

See Page 3

October 21

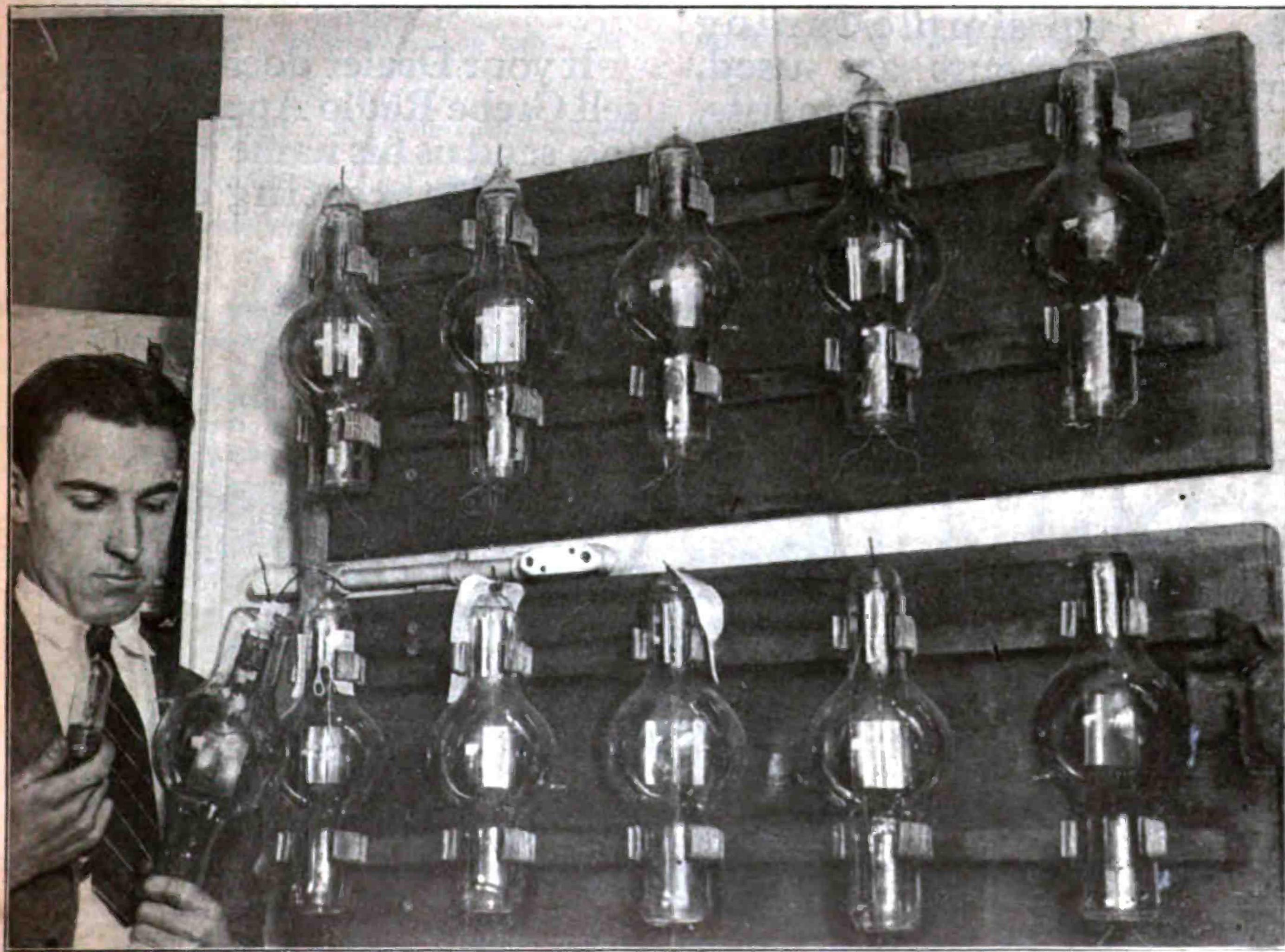
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RADIO WORLD

(Trade Mark)

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PUBLISHED EVERY SEVEN DAYS

250-Watt V-T's Broadcast Big News Events

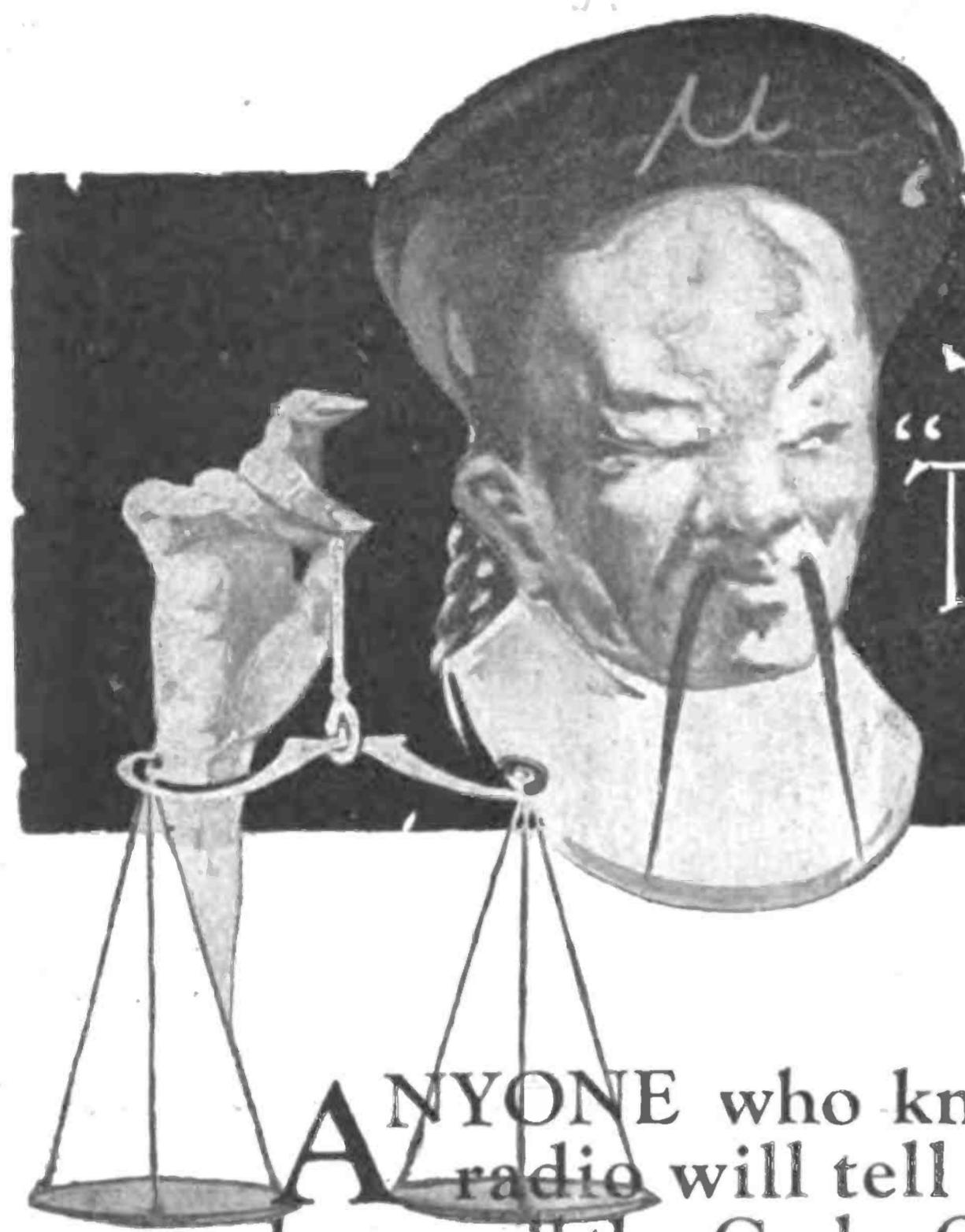


These huge tubes cost \$125 apiece, and are necessary for the broadcasting of big news events such as the World's Series, and the Philharmonic Concerts. Raymond F. Guy, "O G N" of WJZ is comparing a radio-tetrode with a 250-watt V-T.

(C. Kadel & Herbert News Photos)

A PAGE OF HOOK-UPS. See Page 12

10



Just scales and full measure,
injure no man.
The full measure of service
goes with every Grebe Receiver

Doctor Wm.

ANYONE who knows radio will tell you how well the Grebe CR-5 performs on the daily concerts, lectures, etc., in the air.

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range, 150—3000 metres.

Ten years experience in satisfying a critical radio public has taught us how to build it for your year-round enjoyment.

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VOLUME TWO RADIO WORLD

[Entered as second-class matter, March 28, 1922, at the Post Office at New York, N. Y., under the act of March 3, 1879.]

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Vol. II, No. 4. Whole No. 30

October 21, 1922

15c. per copy, \$6.00 a year

Editorial Announcement!

RADIO WORLD Suggests

National Radio Week Nov. 26 to Dec. 2, 1922

REASONS:

To create greater public interest in radio. To increase the output of manufacturers. To increase sales by distributors and dealers.

To make possible a still greater volume of Christmas-gift purchases.

PLAN OF CAMPAIGN:

Request interest and space of radio editors throughout the United States and Canada for a National Radio Week.

Remind fans that Radio parties would be pleasant and profitable, and that during that week they should invite friends—especially those not acquainted with radio—so that they may listen in with their hosts.

Bigger and better window and counter displays during National Radio Week.

Have you, as a manufacturer, distributor, or dealer, or fan, any other suggestion to make?

Suggestions forwarded to Radio World on this important event will be received gladly and accorded attention in the editorial columns of Radio World.

The suggestion now is that NATIONAL RADIO WEEK be held from November 26 to December 2. (Thanksgiving Day falls on November 30.)

Why should not radio, bringing music, entertainment, and information, and supplementing the official Thanksgiving messages cheer from our President and the Governors of States, be made an important part of the wholesome activities of Thanksgiving Day? These greetings, coming from men of our country prominent in science, literature, the stage, and the church, and heard through the new medium of radio, will give an added importance to their utterances.

Write and tell us what you will do to help along National Radio Week

Address at once: National Radio Week Editor, Radio World, 1493 Broadway, New York

Be a Booster for National Radio Week!

Important Improvements in Radio Receivers

By C. White, Associate A. I. E. E.

SO busily are we engaged in trying to invent new circuits that we often forget the possible improvements we can make in the construction of the average radio-receiver. Fortunately there are many manufacturers who, realizing that amateur radio popularity is here to stay, are actually employing scientific research to better their apparatus. Still, nevertheless, there are a vast majority who are satisfied to build anything that just works—and that's all. But, the amateur who builds his own outfit is subjected to the same dangers as the unscientific manufacturer, in that he is often deceived into thinking that if the set works it is O. K. in every respect and represents the height of efficiency.

There is not a man who would knowingly put a poorly constructed appliance in his home, but there are amateurs who care for nothing save to hear a sound over their sets, and they will quickly say, "Why worry" if something is at least heard. On the contrary, a majority of radio fans are electrically inclined and are beginning to seriously consider if they have outfits that present the acme of electrical perfection.

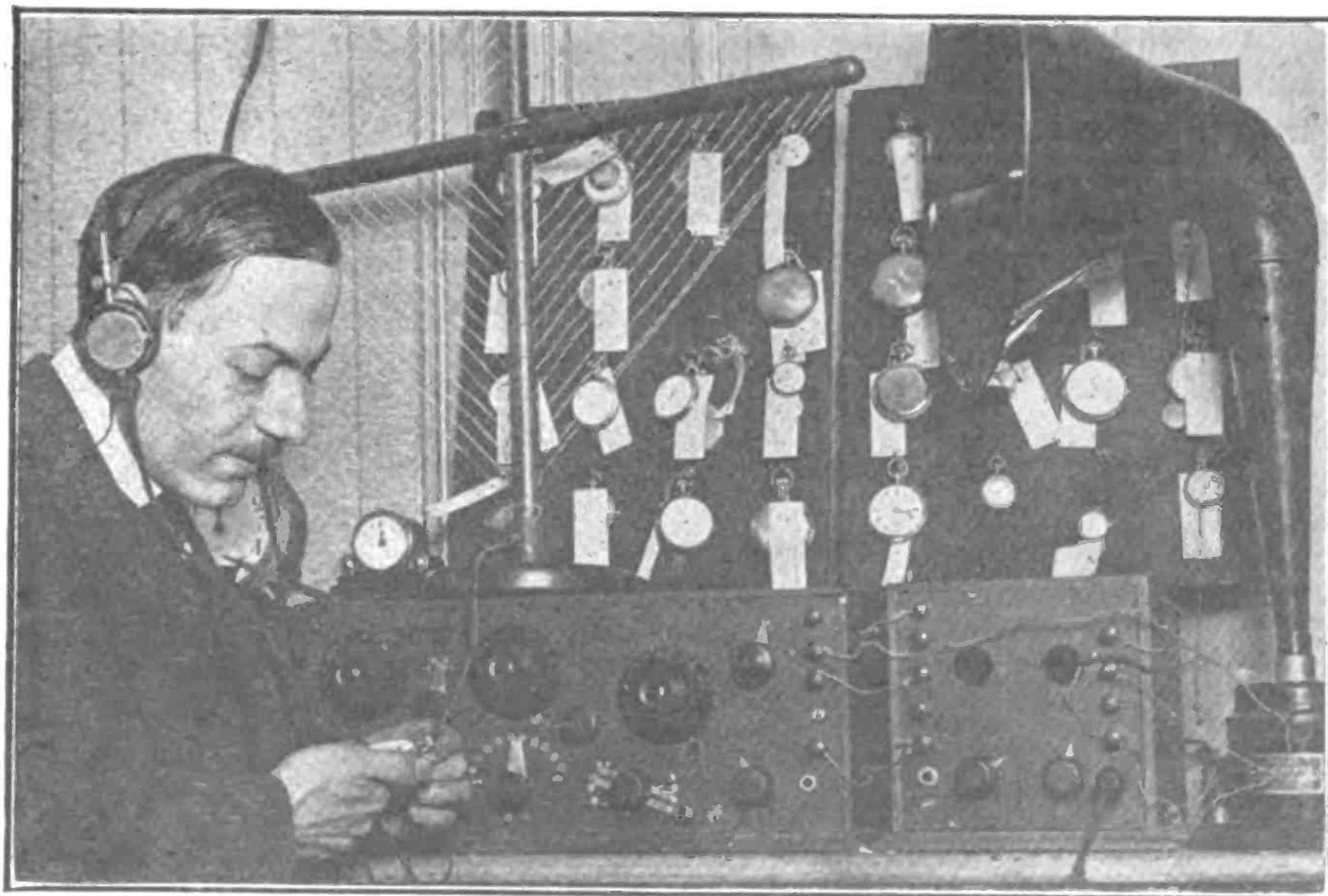
The first consideration in any electrical circuit is to cut all losses as low as possible without incurring too much expense. The average dividing line is generally the point at which scientific perfection and economical construction costs are just about balanced. In other words, if a certain additional improvement saves less than the cost to make the same then it is foolish to incorporate such an alteration. In most every radio circuit, variable condensers of the rotary plate, air insulated, type are employed. These condensers as generally constructed for radio work have a rather high loss of energy, owing to the fact that the air gap is relatively large. The amateur will find that, in the ordinary regenerative and non-regenerative circuit, it is far better to use a fixed mica condenser, shunted with a small three-plate air condenser as a vernier. By so doing, he will not only cut down the initial cost of installation, but will also raise the efficiency of his set, since a mica condenser is more nearly a perfect condenser. For most tuning circuits, a mica condenser of .0005 microfarads with a large three-plate vernier will be

