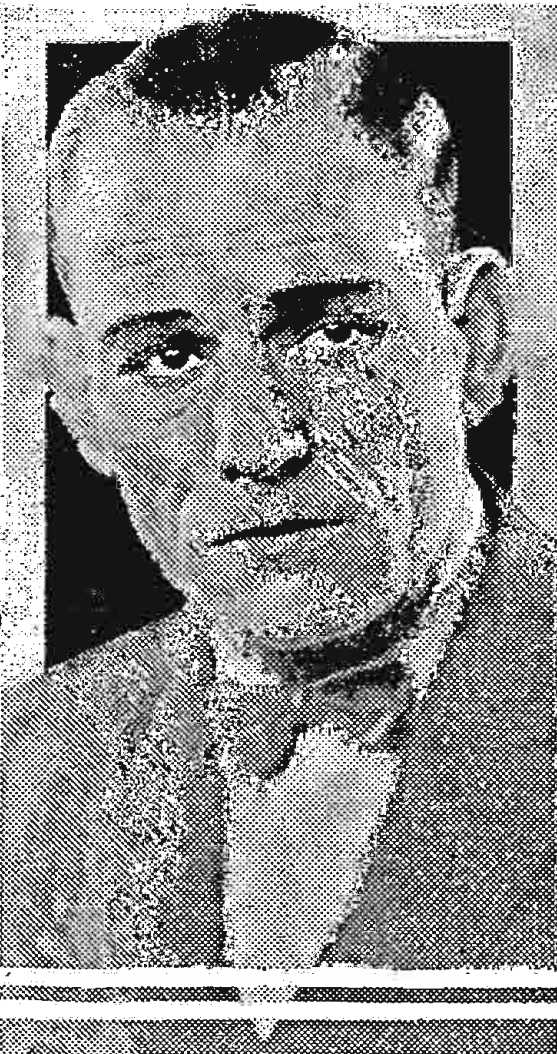
Immediately after a jazz orchestra played on a program for Station WBAV, one of the Erner & Hopkins Company here, the management of one of Columbus' largest restaurants called the station and asked for the manager of the musicians. Terms of a contract were arranged by phone and the company of players left the building in automobiles, being taken to the restaurant for immediate work.

**Station Also Discovers Talent**

The young lady who arranges most of the programs for WBAV cites one unusual case where the station acted as discoverers of talent. A performer billed to sing on a certain evening failed to show up, and in desperation the girl turned to a young man living in her neighborhood, known only as an amateur singer, and asked him to fill in. He did, with the result that one Columbus hotel immediately asked for his services. Ultimately he secured a position in a Columbus church quartet. Three offers for individual engagements were received at the station on the night of his first and only Radio performance.

More amazing still is the record number of engagements which an aggregation of young men from Ohio State university working together as entertainers, received

## TELLS HOW TO PUT MOVIE MAKE-UP ON



Lon Chaney, celebrated star of the silver sheet, recently told the fair and lesser sex listening to WOR, Newark, N. J., just how to proceed when "Making Up for Motion Pictures." Mr. Chaney is famous for his ability as a contortionist. It was because of this ability, partly, that he was chosen to play the lead in "The Hunchback of Notre Dame," a picture which was directed by loud speakers connected with Radio voice amplifiers

after rendering a group of numbers for Station WPAL, the Superior Radio and Telephone Equipment Company here. During their studio performance a fan in St. Louis sent in a long distance telephone call at his own expense asking for encores of a certain selection. Two contracts were made by telephone on the same night, and it is reported that the talented young men are still filling engagements made as a direct result of one night's work.

## State Fair Program Enjoyed at Special Broadcast Station

LONDON, O.—Local Radio fans did not find it necessary to go to Columbus in order to enjoy the recent annual state fair there. The Erner & Hopkins Company of Columbus had installed a special broadcasting station on the grounds which sent out information regarding the programs for different days, winners of exhibitions, entertainment and information of the crowds. Broadcasting was started about noon every day and continued throughout the afternoon. Music from bands at the grounds was also sent out, including a concert given in the evening at the coliseum by the Red Hussar band.

**Swedish Radio Rules Curious**

WASHINGTON.—The status of broadcasting in Sweden is a curious one; the government has now decided that transmitting stations will be constructed by the state, but will be leased to operating companies. Receiving stations may be established by private persons upon obtaining a license from the government.

## Studio Operator Barely Escapes Electrocution

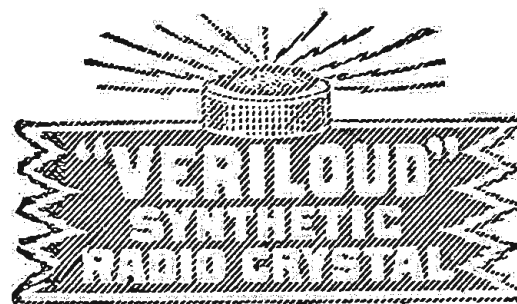
Makes Contact with 2,000 Volts, Current Bores Hole in Arm

CALGARY, ALTA.—W. W. Grant, president of the firm operating Station CFCN here, narrowly escaped death by electrocution recently when making an adjustment. His arm inadvertently slipped and contact was established with a line carrying 2,000 volts. All that saved Mr. Grant from being badly burned was that contact was established with only one arm, the current going into the arm just above the elbow and emerging at all five finger tips on the arm burned. A hole an eighth of an inch in diameter and so deep that the bone could be plainly seen was burned in his arm, paralyzing it so that he did not regain full use of the injured member for several days.

Mr. Grant was unable to broadcast that night. The veteran operator said that in the course of his life work in Radio he has been burned and has sustained electrical shocks several times, but never such a severe one. The fact that the current traveled downward in the arm instead of up saved his life.

## Station WGI Produces First Radario by Harvard Writer

MEDFORD, MASS.—George Brinton Beal, known as a news writer and playwright, has written a one-act play, which was produced recently by the Amrad Players over Station WGI here. It is entitled "Bringing Mother Back." Another of his one-act plays will soon be produced by the Amrad Players.



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

## WBAP HAS PICK-UP USED BY HARDING

Fort Worth Plant to Keep Microphone into Which Late President Talked

FORT WORTH, TEX.—WBAP, Star-Telegram, has received the super-sensitive microphone used by the late President Harding in his speech at St. Louis, June 21. The transmitter will be employed in connection with the in-put amplifier system. This system enables programs to be broadcast from any part of the city with as much efficiency as if they were being sent out from the studio itself.

Upon the microphone is inscribed the words: "Used by President Harding in St. Louis, June 21, 1923." Radiophans will recall that this memorable speech was re-broadcast by WBAP, using a long distance line of the Southwestern Bell Telephone Company and the aid of a member of the American Radio Relay League at St. Louis.

# RADIO BOOK

514 PAGES

Just off the press! The greatest book on Radio ever written. Price only \$1. Filled with sound, practical, tested information for every radio fan, from beginner to hard-boiled owl. Written, compiled, and edited by men of national reputation. Every page tells you something useful—and there are 514 pages. Mail \$1 to-day and get this I. C. S. Radio Handbook before you spend another cent on parts.

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

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WHEN you're wondering which radio set to buy, remember that De Forest invented the vacuum tube, without which present-day radio would still be a dream. Naturally it is De Forest Radiophones which give the greatest satisfaction. Go to your De Forest agent today and let him tell you why.

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Dept. R. D. JERSEY CITY, N. J.

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



# The New Grebe Broadcast Receiver

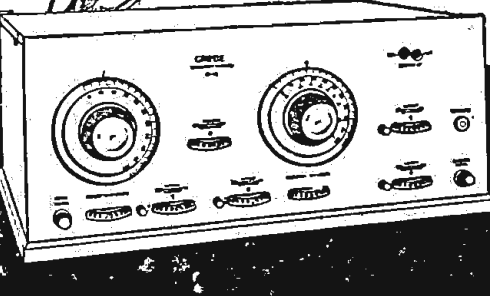
Point No. 5 A TUNING DIAL, graduated in wavelengths, enables you to locate, instantly, the station you desire.

Just One of its Seven Points of Satisfaction

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

Ask Your Dealer

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





**SONG BIRDS OF CHICAGO POLICE FORCE ON AIR**



This line-up represents the pick of the song birds of the Chicago Police Department as they broadcast one of their favorite selections at their recent field meet in Grant Park, Chicago. Many attempts have been made to induce these men to go in vaudeville © U. & U.

**WGR Presents Receiving Set to Buffalo City Hospital**

BUFFALO, N. Y.—Mayor Francis X. Schwab was recently the recipient of a complete wide range receiving set for the patients of tuberculosis and similar diseases at the Buffalo City hospital located at Ferrysburg, N. Y. The set was given by the Federal Telephone & Telegraph Co., through the interest of M. A. Rigg, manager of Station WGR, and J. P. Quinn, director of an orchestra which frequently broadcasts there.

**Good Book Talk by Publisher**  
NEWARK, N. J.—Congressman David J. O'Connell of Brooklyn, connected with metropolitan book publishing for more than forty years, recently delivered a short lecture entitled, "The Value of Good Books," at Station WOR, L. Bamberger & Co., here.

**FLEWELLING ANSWERS TO QUERIES**

By E. T. Flewelling

*(Editor's Note.—This department is written by Mr. Flewelling, the inventor of the famous super circuit. From the questions sent him each week care of Radio Digest, he picks the one considered most informative for all and answers it in this column.)*

**Purpose of Special Plate Lead**

*(Submitted by A. E. C., Toronto, Canada.)*

**Question.** What is the function of the special lead from the plate circuit and how does it operate?

Is there any special reason why the grid leak is connected across the grid condenser instead of the positive A?

If a .001 variable condenser were connected in parallel with .006, should it not control the blocking frequency more easily than a variable grid leak only?

**Answer.** Your first question is a rather difficult one to answer specifically, but we might say that in general it is used as a tie back for the plate voltage. Every circuit has its little peculiarities in the wiring diagram that are of more or less importance. The lead you speak of is, however, of very prime importance in the Flewelling circuit and should be connected exactly as shown in the diagrams. There is not much opportunity for variation here.

So far as the reason for connecting the grid leak across the condenser is concerned, there is plenty of leeway. The circuit will function just as well, so far as we have been able to find out, if the leak is carried over the grid to one of the A terminals; which one depending upon where the best results are secured. As a matter of fact, I often prefer, for convenience sake, to use a leak at this point rather than across the condenser. It is then, as you can see, entirely optional.

The use of a .001 variable condenser in parallel with .006 would be a useless waste of time as you would not notice any effect from this addition. Many attempts have been made to place variable condensers at this point and without much success, as you will see from the following: As a rule, a circuit will work best with a .006 condenser—never any less, but frequently very much more. A good saving and sure value is that given by two .006 condensers in parallel, or a total capacity of .012. Above this point not much effect is shown until values in the neighborhood of .25 mfd. are used, at which point we begin to lose the benefits. It is, however, possible and rather convenient to control the blocking fre-

quency by the use of a variable grid condenser rather than a variable grid leak. The best way to do this is to place a fixed grid leak of 1 or 2 megohms in the regular circuit, as shown—it makes no difference which size—and substitute a fixed .00025 grid condenser with a .001 variable condenser. It will be found then that the blocking frequency may be controlled over wide limits. This is a very convenient way in which to do it, but has not been referred to much before this, because the use of a variable grid condenser, due to its effect on the tuning of the circuit, really complicates the tuning operation and makes the set a little more difficult to operate. There is a point in this—that is, combinations of grid leaks and grid condensers—well worth investigation by those who care to experiment with the circuit.

Paris taxicabs are on the boulevards with Radio receiving sets to entertain the fares. Concerts are picked up from the Eiffel Tower, as well as England and Holland. The fare is two francs higher.

**Speeding Train Keeps in Touch with World's News**

**Convention Special Brings Concerts to Its Passengers**

CALGARY, ALTA.—An observation car equipped with a Radio set for the purpose of receiving messages and concerts for passengers in the car was one of the features of the special train which left here recently for Victoria, B. C. The annual convention of the Association of Canadian Clubs was to be held in that city, and one of the most complete trains ever operated over a railway system in Canada carried the delegates. Arrangements were made with newspapers and firms broadcasting Radio concerts to broadcast to the train programs of entertainments and the world's news during the progress of the journey.

The dining cars of the palatial train were equipped with phonographs operated by special storage batteries, and passengers were entertained while eating.

**Grewol**  
THE PERMANENT DETECTOR

**Fixed Adjustment**

The Grewol is adjusted on the most sensitive spot on the crystal and fixed—proof against vibration and jar. Protected from dust and moisture by glass enclosure. Grewol adds to the efficiency of reception.

Packed in individual carton with instructions ..... **\$2.00**

Write for Booklet

**RANDEL WIRELESS COMPANY**  
8 Central Avenue Newark, N. J.



**LOUD SPEAKER CABINET**

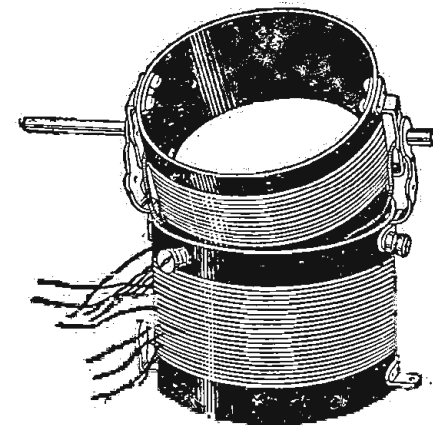
This Cabinet has the best features of Modern Radio Equipment. Install your favorite hook-up in it, making an attractive, complete set at a very moderate cost. Panel size is 7x21. A Horn is built in the lower compartment, equipped to receive any Standard Speaker Unit.

Price **\$12.00**

**ROBBINS WOODWORKING CO.**  
Dept. C. Libertyville, Ill.

**Closer Tuning—Greater Selectivity with the Federal Variocoupler, No. 95**

**\$7<sup>00</sup>**



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

**T**HIS variocoupler makes it easy to tune out local interference and bring in DX stations, because the relation between primary and secondary provides selective coupling over a wide range.

Federal engineers made a searching and extended study before determining primary and secondary inductance values—and every detail of construction meets the Federal standard of workmanship.

Improve your set's performance with a No. 95 Federal Variocoupler, \$7.00.

**Federal Telephone and Telegraph Company**  
Factory: Buffalo, N. Y.  
Boston New York Philadelphia Chicago  
San Francisco Pittsburgh  
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**The Highest Refinements in Modern Radio—**

Regeneration and Tuned Radio Frequency Amplification—find their first successful combination in

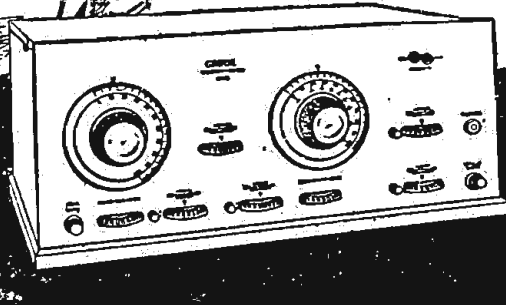
**The New GREBE Broadcast Receiver**

**T**HE only antenna required is the 20-foot silk-covered wire, supplied with the Receiver. This wire may be concealed behind the picture moulding or run along the base-board. Ask Your Dealer Today.

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

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

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



# HE WAS A WISE OLD ELEPHANT!

## Indarini Didn't Recognize His Master's Voice; Zoo Elephant Proves Waterloo

Broadcasting Meets Obstacle in Huge Form of Zoo's Prize Specimen—He Just Couldn't Believe It Was Syed Ali Who Told Him by Radio to "Eat His Hay"



Indarini doesn't believe in sounds originating in an inanimate object. Nor will he obey them. In fact, he was very highly indignant, as this photo of him will substantiate. © U. & U.

By E. E. Leibner

Radio has been stumped at last. The greatest wonder of the age, which has cut down space, helped cure the sick at sea and on land; which has made many of the deaf to hear, and which could have sent the latest baseball scores and live news into the heathen lands, had the people there been sufficiently interested, has encountered its first, apparently insurmountable obstacle in the massive form of an elephant in captivity.

The waves that have carried almost every known sound through the air, as well as many sounds and squeaks and speeches hitherto unknown, have finally cracked under the strain of the elephant language. And Syed Ali, native Indian mahout, nurse and companion of Indarini, the prize elephant of the London Zoo, has lost all faith in modern methods and contraptions.

### Inherit Elephant Lingo

It seems that for centuries and centuries, dating back into the dim mists of the beginnings of time, the Indian mahouts, keepers and trainers of elephants, have inherited, son from father, an elephant language that all the huge pachyderms heed, understand and obey. The principal commands in this "Hathi ki Bat"—"Tongue of the Elephants"—are:

"Eat your hay! Drink the water! Get up! Lie down! Pick it up! Pull! Stop that noise!"

"Indarini is a smart elephant," said Syed Ali, the London keeper, to himself, "but not quite up-to-date. I'll have to teach him some of the new ways."

### All Decides to Broadcast

So Ali dressed himself in state clothes, with crimson headdress and all, and went to a broadcasting station four miles away from the Zoo. He was going to give his orders to Indarini, the elephant, in the way of 1923—by Radio.

Arriving at the station, Syed Ali sent out his commands. From the attendants, who remained at the Zoo to watch the developments, he soon received reports by telephone, regarding the outcome of his experiment.

Did Indarini obey the commands? He did not.

### Indarini Says, "Nothing Doing"

Did he heed his master's voice? Nothing doing on that score. After several attempts, Ali gave up the attempt in disgust. For instead of following the commands of his master, the elephant went on calmly munching the apples, potatoes and locust beans that the London kids, visiting the Zoo, offered him.

Zoologists now believe that elephants will not obey a disembodied voice. These animals apparently must see and smell their master—and they can't do that by Radio—yet.

And that presents an opportunity for some ambitious, far-seeing and ingenious inventor to carve his name in the hall of fame.

Queen Alexandra returned thanks to the British people for their greeting on the sixtieth anniversary of her wedding day by broadcasting.

## RADIO WILL GUIDE ZR-3 ACROSS OCEAN

TO HELP GIANT ZEPPELIN ON 3,600-MILE TRIP

Giant German-Built Craft to Be Protected on Flight by Weather Broadcasts

By Carl H. Butman

WASHINGTON.—Early in November it is expected that the Zeppelin Company will point the nose of the great ZR-3 toward the West and the long overseas journey of the navy's second airship will begin. On her maiden trip to her American home at Lakehurst, N. J., a distance of approximately 3,600 nautical miles, Radio will guide this latest Zeppelin.

She will not be under Radio control, as was the old battleship "Iowa" when sunk by naval gunfire, but Radio will carry to her twice daily complete forecasts of the weather ahead and the meteorological conditions on the southern trans-Atlantic steamship route along which, it is understood, she will proceed under the direction of the German officers and crew. The only American officer who is certain of making the trip over is Capt. G. W. Steele, U. S. N., her future commander.

### Description of Giant Craft

Briefly, the characteristics of the new aerial passenger cruiser (she is not a war craft, at least not yet) are: Length 660 feet, slightly less than the American built ZR-1; diameter, 90 feet; power, four 400 horsepower Maybach engines, giving a speed of approximately 80 miles per hour.

Through arrangements between the weather bureau, navy, shipping board vessels and certain other north Atlantic ships, meteorological data from all along the ZR-3's route will be compiled and Radioed twice a day to a station ship in mid-Atlantic. This vessel will have a powerful Radio set and will transmit to NAA, Arlington, Va., bulletins for broadcasting to the ZR-3, both before and during her flight.

Little is known of the Radio equipment of the ZR-3, but it is said that it is also of the latest German type, and that transmission and reception are assured all the way across the Atlantic, although half that range would be sufficient, due to the co-operation of the station ship and NAA.