about the right size. If .0005 mfd., is too much capacity another mica condenser of .00025 mfd., may be placed in series with it. The cost of such an arrangement is several dollars cheaper than a corresponding 23-plate variable condenser, yet it is more compact, sharper in tuning and, electrically, more efficient. It is even sometimes more economical to use the better scientific methods.

The resistance of a radio circuit is often the least consideration. To the average man, any kind of copper wire is good enough. Generally he will employ No. 22 or No. 24 S. C. C., or D. C. C., magnet wire for his coils and No. 18 wire for hooking-up the component parts of the set. While there is nothing radically wrong with the use of the latter, still for the coils it would be far better to employ a wire made up of the smallest size of S. C. C. magnet wire procurable, wrapped together in the fashion of the strands of a rope. The number of strands will naturally depend on the size of one strand. By so doing, the effective resistance of the circuit to radio and audio-frequency waves will be greatly cut down. A single wire containing the same amount of copper will offer the same resistance to direct current; but with respect to alternating current, its effective resistance will be much more owing to the tendency of high-frequency currents to crowd to the outer surface of the wire and not use the center. By using wires of smaller diameters in parallel and insulated from each other, this so-called skin effect can be reduced. The type of wire just described may be purchased at radio stores. Naturally, if the amateur so desires he can wind these strands if he has the time, but it is a slow and cumbersome job without the aid of the proper mechanical appliance.

Shielding is another point that has been seriously neglected on amateur apparatus—in many cases by the amateur building his own set; in others, by manufacturers of cheap outfits. Any cabinet-mounted set should first be shielded from the body capacity of the operator. This is accomplished by lining the interior of the cabinet with fine copper-screening. Most people think that after this has been done

Have You a "Radio-Regulated" Watch?



(C. Kadel & Herbert News Service)

The up-to-date jeweler regulates the watches left in his charge by radio, because the time of the day sent from Washington, over the ether waves, is so absolutely correct there cannot be the slightest variation of even a fraction of a second. The engraving shows Simon Rimler, a New York jeweler, and his radio time-receiver. Soon the boast of the man who knows that his watch is exactly on the second will be: "Mine is a radio-regulated watch."

Be Sure of Your Ground Connection

By Fred Chas. Ehlert

HERE are few beginners who realize sufficiently the prime importance of a good ground connection. To many, the principal part of the receiving station is the aerial; whereas, if the truth were known, the ground is every bit as vital to good clear and dependable reception as the aerial. Altogether too many amateurs spend hours in erecting an antenna, endeavoring to see that the wires do not touch other objects and inspecting joints to see that they are securely soldered. But the ground is left until the last and is then made by twisting a few turns of bare wire around the most convenient pipe. The accompanying simple sketch explains the essentials of a radio receiving-station.

The radio waves as they pass through the air and the ground are oscillating in character. This means that they first go from the transmitting aerial to the receiving aerial, then to ground and from there back to ground of transmitter. After the cycle is completed, they reverse their direction and travel down through the earth of the transmitting set over to the ground connection of the receiver, up the antenna, and back through the other to the transmitting antenna. This scheme of going first one way and then the other is made possible because of the condenser effect. It is obvious that the ground must play its part as satisfactorily as the aerial. Whatever applies to the aerial applies likewise to the ground.

(Continued from preceding page)
the screening is one hundred percent perfect. This is not the case, because we have only shielded our apparatus against external capacity effects and nothing at all has been done to cure the trouble originating from internal inductive interferences. Each component part of the set should in addition have a copper screen around it. The advantage of so doing cannot be fully appreciated in a small single-circuit receiver; but when the more complex circuits are used and the coils are mounted compactly, mutual inductive interference between coils is sure to occur and the only remedy is to shield each group of coils that are to be mutually coupled from the adjacent group. Care must be taken to see that none of the connecting wires become grounded on the shield; and all shields should be grounded—that is, connected electrically to the ground terminal of the outfit.

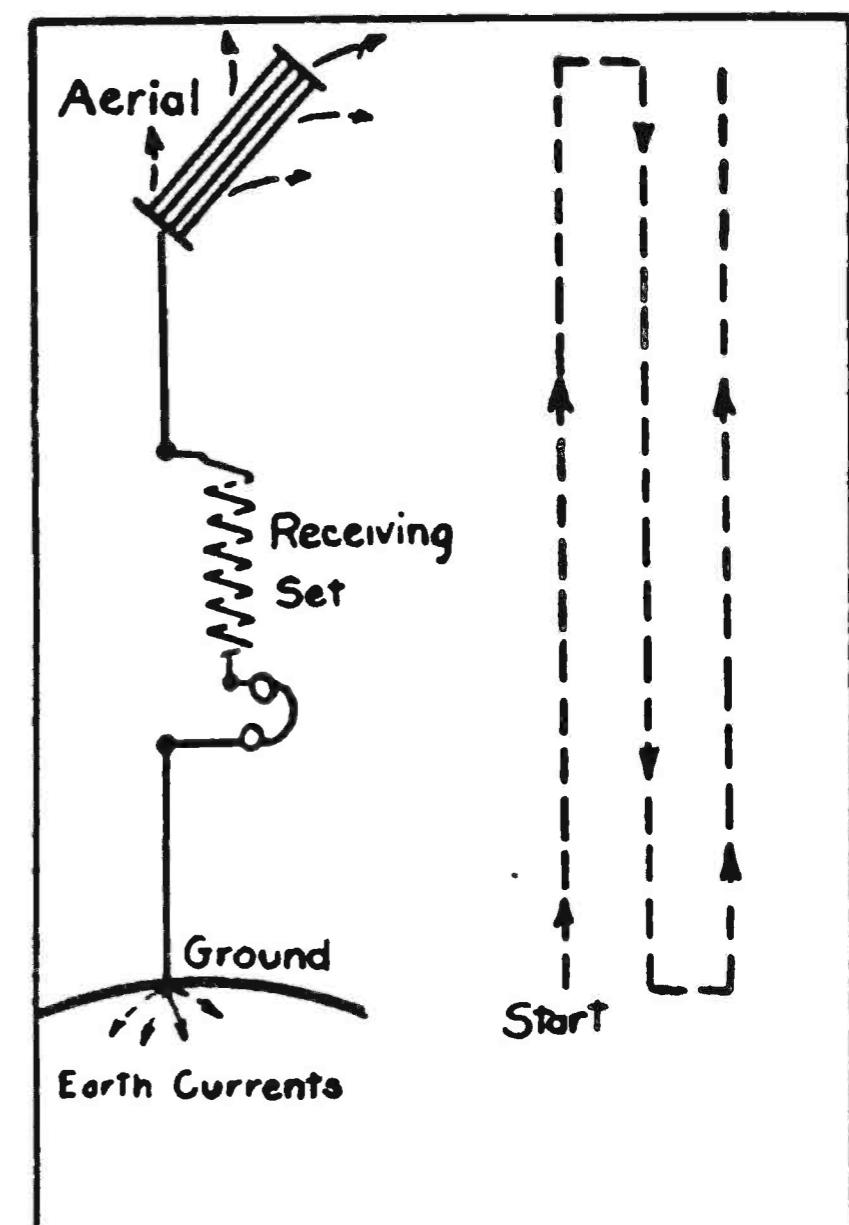
Another element that the amateur gives but little attention, is the selection of his vacuum tubes. The average man is of the general opinion that, for receiving, there are two types of tubes only: the UV 200 and UV 201. This is erroneous. There are other tubes for reception, although their characteristics are much different from those of the ordinary types. The power, or transmitting, tubes have proved very satisfactory in this connection. In fact, they give very much more volume per tube than the others. This is especially noticeable in the regenerative re-

ceiver. The marked advantage of power tubes for reception is the increase in volume and the absence of hissing, such as the soft or gaseous tube is accustomed to do when operating at its critical point. The objection to the use of the power tube as a detector and amplifier is the necessity of securing high-plate voltage. Small-size B batteries in series is not an altogether satisfactory method of obtaining the necessary potential, since the current drain on the same is quite heavy. Manufacturers of B batteries are providing a larger size battery for this purpose. No matter what type of tube is used, it is always satisfactory to use some form of vernier rheostat for precise adjustment of the filament current.

In choosing a circuit, always give a double circuit first preference over a single circuit because the former is better in its selectivity. After you have chosen your circuit and are ready to construct, bear in mind certain facts concerning the general improvement such as I have explained. It may cost a little more to put all these improvements on your receiver; but you will find that they are fully worth the money, time, and trouble. When purchasing or placing an audio or radio-frequency amplifying transformer in your receiver, be sure to see that it is shielded, especially if more than one stage of amplification is used. Buy a good standard make of transformer, because transformers may "howl," even if shielded, if their coupling is too critical.

For instance, the aerial is made up of copper wire of fairly good size. No. 14 will give good service. This is necessary to reduce the antenna resistance.

Similar precautions should be taken with the ground. It should be made to present as low a resistance as facilities permit, so the minute radio currents may pass down the antenna through the set and thence to ground without being forced to overcome obstacles. It is safe to say that most grounds could be improved, but this is not always advisable because of the ex-



Schematic diagram of a simple receiving station showing how the impulses—on the signals or sounds—pass from the earth to the antenna and then back to the earth.

pense involved. A heating system may or may not make a good ground. The chances are against it; but if the receiving set is connected with the earth by a connection on a radiator, the oscillating current must overcome the ohmic resistance at each pipe joint.

If the ground connection is made to a gas pipe, the beginner may find that he has no ground at all. For the protection of their patrons, gas companies, as a rule, insert a wood or composition pipe-insulator somewhere between the gas meter and the first burner. If the amateur discovers one of these insulators, he should not overcome the difficulty by bridging the insulator with a piece of heavy wire, as he is then nullifying the good work of the gas engineers. Instead, the ground wire should be carried beyond the meter before attaching to the pipe.

How Radio Was Installed in Our Home

By Hattie Briggs Hartman

A FEW days ago, a motor-car stopped in front of our home. On the seat, by the driver, was a curious box. Before we were able to decide what it was, an electrician from a neighboring town jumped from the car, dashed up to the porch and announced that he had come to install a radio for us! In spite of our protests, he signaled his helper, and after asking us if we minded having a wire fastened to a tree at one end of the grounds, proceeded to install his magic machine so quickly that it seemed easier to permit him to proceed than to try and curb his enthusiasm.

A wire about the size used for telephones was fastened to a maple tree about thirty feet from the house; the other end was fastened to the eaves on the second story. An insulator was arranged at each end of the wire, and another wire of the same size was dropped down over the edge of the porch. This wire was fastened to the machine.

The men then began to look for the best way to use the ground wire, and decided that it would be feasible to bring the water pipe in the kitchen into play for that purpose. A small wire was run from the

front porch, through the living room and dining room, over the tops of doors and wall molding, into the kitchen. There it was strung to the pipes which went up to the bath-room and so on down to the water pipe where it enters the kitchen from out-doors. The wire was no larger than medium-sized linen thread and was up so high that it did not interfere in any way with the occupancy of any of the rooms.

The electrician rushed back to the porch, placed the jar of flowers which stood upon the porch-table aside very hastily, and put the radio machine on the table, under the hanging wire which came from the upper porch. This was fastened to the rear of the box, and the ground-wire was also adjusted. A battery stood upon the floor near the table and as the wires from the machine were snapped into place, to connect the battery, lights were visible inside the box which constituted the machine. The machine was about 30 inches long and 14 x 14 inches the other way. At the lower right-hand corner there was a knob, which, when turned just right, brought sound to the proper

degree of clearness. The expert adjusted the horn in its proper place, manipulated the knob, turned two small dials which were at the side of the box and, in a moment, cried, "We have it!"