### New Service for Lake Shipping

WASHINGTON, D. C.—Weather bulletins and hydrographic information are being broadcast twice daily by the Intercity Radio Company, located in Cleveland, on Lake Erie. The service is intended for the shipping on the Great Lakes, and will be broadcast on a wave length of 706 meters, spark. The call of the station is WTK. This station also is licensed to communicate with Rogers City, Mich., on a wave of 1,764 meters.

## STOPS PROGRAM TO AID GROUNDING SHIP

WJAZ Picks Up Distress Call of Stranded Vessel in Lake Michigan

CHICAGO.—For the first time in the history of Great Lakes navigation a broadcasting station came to the rescue of a distressed steamship, when Station WJAZ, the Edgewater Beach hotel, recently picked up the SOS call of the Canadian Adventurer off the harbor of South Chicago.

While the program of the broadcasting station was being given, one of the receiving sets, equipped with a wave trap for the reception of signals on a different wave length than that used by the broadcasting station, picked up the distress signal.

R. H. G. Mathews, manager of the central division of the American Radio Relay league, and one of the owners of Station WJAZ, ordered the program stopped and took down the following message:

"SOS. Send tug to Canadian Adventurer, aground outside South Chicago pier."

Mr. Mathews communicated with the ship and learned that the operator had been frantically endeavoring to rouse the Great Lakes station. He then phoned the Dunham Towing company, which at once dispatched tugs to pull the vessel off the shoal. The craft was not damaged.

## FRANCE AND AMERICA STANDARDIZE WAVES

Compare Frequencies Used in Trans-Atlantic Communication

WASHINGTON.—In an effort to standardize Radio frequencies used in trans-Atlantic communication, the Navy Department is co-operating with the French Government and once a month the frequencies of the Annapolis and Lafayette Radio stations are recorded and compared. Transmission on standard frequencies, or wave lengths, is essential to efficient communication in order that all stations can keep to the wave length assigned them by national or international law. Special efforts are now being made by the United States and foreign governments to keep all their stations on the prescribed waves and it is essential that their standards be equivalent and their instruments be calibrated.

When all stations maintain their proper wave lengths or frequencies exactly, tuning in will be more readily accomplished, it is pointed out, the process approaching the simple adjustment of a dial to a known position. Perhaps dials will be marked "London," "Paris," "Berlin," etc., in the future.

John Osborn, well-known Philadelphian, attracted considerable attention recently by appearing on the Fairmount Park bridge path wearing a complete portable Radio set with a loop aerial on his back.

# The "B" Battery is the Life of Your Radio Set

THIS IS NUMBER ONE OF A SERIES

THE only function of your Radio set is to produce sound-waves—those mechanical disturbances in the air caused by some rapidly vibrating body. So far as the Radio set itself is concerned the actual source of the sound is the "B" Battery. It is not an exaggeration to say that the "B" battery is the "life of your Radio"; for the set itself is simply a device to reproduce sounds, and the sounds all have their origin in the "B" Battery.

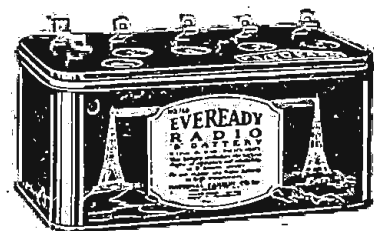
The "B" Battery is simply a box full of electrical energy; harnessed for you by experts. Without the Radio wave the flow of energy from the "B" battery is smooth, steady and silent. It is the final aim and purpose of all the many parts which go to make up a Radio receiving set, to convert the otherwise steady flow of electrical energy from the "B" Battery, into a rippling, vibrating, throbbing, audible current.

As the sound-waves—whether caused by the human voice in talking or singing, or by musical instruments—are modulated up and down—now high—now low; so does the current from the strongly vital "B" Battery follow the modulations and the variations, so that the original message, in all its delicacy of tone and vibration, comes clear and distinct through your Radio set.

Not a mere adjunct to the pleasure-giving quality of your Radio set is the "B" Battery—instead, it is the vital, life-giving part—the very heart of your Radio set.

Do not slight this vital part—give your Radio set the advantage of the best—use Eveready "B" Batteries.

Note: This is No. 1 of a series of informative advertisements which will appear in this magazine. They are designed to help Radio users get the most out of their Batteries and Radio sets. If you have any battery problem, write to G. C. Furness, Manager Radio Division, National Carbon Co., Inc., Long Island City, N. Y.



The New Metal Case Eveready "B" Battery (No. 766)

"The Life of Your Radio"

The same popular 22½ volt Eveready "B" Battery in a new, handsome, durable, waterproof, metal container. Eveready quality throughout. At all dealers, \$3.00.

The "B" Battery is the vital part of any radio receiving set. Eveready Batteries—especially made for Radio—serve better, last longer and give better results.

Manufactured and guaranteed by

NATIONAL CARBON COMPANY, Inc. Long Island City, N. Y.

**EVEREADY**  
Radio Batteries  
—they last longer

# FANS DECIDE FATE OF KGB BY BALLOT

## VOTE TACOMA LEDGER'S PLANT MUST CARRY ON

Support of Listeners In Enables Station to Open on Scale Ten Times Greater Than Before

By A. M. Ottenheimer

TACOMA, WASH.—Radiophans throughout the Northwest are hailing the new 100-watt broadcasting station of the Tacoma Daily Ledger as a distinct triumph for listeners in and an example of what Radiophans can do when they work together.

The new Ledger station, with its old call letters, KGB, still retained, was opened recently with a gala program. Early in June the Ledger contemplated discontinuing broadcasting. Today, instead of quitting, it is operating a new station 10 times larger than its former outfit. Thereby hangs a tale.

Late in May, Ledger officials were on the verge of closing up KGB. There was no method to ascertain the extent of the audience reached by the plant and there was a great deal of doubt in the minds of the officials whether the number of listeners in was sufficiently large to warrant the expenditure of time and money that the constant operation of the station demanded.

### Leave KGB Fate to Listeners

Attempts through the usual requests for letters were made on a number of different occasions to make a check on the number of listeners. This was each time unsuccessful and the number of responses was discouragingly small. Finally matters came to a climax, it was decided that KGB's destinies should rest in the hands of its listeners.

In consequence, there appeared in an edition of The Ledger in June a notice informing the Radiophans as follows: "KGB contemplates discontinuance. If you desire the station to go on with its programs, fill out the blank below saying so, and sign your name and address. KGB's fate is in your hands."

The Radiophans were given a week in which to get their votes into The Ledger office. More than 500 votes were received immediately from fans in Tacoma and twenty-four communities in the state. Some of these votes represented organizations with twenty-five or thirty members. "Keep on broadcasting, KGB," was the universal plea.

So The Ledger decided not only to continue broadcasting, but to do it on a much larger scale. Consequently, the order for the larger set was placed. It was built entirely by Alvin Stenso, chief operator.

## Alaska Company to Install Terminal at Aberdeen, Wash.

ABERDEEN, WASH.—This city is contemplated as one of the possible sites for a large Alaska-Pacific Radio plant, according to Antone Anderson, Radio engineer of Seattle, who visited this city recently in the interests of the Alaska Communication Company. Several locations in this city and Hoquiam, nearby, are under consideration, according to Mr. Anderson. The terminal would be the only one of the company in the States, and the plant one of the largest on the Pacific Coast. Several stations would be established by the company throughout Alaska, he declared.

France has the largest, most efficient and most powerful Radio equipment in Europe.

## OPERATIC ARIA EASY FOR EIGHT-YEAR-OLD



Irma Brahn, the popular "Baby Prima Donna" who has made several very successful concert appearances at eastern broadcasting stations. Miss Brahn sings operatic arias as well as many grand opera stars in spite of the fact that she is only eight years of age

### Navy Station Moved

WASHINGTON.—The naval Radio station at Point Isabel, Tex., is being removed to Fort Brown, Brownsville, Tex., and combined with the army Radio station there. Navy personnel will operate the station, using high and medium power tube sets.

The Department of Agriculture has 41 stations throughout the United States for broadcasting weather, crop and market news.

## PARIS CAFES ANXIOUS TO INSTALL RECEIVERS

Demands for Installation of Sets Increase Monthly

PARIS.—Radio telephony is making marked progress in western France, where, through the efforts of dealers, the demand for installations is increasing every month. Evening concerts are given in Paris by two Radio companies, and the latest commercial, financial and sporting news is broadcast for interested fans. Cafes, hotels and country homes outside the city limits are said to be especially interested in securing receiving sets.

At Nantes, situated about 250 miles from Paris, most of the receiving stations are equipped with four to six tubes; one Radio high frequency, one detector and two audio frequency. Double wire antennae about 131 feet long and raised about twenty-three feet from the ground are popular.

Government taxes on transmitting stations run from 100 francs per year up, according to the power and operation; receiving stations pay a tax of 10 francs per annum.

### —Of special interest to Radio Dealers!

One of Chicago's oldest and largest exclusive radio stores sold more Mu-Rad Receiving Sets in 1922-23 than all other types of Receivers combined!

### Mu-Rad sells—and sells!

That fact has been repeatedly verified by our many other Mu-Rad dealers in the middle-west. Why not join them? Why not enjoy as they do the ASSURED PROFITS of good radio merchandise well advertised?

### Write for a Mu-Rad Franchise

To get complete details of our special Mu-Rad proposition will not obligate you. Write also for a copy of our handbook catalog of other profitable Radio merchandise. Write today before someone else in your neighborhood gets exclusive Mu-Rad privileges.

### Chicago Radio Apparatus Company

Jobbers of Good Radio Merchandise  
General Offices: 407 South Dearborn  
CHICAGO

## FRESHMAN

### Resistance Leaks

The largest and most complete line in the world

Our new construction of all types Variable Resistance Leaks produces a product which we can now guarantee indefinitely as being scientifically correct, mechanically perfect and built for unusual durability.



BASE MOUNTING TYPE VARIABLE RESISTANCE LEAKS

Freshman Leaks give an absolute unbroken range of 180 degrees from zero to 5 Megohms.  
With either .00025 or .0005  
Freshman Condenser ..... \$1.00  
Without Condenser ..... .75



PANEL MOUNTING TYPE VARIABLE RESISTANCE LEAKS

will bring in stations never heard before. Can be mounted on any panel in a few seconds. When mounted, only the knob shows on the panel. The latest and most essential part of an efficient tube set.  
With either .00025 or .0005  
Freshman Condenser ..... \$1.00  
Without Condenser ..... .75

### FRESHMAN FIX-O



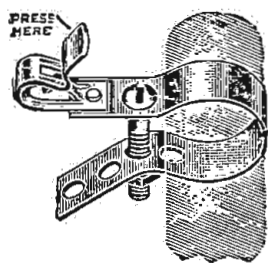
Fixed Resistance Leak Combination—4 in One

Freshman Condenser .00025 } Price Complete  
Leak Mounting } 65c  
Freshman Resistance Leak }  
Safe-T Handle

Separate Leak & Safe-T Handle.....30c  
Separate Condenser & Mounting.....40c  
At your dealers—otherwise send purchase price and you will be supplied postpaid.  
Also ask your dealer for our free diagrams of the Flewelling and Neutrodyne Circuits.

**Chas. Freshman Co. Inc.**  
Radio Condenser Products  
106 SEVENTH AVENUE NEW YORK

## Improved Ground Clamp



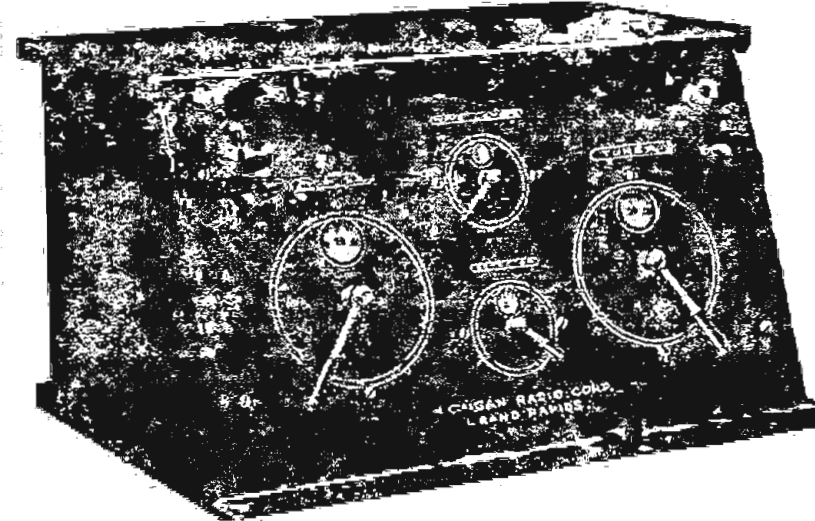
Equipped with Fahnestock Patent Wire Connectors  
Easily Attached

No Soldering. For Radio Use Only

At Your Dealers

### Fahnestock Electric Co.

Long Island City, N. Y.



## Make Pennies Do What Dollars Did Before

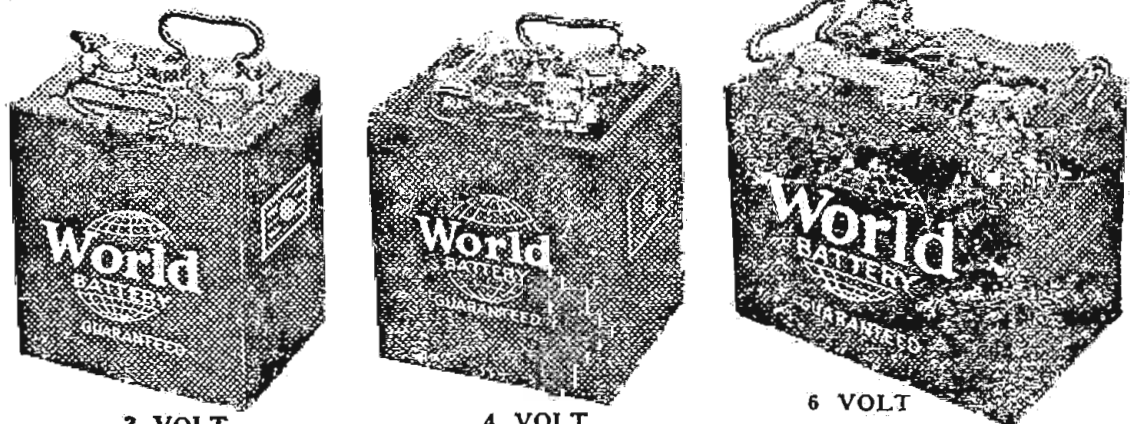
Never before in the history of Radio have pennies done so much. The Michigan "Midget" gives you everything that any set you could pay dollars for will give you—and yet the price is small.

- Long distance** The Michigan "Midget" gives it to you.
- Selectiveness** The "Midget" cuts out local stations and brings in out of town stations.
- Ease of Adjustment** Any ten-year-old boy or girl can operate a "Midget."
- Sharpness of Tuning** A slight movement of the controls brings in other stations.
- Portability** Weighing but 6 lbs. it is ideal for home use or for camping, touring and resort use. You can always take your "Midget" with you.
- Operations** It operates on all makes of 6-volt and equally as well with all dry-cell tubes. It can be used with one or more headphones or can be used with any one or two stage amplifier for loud speaker reception.
- Price** \$27.00, without tubes or accessories

And so we say we have made pennies do what dollars did before. Go to your dealer, ask him to show you a Michigan "Midget"—test it out for yourself. Also ask about the Michigan "Midget" Two Stage Amplifier and our exclusive line of Condensers, Variocouplers, Variometers, Rheostats, etc. When you send for circular, give us the name of your favorite radio dealer.

## MICHIGAN RADIO CORPORATION

GRAND RAPIDS, MICHIGAN



## World Storage Batteries Save You 50% And You Get a Written 2-Yr. Guarantee

We maintain the same high quality material and workmanship found on the most expensive batteries and still are able to allow our remarkably low sale price by greatly reducing our overhead and sale costs.

Special 2 Volt Storage Battery for WD-11 and WD-12 Tubes.....	\$5.00	6 Volt 60 Amp. \$ 8.50	6 Volt 100 Amp. \$12.50
Special 4 Volt Storage Battery for UV-199 Tubes.....	\$8.00	6 Volt 80 Amp. 10.00	6 Volt 120 Amp. 14.50
200 Hours' service on one charge. Rechargeable.			6 Volt 140 Amp. 16.50

SEND NO MONEY. We ship C. O. D., subject to inspection, or will allow 5% discount for cash with order. Shipment made same day order is received. Save 50% on your next battery and get better service and longer life. Our written guarantee is your proof of satisfaction. The Big Fall Radio Season is on now. To get the full benefit of it order your new WORLD battery today!

## WORLD BATTERY CO.

60 EAST ROOSEVELT ROAD, CHICAGO, ILLINOIS



# WBAP CLAIMS TO BE WEST-OF-'SIPPI KING

## RE-OPENS MUSICAL PROGRAMS FOR WINTER

Station's Power Increased Fifty Percent  
—Many Entertainment Treats Scheduled for Winter

FORT WORTH, TEX.—Station WBAP, The Star-Telegram broadcaster, has officially opened the 1923-24 musical concert season as the largest broadcasting station in the Southwest, and also it claims, west of the Mississippi River. The power of WBAP has been increased from 500 to 750 watts, and the change, which increases the power by fifty percent, required many exhaustive private tests during the past few weeks.

These all showed vastly increased range and power. The data on the tests was of such a successful nature that it was decided to institute the new 750-watt power two weeks ago when the fall season began. Musical programs have now been resumed for the winter with two high class concerts daily except Saturday and Sunday—the silent nights for the station.

### Plan Many Feature Programs

Among the features completed for the fall and winter is a monthly musical treat by the Fort Worth Harmony Club, whose programs last year did much to add to Fort Worth's prestige as a musical center.

The Texas Hotel Orchestra will present dance and concert music every Wednesday night all winter for the entertainment of Radioland, through arrangements made by the station with Fenton Baker, manager of the hotel.

Sam Losh, well known artist of this city, will handle a once-a-month program, featuring pupils and contemporary artists. Brooks Morris and Guy Pitner will collaborate on a monthly concert on the same basis, and E. Clyde Whitlock is another of the leading artists to be in charge of several programs during the winter.

## FANS DANCE TO WJAX SYNCOPATED FEATURES

### Ohioans' Letters Tell Satisfaction with Cleveland Plant

CLEVELAND.—A syncopation concert was featured by the Cleveland News in the Radio program broadcast recently from the Rainbow room of the Winto by Station WJAX of the Union Trust company.

The Vernon-Owen orchestra was the attraction. Songs by Miss Rose S. Seton and instrumental solos by Barney Schoen, Boyd Bunch, Dick Johnson and Jack Miles were featured. Especially pleasing to fans was a novelty saxophone solo by Mr. Johnson. The program was given in two parts with an hour and a half intermission. Hundreds of Radiophans in various parts of the city and out of town danced to the tunes played by it in the latter half of the program. The concerts of the Cleveland News from WJAX are popular over the entire state.

## Radio Fog Signals Now Sent by Nantucket Shoals Light

WASHINGTON.—A new light ship equipped with a Radio fog signal was recently put into service on Nantucket Shoals, Secretary of Commerce Hoover has announced. The new vessel will have the first Radio fog signal, an automatic apparatus sending during fog a group of four dashes every thirty seconds, enabling vessels with Radio direction finders of compasses to obtain an accurate bearing from a distance of thirty miles or more in any weather, and to steer for and "make" the light ship.

The light vessel will also have two other fog signals, a powerful steam whistle, and a submarine bell; a little later a submarine oscillator will be substituted for the bell. The electric signal light of 3,000 candlepower will show at the masthead. There is Radio equipment for communication, with an operator in attendance, reporting vessels in distress, as well as for the maintenance of the light vessel itself.

## TAKES WORK TO KEEP BEAUTIFUL



Miss Marian Ford, Boston girl who won contest for the most beautiful limbs, keeps fit by limbering up to Radio tunes. She exercises religiously for forty minutes every day © K. & H.

## Tommy Gibbons Gives Inside Story of Fight

### He Is Second Title Contender to Speak from KGB

TACOMA, WASH.—Tommy Gibbons, world's heavyweight boxing championship contender, was a recent attraction at KGB, The Tacoma Daily Ledger broadcasting station here. Mr. Gibbons and his manager, Eddie Kane, gave the Radiophans some inside information on Gibbons' bout with Champion Jack Dempsey at Shelby, Mont., July 4.

This makes the second world's heavyweight contender to speak at The Ledger station. Jess Willard spoke at KGB some months ago.

Among the other celebrities appearing at The Ledger station recently were Guy Bates Post, world-famous actor; Wesley Barry, juvenile film celebrity; Fritz Leibner, Shakespearean actor of note, and Nan Halperin, noted musical comedy star.

## Greenwich Village History Retold in Radio Lecture

NEW YORK.—Radio folk recently heard Mrs. Katherine Parker Clivette, president of The Greenwich Village Historical Society broadcast from WDT here, a tale about the rise and fall of Richmond Hill Mansion, the truth about Aaron Burr, and about the olden days when Richmond Hill Mansion was the scene of diplomatic circles, society revels and intrigue. Mrs. Clivette's concise descriptions added to the interest of the story much of the charm which histories omit.



## YELLOW TIP MICROMETER ADJUSTING CRYSTAL DETECTOR

Any adjustment made in a moment—fixed instantly! Hold indefinitely, until you wish to change, then—"A Twist of the Wrist—It's Set." Ideal for \$2 reflex and other circuits.

Write for folder, and name of your nearest dealer

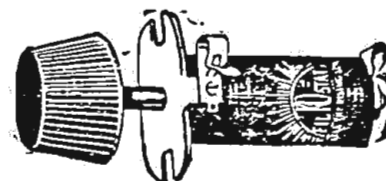
Wholesale Radio Equipment Co. Exclusive Factory Representatives 35 William Street, Newark, N. J. Dealers and Jobbers—Write for Attractive Proposition

## U. S. RADIO POLICY CONFEREES CHOSEN

### Will Meet Soon on International Communication Problem

WASHINGTON.—The United States committee of electrical and Radio experts representing eight governmental departments having to do with Radio and other electrical communications has just been announced by the State Department. This committee, headed by under Secretary Phillips of the State Department, will meet at an early date to consider the plans and policies of this Government on matters pertaining to international electrical communications.

The agenda prepared by the committee will become the basis for the United States' report to the Fourth International Electrical Communication Conference when it is held in Paris. It is probable that the American delegates to the International Conference will be selected from the personnel of the committee, but no date for the general conference has been set because of European troubles.



## MISSING WHAT YOU GET

YOUR set is probably bringing in DX stations you never hear because your rheostat cannot control your filament action. The Fil-Ko-Stat gives infinite adjustment and enables you to magnify the weak stations and bring them in strong and clear.

Full resistance 30 Ohms, adjusted to ALL TUBES. "Avoid the use of inferior powdered carbon rheostats."

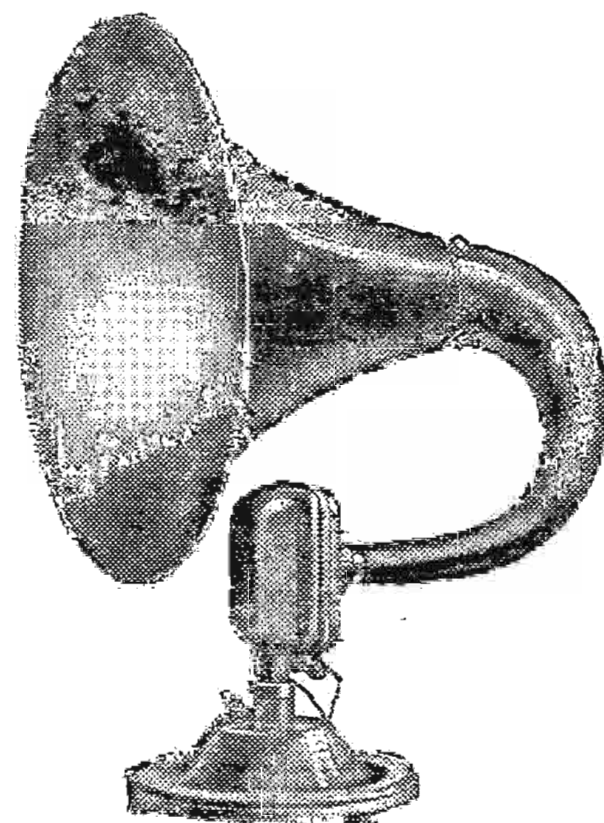
At All Dealers in High Grade RADIO SUPPLIES \$2

## FIL-KO-STAT

Made and Guaranteed by Dr Instrument Co., Harrisburg, Pa. Sole International Distributors. Radio Stores Corp., 218 W. 34, N. Y. City

## THE AUDIOPHONE

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



## Bristol's Single Stage Power Amplifier



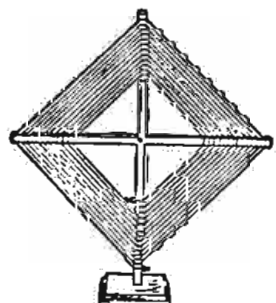
gives additional VOLUME with any two stage amplifier. No separate batteries required. It provides the additional volume necessary to bring in very distant stations on the loud speaker.

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

## THE BRISTOL COMPANY

WATERBURY, CONN.

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



## Loop Antenna

The loop is coming more into favor each day, because it makes a set more portable and does away with the outdoor aerial.

It is shipped knocked down but complete—all binding posts, wire, etc. Postpaid in U. S. A. \$1.25

ROBBINS WOODWORKING CO. Dept. C LIBERTYVILLE, ILL.

**NEW MILOPLEX CIRCUIT**

(Continued from page 1)

two, anyone can build it in a few moments' time, and most important of all—it works! How it works is still open to conjecture. But that doesn't lessen its efficiency. The mysterious inventor vouches that it reflexes and "soups" in a most peculiar manner, but believes its secret lies in its accomplishment of a perfect equalizing of the three capacities present in every vacuum tube. At any rate, as the inventor says, the Miloplex smashes the tube with its volume.

The first of a series of several articles, prepared by the designer of the set, is given in this issue. The remaining articles will be given in succeeding issues. The first article follows:

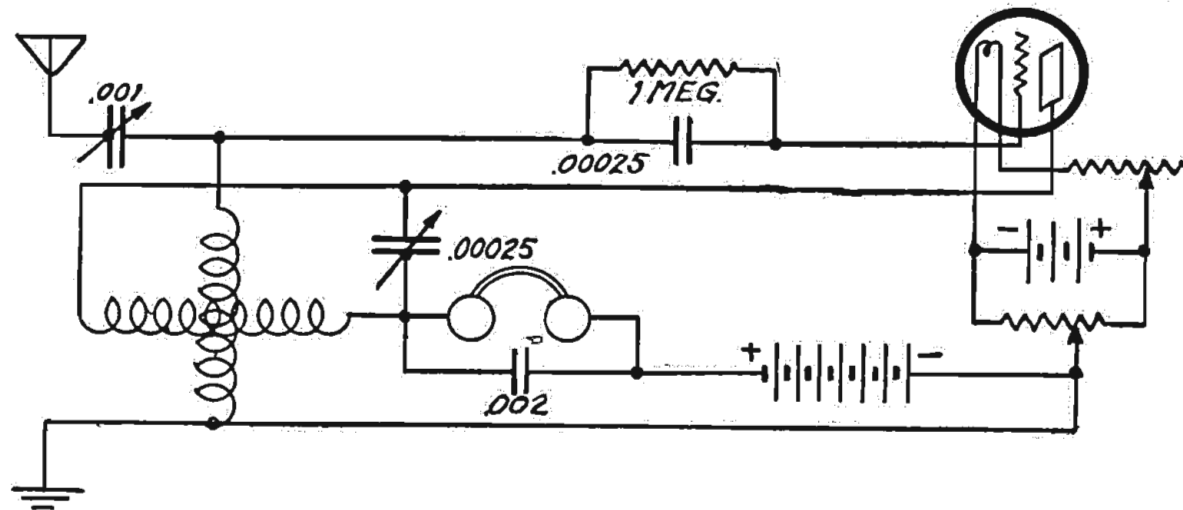
ONCE upon a time—as all good stories begin—a Radio bug didn't know any better than to try to make one of the oldest and most simple "single tuber" circuits do a few new tricks.

Thirty-one minutes was the slow record in hooking it up; thirty-one days have passed and he is still trying to find why it "soups" reflexes with a volume that almost makes a three tube job sit up to take nourishment.

It works; that's a feature, and best of all anyone can build it with the writer's guarantee that it will start "perking" and not quit when company comes. It is passed on to you (not with the usual editor's note and the discoverer's autobiography) but for experiment and advice because somewhere, somehow, some fellow is going to discover, and tell me, why it decides to smash the tube with volume.

I confess only that way back in my younger days there was a theory that if one could but equalize, not the total tube capacity, but rather the three counter capacities indicated by plate, filament and grid—look out—something big would happen. And it did; if you don't believe it, build it yourself and be prepared to fall in love with it. Is it selective? Well, Los Angeles doesn't bother me nearly as often as it does some single jobs that "go west" every night. But it so happened that I found one easy landlord in Chicago; hence my address is just six blocks from WJAZ, four miles from WDAP, and just to keep me busy, two miles from WPAD.

**DIAGRAM FOR WIZARD MILOPLEX**



**Here's an Invitation**

Come over any night I am busy and watch me tune out that fellow six blocks away; in fact the only station I cannot tune out is the fellow next door but I'm going to buy him another record; then he will have two but they won't bother me, 'cause he'll have to shut down when his kids go to bed.

But let's get serious. Don't just glance at the circuit and say "old stuff," perhaps if you look twice you will discover something; also if you know how to separate circuits, you may find something else. Its most desirable feature is that it has no "dead end" losses in the tuning element.

Of course you know just why "dead

end" losses are bad pills in Radio. Then listen—when you tap a coil and put on switch points, between every two points and the leads running to them is a condenser or capacity effect (bad business) but the worst of it is those windings which are dead or not in circuit from the last tap you are using, on to the end, have a very impolite habit of oscillating at frequencies other than those you desire and thus cut down your signal voltage. And that's that, as Jack Nelson at WDAP says. So I saved 27 cents for switches and points and gave her more steam.

**What Is a Good One?**

The variable condensers, particularly the one in the slate circuit, should be class AAA. My definition of a good one is that

it should cost three or four dollars. Those funny pigtails in the drawing are supposed to be the picture of a split variometer; but don't split it as the fellow did with an axe and then wonder which half went where. (Radio is maddening, isn't it?) But here's a secret—you must use a split variometer; procure one that has a lot of wire on it, the more the better; the one I use has 62 turns on the stator and the same number on the rotor, size 22. Remember that. And now that you have missed supper you may as well read on, for here comes the "big idea," the inside story, the main reason why, it super-reflexes and what not. Be very certain to run your minus B battery lead direct to ground, not on to minus or plus A as is usually done; then (now be careful) tap the minus B to ground lead, running this tap to the center contact on your potentiometer. That's all except that, of course, you know you should try different

(Continued on page 20)

**"RED-HEADS"**

Better Radio 'Phones

HERE'S what we say about "Red-Heads"—they're EXTRA-ORDINARY radio receivers. We believe they're the best receivers on the market today. Superlatives are easy to say and hard to back up. Here's how we back ours. We GUARANTEE that you'll like "Red-Heads." You take no risk in buying them. We'll refund your money plus postage if you don't agree with us after trial.

"Red-Heads" are the lowest priced, high-grade, aluminum-backed receivers on the market. Nine years of receiver experience are behind their quality.

**MODEL "F" \$6.50**  
Complete 3000-Ohm set with cord and head band; aluminum back; brown-red ear caps; small, light-weight; exquisitely sensitive and fine-tuned.

**"RED-HEAD" Jr. \$5.00**  
Complete 2000-Ohm set of new design; a remarkable production with the same workmanship and guarantee as on our standard Model "F".

Since 1915 Pioneers in Radio—year after year striving to achieve one purpose—better and better radio receivers.

**THE GUARANTEE**  
Money back after 7 days' trial you're not satisfied that "Red-Heads" are the BEST receivers on the market at the price.

The NEWMAN-STERN Co.  
Dept. RD, E. 12th St., Cleveland, O.

**The BULL DOG Aerial Mast Seat**  
Fills a Long Felt Want



By enabling any one to install a firm and rigid aerial mast on either a peaked or metal ridge roll type of roof, with the ordinary tools found around the home, thereby eliminating the customary trouble, labor and expense and supplying neat, substantial construction throughout the entire aerial.

Made in two types: Hinged sides with holder for "lead in" support. Also plain peaked, without hinged sides and "lead in" support.

Seat for 1 1/2" mast, hinged type.....\$3.00  
Seat for 1 1/2" mast, peaked type, plain..... 2.50  
Seat for 1" mast, peaked type, plain..... 2.00  
Seat for 1 1/2" mast, flat base type..... 2.50

If your dealer cannot supply you, clip coupon and mail with your remittance.

Jobbers and distributors write for discounts

MAST SEAT MFG. CO., 119 5th Street S. E., Minneapolis, Minn.  
Gentlemen:—Enclosed is \$..... Send me Mast Seats to cover remittance.

Kind .....

Name .....

Address .....

City .....

Check, Money Order or Bank Draft.

**FORMICA**  
A Laminated Phenolic Condensation Product  
SHEETS TUBES RODS

**RADIO PANELS**  
POLISHED BLACK FINISH

CUT PERFECTLY SQUARE TO ANY SIZE

1/32" THICK	1/2¢ PER SQ. INCH
1/16" THICK	3/4¢ PER SQ. INCH
3/32" THICK	1¢ PER SQ. INCH
1/8" THICK	1 1/2¢ PER SQ. INCH
3/16" THICK	2¢ PER SQ. INCH
1/4" THICK	2 1/2¢ PER SQ. INCH
3/8" THICK	4¢ PER SQ. INCH
1/2" THICK	5 1/4¢ PER SQ. INCH

SEND FOR COMPLETE PRICE LIST PROMPT ATTENTION TO MAIL ORDERS DEALERS PRICES ON APPLICATION

STARRETT MFG. CO.  
519 SOUTH GREEN ST. CHICAGO

**WATCH FOR OUR ANNOUNCEMENT.**

To those Radiophans who appreciate high-grade, standardized Radio apparatus we will offer parts designed by our Radio Engineer.



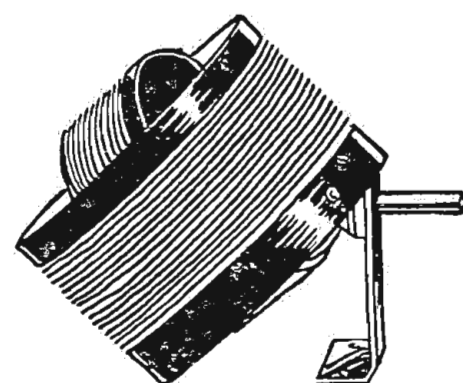
(Inventor of the Flivver Circuit)

**BUELL MANUFACTURING COMPANY**

Cottage Grove at 30th Street  
CHICAGO

**WATCH FOR OUR ANNOUNCEMENT**

**QUALITY RADIO PRODUCTS**



VARIOMETER

**Specifications:**

Range, up to 600 meters; Green silk wire; Sharp tuning, 180°; Very close coupling; Metal sleeve taps; Aluminum brackets; Bronze extension washer, Fibroid tubes (moist proof); 1/4 in. nickled shaft.

**\$1.50**

EACH

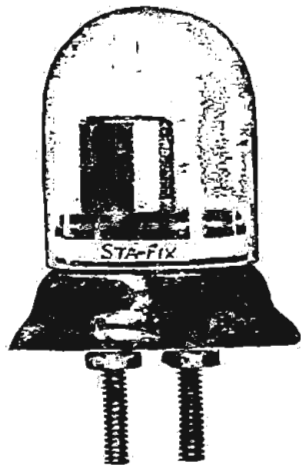


VARIOCOUPLER

**STA-FIXED CRYSTAL DETECTOR**

Over 10,000 ordered by local dealers before one delivery is your guarantee that Sta-Fix Detector is the find of the season.

**Price, \$1.00**



Guaranteed 600 Meter Four Circuit

**COCKADAY**

Mounted Tuning Coil

**\$2.50**

Special Seventeen Plate

**COCKADAY**

Vernier Variable Condensers

**\$3.75**

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ULTRA AUDION

**RADIO-DEMON**

TUNING COILS

**\$1.50**

Dealers—Write for Samples and Your Discounts

**ELECTRIC SERVICE ENGINEERING CO.**

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**BLUE PRINTS**

How to Make a **Reinartz** Receiver

Blue Prints for the construction of a Reinartz Receiving Unit and two step amplifier.

Description of apparatus and details of tuning.

WINDING A REINARTZ COIL

Send only money orders—no checks or stamps. Coins at your own risk.

**Flewelling** Receiver

Blue Prints for the construction of a Flewelling Receiving Unit and two step amplifier.

ALL DETAILS FOR ASSEMBLY

Description of apparatus and accessories and details of tuning.

Send only Money orders—no checks or stamps. Coins at your own risk.

**Radio Digest**

Publications  
123 W. Madison St., Chicago, Ill.

**Only 50¢ Each**

# Simple Explanation of Radio for Everybody

## Chapter I—Atmosphere and "Ether"

By M. W. Thompson

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

- Chapter II—Electrical and Radio Terms.
- Chapter III—Rectification and Receiver Essentials.
- Chapter IV—Inductances—Fixed and Variable.
- Chapter V—Condensers—Fixed and Variable.
- Chapter VI—Vacuum Tubes.
- Chapter VII—Antennas and Grounds.
- Chapter VIII—Regeneration.
- Chapter IX—Audio Frequency Amplification.
- Chapter X—Loud Speakers.

**T**HE history of Radio communication will not be taken up in this series of articles as the owner of a set, or the Radio experimenter, is interested primarily in what we know of Radio now and not in how this knowledge was evolved through the years, nor by whom it was brought to light.

### The Atmosphere

Radio communication and entertainment is carried from place to place by the atmosphere. That we know, but on the subject of just how the atmosphere is utilized many of our leading scientists, such as Steinmetz, Sir Oliver Lodge, Fleming and Elihu Thomson, are disagreed. However, the generally accepted theory at present, and one which seems correct on our present knowledge of the atmosphere and electricity, is as follows:

The atmosphere is composed of atoms of oxygen, nitrogen, helium and other

which we are familiar, such as oxygen, nitrogen, etc., are removed. Yet, if an object is placed behind the bottle we can see the object through the glass and the "nothing" within. Obviously, something carries the light rays through the bottle to the eye. As we know that light rays are wave motion, it follows that a medium which for want of a better name we call "the ether" must exist.