He listened a second longer, jerked the head-set from his ears, and turned with a satisfied expression as he looked at our bewildered faces. In the shortest space of time imaginable, a burst of music came to us from Washington, D. C., and we were listening to one of the most famous bands in the country. Our home is at least six hundred miles from Washington. It was the most entrancing music we had ever listened to and we all sat with taut nerves, wondering whether it was really true or if the "city man" were playing a trick on us.

It was rather a shock to us when the announcer gave the name of the band. We knew we had been listening to real music and not to a reproduction on a phonograph disc. Our visitor manipulated the discs a few seconds, and exclaimed: "Here is something!" At once we were listening to an orchestra in Pittsburgh. At the end of an overture familiar to every music lover, we were ready for anything which might come to us; for we knew that it was coming to us through space—over vast stretches of country. We called in the neighbors by telephone and, in a short time, the porch was filled with a wondering audience.

At ten o'clock we set clocks and watches by radio. A few moments after that, we were listening to a college glee-club in Wisconsin. We caught Newark, New Jersey, and heard a famous tenor. Later we heard a Shakespearian recitation. It was an adventurous evening; sitting on our front porch and hearing voices from the air!

Sunday afternoon a sermon came to us from Rochester, New York. We heard it as plainly as if we had occupied a front pew in the church. We were rather awe-stricken to hear the earnest message from the lips of a man of God so many miles away from us. The choir was wonderful. That same evening we had a treat in listening to a lecture on the City of Albany. The bed-time stories sent out from the broadcasting stations might have easily come from the lips of a mother in her own home while coaxing her babies to sleep.

Bulky Loose Coupler of 12 Years Ago and the Vario-Coupler of To-day

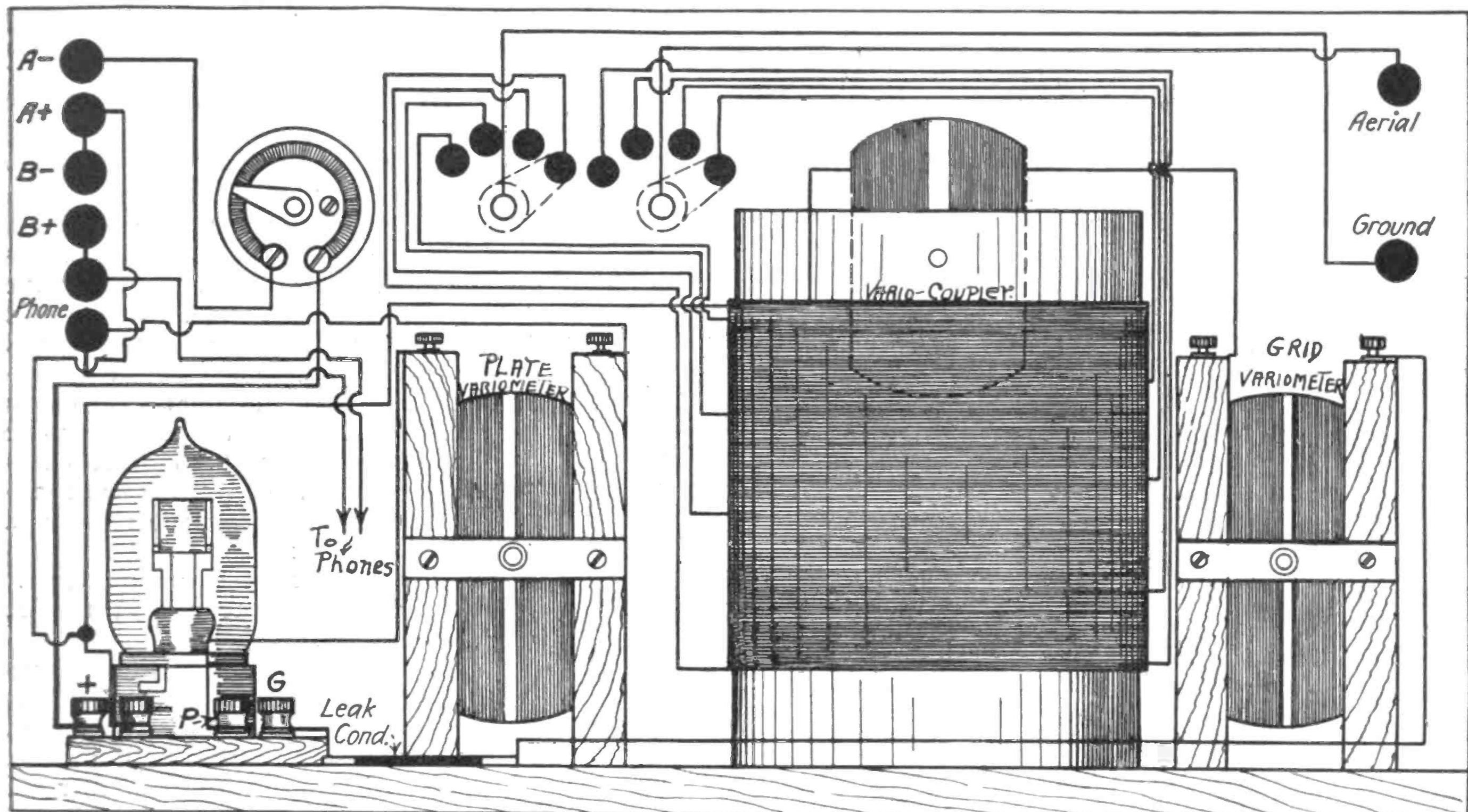


(C. Kadel & Herbert News Service)

Compactness is the watchword in radio as in all other up-to-date matters. Mr. F. Clinton (right) is holding one of the old, massive loose-couplers, popular twelve years ago. Mr. W. Guillet (left) is showing, in comparison, the modern vario-coupler which has replaced it.

The big instrument is on the way to the scrapheap.

One-Tube Regenerator Hook-up for Loud Sigs *By Harold Day*



Schematic diagram of a set capable of receiving signals of great volume. It is known as a two-variometer regenerative-type receiver, and it will pick up short wave-lengths of the broadcasting stations, continuous waves, interrupted continuous waves, and also damped waves. All of these may be received on this machine, owing to the feed-back in the plate circuit. Drawn by S. Newman.

WHAT should I do to my set that will enable me to hear the broadcasting stations with much more volume, or, as they say, louder signals?

This question I am asked most every day. Here is the answer:

There are many circuits which may be tried out, but most of us don't like to dabble with hook-ups with which we are not familiar. The above is a hook-up of a one-tube circuit which will surprise any operator who dabbles with it. There is nothing complex about it—it is a plain, simple hook-up. No trouble should be experienced with a good aerial and ground. The parts need-

ed for this set may be purchased at most any radio shop. They consist of two variometers, one vario-coupler, one tube socket and detector vacuum-tube, one vernier rheostat, two switch knobs and about a dozen contact points.

The wiring diagram is clearly shown. Care must be exercised to see that the proper connections are made. In the illustration, six connections, or binding posts, will be seen at the left. They are two for the A, or storage, battery; two for the B battery of 22 volts, and two for the connection with the telephones. In connecting up the B battery, one must be careful that

the plus side is connected to the plate side of the tube. If this connection is not correct, signals will not be heard.

There are two variometers, one in the grid circuit and the other in the plate circuit. The variometer in the plate circuit tends to tune in and feed back into the grid the added voltage of the plate circuit. The set then becomes what is called a regenerative set. As all regenerative sets generally are hard to tune, it will be noticed that this type receiver is very simple to operate. Due to the self-amplifying feature of the set, signals of satisfactory volume will be experienced.

Another Radio Myth Exploded *By C. D. Waggoner*

ANOTHER myth to be exploded. Many people have the idea that an antenna attracts lightning, that it is dangerous to have it erected near the house. When their attention is called to, possibly, the electric-light wires crossing the street and coming into the house overhead, or the telephone wire running in a long span from a distant pole, the answer often is, that these wires are insulated, and hence lightning will not strike them!

This would be laughable if it were not so often heard. Lightning, striking through thousands of feet of air, the best insulator there is, would not bother much about an eighth of an inch of rubber surrounding a wire. The fact is, that lightning is just as likely to strike the power wires as it is the antenna. Yet we do not often hear of accidents due to lightning coming into a house by the electric-light feed-power wires.

Do not understand me to say that lightning *will not* strike the antenna, or the power wires either. If lightning makes up its mind to strike in a given locality, it is going to strike, and it is as likely to hit the house or the wiring inside it as any other point. As a matter of fact, a well-installed antenna with correct grounding device—described later—actually helps to *prevent* the house from being struck, in that it "drains off" the charges.

Broadcasting Increases Five-Hundred Per cent in Past Year

Stations Now in Every State—Additions up to Going to Press

WASHINGTON, D. C.—There were 546 broadcasting stations in the country on October 5; one or more in every State of the union. These stations supply radio enthusiasts with all the entertainment, news, governmental data on weather, agriculture, health and other subjects they may listen to all day and far into the night. But the total of 546 stations is literally too great, and the stations are not well distributed, according to Department of Commerce officials. Most of the broadcasters are located in the East and Southeast, where time schedules must be employed to avoid interference. The public would be better served, it is held, if there were fewer stations and they were more widely distributed or located in proportion to areas and population. Five hundred and thirty-five stations are broadcasting on 360 meters, the balance on 400 meters.

Sifting of Stations Needed

"What is needed now," one official explained, "is a sifting out of the lesser stations, which are not rendering satisfactory service and popular entertainment, so that the radio public may listen in to good music, authoritative statistics, and current news." The creation by the department of the Class-B license, granted to only the superstations, will guarantee high-class entertainment and excellent radio service, since those stations are granted authority to use a special wave length of 400 meters. There are eleven of these stations located in seven States, making good programs, without mechanical music and cheaper forms of entertainment, available in practically all the eastern and some central States, where the fans listen in on 400 meters, watching local papers for the daily programs.

The 535 stations operating on 360 meters will have to look to their programs, as public opinion will indicate which shall continue in service for any length of time. The operating expense is so high that, eventually, only the good ones with sound backing will remain.

In September, 1921, the Department of Commerce licensed WBZ, WJZ, and KDPM, three Westinghouse Electric stations, to broadcast at Springfield, Massachusetts,

By Carl H. Butman

Newark, New Jersey, and Cleveland, Ohio. They are still active today. During the next two months, October and November, the Detroit News, WWJ, and the Westinghouse station at East Pittsburgh, KDKA, were licensed, and then, in December the fun began. Twenty-three stations were licensed, January saw the addition of only eight, in February there were 24 new licenses issued; 77 in March; 76 in April; and, in May, the peak of the radio curve was reached with 97. Since then the number of licenses issued has fallen off slowly each month as follows: June, 72; July, 76; August, 50. In September but 39 stations were granted licenses. This, a government radio inspector says, is due to the fact that the saturation point is reached. There are enough regular broadcasters. Many of the larger, mostly the older, stations are seeking Class-B licenses, but not many such licenses will be granted, due to the qualifications laid down and the program requirements.

Broadcasting Now in Every State

With the issuance of a license in Laramie, Wyoming, every State in the Union now has one more broadcasting stations. As has been the case since the industry got a fair start, California still leads, having to-day, 66 stations, Ohio follows with 35, and New York is third having 30. There were eleven licenses issued during the past week, as follows:

KFDA—Adler's Music Store, 5 watts, Baker, Oregon.

WMAV—Alabama Polytechnic Inst., 750 watts, Auburn, Alabama.

WRAU—Amarillo Daily News, 20 watts, Amarillo, Texas.

WMAU—Louisiana State Fair Association, 50 watts, Shreveport, La.

KFEC—Meier & Frank Co., 100 watts, Portland, Oregon.

WMAT—Paramount Radio Corp., 400 watts, Duluth, Minn.

WNAG—Rathert Radio & Elec. Co., 45 watts, Cresco, Iowa.

WMAQ—The Fair Corporation and The Chicago Daily News, 1,500 watts, Chicago.

KFBU—Bishop N. S. Thomas, 10 watts, Laramie, Wyoming.

WMAR—Waterloo Electric Supply Company, 50 watts, Waterloo, Iowa.

WQAQ—West Texas Radio Co., 60 watts, Abilene, Texas.

Few Broadcasters Have Quit

Of the 558 broadcasting stations licensed, twenty-six only have fallen by the wayside, so to speak, and some of those were deleted from the department's active list because of the amalgamations of two stations in the same district or the transfer of a station, in which cases the service did not stop. The broadcasting stations dropped or changed are as follows:

KOQ—Modesto Evening News.

KNR—The Beacon Light Co., Los Angeles.

WGNC—Orpheum Radio Stores Co.

WCAZ—Robert E. Compton, Quincy Whig Journal, Quincy, Ill.

WAAE—St. Louis Chamber of Commerce.

KZI—Irving S. Cooper, Los Angeles.

WGH—The Fair, Chicago.

WFAK—Domestic Electric Co., Brentwood, Mo.

WEAQ—Y. M. C. A., Berlin, N. H.

KGC—Electric Lighting Supply Co., Hollywood, Calif.

WAAT—Otto H. Taylor, Wichita, Kans.

WGM—Georgia Ry. & Power Co., Atlanta, Ga.

KSC—O. A. Hale & Co., San Jose, Calif.

WOC—Karlowa Radio Co., Rock Island, Ills.

KQL—Aron A. Klugs, Los Angeles.