### Radio's Use of the "Ether"

To transmit Radio signals, either in the

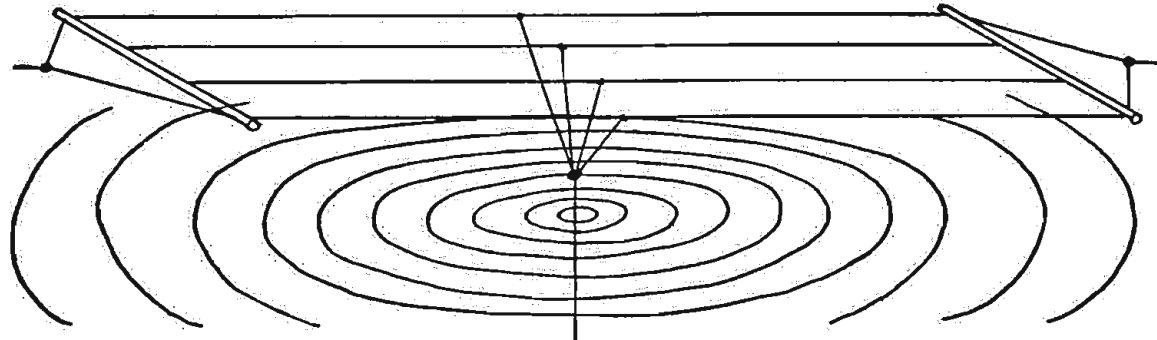


Figure 1b—Electromagnetic components of the Radio waves

form of dots and dashes or as Radio telephony (broadcasting), it is necessary, therefore, to first create waves in varying groups and of varying, predetermined strength, frequency and length, and second to intercept them with apparatus for changing them to sound or light waves.

It is the practice, at present, in creating Radio waves, to use two electrically conductive surfaces separated by a distance of from ten to several hundred feet and to create between them an electrical pressure which changes its direction (first toward one surface, then toward the other) hundreds of thousands of times per second. To explain the term "electrical pressure,"

structure composed of one or more wires, insulated from the earth and suspended many feet above it.

These electrical pressure waves are, however, only part of a Radio wave. From any wire in which electrical current is flowing, we know that waves of a different character are thrown off, as shown in Figure 1b. These are, for various reasons, termed "electromagnetic" waves and the distance they travel before dying out varies with the quantity of current flowing

solid objects such as wood, stone and cement because Radio waves travel through these materials.

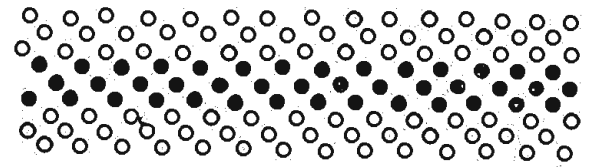


Figure 2a—Ether particles in normal position undisturbed

One peculiar feature of the ether is the difference in behavior of the various waves traveling through it. Light waves which are but tiny fractions of an inch in length cannot be conducted by it through such objects as wood and stone, nor can they turn corners and affect the eye of a person between whom and the source of light there is a solid material such as a piece of wood. Yet radio waves, whose lengths vary from ten yards to several miles, not only can pass through these objects but seemingly, also, around on either side of an object and form again.

Steel and iron, for reasons which we will discuss later, seem to have the property of absorbing or nullifying the wave motion in ether. If a Radio wave consisted only of the "electrical pressure" component this would probably not be true. It seems logical to suppose that it is the "electromagnetic" component which is nullified because iron is an electrical conductor and has magnetic properties.

Broadcasting has been received, it is true, when both aerial and receiver were

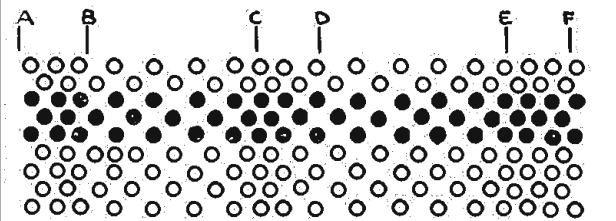


Figure 2b—The "pressure" method of wave travel through the ether

within a bank vault made entirely of steel, but the signals were much weaker

(Continued on page 20)

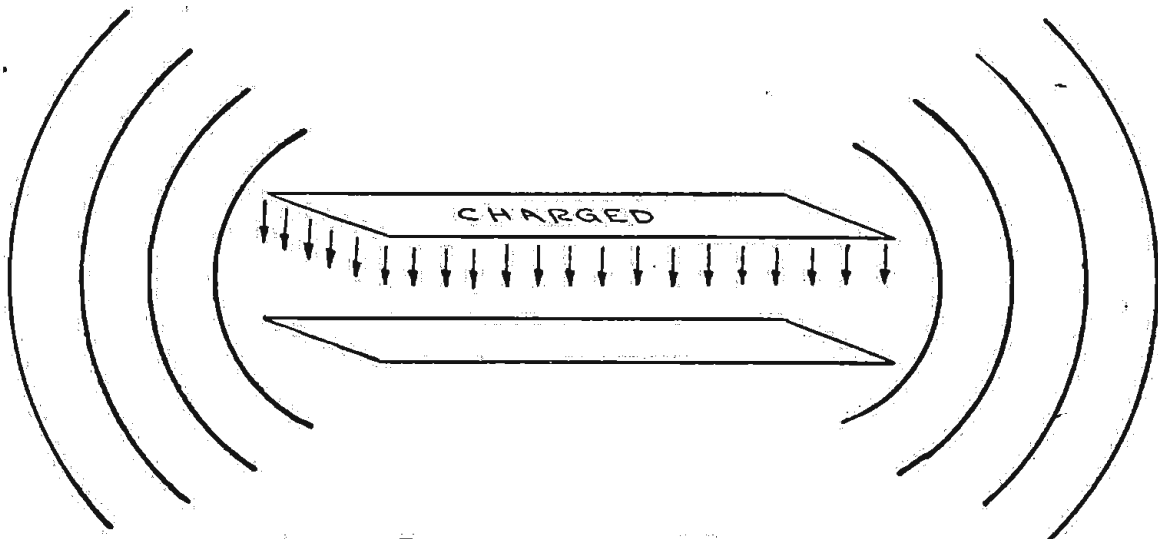


Figure 1a—Pressure components of the Radio waves

known gases suspended in what most of us would call "nothing" or vacuum. This "nothing" is known to Radio engineers as the ether. To this ether can be given a wave motion similar to that which occurs in water and other fluids.

### Proof of "Ether's" Existence

That some such great invisible, unmeasurable medium does exist is proven by the following physics experiment familiar to all high school students. A large glass bottle is connected to a mercury pump and evacuated, that is, all the elements with

let us imagine a very large, shallow pan of water and resting on the water's surface a flat piece of wood. If we press the wood, waves or ripples go out in all directions. Just so with the atmosphere; if one surface is charged with electricity which tends to reach the other surface and presses on the intervening atmosphere in its efforts to do so, waves are created which go out in all directions. See Figure 1a.

As Radio communication is carried on just now, we use the ground for one surface and provide another by erecting a

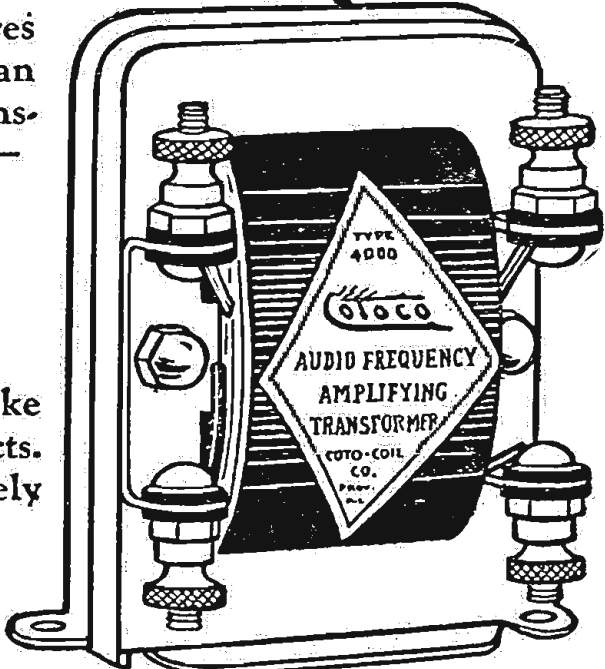
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—the essential features necessary to make an audio frequency transformer a good one—

1. High Amplification.
2. Minimum Distortion.
3. Low Interstage Linkage.
4. Convenient Mounting.
5. Compactness.

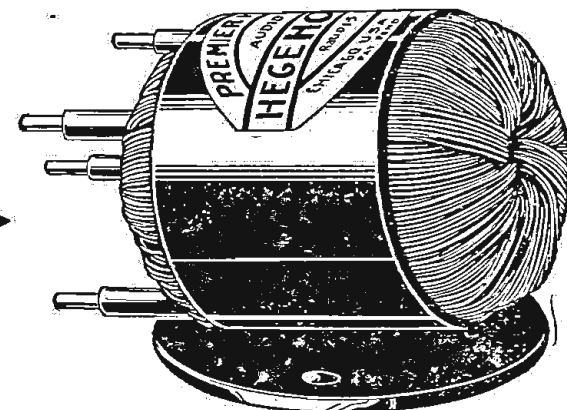
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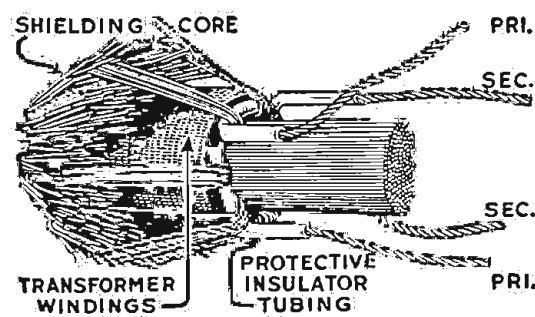
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## PREMIER 'HEGEHOG'

(TRADE MARK)

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This little wonder is the surprise and talk of Radio Engineers everywhere. Fix in your mind's eye an AUDIO Transformer about the size of an English Walnut and you have the "HEGEHOG," for size. Then recall the best radio amplification you ever heard and you have the "HEGEHOG" for volume and tone quality. Our new patented design and construction (100% shielded) makes this possible. It's a real bit of engineering, and is the most efficient, compact AUDIO Transformer yet designed. Try them in your next "Hook-up"—you'll be pleased and (we guarantee) satisfied.



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This cut shows the "HEGEHOG" in the process of assembly. The compactness of design is apparent as is the self shielding feature. Windings are high wound (No. 44 copper wire on both primary and secondary), vacuum process impregnated against moisture, etc. The core is of fine gauge, pure Norway iron wire which, with our construction, prevents eddy currents and hysteresis, consequently eliminating distortion, and increasing the reproduction volume.

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CHICAGO, U. S. A.

MANY BRILLIANT FEATURES MARK C

The Week's Headliners on the Air

SCANNING the offerings of the week, one can hardly complain for lack of choice. Let us see. On Tuesday night WOAW has an excellent classic program. How about Wednesday? Well there's a good classic program on at KDKA, an orchestra concert at KSD, a Cuban Navy band concert at PWX, and a special birthday party and jazz song riot at WDT. Then for the children, WLW is giving a child play. Aspiring writers would do well to listen into WBZ Thursday, when Dr. J. Berg Esenwein tells, "What Is a Plot?" And on the same evening William Johnson at WJZ gives another installment of his detective serial story, "The Waddington Cipher." Friday looms up with two radio dramas; at WDAR and WGY. WMAQ will devote Friday night to a special Indian program, while WOAW will give two hours of good dance music. WJZ's Peruvian Night on Saturday ought not be boring. Sunday let's tune in WDAP and hear the Drake Concert Ensemble, and Monday—let's see—ah, Monte Cross will give us some real baseball dope via WIP.



"Herbie" Mintz, left, popular pianist who will be heard at Station KYW, Chicago, Tuesday, Thursday and Friday this week



Some of the Players, 1922-23 Schenec General, her 25, "T

Tuesday, September 25

CFCA, Toronto, Ont. (Eastern, Daylight Saving, 400), 8:00-9:00 P. M., Musical program, "A Ball Scene," "Passepied," "Minuet," "Molly on the Shore," Star Concert Orchestra; "Cradle Song," "O, Dr. Throat, Tears," "I Hear a Thrush at Eve," Ina Lockart, contralto; Cello Solo, selected.

WJZ, New York, N. Y. (Eastern, Daylight Saving, 455), 4:05 P. M., Recital, Maddalena Houff, soprano; 6:05, "The Little Lame Prince," bedtime story; 7:35, Address, Dr. Leland E. Coker; 7:45, "Causes of Business Failures," Herbert F. De Bower; 8:00, Address, James W. Gerard, former U. S. ambassador to Germany; 8:15-10:00, Musical; Annette Royak, soprano; Felix del Sarto, violinist; Joseph Zellman, baritone; Dance program, Hotel Astor Dance Orchestra; 11:00, Dance music, Hotel Astor Dance Orchestra.

WDAP, Chicago, Ill. (Central, Daylight Saving, 360), 7:00 P. M., Drake Concert Ensemble; Henry Selinger, director; Blackstone String Quintette; Irving Margrath, director; 10:00, Salvation Army Staff Band; Jack Chapman and his Dance Orchestra.

DO YOU LIKE DANCE MUSIC? FOR LOVERS OF syncopation, the following list of broadcasting stations whose programs include dance music on the nights named, will be an invaluable aid: Tuesday, September 25: Stations KGW, KYW, WDAP, WFAA, WFI, WIP, WJAX, WJAZ, WJZ and WMAQ.

WDAR, Philadelphia, Pa. (Eastern, Daylight Saving, 395), 12:00-12:54 P. M., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Concert, Arcadia Cafe Concert Orchestra; Soprano solos; 4:30-5:55, Song recital; 7:30, Bedtime stories, Uncle Wip; Drama review, Walter Greenough.

WMAQ, Chicago, Ill. (Central, Daylight Saving, 447), 4:30 P. M., Program, Glenn Dillard Gunn School of Music; 7:00-8:00, Talk on foreign relations, Edward Price Bell; Irish ballads, Simon H. Rhoades, colored tenor; 9:00, La Salle Hotel Orchestra; 9:15, Musical program, Jennie F. W. Johnson.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 P. M., "Removing the Handicap," J. O. Mahoney, principal of the Dallas night schools.

WGR, Buffalo, N. Y. (Eastern, Daylight Saving, 360), 12:00-12:30 P. M., George Albert Bouchard, organist; 6:30-7:00, George Albert Bouchard, organist; 7:00, Digest of the day's news; 8:45, Address, Sidney Coleman, secretary of the Buffalo Safety Council, on "Fire Prevention"; 9:00, Concert, South Side Choral Club.

Wednesday, September 26

CFCA, Toronto, Ont. (Eastern, Daylight Saving, 400), 8:00-9:00 P. M., Musical program, Overture, "Zampa," "Forget-Me-Not," "A Day in Venice," "A Perfect Day," "Le Fere de La Victoire," Star Concert Orchestra; Nocturne in E Flat, "The Meistersingers," Harry Adaskin, violinist; "Selected," Alex Elder, baritone.

WJZ, New York, N. Y. (Eastern, Daylight Saving, 455), 3:00 P. M., Concert, Hotel Astor Organ, Harry Riggs, organist; 6:05, "The Adventures of Peter," Florence Smith Vincent; Address, E. J. Mehner; 8:30-10:15, Recital, Benjamin Linstangert, violinist; Ernesto Barman, pianist; Walter Mills, baritone.

WFI, Philadelphia, Pa. (Eastern, Daylight Saving, 395), 1:00 P. M., Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Musical program and short talks; 6:30, Dinner music, Meyer Davis Bellevue Stratford Orchestra; 7:00, Children's bedtimes stories.

WJAX, Jacksonville, Fla. (Eastern, Daylight Saving, 395), 12:30-1:15 P. M., Concert program; 2:30-3:30, Matinee Musicale; 6:45-7:30, Children's program, "Uncle John"; 8:00-10:00, Do Luxe program, Hancock Trio; G. Allen Hancock, cellist; Albert Angermayer, violinist; Mrs. Albert Angermayer, pianist; Rev. Thomas Lutman, lecturer.

Thursday, September 27

WJAX, Jacksonville, Fla. (Eastern, Daylight Saving, 395), 12:30-1:15 P. M., Concert program; 2:30-3:30, Matinee Musicale; 6:45-7:30, Children's program; 8:00-10:00, Do Luxe program, Lucille Holman mezzo-soprano; Virginia Hubbard, violinist; Edna B. Hanna, pianist.

WJZ, New York, N. Y. (Eastern, Daylight Saving, 455), 3:00 P. M., Concert, Hotel Astor Organ, Harry Riggs, organist; 6:05, "The Adventures of Peter," Florence Smith Vincent; Address, E. J. Mehner; 8:30-10:15, Recital, Benjamin Linstangert, violinist; Ernesto Barman, pianist; Walter Mills, baritone.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 P. M., "The Community Chest," T. P. Junkin, lecturer; 8:30-9:30, Recital, Choral Club.

WJZ, New York, N. Y. (Eastern, Daylight Saving, 455), 3:00 P. M., Concert, Hotel Astor Organ, Harry Riggs, organist; 6:05, "The Adventures of Peter," Florence Smith Vincent; Address, E. J. Mehner; 8:30-10:15, Recital, Benjamin Linstangert, violinist; Ernesto Barman, pianist; Walter Mills, baritone.



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**KDKA, E. Pittsburgh, Pa.** (Eastern, 326), 9:00 A. M. Music; 11:30, Victorola and Victor records, S. Ham ton Company; Piano and player rolls, C. C. Mel Company; 5:15 P. M., Dinner concert, Grand Symp ony Orchestra; 6:45, Children's period, Dreamti Lady; 7:05, "Need for Trained Men," John T. Mc ris, director College of Industries, Carnegie Instit of Technology; 7:20, Concert, Pittsburgh Musical I stitute.

**KGW, Portland, Ore.** (Pacific, 492), 3:30 P. M., Ta Jeannette P. Cramer, home economics editor of T Oregonian; 10:00, Dance music, George Olsen and I Orchestra.

**KHJ, Los Angeles, Calif.** (Pacific, 395), 12:30-1:15 P. M., Concert features; 2:30-3:30, Matinee Musical; 6:45-7:30, Children's Hour, "Uncle John"; 8:00-10: De Luxe Program, Flournoy's Californians.

**KSD, St. Louis, Mo.** (Central, 546), 8:00 P. M., P gram to be announced.

**KYW, Chicago, Ill.** (Central, 345), 1:35 P. M., Stud program; 4:00, News; 5:50, Children's bedtime stor; 7:00-7:58, Herbie Mintz, pianist; Sallie Menkes, a companist; A. W. "Sen" Kaney, specialty ar Schlewsig Helsteiner Saengerbund (Male Voices); M Hotton, director; "Concerte," "Andante," "Will the Wisp," "Fen Follett," Mary McAuliffe, pianis Isham Jones and his Dance Orchestra; 8:01, Prograi American Farm Bureau Federation.

**WBZ, Springfield, Mass.** (Eastern, 337), 6:30 P. M Bedtime story for children; 7:00, Concert, Mrs. Flo ence W. Rosenberg, pianist; Pauline Ewig, contralt Mrs. Van Buren, accompanist; 8:00, Bedtime sto for Grown-ups, Orison S. Marden; Speeches at music, National Convention of the Exchanges Club.

**WDAP, Chicago, Ill.** (Central, Daylight Saving, 360) 7:00 P. M., Drake Concert Ensemble; Henry Selinger director; Blackstone String Quintette; Irving Ma grath, director; 10:00, Frederick W. Agard, teno Bob Cougle, pianist; Jack Chapman and his Dan Orchestra.

**WDAR, Philadelphia, Pa.** (Eastern, Daylight Savin 395), 12:00-12:54 P. M., Organ recital, Stanley The ter; Dinner music, Arcadia Cafe Concert Orchestr 2:00-3:00, Concert, Arcadia Cafe Orchestra; Soprar solos; 4:30-5:55, Song recital; 7:30, Bedtime storie Uncle Wip; Drama review, Walter Greenough.

**WFI, Philadelphia, Pa.** (Eastern, Daylight Saving, 395) 12:00 M., "Blue Hoosier Blues," "Hi-Lee-Hi-Low," "No, No, Nora," Bob Miller, tenor; Herbert Steine pianist; 12:15 P. M., "Carolina Mammy," "Swingin Down the Lane," "Steve, Rose, and Ben," Lew Pianni, soloist; Herbert Steiner, pianist; "Wondel ful One," "Cry Myself to Sleep," Jimmy Flin soloist; 12:45, "Saw-Mill River Rose," Boh Mil soloist.