KGB—Edwin L. Lordon, San Francisco.

WGH—Montgomery Light & Power Co., Montgomery, Ala.

WPD—Newspaper Printing Co., Pittsburgh.

KFU—The Precision Shop, Gridley, Calif.

WDW—Radio Construction & Electrical Co., Washington, D. C.

KDYY—Rocky Mountain Radio Corp., Denver, Colo.

WAAB—Times-Picayune Pub. Co., New Orleans.

WQB—C. D. Tuska Co., Hartford, Conn.

WAAF—Union Stock Yards & Transit Co., Chicago.

KOJ—University of Nevada.

Every Radio Set Has a Reliable Range

By John Kent

IT seems that the first question the average person asks when purchasing his collection of radio equipment concerns the relative range of such a set. The dealer eventually may answer this question by giving some attractive distance, or he may be more honest and tell his customer the limitations of the apparatus and the range that may be expected under varying conditions.

The range of any set, no matter how good or how poor, cannot be guaranteed. An estimate is no more than a guess. Two sets, identical in every respect, may have a widely different range when set up in different localities. You may have a set that gives very good results and you may move only a few blocks away and discover that your set is useless. This may be due to the fact that you were not able to erect as good an aerial in your new locality as in your old, or your ground may be not as good. Possibly there are high buildings about you that would cut off some of the waves.

Under given conditions, you can shortly ascertain the working or reliable range of your set. You will find that there are some stations that you can hear with, practically, the same intensity under almost all conditions. This distance you may call your "reliable range" although it may seem considerably lower than the range advertised by irresponsible dealers and manufacturers.

At times you may hear remarkable distances with satisfactory intensity, but these results cannot be depended on. Therefore, they must be classified under the variable range of your set.

There are many things which determine the range. Among them are time of day, atmospheric conditions, local conditions, circumjacent obstructions, topography,

(Continued from preceding page)

KYW—Westinghouse Electric & Manufacturing Co., Chicago.

Amateurs Still Increasing

The interest in radio has been demonstrated also by the applications for amateur transmitting stations, of which there were 16,467 on September 1, 1922. On June 30, 1921, there were but 10,809 amateurs authorized to send radio communications. Since that time, fifteen months ago, 5,658 more have been added to the ranks using 200 meters wave-length.

and the nature of the aerial and ground. Reception of transmission can seldom be carried on over as great distances during the daytime as during the night. This is due, possibly, to the ionization of the air particles by the sun's rays, causing a partial absorption of the waves. Buildings with steel frames also ab-

sorb waves. Topography has a decided effect on radio. Waves travel much more readily over water than over land. Metal and mineral deposits sometimes causes absorption losses.

The importance of a good aerial and ground cannot be overestimated, as this greatly affects the range of a set. You cannot expect to get the same result with an indoor loop as with one outdoors.

To Study Radiotelegraph Signals

(Reprinted by General Request)

INTERNATIONAL RADIOTELEGRAPHIC CONVENTION

LIST OF ABBREVIATIONS TO BE USED IN RADIO COMMUNICATION

ABBREVIATION	QUESTION	ANSWER OR NOTICE
PRB	Do you wish to communicate by means of the International Signal Code?	I wish to communicate by means of the International Signal Code.
QRA	What ship or coast station is that?	This is.....
QRB	What is your distance?	My distance is.....
QRC	What is your true bearing?	My true bearing is..... degrees.
QRD	Where are you bound for?	I am bound for.....
QRF	Where are you bound from?	I am bound from.....
QRG	What line do you belong to?	I belong to the..... Line.
QRH	What is your wave length in meters?	My wave length is..... meters.
QRI	How many words have you to send?	I have..... words to send.
QRK	How do you receive me?	I am receiving well.
QRL	Are you receiving badly? Shall I send 201.	I am receiving badly. Please send 201.
	• • • — —	• • • — —
	for adjustment!	for adjustment.
QRM	Are you being interfered with?	I am being interfered with.
QRN	Are the atmospherics strong?	Atmospherics are very strong.
QRO	Shall I increase power?	Increase power.
QRP	Shall I decrease power?	Decrease power.
QRQ	Shall I send faster?	Send faster.
QRS	Shall I send slower?	Send slower.
QRT	Shall I stop sending?	Stop sending.
QRU	Have you anything for me?	I have nothing for you.
QRV	Are you ready?	I am ready. All right now.
QRW	Are you busy?	I am busy (or: I am busy with.....). Please do not interfere.
	Stand by.	Stand by. I will call you when required.
QRX	Shall I stand by?	Your turn will be No.
QRY	When will be my turn?	Your signals are weak.
QRZ	Are my signals weak?	Your signals are strong.
QSA	Are my signals strong?	The tone is bad.
QSB	Is my tone bad?	The spark is bad.
QSC	Is my spark bad?	Your spacing is bad.
QSD	Is my spacing bad?	My time is.....
QSF	What is your time?	Transmission will be in alternate order or in series!
QSG	.....	Transmission will be in series of 3 messages.
QSH	.....	Transmission will be in series of 10 messages.
QSJ	What rate shall I collect for.....?	Collect
QSK	Is the last radiogram canceled?	The last radiogram is canceled.
QSL	Did you get my receipt?	Please acknowledge.
QSM	What is your true course?	My true course is..... degrees.
QSN	Are you in communication with land?	I am not in communication with land.
QSO	Are you in communication with any ship or station (or: with.....)?	I am in communication with..... (through.....).
QSP	Shall I inform..... that you are calling him?	Inform..... that I am calling him.
QSQ	Is..... calling me?	You are being called by.....
QSR	Will you forward the radiogram?	I will forward the radiogram.
QST	Have you received the general call?	General call to all stations.
QSU	Please call me when you have finished (or: at..... o'clock)?	Will call when I have finished.
QSV	Is public correspondence being handled?	Public correspondence is being handled.
QSW	Shall I increase my spark frequency?	Please do not interfere.
QSX	Shall I decrease my spark frequency?	Increase your spark frequency.
QSY	Shall I send on a wave length of..... meters?	Decrease your spark frequency.
QSZ	.....	Let us change to the wave length of..... meters.
QTA	.....	Send each word twice. I have difficulty in receiving you.
		Repeat the last radiogram.

*Public correspondence is any radio work, official or private, handled on commercial wave lengths.

When an abbreviation is followed by a mark of interrogation, it refers to the question indicated for that abbreviation.

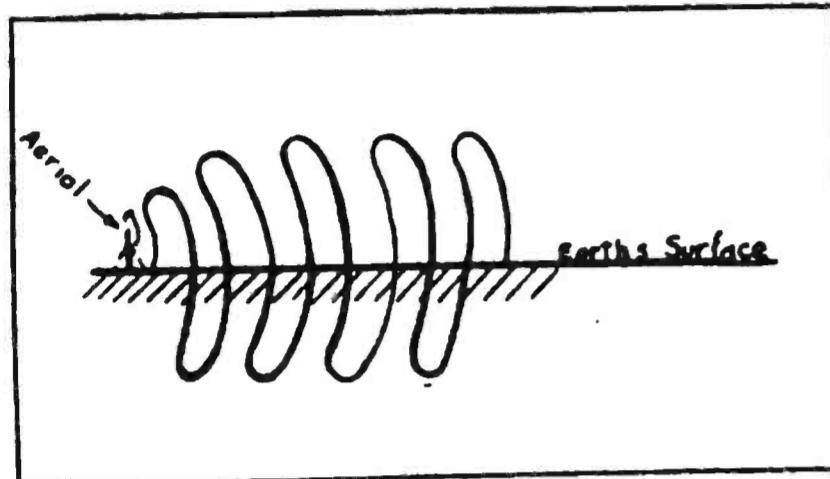
In order to pass the government examination, an amateur or expert must be familiar with the signals adopted by the International Radiotelegraphic Convention. This is an important question covering a license of communication.

The Radio Primer

Weekly A B C of Radio for the Beginner, in which Elementary Facts and Principles Are Fully and Tensely Explained

IF radio waves use the ether of the air, why is the earth necessary?

Electricity must have a positive and a negative pole before it can be made to travel from one point to another. Electric currents always travel from a positive pole to a negative pole. If a radio wave of only one pole—either positive or negative—were to be



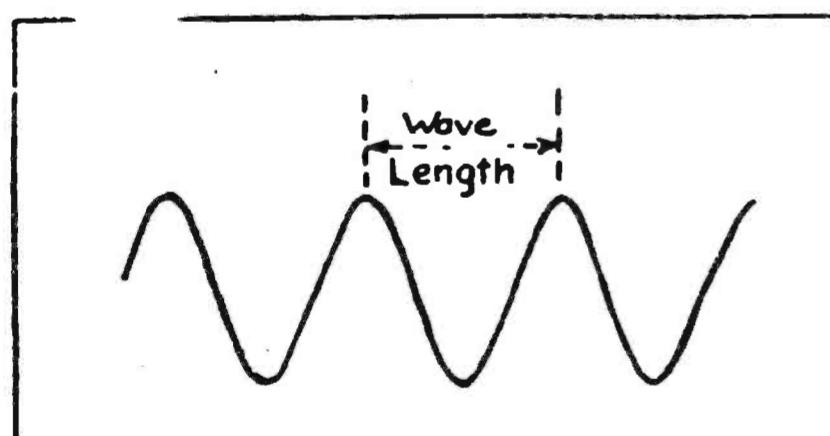
Showing the wave length measurement of a continuous wave.

sent to the top of the antenna, there would be no corresponding negative pole to attract it. Therefore, to secure a movement of the waves, the earth must be used as the other pole. The sketch shows how the wave travels. Part of the wave is above the earth's crust, the corresponding half is beneath it.

* * *

What is meant by the wave length?

A radio wave is supposed to have the shape shown in the illustration.



Hoops of the electrostatic component of an electric wave motion.

The length of the wave is figured as being the distance from the top (crest) of one wave to the top of the next wave.

* * *

Now that we know what wave lengths are, what have they to do with the sending and receiving of messages?

One may have his own idea; but the best answer to this question is the recent transatlantic achievement of the Amateur Radio Relay League by which it was proved that a short wave can travel great distances. Wave length does not have a bearing on sending distance, but the latter is not directly dependent on it. The large stations, such as the transatlantic, use the longer wave-lengths because they

By Lynn Brooks

are least affected by atmospheric disturbances and because it would be more difficult and more expensive to generate the high frequencies of short waves while using high power.

* * *

Transmitting stations use a number of wires, while for receiving only one wire is used. Why is this?

The problem at the sending station is to shoot out just as much electrical energy as can possibly be handled. The additional wires provide this capacity. At the receiving station it is not advisable to try and pick up a great amount of the transmitted energy. It is better to arrange an aerial in the most economical manner and then use the energy so as to get the most from it. The receiving station is also bothered with receiving impulses of interference either from other stations or from waves generated in the air by natural means. A multiwire aerial picks up more of both kinds of waves and makes it necessary to lose much of the signal energy in order to get rid of the interfering energy.

* * *

Why is it that radio signals do not continue traveling forever?

If the earth were perfectly flat and without trees, houses, or wires, and if the air did change its character by day and night, there is no reason why the waves should not continue indefinitely. But every tree is a miniature antenna which picks up some of the etherized energy, houses and wires afford an easy path into the earth, and the air is affected by the sun rays to such an extent that much of the initial energy of the waves is neutralized.

* * *

Then would a one-wire aerial be best for receiving purposes only?

This depends on the location and general make-up of the station. If the amateur is located over fifty miles from a broadcasting station, he should not attempt to receive with anything less than an outdoor aerial consisting of one copper or phosphor bronze wire, one hundred or more feet in length. If he is within fifty miles and intends to install an outfit with one or more stages of amplification, then an indoor aerial may be considered.

* * *

Why is one-wire considered sufficient for a receiving station?

For two reasons: wave length and static. Most amateurs are concerned

primarily in the broadcasts which are sent out, with a few exceptions, on 360-meter wave lengths. To receive these broadcasts most efficiently, the natural wave length of an aerial should not be over 360 meters. The second reason has to do with radio's greatest enemy—static. Therefore, the greater the number of wires making up the aerial, the greater the static charge on them. The greater the aerial the stronger the signals received, but not in the same proportion. For these reasons it is best to sacrifice some of the signal strength in order to reduce the intensity of static.

* * *

What is meant by the natural wave length of an aerial?

Every aerial has a wave length which it should pick up without any tuning whatsoever. This is the natural, or fundamental, wave of the aerial in actual use.

* * *

If the frequency of these waves are inaudible, how are they reduced?

After the detector has eliminated one-half of each wave, it has done all in its power—all that may be expected. The remainder of the action must be carried out by the telephone receivers. Every time an operator at the transmitting station presses the telegraph key, a series of little sparks jump a gap and travel to the antenna. To a listener it sounds as if the spark were a single one, but it is really made up of hundreds of little sparks that start without much power and gradually grow to their highest power then decrease to zero again. If we had a pen that could move fast enough it would trace a series of curves. For it is the sparks that leave the gap and pass up the aerial wire and down to the ground connection. In general, the spark impulse can be considered as having the same form until it strikes the receiving antenna, passes down through to the tuning coil, thence to the detector.

* * *

What happens to this wave when it meets the detector?

The detector refuses to pass the entire wave. It will, however, allow one-half to pass through.

* * *

Will these waves make sound in the phones?

No; because they are still traveling too frequently. They must be slowed down many more times before the little diaphragm in the phones will transmit their message to the ear.