**WFAA, Dallas, Texas** (Central, 476), 12:30-1:00 P. M DeWitt McMurray, lecturer; 8:30-9:30, Sanger Brot hers, choral club; 11:00-12:00, Footwarmers' Orchestr

**WFI, Philadelphia, Pa.** (Eastern, Daylight Saving, 395) 1:00 P. M., Dinner music, Meyer Davis Bellevu Stratford Orchestra; 3:00 P. M., Song recital; 6:30 Dinner music, Meyer Davis Bellevue Stratford Dan Orchestra; 7:00-7:30, Children's Own Half Hou Stories by Cousin Sue; 8:00, Boy Scout Radio Corps; 9:00, Song recital; 10:30, Dance music, Meyer Davi Bellevue Stratford Orchestra.

**WGR, Buffalo, N. Y.** (Eastern, Daylight Saving, 360) 12:00-12:30 P. M., George Albert Bouchard, organist 3:30, Recital, Dorothy Lockwood, pianist; 6:30-7:00 George Albert Bouchard, organist; 7:00, Digest o the day's news; Topics of scientific interest.

**WGY, Schenectady, N. Y.** (Eastern, 380), 2:00 P. M Music and address, Mrs. Chester Moore; 7:45, Mus ical program; Selections, The Lawrence Trio, Williar T. Lawrence, violinist; Willard D. Lawrence, cellist Eleanor Padley, pianist; Mrs. William T. Lawrence soprano; Eleanor Padley, accompanist; Address, Dr. Louis C. Cornish.

**WHAS, Louisville, Ky.** (Central, 400), 4:00-5:00 P. M., Concert, Mary Anderson Theater Orchestra; Ollie Jones, conductor; "Just Among Home Folks"; Selections, Alamo Theater Organ; 7:30-9:00, Concert, Henry M. Schilling and His Orchestra; Fred Wells, tenor; Reading, "An Interesting Historical Episode."

**WIP, Philadelphia, Pa.** (Eastern, Daylight Saving, 395) 3:00 P. M., Artist recital; 6:02, Dinner music, Dick Regain's WIP Little Symphony Orchestra; 7:00-7:30, Bedtime stories, Uncle Wip; 8:00, Short talks; 8:15, Song recital; 9:00, Musical program; Dance music, Charlie Kerr's Cafe L'Airlog Orchestra.

**WJAX, Cleveland, Ohio** (Eastern, 390), 7:30 P. M., Concert program, the Cleveland News-Leader; 7:30-8:00, Song recital for children, Carabelle Johnson; Bedtime story; 8:00-10:00, Thow's Synopators; 10- piece jazz orchestra in popular dance music; Vocal selections, Soprano Trio, Miss Helen Cannon, Miss Ross Seton, Miss Dorothy Mastel.

**WJAZ, Chicago, Ill.** (Central, Daylight Saving, 448), 10:30 P. M., Organ recital, Columbia All-Artist Orchestra, Harry Linden, director; 10:00, Dance music, George Olsen and bis orchestra.

**KGW, Portland, Ore.** (Pacific, 492), 3:30 P. M., Chil dren's program; 8:00, Concert, Columbia All-Artist Orchestra, Harry Linden, director; 10:00, Dance music, George Olsen and bis orchestra.

**KHJ, Los Angeles, Calif.** (Pacific, 395), 12:30-1:15 P. M., Concert; 2:30-3:30, Matinee Musicale; 6:45-7:30, Children's Program, "Uncle John"; 8:00-10:00, De Luxe Program, Lucille Holman, mczzo-soprano; Virginia Hubbard, violinist; Edna B. Hanna, pianist.

**KSD, St. Louis, Mo.** (Central, 546), 7:00 P. M., Concert, Abergli's Concert Orchestra of the Hotel Slatier.

**KYW, Chicago, Ill.** (Central, 345), 4:00 P. M., News; 5:50, Children's bedtime story; 7:00-7:58, Isham Jones and his Dance Orchestra; Harry Geise, pianist; Mary Lee, soprano; Marguerite Kugel, soprano; 8:05, Reviews of the latest books, Llewellyn Jones.

**PWX, Havana, Cuba** (Eastern, 400), 9:00-11:30 P. M., Concert, Cuban Navy Band.

**WBZ, Springfield, Mass.** (Eastern, 337), 5:00 P. M.; Dinner concert, "Pique Dame Overture," "Serenade," concert; 3:30 P. M., Educational Program, Clyde G. Kern; Music; 6:30, Sandman's visit; 8:00, Pipe organ recital, Erwin Swindell; Edith Barlow, reader; 10:00, Artist Musical Program; Erwin Swindell, musical director.

**WOO, Philadelphia, Pa.** (Eastern, Daylight Saving, 509), 11:00 A. M., Organ recital, Mary E. Vogt; 12:00-12:54 P. M., Dinner music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt.

**WWJ, Detroit, Mich.** (Eastern, 517), 12:00 M., Detroit News Orchestra; 8:30 P. M., Detroit News Orchestra; Town Crier; Lyle Cook, baritone; Elsie Bond, soprano.

## Thursday, September 27

**CFCA, Toronto, Ont.** (Eastern, Daylight Saving, 400), 8:00-9:00 P. M., Musical program, Melodique, "Sere-nade Espagnole," Selection from "The Country Girl."

**Henry Selinger, director; Blackstone String Quintette; Irving Margrath, director; 10:00, Johu Stamford, tenor; Artists from the Metropolitan Conservatory of Music; Jack Chapman and his Dance Orchestra.**

**WDAR, Philadelphia, Pa.** (Eastern, Daylight Saving, 395), 12:00-12:54 P. M., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, concert, Arcadia Cafe Orchestra; Song recital, Edna Finestone, accompanist; 4:30-5:55, Short talks and musical program; 7:30-8:00, Bedtime stories, Dream Daddy.

**WDT, New York, N. Y.** (Eastern, Daylight Saving, 405), 12:00-12:55 P. M., Concert, Leslie Smith, pianist; Lillian Croton, soloist.

**WFAA, Dallas, Texas** (Central, 476), 12:30-1:00 P. M., "The Community Cbest," T. P. Junkin, lecturer; 8:30-9:30, Recital, Choral Club.

**WFI, Philadelphia, Pa.** (Eastern, Daylight Saving, 395), 1:00 P. M., Dinner music, You," "S tone; Sel solos, Ma You're A Oriole Orcl

**WJZ, New Saving, 4 Wanamake Muriel Str lander's, M Stories, y Schools, y lon Ciple**

**William J Alexander C torium; C**

**P. M., C WLV, Cincinnati 10:00, Pr**

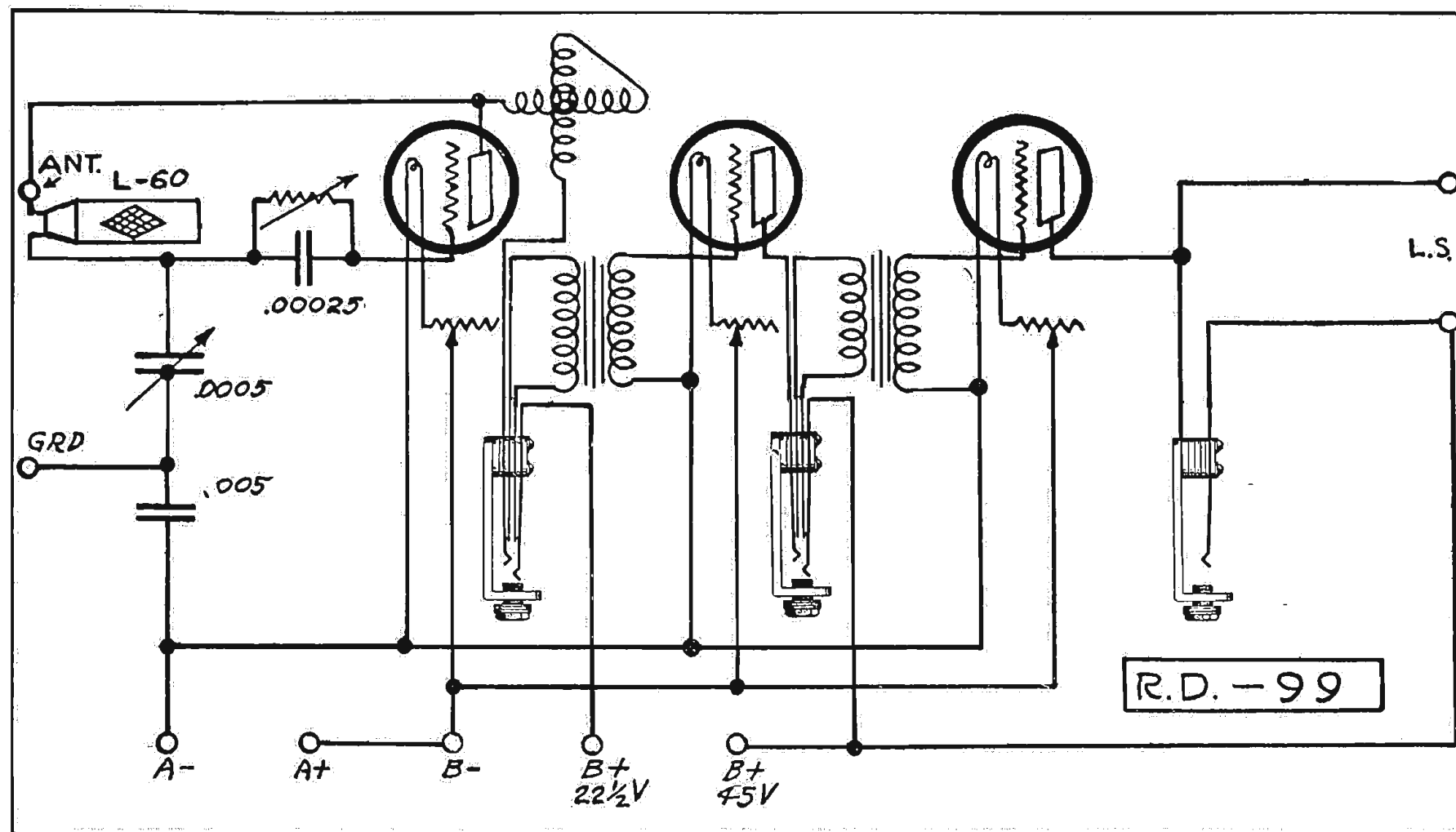
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The circuit, as presented in Hook-up R. D.-99, has two stages of amplification and jacks so that phones or loud speaker can be plugged in where desired.

The honeycomb coil in the antenna circuit has only 60 turns; this can be taken care of by unwinding 15 turns off a 75 turn coil or by winding 60 turns of number 22 dcc. wire on a 3 inch tube.

The variable condenser should have a vernier control and a capacity of .0005 mfd. A .005 mfd. fixed condenser is in-

serted in series between the ground and the negative filament battery. A variable grid leak with a .00025 mfd. grid condenser is necessary. The variometer between the plate and grid increases the selectivity and volume of reception.

The jacks are not the filament control type but consist of two double circuit or

four spring jacks and one open circuit jack.

This circuit can be used with any of the tubes at present on the market. The rheostats must be suited to the tubes and batteries. The detector plate voltage should be not more than 22½ and the amplifier 45 or more.

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Do you use many short pieces of wire to connect from instrument to instrument in your set, with soldering at each end of each bit of wire? Don't do it. Put a clip or other binding post on each instrument, then take a long strip of bus bar or plain copper wire and start at one instrument, put the wire through the binding post, run it to the next instrument and through the binding post, and so on. You can sometimes run half way around your set with one strand of wire, with no breaks, good contacts, and a minimum of soldering. The reduction of resistance brings in the DX and saves the annoyance of broken soldering connections.—Guy M. Chase, Elizabeth, N. J.

Headphones are most sensitive when wound with the finest wire to give the greatest number of turns; copper is the best kind of wire.



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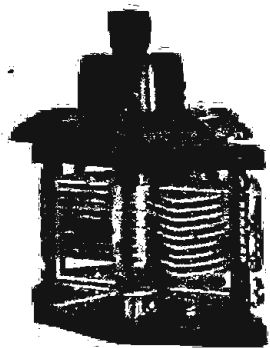
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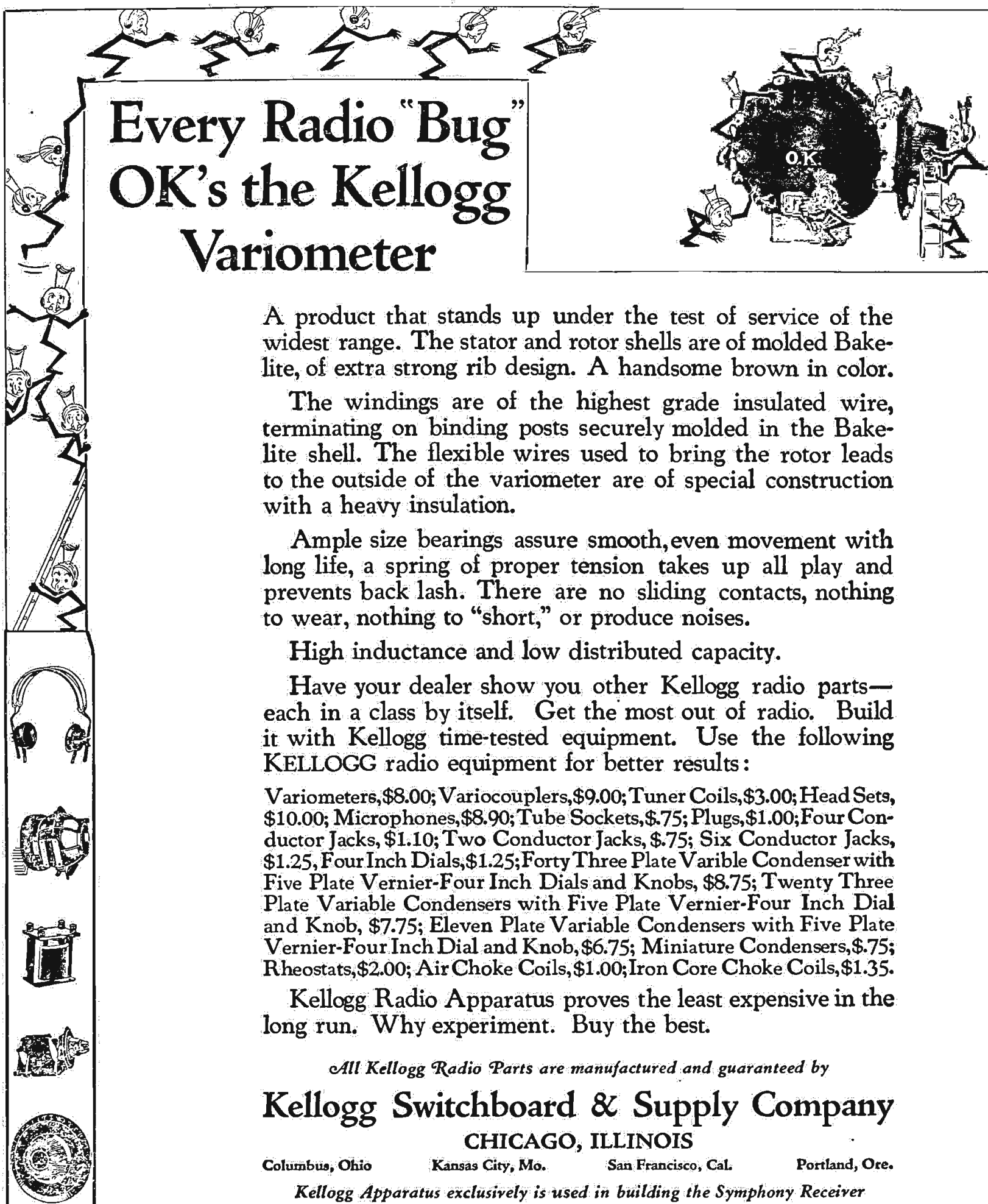
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# Radio Digest Illustrated

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Vol. VI Chicago, Saturday, September 29, 1923 No. 12

## Entertainment for the Blind

Concerts Sent on the Air Great Aid to the Sightless

IN LIEU of the inspiration which the artist derives from the up-turned expectant faces of his audience, the singer at the Radio broadcasting station, if he has imagination, can picture hundreds of homes where sit invalids, blind men and women, even deaf persons, thrilled by his every note.

Letters which come to the Radio broadcasting station emphasize the enjoyment which the "stay-at-homes" derive from broadcast music. To many of them "air" entertainment is the only pleasure that breaks the monotony. To many, Radio brings for a time at least surcease from suffering.

## Static and Its Elimination

The Trouble May Be Reduced But Not Entirely Cut Out EVERY Radio enthusiast is deeply interested in the news regarding the development of static eliminators. While such an instrument is still in its experimental stage, the results obtained from the tests seem to indicate that much of the trouble may be eliminated in the near future.

What is expected by many engineers is the early development of some device that will relieve static conditions, which, so far, are among the great mysteries of the age. No one knows what its physical characteristics are. Naturally these must be revealed before direct eliminative steps can be taken.

Everything indicates, however, that before very long there will be perfected some instrument that will relieve the situation which is practically the same as that faced by phonograph manufacturers some years ago. The scratching was terrible, but in time methods of eliminating part of this defect were devised. Scratching never was eliminated, and probably never will be, but it was reduced to such a degree as to make it hardly noticeable.

Thus it may be with static. There may be offered, before many months, an instrument that will relieve the situation but so far as the total elimination of static is concerned the end may be far off.

## Evidence of Conception

Protecting Ideas Until Patents Can Be Obtained

IT IS always better to be safe than to have regrets. Perhaps you have an original idea and you do not think it amounts to much. It may not, then again the same idea may be brought out in a new way with just an improvement; then what do you get for your idea? Nothing. It may turn out immensely valuable, but what claim have you on it? Why not play safe and protect your invention from the very start? The fact that you are the original inventor will avail you nothing unless you preserve the evidence to prove this fact, and even then you may not be safe unless you take certain further steps.

Therefore, the moment you conceive a new and useful invention, you should at once prepare the evidence of conception, that is, a sketch signed by the inventor, recording the date of conception, and witnessed by two persons, whose indorsement should contain substantially the following: the date, and a statement that the sketch has been explained to and understood by the witnesses, followed by their signatures.

Such a sketch should also have or be accompanied by a sufficient written description to render the drawing perfectly clear and understandable.

This paper serves several purposes. First, it provides you with two witnesses who can prove your date of conception and date of first disclosure. Then, too, it constitutes your first drawing and first written description. Thus you have, in a single document, the means of answering the first four questions which will arise in any interference proceeding.

The only function of an evidence of conception is to refresh the recollection of one or both of the witnesses, so that he can testify to the dates of conception, drawing, description and disclosure, if necessary, and can make that testimony sound a little more plausible than merely his own uncorroborated word.

## RADIO INDI-GEST

### Radio in Cactus Center

(Part II (Conclusion). Written and Originally broadcast via WOR, by Arthur Chappman.)

There was various expressions on Bear's face, when come the noise

Of a jazz dance, up in Denver, by the Saxophony Boys.  
Then he heard a needed sermon, by a sky pilot in Butte.  
After which come op'ry singers, and a solo on a flute  
And reports upon the weather and the outlook for the crops  
And a swell piece on the organ, by an artist at the stops.  
Then Bear slipped his Radio bridle and declared: "And such things seethe

In the air that we've been thinkin' was no good except to breathe!"

So the Radios on the ranches reach up, web-like, all around;  
The Hashknife and the Bar X and the Lazy Y resound  
To the multitude of good things that is floatin' overhead  
When you git up in the mornin', or afore you go to bed.  
That is why the cattle punchers hang around and listen in—  
Why they slap their leather breeches and exclaim: "By gosh!" and grin;

For we've all got wireless fever, sence that dude put up his kit,

And, in case he runs for Mayor, this same tenderfoot is it.

### A Tip for the Calciminers

Lawyer on breach of promise case: "But couldn't you let me have some of his letters?"

Fair Client: "There weren't any; we both had Radio sets.

—Crosley Weekly.

### A-B-C Lessons for Indigest Beginners

Chapter XV—Even through Solid Ivory at Times

BY GOSH

O IS for Oscillator,  
It doesn't move at all,  
But yet it sends out waves,  
- Thru hill and stone and wall.

In quiet below  
Rests O. O. Diedsieck,  
Took a Micadon  
For Piper Heidsieck.

### GALLAGHER & SHEAN, INC., NO. 9094X130M\*Z

Oh, Mr. Gallagher, Oh, Mr. Gallagher,  
I paid fifty dollars for a Radio set,  
Und my wife is full of smiles, as she fiddles mit da dials,  
Dere's no station in da country she don't get.

Oh, Mr. Shean, Oh, Mr. Shean,  
Does she get Paris, London, China, and Berlin?  
She's a wonder I must say, did she ever hear Bombay?  
She gets Chile, Mr. Gallagher.  
In the winter, Mr. Shean?

Oh, Mr. Gallagher, Oh, Mr. Gallagher,  
Would you believe she put a vire on da hed,  
And vent to sleep last night mit da phones clamped on her tight,  
Und vat station do you tink dot she did get?

Oh, Mr. Shean, Oh, Mr. Shean,  
Did she get an unknown station in her dream?  
If she did it sure was good, was it dear old Hollywood?  
It vas Hot Springs, Mr. Gallagher.  
I believe you, Mr. Shean.

Oh, Mr. Gallagher, Oh, Mr. Gallagher,  
Vill dese vonders dot ve're having never cease,  
It was just de other day, dot a lady cross da vay,  
Heard some opera from Turkey und from Greece.

Oh, Mr. Shean, Oh, Mr. Shean,  
I know the very woman that you mean.  
Was she rather short and fat, with a feather in her hat?  
Dot's da lady, Mr. Gallagher.  
It was my wife, Mr. Shean.

Oh, Mr. Gallagher, Oh, Mr. Gallagher,  
Do you tink some day dot we will talk to Mars?  
It is not so far away, I have heard some people say,  
Und there's even people living on da stars.

Oh, Mr. Shean, Oh, Mr. Shean,  
You have some wild illusions in your hean,  
What I wanted you to tell, is when will we hear from H—1,  
When you get there, Mr. Gallagher?  
I will write you, Mr. Shean.

ROZEE.

### He Couldn't Have Been Bald Headed

We fear for our friend, Jimpson Jones,  
His actions are erratic.  
His amplifier costs ten bones—



It amplifies the static.  
He tunes with care, then tears his hair  
When raucous noises rend the air.  
WALT DRUMMOND.

### Ask WOC, "Where the Tall Pop Corn Grows"

Dear Unable-to-digest: I received a beautiful selection over my Radio the other evening and believe it was from Walla Walla. It sounded something like unto this: Ta-da-dee-spizzre-e-e-ta-da-dee-meow-ow-ow-squeal-squeal-spizz-pop. And now I wish you to confirm my misery by informing me if this was the selection you broadcast from Walla Walla, and if it was followed by this announcement:

"This is station POP-POP-POP located in the—POP—of the POP-POP-POP. Our next POP will be a POP—entitled —POP while you can. By POP—and accompanied on the POP—by Mr. POPOP. One POP please."

LOTTA STATIC.

P. S. Where this (—) is seen it means "Cats-a-fighting."  
P. P. S. Mamma won't let me send the dollar, but will enclose a POP instead.

## Radio India-Jest



## Condensed

By DIELECTRIC

Station WHAZ, Troy, N. Y., gave to the Radio world recently the voice of a man said to have been the oldest Radio soloist. He had marveled at the telephone when that was first used, as you and I were astounded by the wonders of Radio. In spite of his eighty-five years Mr. Dater produced tones of such quality as to bring demands for encores. I don't know of many speakers who have used a microphone who were older than Mr. Dater, but certainly few have talked into one of these modern inventions who were younger than that famous little movie star, Jackie Coogan.

Station WJZ was responsible for listeners in hearing a program somewhat out of the ordinary a short time ago. When the huge ocean liner Leviathan slipped into her dock in New York City Paul Whiteman, "King of Jazz," heard from her decks strains of music from orchestras ashore, musicians in an airplane and others in diving suits. It was a great ovation to Mr. Whiteman, which thousands heard at their sets. One thrilled with the reality of the thing when the whir of the plane could be heard as it flew near the microphone.

If you should happen to enter a library in which a year or so ago you always found certain individuals night after night, then drop in now, most likely you would find them absent. I have known one elderly gentleman whose presence at a certain public library was unfailing. He was a great reader. For a month past he has not been seen near a window with a book in his hands close to the librarian's desk. The reason is to be found in a small Radio set at home. The fascination of listening to lectures, music and book reviews has evidently taken the place of reading by a great many who frequented libraries.

The municipal Radio plant idea is spreading. How far it will go depends largely upon the success of those already in action. Chambers of commerce in various parts of the country may conceive broadcasting as an important ally to publicity gained by advertising. There is no question but that many would hear attractive features of a city described over the Radio whose attention would never be drawn to an advertisement. Citizens of San Diego are busy raising money sufficient to cover the cost of building a municipally owned station.

There is a fascination to a broadcasting studio which impels one to devote considerable time watching the announcer and artists as their voices are carried out into space, while no sound comes to you only a few feet away. One of the most interesting studios is that of station WJAZ, wholly enclosed in glass, where you may observe from any angle. Music from the dance orchestras (one in the hotel, the other on the beach) has been heard in a great many states—much to the pleasure of Radiophans. This station is announcing the movements of the Mac-Millan party as it seeks to reach the North Pole. An interesting experiment.

Still another broadcasting station has entered its second year "on the air." WHAZ, located at the Rensselaer Polytechnic Institute, Troy, N. Y., broadcast a program at that time by the same group to be heard on their opening night a year ago. In time, of course, broadcasting stations, like women, will cease referring to their age, though at present the former manifest pride in having served a whole year in entertaining Radio audiences. This station is to be congratulated on its great record, including as it does transmission over a greater distance than that of any other station. Its concerts are heard regularly from coast to coast.

# First Steps for Beginners in Radio

## Chapter XVIII—Testing Radio Instruments

By Thomas W. Benson, A. M. I. R. E.

**BEGINNERS** will find the accompanying series by Mr. Benson very helpful in learning the rudiments of the popular science of Radiotelephony. The articles yet to appear are:

Chapter XIX—Locating Trouble in the Set.

Chapter XX—Useful Information and Formulas.

WHEN difficulty is experienced in inducing a circuit to operate properly the question often arises as to whether there is a defect in one of the instruments. The beginner is often at a loss how to test. In this chapter we will consider a number of tests that can be readily made and that will detect defects in the wiring or assembly of the instruments.

The only apparatus necessary is a dry cell, a buzzer and a telephone receiver. An eighty-ohm receiver fitted with a head band is to be preferred, but if none is available the Radio headset can be used if it is kept in the circuit only for a very short time. To facilitate the tests it is advisable to assemble the instruments on a board and wire in a three-point switch, as shown in Figure 63. Binding posts are provided to connect the test leads and the receivers. The operation of the testing device will be made clear by carefully examining the diagram.

### Connections for the Switch

When the switch lever is placed to bridge points 1 and 2 the phones are short-

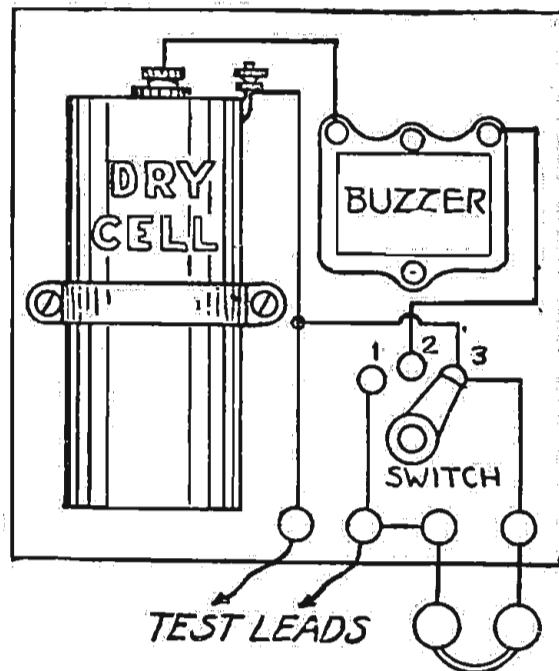


Figure 63—Simply made test set for testing Radio instruments

circuited; the battery and buzzer are on the test leads and the apparatus is set for testing low resistance circuits. The phones can be removed if desired and used otherwise, as will be shown later. On point 2 the phones are in series with the test lead to test high resistances. When on point 3 the phones are connected across the test leads; the reason for this arrangement will be apparent shortly.

Now as to the testing. Let us consider tuning inductances first. With the variometer the usual troubles are an open circuit in the windings or poor contact at the bearings. To test for an open place, switch bridging 1 and 2 and touch the test leads to the terminals of the variometer. If the wiring is not open the buzzer will sound, indicating a closed circuit. If it shows the circuit is open, start at one terminal and follow the wiring and touch the other test lead to the various leads from the windings in order until the locality of the open is determined; then steps may be taken to make repairs. A tapped inductance is tested in the same manner, simply attaching the test leads to the terminals of the winding to determine if the circuit is complete.

### Testing for Poor Contact

To test for poor contact at the bearings

of a variometer or variocoupler place the switch on point 2, putting the phones in series, and attach the test leads to terminals of the variometer or to the bearings of the rotor in the case of the variocoupler. Rotate the rotor listening in. Poor connections will be indicated by loud clicks in the phones when the circuit is made and broken.

A complete test for a variometer in one operation can be made by bridging points 1 and 2, connecting the test leads to the stator terminals and connecting the phone to the rotor terminals. If everything is right the buzzer will operate and a steady buzz will be heard in the phone. If when rotating the rotor there are breaks in the buzzing it indicates poor contact at the bearings. Large honeycomb coils may have a resistance to operate the buzzer; in that instance the switch is put on point 2; when the circuit to the coil is made and broken a loud click in the phones indicates the coil is not open. A faint click or none at all shows that the circuit is open.

### Finding Shorts in Condensers

In testing condensers, particularly of the fixed type, we have a more difficult problem for the condenser may be either short circuited or the leads to the plates may be open. If, on applying the test leads to a fixed condenser with the switch on 1 and 2, the buzzer operates it is shorted. A complete test is made by connecting the leads to the condenser and placing the switch on point 2. A click will be heard when the circuit is closed; a loud click shows a shorted condenser; a very faint one indicates it is not shorted but that the leads may be broken. Therefore we move the switch to point 3 when a faint click should be heard in the phones. The principle of this test is: We first charge the condenser on point 2, then discharge it through the phones by putting the switch on point 3. A good condenser will bring a faint click.

A variable condenser is prone to short circuit. We test it with the switch on points 1 and 2. A buzz indicates a shorted condenser usually due to the rubbing of plates. Many variables are made with a spring pressing against the bottom of the shaft of the movable plates. After a short time this spring makes a poor contact and affects the signals. To detect this defect connect one test lead to the terminal of the rotating plates and the other lead to the shaft of the variable, twisting it tightly. Place the switch on point 2 and listen in the phones while the shaft is turned. Poor contacts will be shown by a series of clicks in the phone as the circuit is opened and closed. The contact spring should be removed and the shaft and spring cleaned with fine emery cloth. To prevent the trouble occurring again it is best to solder a flexible lead to the shaft and arrange some sort of stop for the plates.

### Rough Test for Vacuum Tubes

The proper testing of vacuum tubes calls really for meters but a rough test to determine if a tube will work can be made with the simple apparatus we have at our command. Connect the tube in the usual manner with the phones in the B battery circuit. Turn on the rheostat and bring the filament up to brilliancy.

A wire connected to the grid of the tube

is touched to the first tap of the B battery—a loud click should be heard in the phones. The effect of this test is to put a positive charge on the grid that increases the current flow through the tube.

The dry battery tubes which work with

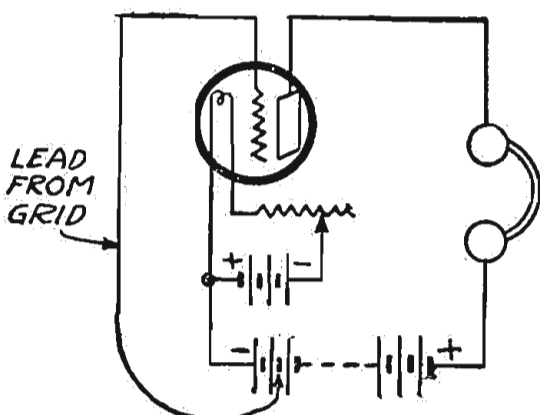


Figure 64—Circuit for testing if tube will work

a dull filament depend for their action on certain chemicals on the filament. When these chemicals are exhausted the tube will not function well without a high plate voltage. Therefore when it is found necessary to increase the plate battery to a great extent to get the signals in with usual strength it is safe to say the tube's life has been ended and that it should be replaced.

The testing of transformers offers no difficulty, yet trouble is often found in these instruments. The windings are of such very small wire that a loose terminal will often result in the wire being broken or when one attempts to solder leads to the terminals the solder on the inside connection may be melted off.

To test a transformer the switch is placed on points 2 and the test leads applied to the terminals of the primary and secondary windings separately. A decided click should be heard in the phones in each case. It will be noted that the secondary of a high ratio transformer gives

a weaker sound in the phone than the primary, due to the greater amount of wire. If only a very faint click be heard it will indicate an open circuit in the windings. The faint click is due to the capacity that exists between the sections of the open windings. It is sometimes possible to open an audio frequency transformer and find the trouble, which is usually at the terminals.

The testing of a radio frequency transformer is done in the same way but the sounds will be much louder, due to the lower resistance of the windings.

### An Aerial Test

To test an aerial for insulation connect the test leads to the aerial and ground and place the switch on points 1 and 2. If the buzzer sounds the aerial is grounded or the lightning arrester is shorted. Remove the arrester and test again. Put the switch on point 2; a slight

(Continued on page 18)

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<b>AMPLETONE Horn-Nickeled</b> 18 inches high ..... <b>\$3.95</b> List \$12	<b>WORK-RITE Variometer</b> <b>\$2.95</b>	<b>DIETZEN Loop Aerial</b> Set up in 5 minutes All parts complete <b>\$1.00</b>	<b>BRISTOL Audiophone Loud Speaker</b> Jr. \$22.50 (as illustrated) Sr. \$32.50 1 stage power amplifier \$25.00

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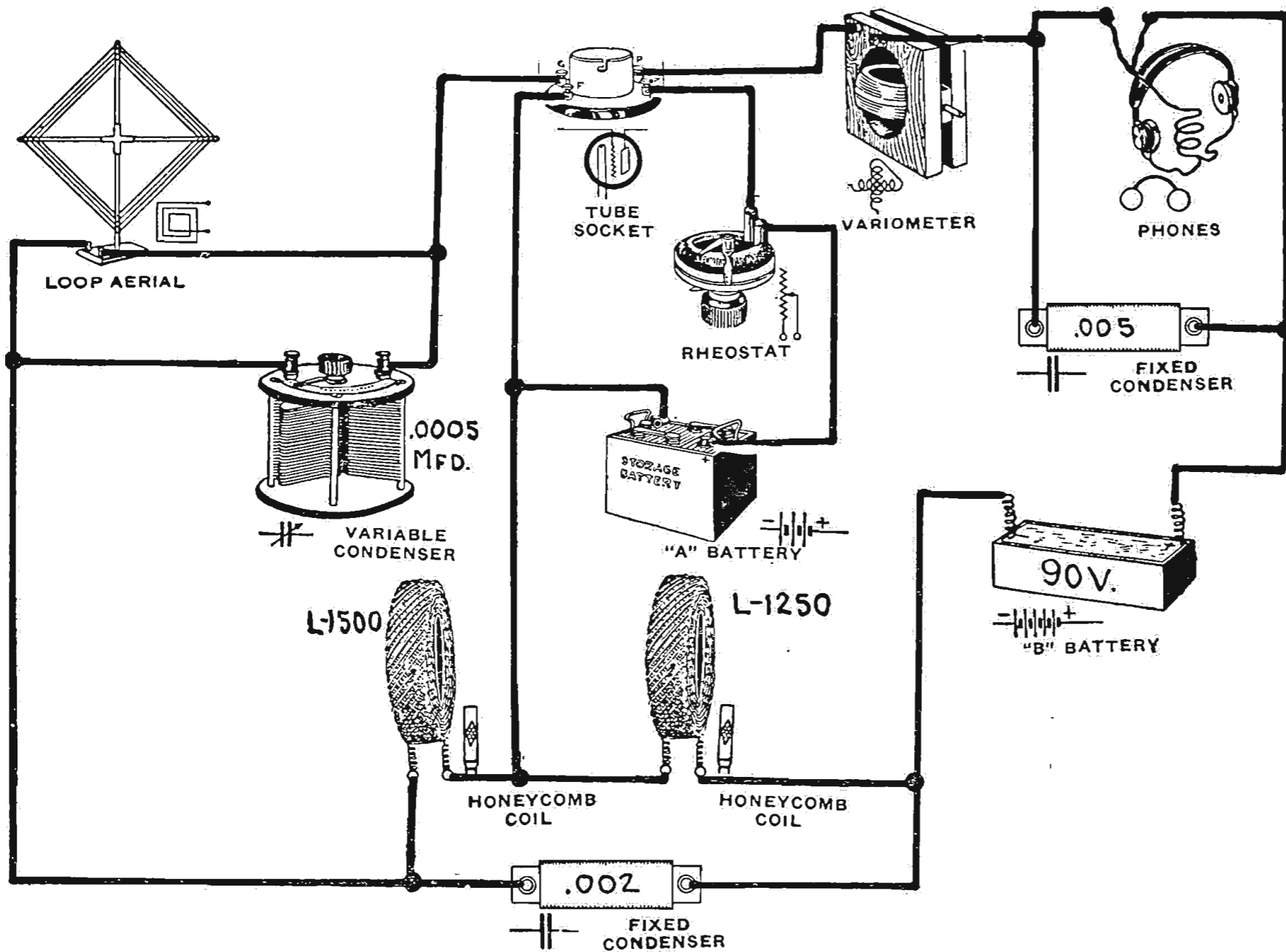
Sharper tuning than possible with any other coupling and at one-half the cost..... **\$4**

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

**SINGLE TUBE SUPER-REGENERATIVE CIRCUIT**



THE single tube super-regenerative circuit has never been shown in the Simplex Diagram form. For the benefit of those fans who find it somewhat difficult to follow the usual wiring diagram it is repeated in this form. When panel-mounted, the use of shielding on the back of the panel is recommended. For use with a long aerial, it will

be found that this circuit is very selective. The two honeycomb coils are not inductively coupled but two single coil mounts are used, keeping them fairly well separated. A variometer placed in the plate circuit controls regeneration. Wave length tuning is controlled by means of the .0005 mfd. variable condenser shunted across the loop.

The capacity of the phone condenser is rather high, namely .005 mfd. Likewise, a high plate voltage, 90, is required. The tube should be an amplifier, whether storage battery or dry cell type is used. The rheostat should conform with the type required by the tube and filament battery. A .002 mfd. fixed condenser is connected across the two honeycomb coils.

**FIRST STEPS IN RADIO**

(Continued from page 17)

click will be heard as the aerial charges; swinging the switch to point 3 will give another click if the aerial is well insulated. Try this on a wet day to see whether the insulators are good.