The Theory of Radio Communication

How Radio Waves Are Generated so We Are Able to Hear Them

By Horace Beers

THE atmosphere is composed of atoms of oxygen, nitrogen, helium and other gases suspended in what the average individual terms "nothing, or a vacuum." "Nothing," however, is known to radio engineers as ether. Ether can be given a wave motion similar to that which occurs in water.

To transmit radio signals it is necessary, therefore, to first create waves in varying groups and of varying strength; second, to intercept them with apparatus capable of changing them to sound waves.

To create the waves it is necessary to have two 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 every second.

It is the common practice to use the ground for one surface and provide another surface by erecting a structure composed of one or more wires insulated from the earth and suspended many feet above it. Between these, by means of suitable transmitting equipment, we create an electrical pressure of from one to twenty thousand volts, which radiates in all directions.

These pressure waves are, however, only part of a radio wave. From any wire in which the current is flowing electro-magnetic and pressure electro-static waves are radiated.

The creation of these waves may be compared to the action of hurling a rock into a pool of water. The amperes of current put into the antenna correspond to the size of the rock, while the volts of electrical pressure are equivalent to the force with which the rock is hurled. The

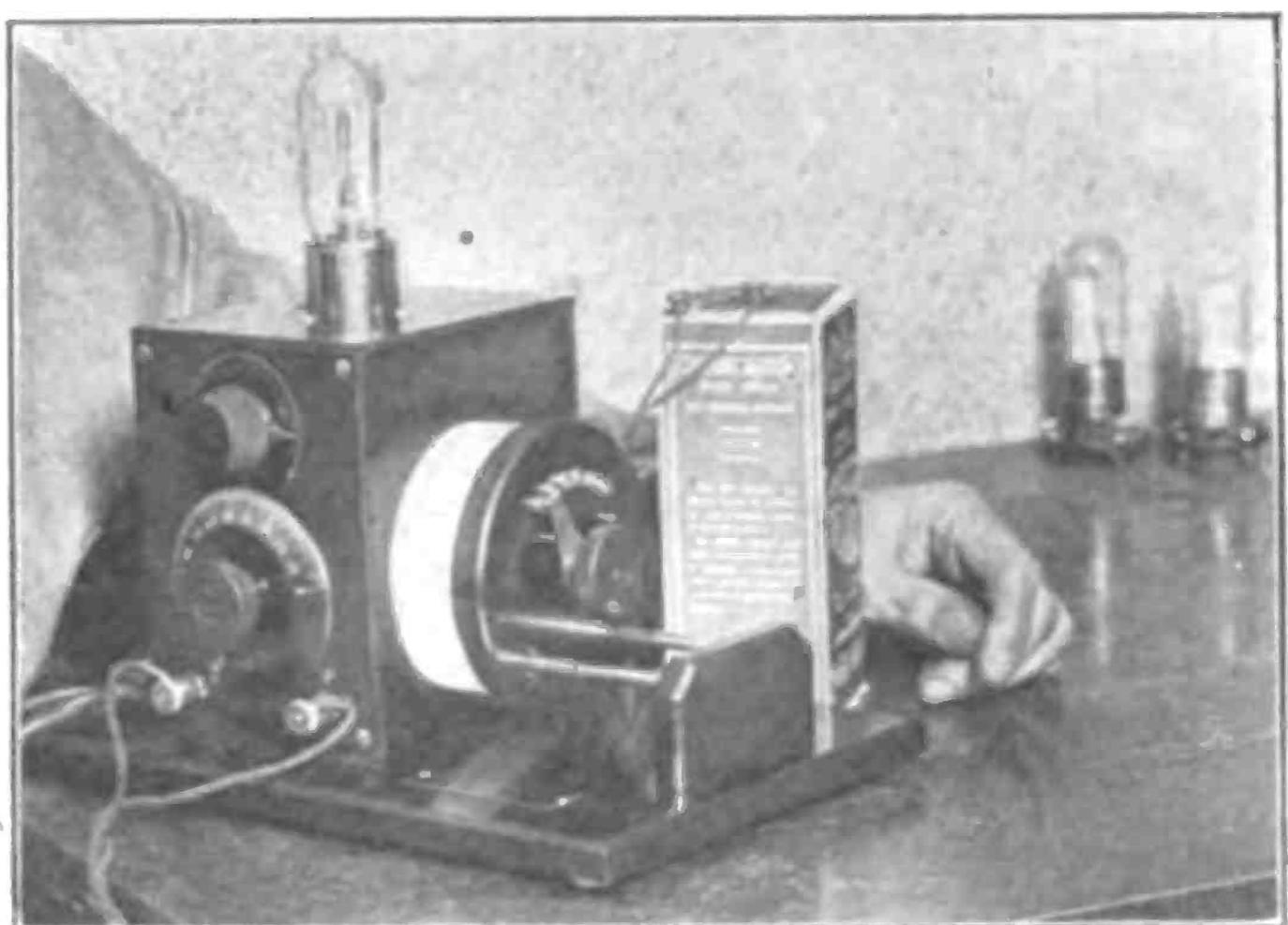
larger the rock and the greater the force behind it, the bigger the splash and consequent waves. The more amperes of current flowing in the antenna circuit and the greater the pressure (volts) between antennae and the ground, the stronger the waves radiated. These radio waves have similar characteristics to another class of waves—sound waves. When the note, C, is struck on a piano, the sound waves it produces vibrate 256 times per second, and either a C tuning-fork, or wire, tuned to C—or in its immediate vicinity—will vibrate 256 times also. Then the two wires are said to be in resonance. The waves radiated by a radio transmitter always produce a definite number every second. In order to hear a station, the receiving equipment must be put in resonance with the waves radiated by the transmitter. This operation is known as tuning.

Smallest Two-Stage Amplifier and a Dry-Cell Set



(C. Kadel & Herbert News Photos)

Two new and distinct apparatuses for radio use are shown in the above pictures. They were constructed by William A. Bruno. The first illustration is that of a two-stage amplifier which, Mr. Bruno claims, is the smallest of its type. Due to its small size it is obvious how such a small amplifier could be made to operate. Mr. Bruno, of the American Institute of Electrical Engineers, built this amplifier for the purpose of making it a "space saver." Two vacuum tubes, two transformers, and the rheostats are all confined in the cabinet. One control takes care of both tubes. Notwithstanding its small size it is so well designed that it eliminates all distortion. Another important feature of this amplifier is that it eliminates



(C. Kadel & Herbert News Photos)

the troublesome storage-battery for lighting the filaments and, in its place, uses the dry cell as its filament power. The smaller engraving at the right shows a set which also operates on the dry cell. Without a doubt, more people would own radio sets if the costly and bulky storage-battery could be eliminated. Of course, radio sets using the dry cell would become more popular. Concerts have been received from Detroit and Pittsburgh as well as other local stations, using but one dry cell. This receiver is a compact one of the coupler-type. There are simple circuits with a physical connection between the aerial-ground circuit and the closed circuit, known as the oscillating circuit, in which the detector is placed. Since this work is not concerned with the theories, or mathematics, of radio, but rather with the application of the results, many sets are used with the distinct aerial and ground, also oscillating circuits, with no physical connection between them. Transference of energy between the former and the latter is affected by means of two windings which are brought in to more or less close inductive relation. In one form, these windings are known as the loose coupler; in another, they form a vario-coupler. These coils are in this machine. The vacuum tube is mounted on top of the cabinet.

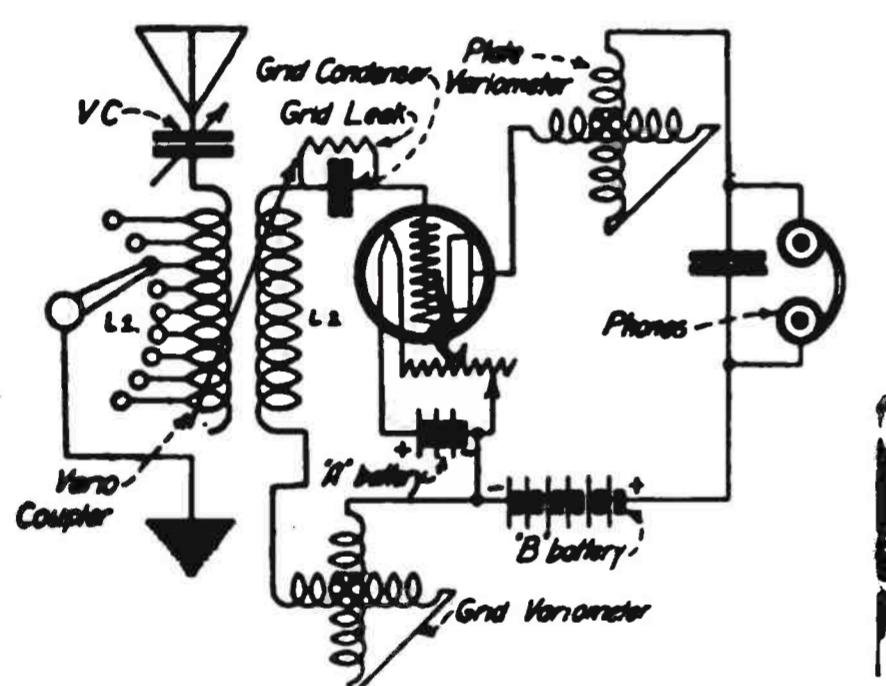
dry cell is along side to be used as fuel for filament lighting

Radio World's Page of Hook-ups

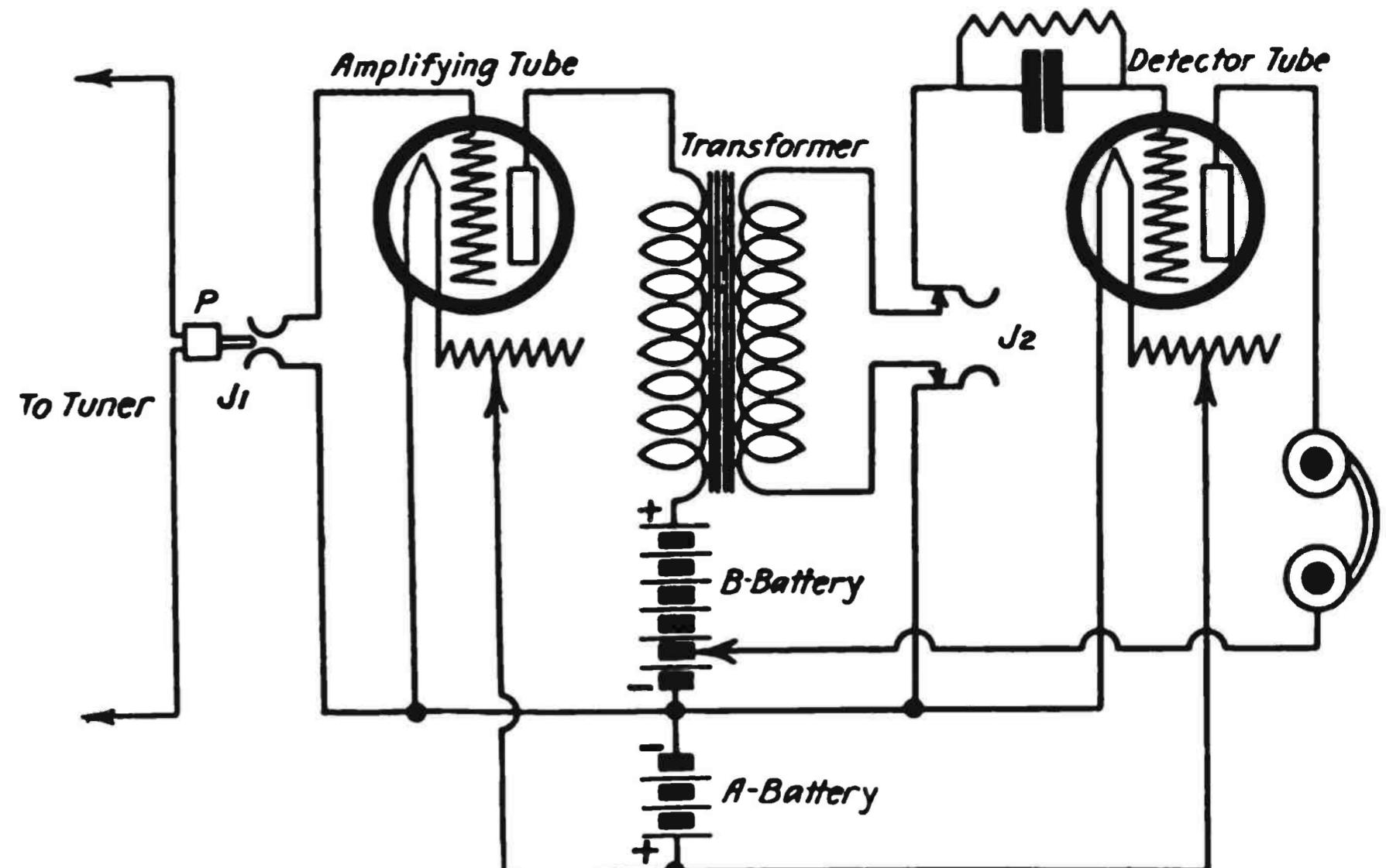


Realizing that the most interesting phase of radio with the average "fan" is the testing out of hook-ups, Radio World will publish, from time to time, a page of the most interesting diagrams, some of which have already appeared in its pages. An editor guides his policy by the wishes of his readers, and the number of requests for back numbers containing these diagrams indicates that there is an insistent demand for them.