With the above suggestions the Radiaphan should have no trouble in making other tests that may seem necessary. When the test apparatus is not in use it may be used as a portable call system or as a buzzer test for crystal detectors by simply connecting the interrupter on the buzzer to the ground lead of the set. Having considered the location of faulty instruments the next chapter will consider the location of trouble in the complete set when it fails to function properly.

(TO BE CONTINUED)

**Tube Filament in Series**

The operation of two vacuum tube filaments in series with a single controlling rheostat necessitates the use of tubes of the same characteristics otherwise it will be impossible to adjust the filament currents to the proper value for satisfactory functioning of the tubes.

**Dowel Rod Used as Vernier**

A dowel rod or any wooden or fiber rod about the length and diameter of a pencil, with tape or a wide rubber band around one end, is the best vernier you can apply to any dial. It can be used on any dial, is not attached to the panel, keeps the hand as far away as you want it, and does the work.—Guy M. Chase, Elizabeth, N. J.

**LEARN RADIO**

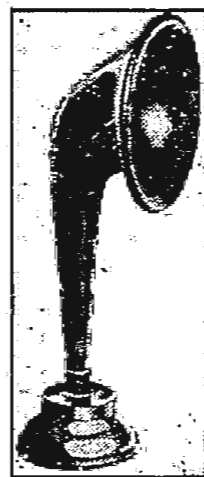
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**Varnish of No Capacity for Coils Easily Made**

A coil varnish with no capacity is the best thing in Radio work. This formula is very cheap, costing but a few cents and can be secured at any drug store. Simply get some sodium silicate or what is commonly known as water glass, and with a brush apply a coat on the coil; then put the coil into an oven or on a stove. After heating about 30 minutes the sodium silicate will become hard; you now have a coil that can be thrown on the floor without breaking off the varnish. I have used this for some time with the best results.—O. Riddel, Chicago, Ill.

**Hint for Fine Tuning**

For fine tuning, it is best to take a lead pencil with a rubber tip and use it to move the dials. This keeps the hands away from the instruments and eliminates a good part of the body capacity.

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# Reflex De Luxe with Loop Aerial

## Reception Is Clear, Loud and of Unusual Range

By H. J. Marx

WHEN the details of the Reflex De Luxe were presented in the four May issues of Radio Digest, most of the fans were too busy considering the

High plate voltages are the direct cause of the burning out of the transformer windings. It is necessary, therefore, to find out the voltage limit recommended

The variocoupler should be one with low internal capacity. The lattice wound type fills this requirement very well. The potentiometer is not effective on

crystal detectors are apt to give trouble. Try lifting the catwhisker off the crystal, the set should immediately begin to howl; in fact as a rule it howls the moment the finger is placed on either crystal terminal. This howl is one means of telling whether that part of the circuit is functioning properly.

Very often tubes will be found that are unsuitable for Radio frequency or reflex work. Try changing the tubes around for best results. If they can be tested, do so, and use the two best in the first two stages and the remaining one in the third or separate audio stage. Don't turn the filament rheostats too far. Distortion and howls are the result of trying to force your tubes. See how low you can burn them.

### De Luxe for Loop Aerial

The second illustration presents the hook-up of the Reflex De Luxe for use with loop aerial only. It is considerably simplified, without the battery switch, extra jacks, variocoupler, etc.

Wave length tuning becomes a one control operation and makes it simple for anyone in the family to tune in. The use of a loop aerial helps solve the apartment house problem and eliminates a lot of indoor wiring and trouble. The expense of construction is also considerably reduced.

The same care and attention in assembly and wiring is also necessary, but the work is considerably simplified. The instructions regarding the apparatus used apply in this circuit also.

### List of Apparatus

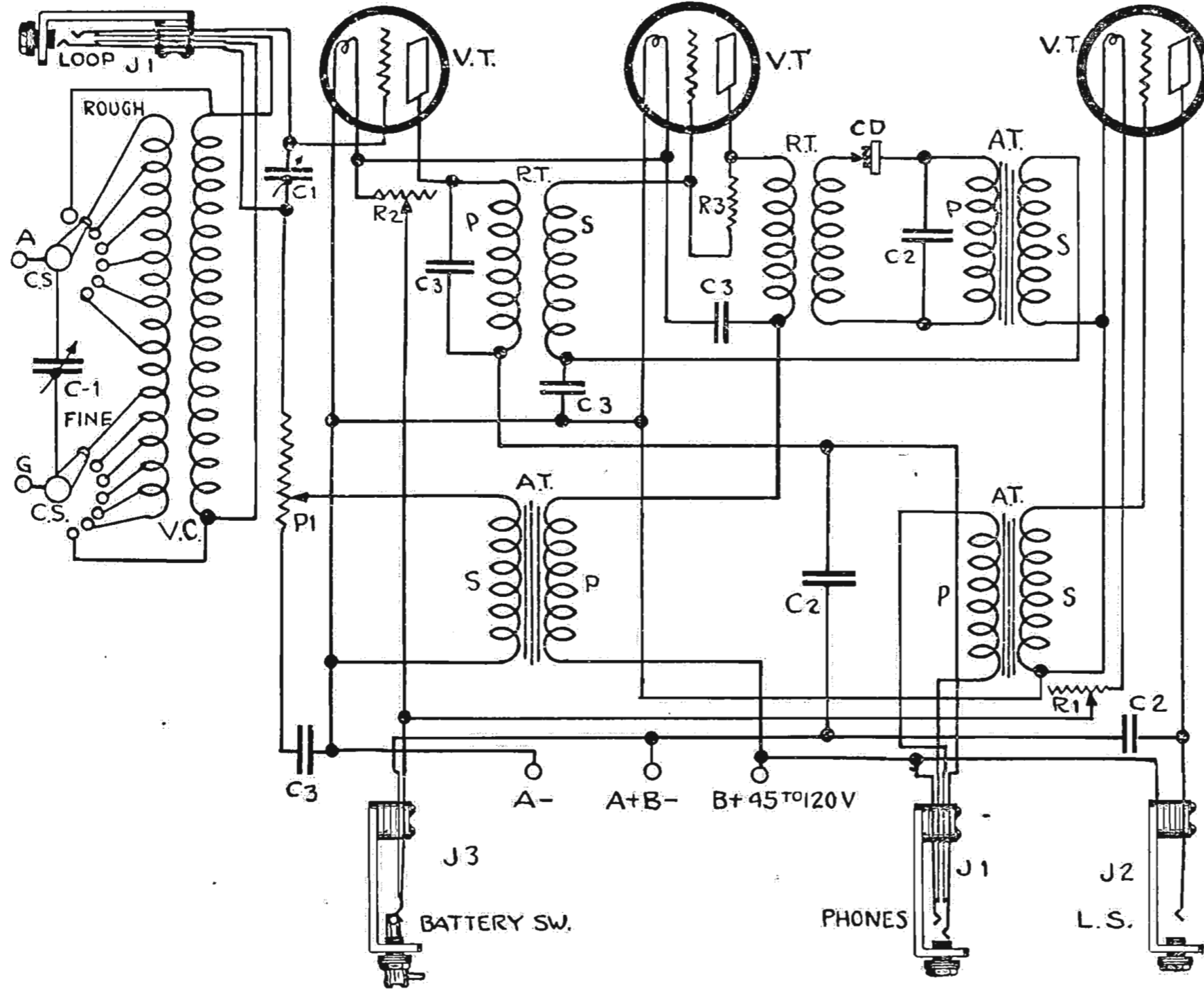
C-1, one .0005 mfd. vernier variable condenser; C-2, one .005 mfd. fixed condenser; C-3, four .002 mfd. fixed condensers; J-1, one open circuit jack; P-1, one 200 ohm potentiometer; R-1, one single tube rheostat; R-2, one two tube rheostat; R-3, one 1 megohm fixed grid leak; RT, two radio frequency transformers; AT, three audio frequency transformers; CD, crystal detector; VT, three amplifier vacuum tubes.

### Testing Sets

If you like to test sets, here is a suggestion that is very handy: take a bit of old panel; mount it on the edge of a board with a rheostat and a jack on it. Put a tube socket on the board and a grid condenser mounting and a grid leak mounting. Put binding posts, preferably of the clip type, on each lead in and out of the set. Then you can connect any A or B battery and any coil, or any style of plate tuning device. The battery and tube connections are practically standard, unless you want to try the ultra-audion, in which case a slight change will produce it. With flexible wires and the binding posts any hook-up ever drawn can be connected in five minutes.—Guy M. Chase, Elizabeth, N. J.

### Protection from Lightning

Protection from lightning lies mainly in the provision for dissipating properly the inductive effects in the immediate vicinity of a powerful flash, rather than protection from a direct hit. An approved lightning arrester is not only required by law but it is also helpful



arrangements for their summer vacations to decide to try out any new Radio circuits. The few that did try it out immediately started writing in and announcing the results obtained. Since then there has been a gradual increase in the demand for a review of the main details and also requests for a simpler arrangement for loop aerial use only.

### The Original Circuit

The original Reflex De Luxe with a few improvements incorporated is presented in the first illustration. Only a few unimportant changes have been made. These are the elimination of the loud speaker binding posts, also of the variable grid leak on the last audio frequency transformer; the addition of the grid leak between the grid and plate of the second tube; the placing of all tubes on the same plate voltage and some slight changes in condenser values.

The theory of operation is exactly as before. The circuit is of the inverse reflex type using a crystal detector instead of a tube, for greater ease in the control of the circuit.

The first two tubes are Radio frequency and reflexed audio frequency amplifiers while the last tube provides an additional stage of audio frequency amplification (not reflexed) that makes the set suitable for loud speaker operation even on long distance reception.

Reception with these circuits is clear, loud and of unusual range. The tuning controls present no difficulty in operation, making it possible for anyone in the family to enjoy the music even if the family radio operator doesn't happen to be in.

### Identification of Parts

C-1, two .0005 vernier variable condensers; C-2, three .005 mfd. fixed condensers; C-3, four .002 mfd. fixed condensers; VC, vario coupler; J-1, two double circuit jacks; J-2, one open circuit jack; J-3, battery switch; P-1, one 200 ohm potentiometer; R-1, one single tube rheostat; R-2, one two tube power rheostat; R-3, one 1 megohm fixed grid leak; RT, two radio frequency transformers; AT, three audio frequency transformers; CD, one crystal detector; VT, three amplifier vacuum tubes; CS, two lever switches.

### Apparatus Details

Numerous questions were asked in reference to the types and ratios of transformers used. High voltage transformer was generally misinterpreted as high ratio.

by the manufacturers. When this is exceeded and the windings are burned out, fans are usually at a loss for the real reason their circuit isn't functioning properly.

High winding ratios also should be avoided for circuits of this type. The maximum limit should be a five to one ratio.

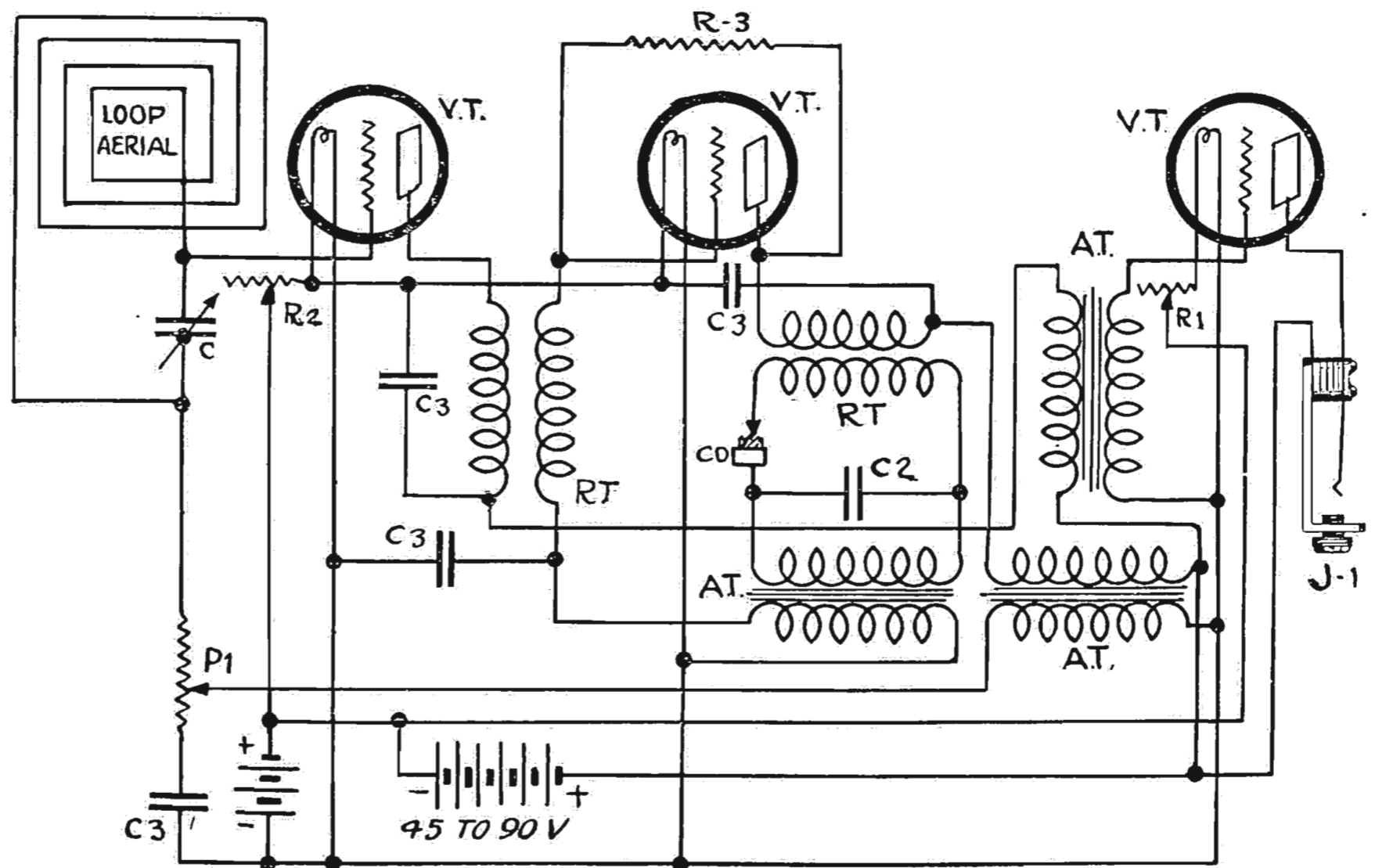
The resistance of the rheostat is dependent on the type of tube used. Rheostat R-2 controls two tubes and this must be considered in its selection. For dry cell tubes it is not so important, but the ampere flow of two storage battery tubes may be greater than the capacity rating of a 6 ohm rheostat.

local reception but its value immediately becomes apparent on long distance work.

Many of the Radio frequency transformers now on the market can be used, although there are a few that will not function properly. The type with the laminated iron core does not, as a rule, work well, either air core or iron dust core serving best.

### Assembly and Wiring

As stated in the original article, the question of assembly and wiring is important. Care must be taken in the arrangement of apparatus and wiring. Inductive interference will give a lot of trouble if wiring is carelessly done. Poor



**RADIO FOR EVERYBODY**

(Continued from page 11)

ened and not nearly so strong as when the outfit was outside of the steel box. Were the steel walls to be increased to ten feet in thickness it is doubtful whether Radio waves would get through.

Another property of ether that should be brought out is the fact that, no matter what the lengths of either Radio or light waves, their speed forward is 186,000 miles per second, which is seven and one-half times the circumference of the earth.

**Wave Motion**

The propagation of a wave motion forward can be accomplished in two ways,

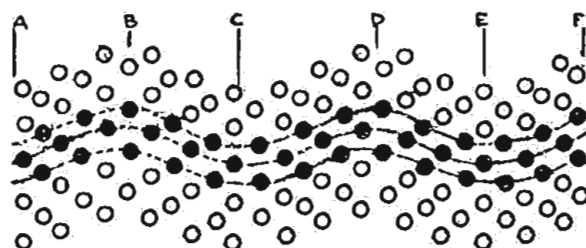


Figure 2c—The "side-to-side" method of wave travel through the ether

and it seems very likely that Radio utilizes both of them.

The ether must be composed of very small particles such as is oxygen or water, as otherwise it would not be capable of carrying wave motion. Normally these small particles would appear as in Figure 2a. One method of wave travel is as shown in Figure 2b and this is known as the "compression" method. From point

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A to point B, the particles are all pressed together, as they are also from point C to point D. Between the waves or from B to C, however, they are abnormally far apart.

In Figure 2c we see a graphic presentation of the "side to side" method. Here the small particles are caused to swing to one side of their normal position, back through normal, and out to the opposite side of normal. In this diagram we have wave peaks at B, D and F. Radio may utilize either of these methods but due to the fact that, as will be shown later, a Radio wave is made of two components, it appears very probable that both systems of wave motion come into action.

(TO BE CONTINUED)

**Old Tube Used as Guide**

Did you ever wire a set and then find that some wire was too close to or just over the tube socket? If so, you'll appreciate this suggestion. If you have a burned out tube or can get one, use it as a guide. When you wire a socket, put the tube in the socket. You can't hurt it if the pliers or the iron slips and you have a guide to keep wires properly spaced.—Guy M. Chase, Elizabeth, N. J.

**COPPER:** Strip 1/16"x1" per ft., 45c, for switches, etc.; foil, .001"x4", per ft., 10c, 10 ft., 80c, for condensers, etc. Post extra on orders under \$1.00. L. D. SEAVER, 341 Piedmont St. WATERBURY, CONN.

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to get out of town. If you want new stations on your crystal set WRITE ME TODAY. Mine works 400 to 1,000 miles without tubes or batteries! Thousands have bought my plans and now get results like mine. CHANGES OFTEN COST LESS THAN A DOLLAR. Send self-addressed envelope for further information. Leon Lambert, 501 South Volusia, Wichita, Kansas.

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This copyrighted circuit is the most successful of any Reinartz modification yet produced, and is imitated the most. Thousands are in use.  
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Sets built from these plans will receive all broadcasting stations operating under the new laws. Their wave length range is from 170 to 800 meters.

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

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

**S. A. TWITCHELL**

1925 Western Avenue, Minneapolis, Minn.

**MILOPLEX NEW CIRCUIT**

(Continued from page 10)

voltages of B battery for your detector. If you are going to use dry cell tubes your potentiometer should be around 1600 ohms; a 200 ohm one will do for storage cells.

Supper is ready; my better ½ths is calling. I have just answered—"in a minute"—so I will take that last minute to tell you something about aerials. No aerial is better than its ground; if you have a good ground get a better one; put on two, keep piling grounds on, the more the better. Let's eat!

**Making a Good Ground**

Gas pipes are poor grounds, due to insulating joints at the meter. Water pipes are often a long way and a crooked way from the set. If the set is connected to the gas pipe in the room where the set is, with a good ground connector and if a connection is made in the bath room or

elsewhere from the gas pipe to the water pipe, using large wire and ground clamps on the pipes, you have a water pipe ground without a long and crooked wire running from the set to the water pipe. —Guy M. Chase, Elizabeth, N. J.

Much of the troublesome "static" can be avoided during the summer months if the right circuit is employed and the aerial shortened.