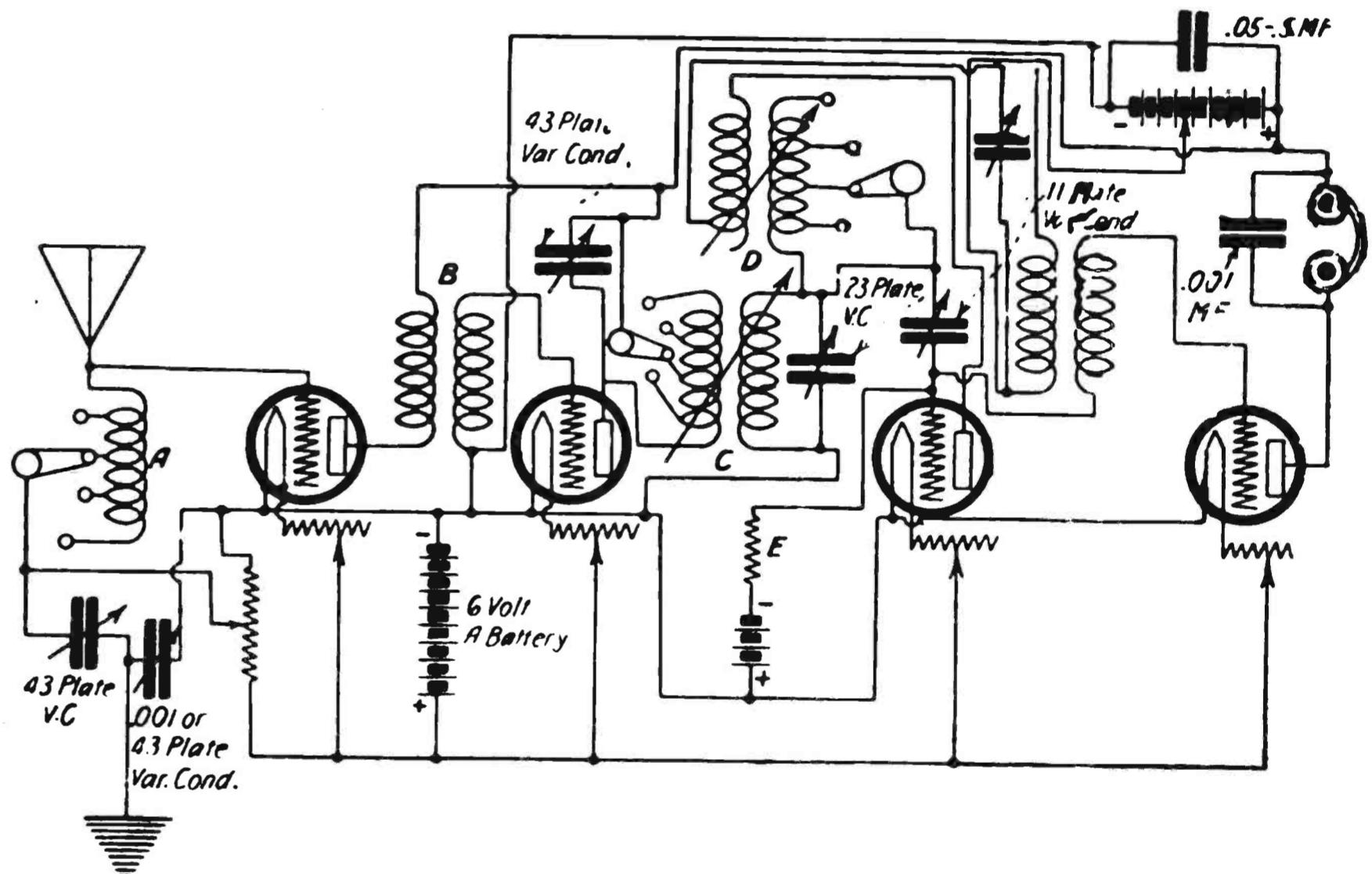
Schematic diagram of a crystal receiver, showing the loose coupler in a circuit. This method of coupling is termed inductive coupling. It has many advantages over the conductive or single circuit receiver. Suggested by Charles H. Plath. Drawn by S. Newman.



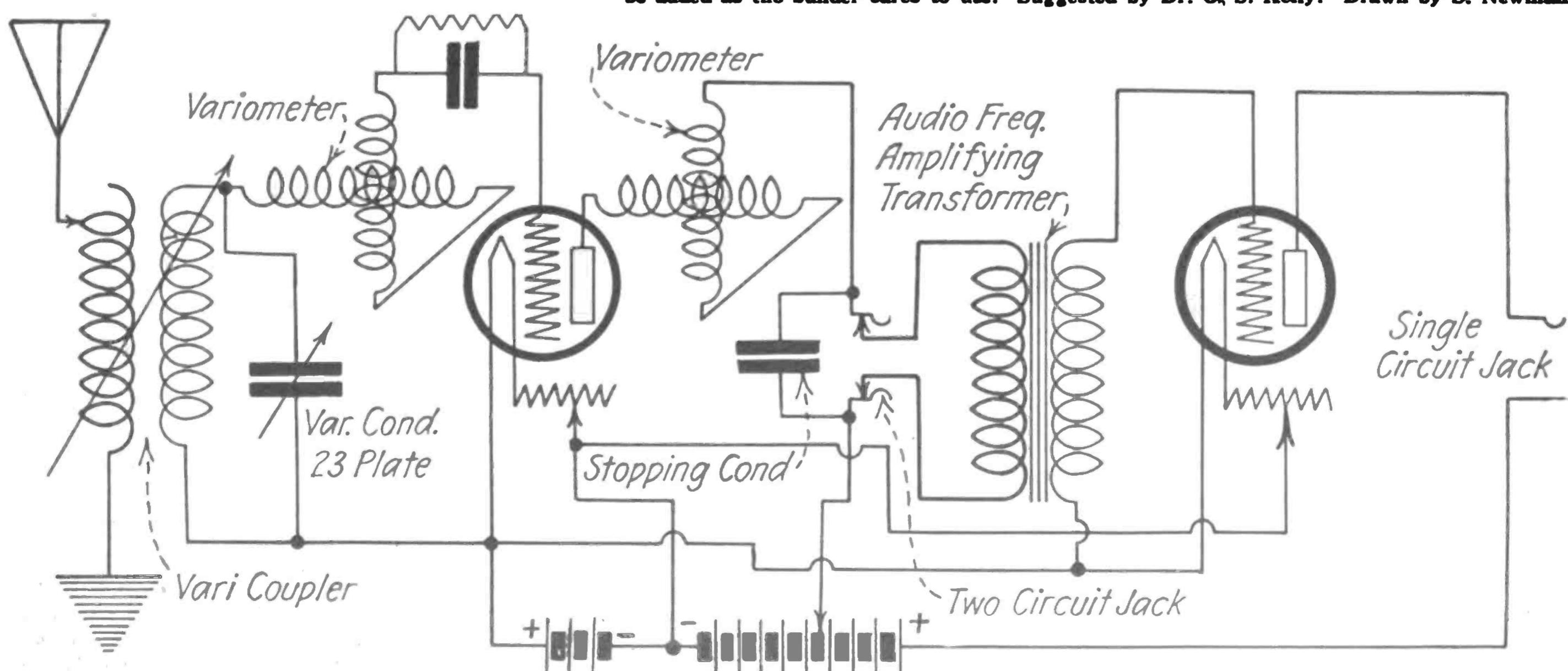
Schematic diagram of regenerative receiver of the variometer type. In the above hook-up it is easy to discern where the variometers are placed in the grid and plate circuits, respectively. Suggested by George W. May. Drawn by S. Newman.



Schematic diagram showing the amplifier and detector with radio-frequency transformer. P is a plug from the tuning circuit, J-1 the jack of the amplifier. Suggested by Harold S. Potter. Drawn by S. Newman.



Schematic diagram showing circuit employing radio-frequency. A is the loading coil. B, any standard radio-frequency transformer. C-D are variocouplers. E is a variable grid leak from $1\frac{1}{2}$ to 3 volt bias. As many stages of radio-frequency and audio-frequency may be added as the builder cares to use. Suggested by Dr. O. S. Kelly. Drawn by S. Newman.



Schematic diagram of a regenerative set, employing variometers as means of regeneration. Jacks are utilized in the stages, which enables the radio listener to use as many stages as he desires. The grid condenser shown in the circuit of the second stage may be left in or out. This is to be considered by experimentation. Suggested by Fred. Chas. Ehlert. Drawn by S. Newman.

Parts of a Radio Receiver

THE telephone receiver commonly employed in radio reception is known as the watch-case receiver.

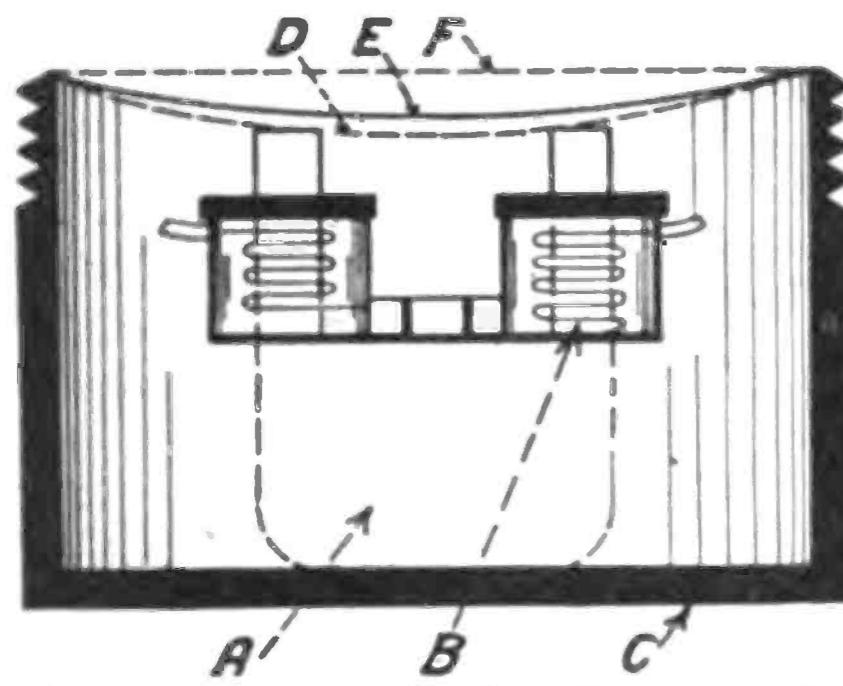
It consists essentially of a permanent magnet, A, with pole pieces having a north and south pole. On these poles are wound coils consisting of many turns of fine wire, as shown in B.

C is the case of the receiver which is made either of aluminum or bakelite.

E indicates when a current is sent through the coil of the magnet which takes this position.

F indicates when the current flows in the opposite direction, decreasing the total strength and allowing the diaphragm to spring away from the pole.

A D-C resistance of a receiver, as described, would be about 2200 ohms. Over 10,000 turns of fine



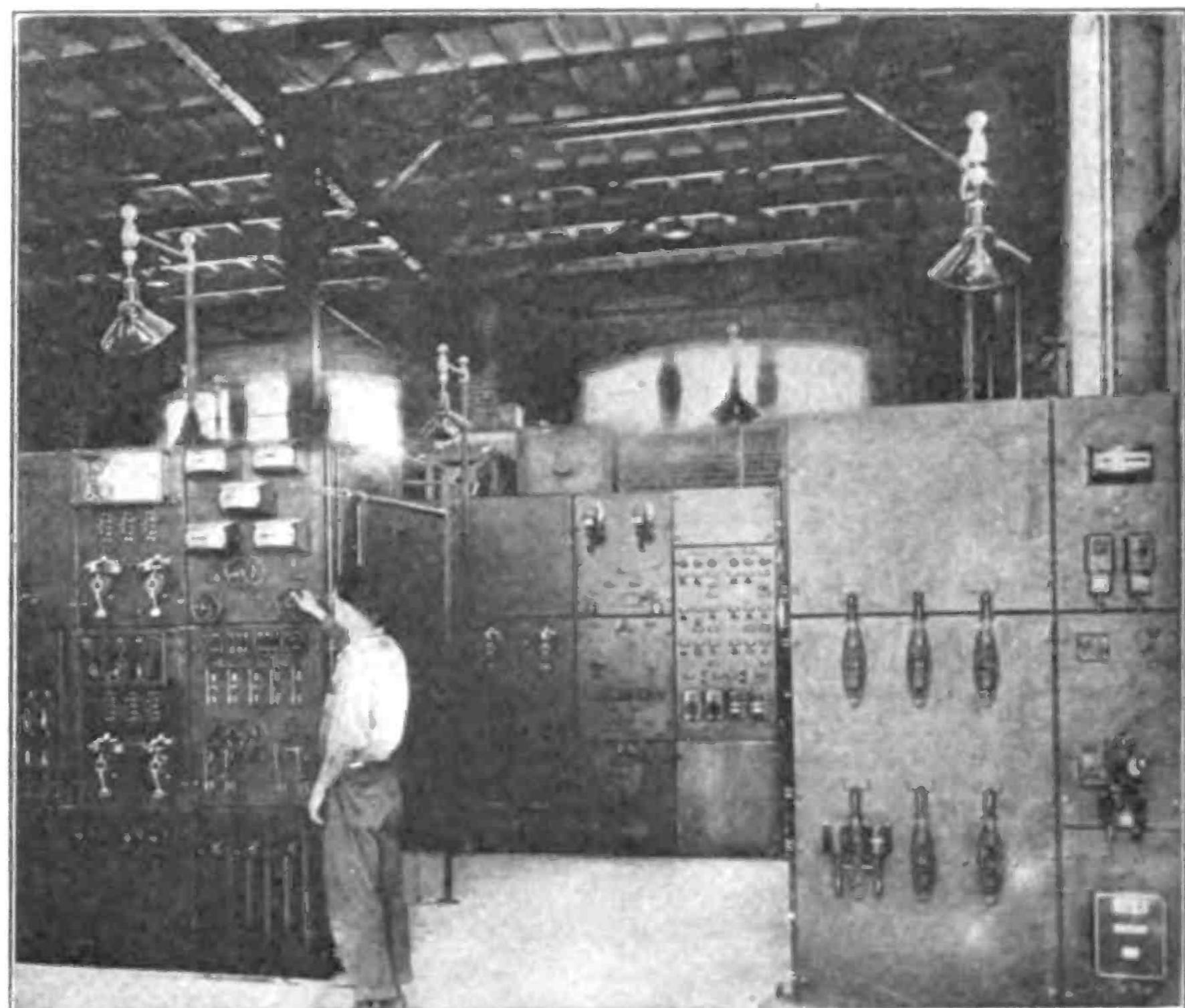
Schematic diagram showing the inside of a telephone receiver, and indicating how the telephone functions.

wire are employed to make up the winding. The impedance to an alternating current, of course, will be greater, depending on the frequency of the current and the effective resistance of the circuit. At 400 cycles, a certain receiver of this type had an impedance of 2900 ohms; at 800 cycles, an impedance of 3900 ohms; at 1000 cycles, an impedance of 4400 ohms. This is the type receiver used by most amateurs and radio operators, to-day, in radio reception, whether it be spark, undamped, or telephonic reception.

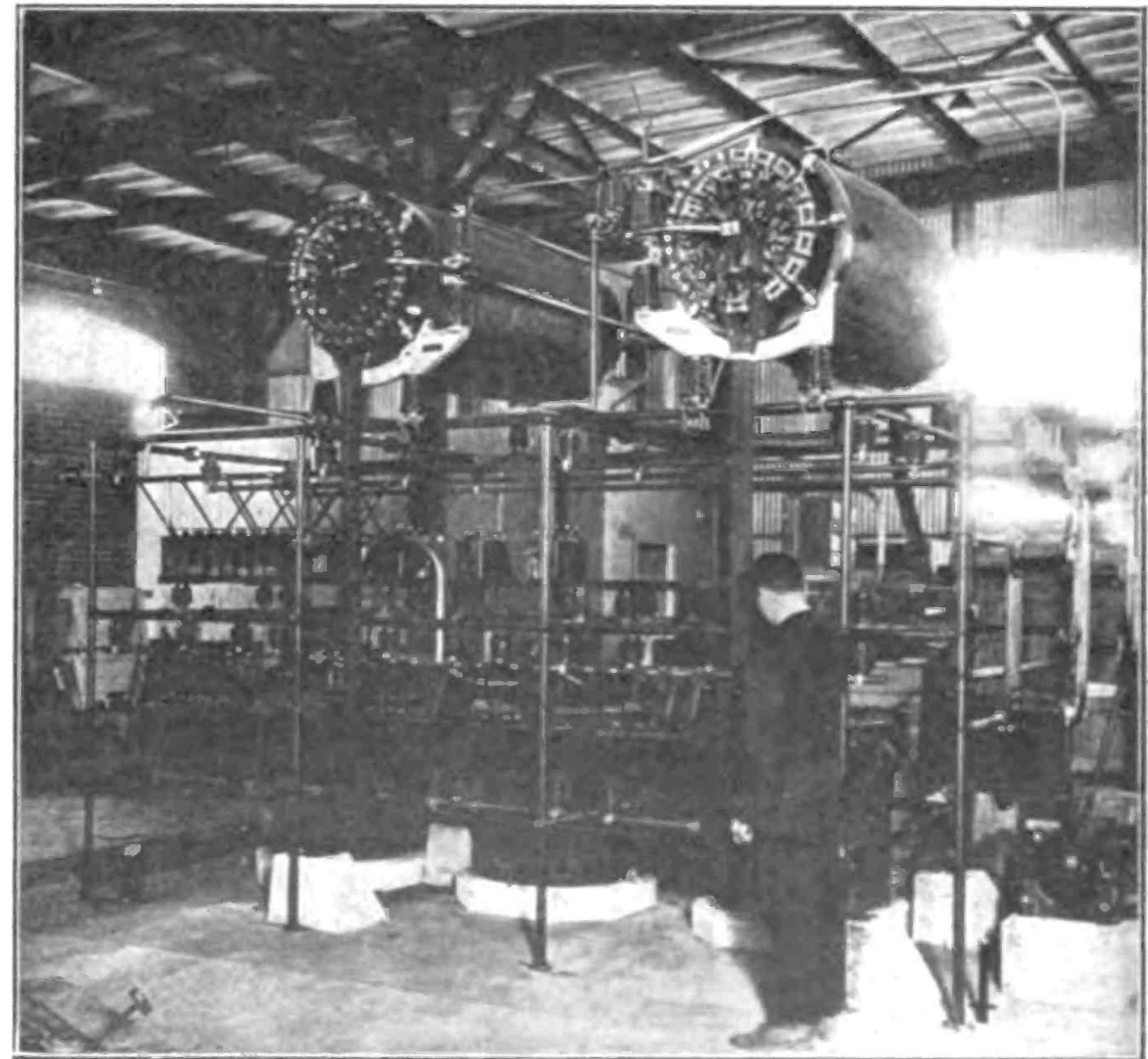
Army Tank Directed by Radio

ONE of the new Signal Corps radio sets designed for the whippet tanks of the United States Army was tested out last week, for the first time, at the annual field day of the Army Ordnance Association, Aberdeen, Maryland. The standard sets, designed for the master tanks of each group, include both telegraph and telephone apparatus. Under direction of the commanding officer, in the rear, the radio tank executed intricate orders immediately, charging and attacking enemy tanks directed solely from back of the lines. Observers report a most satisfactory test.

Radio Apparatus that Hurls Messages Across the Atlantic



(Both photographs, C. Central News Photo Service)



The huge radio stations used for transatlantic work are interesting studies. One of these stations, the Radio Central, located at Riverhead, Long Island, New York, some seventy-five miles east of the metropolis, contains some of the most valuable radio apparatus in the world. The actual operation of this station takes place in New York City. The operator located there sends the dots and dashes over land wires to Riverhead, from which place they are broadcast. In order that messages of such a nature may be sent, it is imperative that the proper power and circuits be employed. The illustration at the top shows the switchboards which control the power. The various meters and circuit breakers which appear on the front of the switchboard keep the operator informed in regard to the power being used and also the power being transmitted to the aerial. The illustration below shows the transformer rack.

Radiograms

Latest Important News of Radio Garnered from the World Over, and Reduced to Short Wave-Lengths for the Busy Reader.

THE management of the Hotel Belmont-Causarinas, Bermuda, proposes the installation of radiotelephony for the reception of the United States broadcasts. In view of its ideal situation on one of the highest points of the islands, the Hotel Belmont is particularly adapted to the installation of radio apparatus. The stretch of several hundred feet between the hotel proper and the Causarinas Annex provides an excellent span for an antenna.

* * *

The boys who attended after school Athletic Centre 62, New York City, received a pleasant surprise from their teachers. As school was dismissed, a large scoreboard was set up in the outer yard, and all the plays of the World Series were bulletined as fast as they were received by radio. About 1,000 boys watched the returns, and expressed delight at getting the scores and plays. The teachers felt that the plan was worth while, as it served to keep the boys out of the traffic-crowded streets where they would have gone for the results.

* * *

Formation of a broadcasting company by the six principal manufacturers of radio equipment in Great Britain is announced by Frank Gill, chief engineer of the International Western Electric Company and president-elect of the British Institution of Electrical Engineers. The company will have a capital of \$500,000. Present plans call for the erection of stations at London, Birmingham, Manchester, Newcastle, Cardiff, Glasgow, Plymouth and Aberdeen.

* * *

The authorities at Yale University announce that athletic events will be broadcast by radio. This means that anyone within a distance of fifty miles of New Haven, will be able to receive by radio, play-by-play, reports of all the university's athletic events. All that is necessary is a small Crystal radio-receiving outfit.

* * *

The Radio Corporation of America has purchased the White Oil Building at 64 to 68 Broad Street, New York City, which it now occupies as its headquarters. The White Oil Realty Company is the present owner of the property. The building is ten stories high and contains 43,000 square feet and is valued at close to \$1,000,000. It is within two blocks of the principal cable and telegraph forwarding offices and is near the Postal Telegraph Company's headquarters. The name of the building will probably be changed to "Radio House."

* * *

Southwest Texas is coming to the front in radio affairs, according to the various county fairs held recently. There have been more than a dozen county fairs so far where loud speaking radio apparatus carried music and world news to the rural residents for the first time from WJAE at San Antonio.

* * *

Lord Louis Mountbatten, cousin of the Prince of Wales, is visiting New York City with his bride, who was Edwina Ashley, heiress to the great fortune of her uncle, Sir Ernest Cassel, Lord Mountbatten, before the war a Battenberg Prince, is a lieutenant in the British Navy and he told reporters that he intended to specialize in naval radio.

* * *

A proposal of marriage by radio is reported by "The American," New York. John Smiley, a wealthy engineer, sent "Will you marry me?" by radio, across the Atlantic, to Miss Evelyn Greeley, moving-picture actress, who is touring Europe. However, it is reported, Miss Greeley will return soon to answer "Yes," in person.

* * *

Radio has played a real part in the "movies." Marshall Neilan uses it in his forthcoming picture, "Minnie." In this production, suggested by George Pattullo's story, "Her Man," radio is employed not only as a means of carrying the voice, but also as a medium of conveying power through the air and running distant automobiles, wind-machines, pumps, and other machinery.

* * *

The Hippodrome, New York, radio enthusiasts were particularly elated last week when Edward Demmler, master electrician of the playhouse, with a radio receiving set of his own development, was able to hear the attempts being made to relay a telephone message from San Francisco to London.

* * *

WJZ, at Newark, has invited the Republican and Democratic candidates for Governor and United States Senator in New York and New Jersey to speak from this station. The follow-

ing tentative schedule has been arranged: Governor, New York—Alfred E. Smith, Democrat, October 25; Governor Nathan L. Miller, Republican, November 1. Governor, New Jersey—Senator William N. Runyon, Republican, October 18; Judge George S. Silzer, Democrat, October 21. Senator, New York—Dr. Royal S. Copeland, Democrat, October 31; Senator William M. Calder, Republican, October 24. Senator, New Jersey—Senator Joseph E. Freylinghuysen, Republican, October 20; Governor Edward I. Edwards, Democrat, October 28.

* * *

H. V. Carpenter, dean of the State College of Washington, school of engineering, claims that ordinary telephone wires may be used instead of aerial antenna in radio reception without interruption of either service. Professor Carpenter claims that conversations over the ordinary telephone are not heard on the radio receiving set when telephone wires are used for antennae, nor are radio messages detected on the telephone, so there is no interference or interruption in the service of either. This is probably the biggest step yet taken in the popularizing of radio, for it eliminates the most difficult feature of the receiving station.

* * *

A radio-equipped flying boat broadcast news of the National Airplane Races, at Detroit, on October 9. Those who listened in on 507 meters received the first radio report of an aviation meet. A high-powered flying boat, christened the "Wilbur Wright" by Miss Katherine Wright, sister of the "fathers of flying," was equipped by the General Electric Company with a 50-watt radio transmitting set with a range of 100 miles. Reports from this aircraft were sent successfully on a wave length of 507 meters, a length that was not too great for even the small crystal sets to tune with. Soaring at a height of 3,000 feet, this flying boat observed the contestants in the various events and sent reports by radio on the progress of the races. Special receiving sets were placed about the flying field so that spectators were informed constantly regarding the position of the planes, even when they were out of sight.

* * *

A novel use of radio broadcasting has been announced by "Adventure." In a series of radio talks, L. Patrick Greene, of the editorial staff, will read the answers to a number of questions submitted by readers to the "Ask Adventure" experts, from WJZ, at Newark, twice a month. Nearly fifty experts having first-hand knowledge of the far corners of the earth have been answering readers by mail, but will now use radio. If "listeners in" wish to know about Alaska, India, Borneo, Central Africa or any other country, they are invited to mail their questions to the editor.

* * *

New York City becomes the world's radio central station, and the United States gains great commercial advantage by arrangements concluded by the Radio Corporation of America, which organization has placed under one head American, British, German, French and Argentine radio plants, representing an invested capital of \$170,000,000. Concluding stages of the negotiations, in progress several months, have been arrived at by radio between Edward J. Nally, president of the American corporation, who is in Paris; David Sarnoff, vice-president in New York City; Captain Powhatan Page, vice-president and general manager of the Pan-American Wireless Telegraph and Telephone Company of Buenos Ayres, who came here six weeks ago in furtherance of the plan, and officials of the British and German radio interests.

* * *

Chauncey Olcott, comedian, returned so seriously ill on board the "Orbita" of the Royal Mail Steam Packet Line that a radio message was sent to his physician, Dr. John A. Stillwell, of 9 East Forty-ninth street, New York, to meet the ship at the foot of Morton Street. The radio was sent from midocean.

* * *

A radio corporation, capitalized at 200,000,000 yen, approximately \$100,000,000, soon will be established in Japan, if plans formulated by the Nippon Yusen Kaisha, the Osaka Shosen Kaisha, the Industrial Bank, Suzuki & Co., Takata & Co., Mitsui & Co., Okura & Co., Fujita & Co., Viscount Shibusawa and other Japanese financiers receive the support of the government and are brought to completion. The plans have been laid before Premier Kato and have received this personal sanction. It is desired to form a company that will compare favorably with the Radio Corporation of America, the Marconi Company of Great Britain, and the Telegraph Company of France. The new company will concern itself principally with improving communication between Japan and America.