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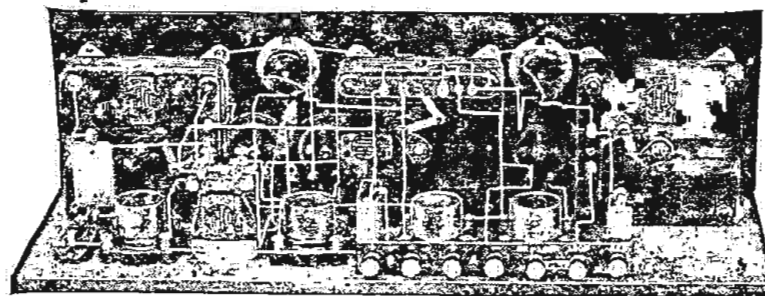
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**RADIO FANS!**



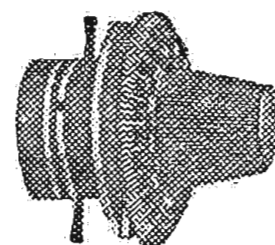
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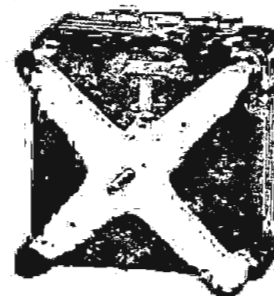


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Special price for complete parts for 5 tube set

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- 1 Erla Bezel.
- 8 Name Binding Posts.
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# Control Knob for Book Type Condenser

## Vernier Adjustment for the Leaves of Copper

In looking through one of your papers, the Radio Digest, I saw a type of vernier condenser, using the principle of two wooden plates, each being covered on one side with a copper plate, one of the sheets

**WORKSHOP KINKS? EARN A DOLLAR—**

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

**RADIO KINKS DEPARTMENT,**  
Radio Digest,  
123 W. Madison St., Chicago

of copper being covered with a sheet of mica. This appeared to be a great idea to me, all but the control, which, according to my way of thinking, did not give very close adjustment. As I had an old broken Bradleystat handy I removed the control knob and shaft and put them on this condenser in place of the control mentioned in the article.

I find that this gives very close adjustment and simplifies the tuning of the illusive stations.—Walter W. Mulcahy, Sparks, Nevada.

### Drain Pipes Make Aerial Mast

A mast that one person can erect alone may be made of corrugated and galvanized drain pipes. These I have found to make good masts; they are not expensive. Three or four lengths can be joined together and soldered. A wooden plug is driven tightly into the upper end and a screw eye turned into the wood to make a place for attaching a pulley. A wooden stake is driven into the ground over which the drain pipe tube is placed. The mast is held rigid in a perpendicular position with guy wires about Number 14 or 16 in size. A mast about 30 or 40 feet is easily raised by one person. It can be placed on top of a building.—F. W. Steffen, Hartley, Iowa.

An audion is more delicate than an ordinary incandescent lamp; treat it accordingly.

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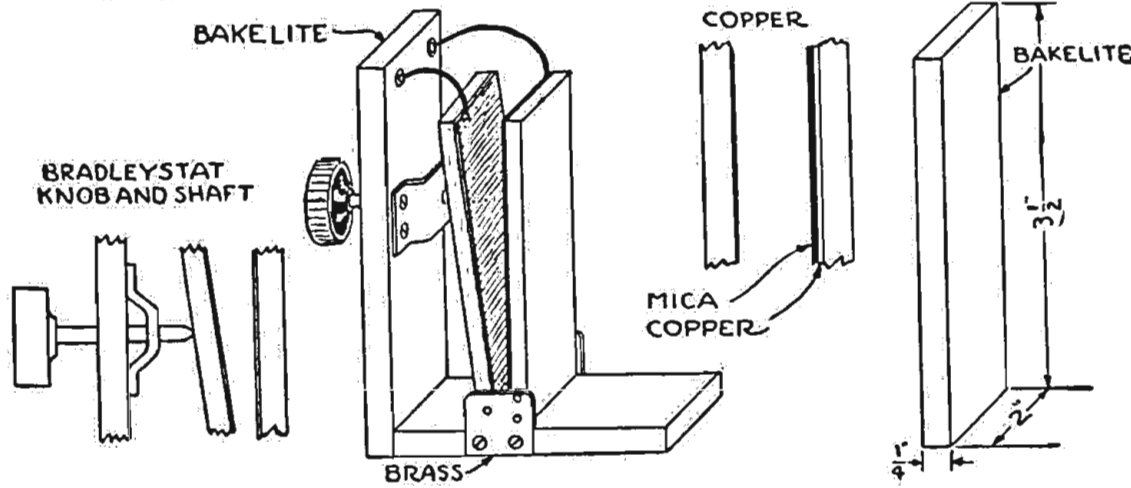
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Atmospheric disturbances, known as static or strays, are the greatest obstacles to perfect Radio reception. The most common type produces a frying or grinding noise in the phones, and for this reason is called "grinder" static. The second type, caused by lightning flashes, gives a sharp click. The third type creates a hissing noise and frequently occurs during a heavy snowstorm. The lightning clicks and hissing static produce little interference with communication because they are generally local and last only a few hours. Static is generally at a minimum at 1:30 a. m. and just after dawn. Its maximum strength is reached from 10 p. m. to midnight.

### Megaphone Makes Loud Speaker

You can convert one of your receiving telephones into a loud speaker by placing it against the small end of a megaphone. This will cause the sound to be concentrated and heard all over the room.

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## Turn Filament Control Before Removing Tube

Before removing vacuum tubes from their sockets in an amplifier circuit precaution should be taken first to turn the respective filament control rheostats to the "off" position. This is necessary because when one of the tubes is removed from such a circuit, the potential across, which is used to supply several tubes in multiple or parallel, there is an increase in current through the remaining tubes. This sudden increase in current may be sufficient to damage or impair the filaments of the tubes still in the circuit. Filament control jacks are objectionable for the same reason, unless similar precautions are exercised.—Peter J. M. Clute, Schenectady, N. Y.

**A Battery Switch**

A closed single circuit jack can be used for an A battery switch; it can be mounted on the panel. If you have such a jack lying in the junk box, mount it in the A battery circuit between the battery and the tubes. Fashion a wooden, rubber or composition rod the size of a plug, with a handle on one end. Insert it in the jack; it breaks the circuit, the plug being of insulating material. Pull the plug out and the circuit is restored. If the plug is kept in a good place, small brothers and sisters won't burn out tubes.—Guy M. Chase, Elizabeth, N. J.

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Moulded Bakelite Variocoupler.....	\$6.00
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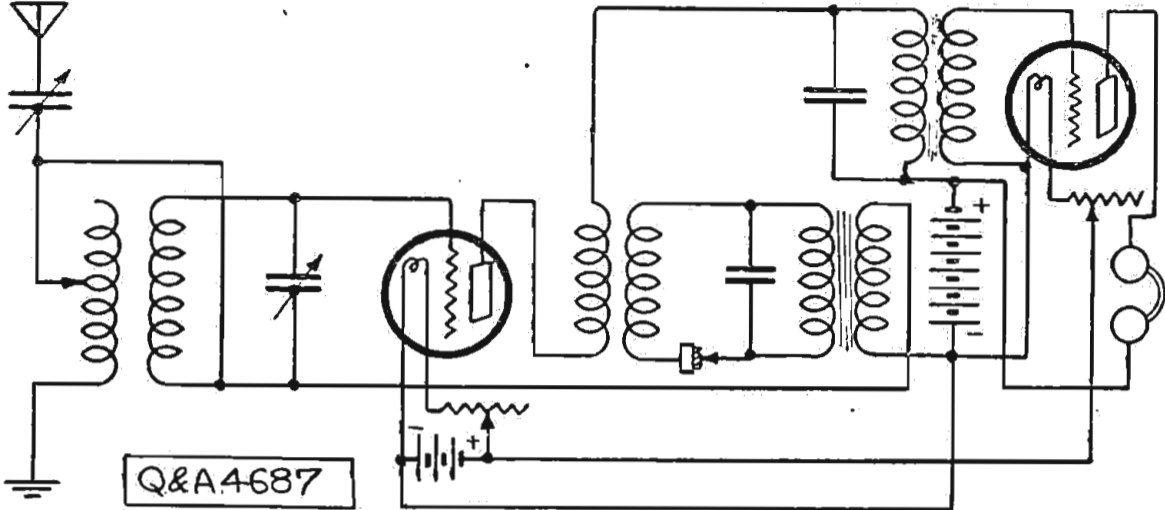
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# Questions and Answers

## Single Tube Reflex

(4687) WHM, Wagstaff, Kans.  
Please send a sketch of how to add one stage of A. F. ampere to the single tube reflex circuit.



I made a loop 3 feet to a side with 9 turns of Number 22 d.s.c. wire spaced 1 inch apart. The description from which this was made said to space wire 1/2 inch apart but the working drawing showed it spaced 1 inch. The set refuses to work. I would like to know if it is because the spacing or the small wire, or both? Would a loop 2 feet to a side with 14 turns give the same results?

Do you think the Cockaday four-circuit receiver with its inductively coupled stabilizer circuit is superior to the Armstrong two variometer-variocoupler circuit? Would this help relieve static?

I am looking for something that will get by WDAF and WHB, but have not found anything except the Flewelling and your RD-80. There is too much trouble with body capacity in both of them.

A.—Complying with your request we are presenting a diagram showing a method of adding audio frequency amplification to the single tube reflex circuit.

Your described construction of a loop aerial is correct in detail and will work. However, when using a loop aerial tuning will be found quite difficult. In all probability it is largely responsible for the limitations experienced.

The Cockaday circuit is in no particular superior to the Armstrong three-circuit hook-up, and would not eliminate static disturbance. The latter circuit is recom-

mended as more effective in the elimination of local interference. The body capacity effect is not pronounced and can be entirely done away with by shielding the panel and grounding shield. However, shielding should not be necessary.

## A. F. Transformers

(4698) CFC, Arcadia, Wis.  
In an audio-frequency transformer is the inner or smaller number of windings called the primary or secondary? Does the plate of the amplifying tube connect to the outside layer in the coil of the primary for best results? When using the new tube C 301-A as a detector the manufacturer advises connecting positive A of the tube to the grid return. Please explain this connection.

A.—The primary has the fewest number of turns of wire.  
The plate of the amplifying tube is connected to the outside turn of the inside coil.

C 301-A tube is connected with return side of the transformer (inside turn of outside coil, usually marked F) to nega-

tive A battery. Follow this method to accomplish a proper connection.

## Transformer Data

(4727)HFF, Council Bluffs, Ia.  
Where may I procure the silicon steel .018 thick mentioned in Questions and Answers 3694 of August 4, 1923, issue of Radio Digest? Will you please give me the necessary data for constructing a C. W. transformer which will handle four 5-watt tubes, using 750 volts on the plate?

A.—It will be necessary to use two transformers, one for the plates of the tubes and the other for the filaments; if both windings were placed on the same core the filament voltage would drop when the plate current was being used.

For a plate transformer make 400 turns of number 18 magnet wire on a 1 1/2-inch core for the primary and 3,000 turns of number 28 magnet wire for the secondary.

For the filament transformer make 400 turns of number 18 magnet wire for the primary, the same size core, and 40 turns of number 10 magnet wire for the secondary.

## Nacireman Circuit

(4716) HGK, Louisville, Ky.  
Kindly answer the following inquiries regarding the Nacireman easy super-hook-up, R. D. 87, June 30, 1923 issue:

Can spider web coils be used in place of the variocoupler or variometer?

Please give the dimensions of the spider web and the size of wire and number of

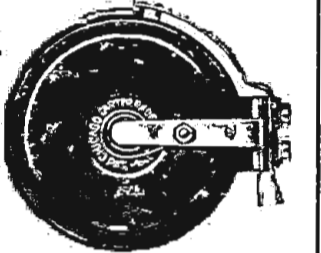
turns on primary and secondary, if they can be used.

A.—Spider web coils may be substituted for variocoupler or variometer. The primary may consist of a 1 1/2-inch core, exact number of slots not material, wound with 40 turns of number 22 wire, secondary wound with 50 turns of number 22 wire.

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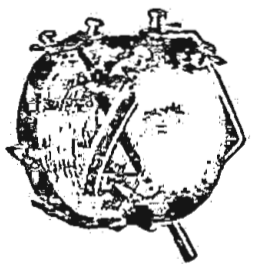
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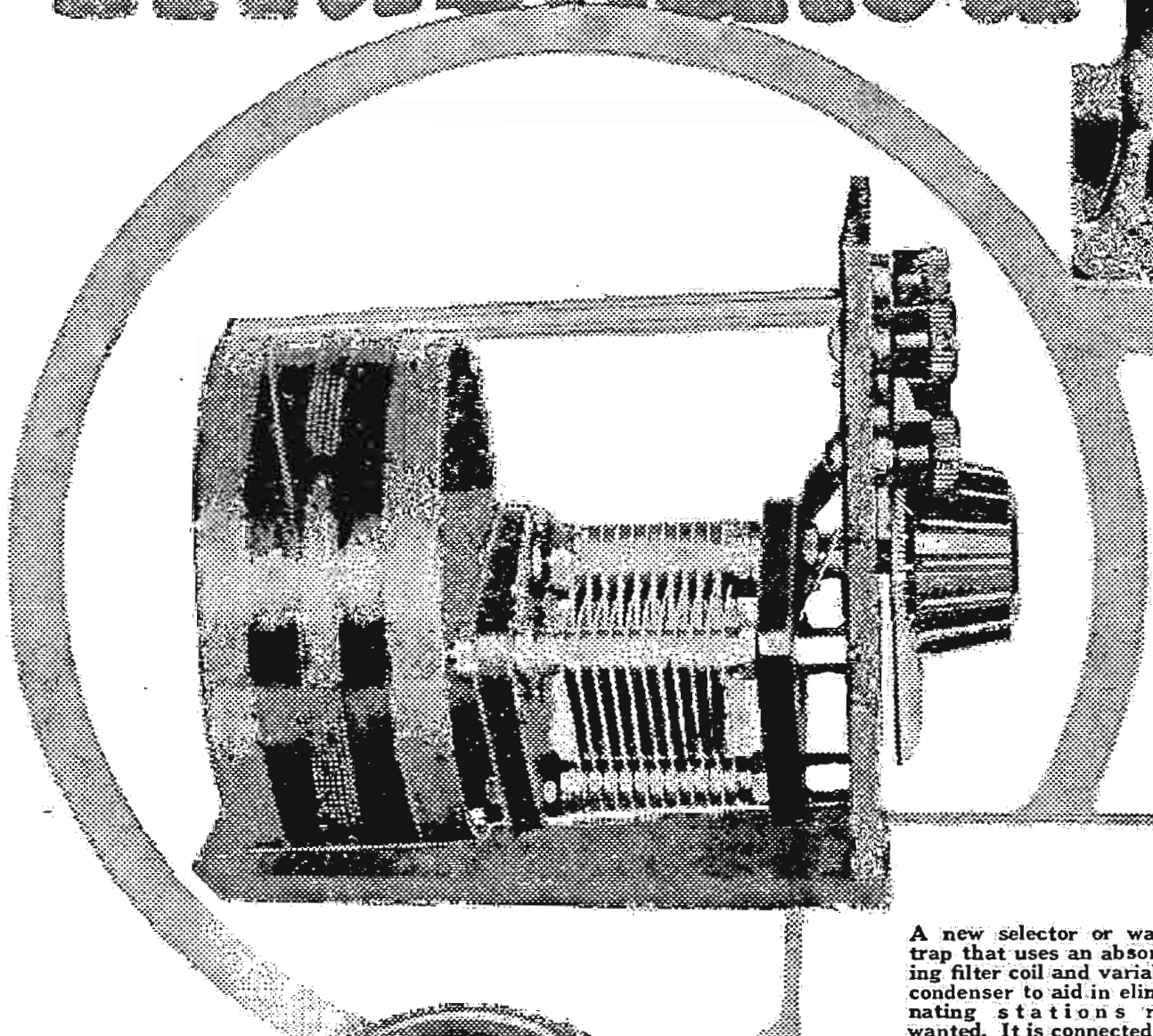


# Radio

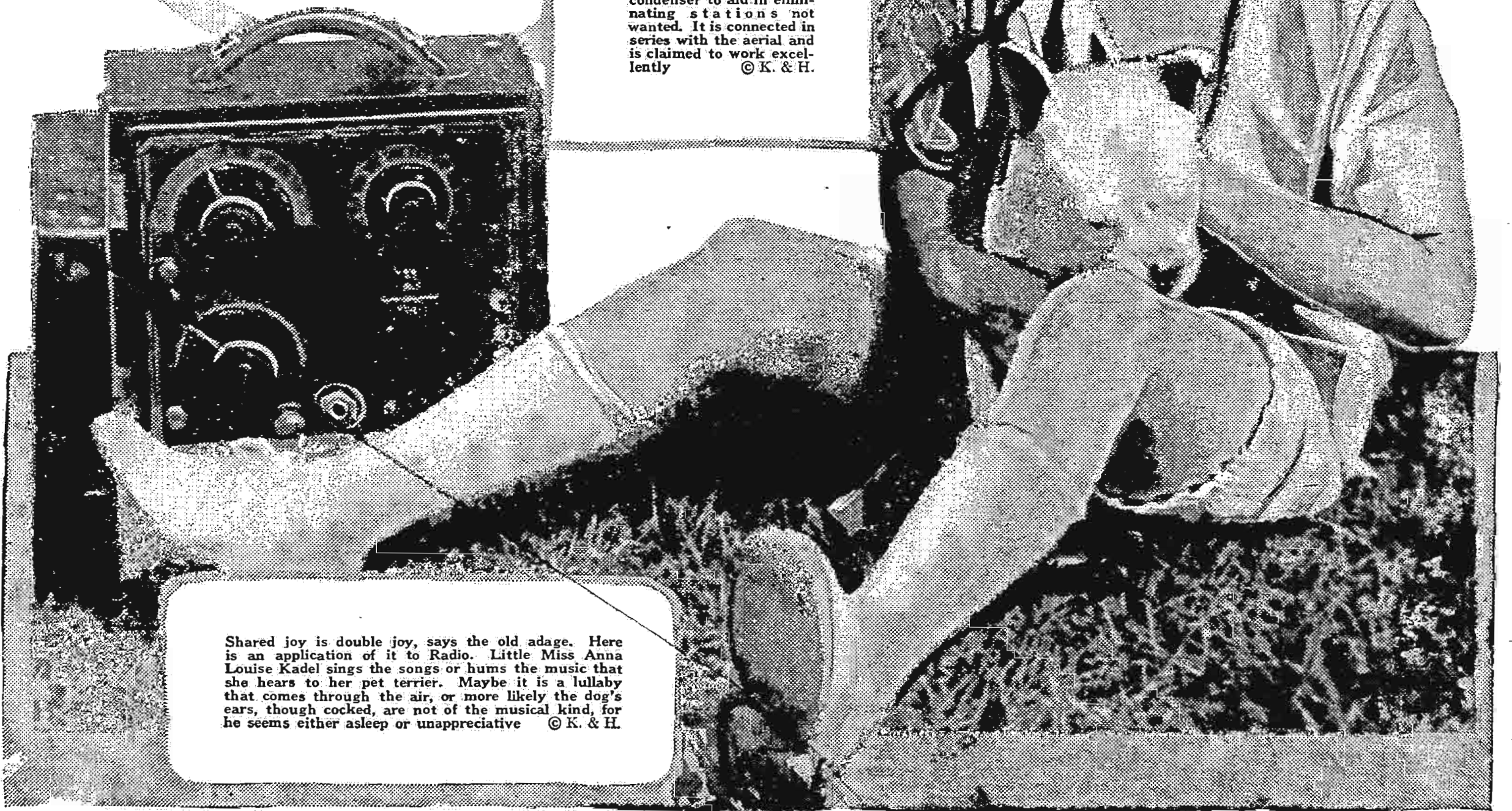
## Illustrated



This Radiophan, Master Fred Alden of Oakland, Me., combines business and pleasure in a clever way to break the tediousness of his farm chores. The cow, too, seems to be interested in the novel arrangement © K. & H.



A new selector or wave trap that uses an absorbing filter coil and variable condenser to aid in eliminating stations not wanted. It is connected in series with the aerial and is claimed to work excellently © K. & H.



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