Radio and the Woman

*By
Crystal D. Tector*

ONE of the most attractive numbers sent out by WBZ, Springfield, Massachusetts, is the church service conducted by the Reverend Mrs. Frank L. Briggs. Mrs. Briggs is an ordained minister and served her husband's church as a regular pastor during his absence in France. Her choir is as follows: Hazel Rogers, soprano; Esther Carlson, soprano; Helen Page, alto; Dorris Armstrong, alto; Anna Carlson, accompanist. Truly, women and radio are doing their share to spread religion.

* * *

Another unusually interesting broadcast, in which a clever woman was the bright particular star, was the address of Miss Minnie Tracy, a prominent music teacher, who told of her work with the late Enrico Caruso. Miss Tracy was a personal friend of Caruso. Her address was replete with some wonderful reminiscences of the famous tenor.

* * *

A woman friend whose hobby is golf has become, also, an ardent radio fan—and all on account of a new golf ball with "a radio-active center." She tried to secure a brand of ball, she says, which she had used for years, and the radio ball she purchased because the dealer was out of her favorite kind. She says that this new ball, when hard hit, races yards farther than any other she has used.

* * *

The big alternator in the musical comedy, "Molly Darling," now playing at the Liberty Theatre, New York, really gave me a thrill. It was the first time that I had seen radio on the stage in a truly startling way. The management is wise in saving this piece of dramatic intensity until the last scene, for it is a very unusual climax to a snappy entertaining show.

* * *

Miss Jessie E. Koewing, recently gave a very interesting talk on radio before the Men's Club, Belleville, Ohio. Miss Koewing, as most every radio fan knows, is the announcer at WOR, Newark, New Jersey and by the bye, one of the best announcers in the country. After the talk, Miss Koewing was accosted by one of the members who told her that his seventeen-year-old daughter had made a wonderful receiving set entirely by herself. I wish that I might meet and interview this girl. Miss Koewing, in the rush of the night, did not get her name, but I would consider it an honor, indeed, if she would write me and tell me all about it.

* * *

WJZ recently broadcast a joint recital by Effie Briggs, soprano; Vincenzo Alpino, tenor, and Hazel Gruppee, pianist and accompanist. Miss Briggs began her musical career when only a child. Her dramatic ability, much in evidence in high-school entertain-

ments, suggested that some day she would develop into a celebrated Shakespearean exponent. She attracted the attention of several Bostonians who suggested that she prepare for a grand opera career. She has studied under Camille Bonsignora and other grand opera coaches. Miss Briggs is quite versatile, being able to sing in nine different languages. "Including radio?" asked Friend Husband when I told him of Miss Briggs's versatility.

* * *

They tell me at many of the New York department stores, that the most interested—and frequently, the most numerous—customers at the radio counters are the mothers whose young sons act as escort. Of course, it is the boys who actually want the sets, not the mothers! But it is mother who opens her purse to purchase the set, and, also, to ask innumerable questions in regard to the new magic. A well-informed radio clerk told me that several mothers told him that radio sets have tops and balls and other matters of boyish interest beat to a standstill as a suitable reward when Johnnie has been extra good.

* * *

One of my correspondents—a lady who lives in Portland, Oregon—writes to ask if I can tell her what Major Edwin H. Armstrong looks like. I saw the major when he demonstrated his superregenerative set at Columbia University. In fact, I stood very close to him. He is a very interesting personality. Unless you watch them very closely, his blue eyes do not flash. He has an open interesting face, an erect figure, rather prominent mouth, and is beginning to show traces of baldness. But what impressed me most was his modesty. I doubt if I ever met a more modest young man in all my life. Looking into his face, I would say that he becomes wonderfully animated when trying to solve some deep problem.

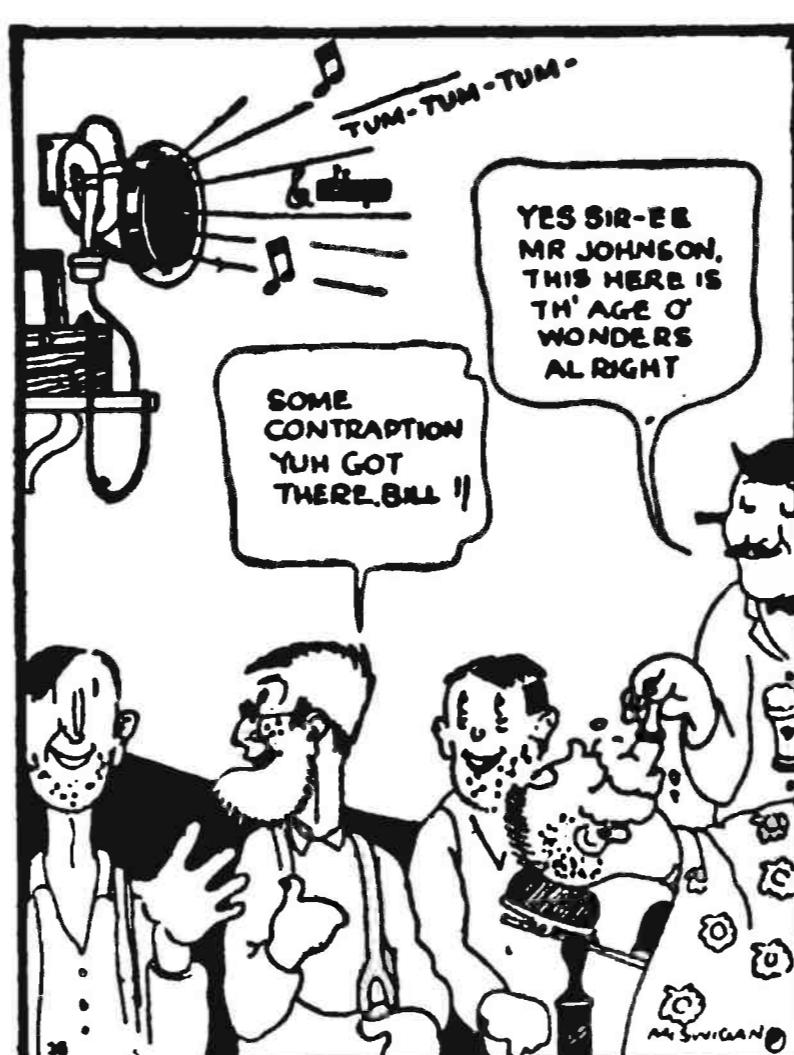
* * *

I have been asked by several women's radio clubs to speak before them this winter. Really this is impossible. In the first place, I am a poor speaker; in the second, I dislike traveling; in the third, I prefer to write what I have to say. I am always pleased to tell my sisters, through the courtesy of RADIO WORLD, anything they may want to know—and may I be so bold as to add that some of my pages in RADIO WORLD this fall and winter, will contain matter that may be read to advantage before any club. You will always find some practical informative paragraphs every week that will be worth saving and that, when put together, will comprise a better lecture than I could deliver from the platform. We women are not good talkers as a rule.

Broadcast Bill's Radiolays

(Copyright, 1922, Westinghouse Electric & Manufacturing Co.)

THEY say the village barber shop's the most convenient place to settle all the troubles that affect the human race. The one we've got in our town's no exception to the rule, so as a natural consequence, the shop is always full. Since Mister Barber first invented tools fer cuttin' hair, the way the government should run has been decided there. The last time I went down to get my curly locks cut short, I helped them settle questions that we thought of great import. But gosh! with nine ahead of me I had to wait so long I said right then the next time I'd amuse the waiting throng in manner more befitting, so to speak, an' up-to-date than tryin' by our talking to direct the affairs of state. An' while I like to keep our land from goin' to the dogs, I'd rather have 'em tell me what's the market price on hogs. So yesterday, when I went in to get my weekly shave, the barber shop executives had started in to rave about the possibility of war with China soon. I busted up the meetin' when I sez, "Let's have a tune." I'd brought my faithful radiophone along with me this time to listen to while waitin' 'stead of talk of war and crime. With set an' horn connected up, the music came in grand, an' while we



sat there waitin', Sousa's Military Band played four or five selections an' the time went by so fast that pretty soon I noticed I wuz "next" instead of last. We had some right nice music an' as I wuz gettin' shaved, they told us in the latest news how Wall Street had behaved. "Doc" Dalton runs this barber shop an' I've a dern good hunch, he's goin' to buy a radiophone an' then surprise the bunch.

He asked me all about my set, an' how much I had paid an' if I thought a set like mine would help bring in the trade. Well you know me—I sez, "Why sure, I'd get one right away. Just look at all the extras this here one brought in today."

WJZ to Broadcast Football Games from Field

WJZ, Newark, New Jersey, has, through the courtesy of the Western Union Telegraph Company, arranged to broadcast the more important football games that will be played at the Polo Grounds this fall. The radio audience will not only learn every play the moment it is made, but will also be able to hear the cheering and the songs of the college men.

The schedule is as follows:

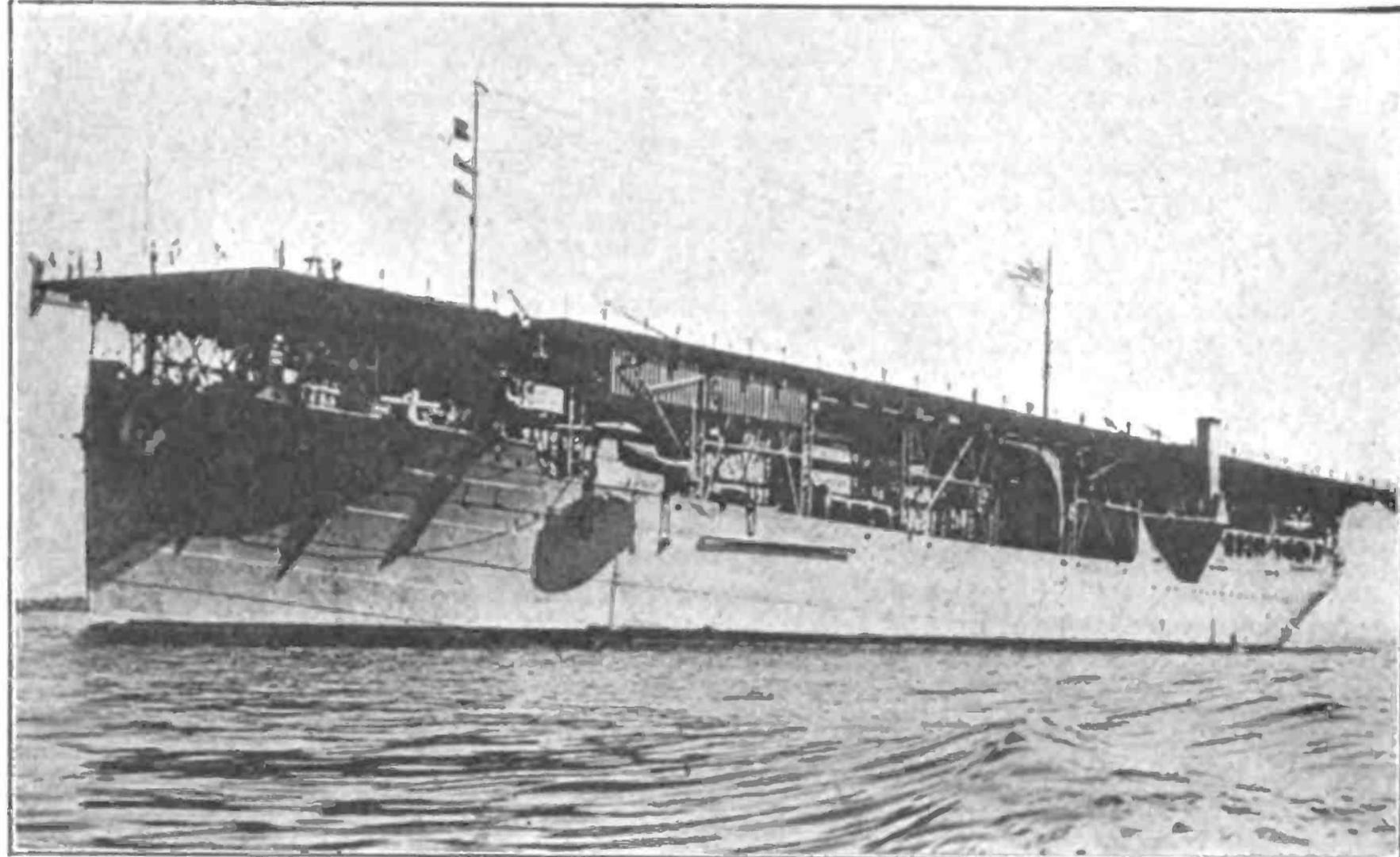
- October 21—Fordham University vs. Georgetown University, Polo Grounds.
- October 28—Syracuse University vs. Pennsylvania State College, Polo Grounds.
- November 4—Lafayette College vs. Washington and Jefferson College, Polo Grounds.
- November 11—Cornell University vs. Dartmouth College, Polo Grounds.
- November 18—Columbia University vs. Dartmouth College, Polo Grounds.
- November 25—Army and Navy, Philadelphia.
- November 30—University of Pittsburgh vs. Pennsylvania State College, Pittsburgh.

The Most Up-to-Date Things of the



(C. Kadel & Herbert News Service)

(Right) The U.S.S. "Langley," the first radio-airplane carrier to be commissioned in the United States Navy. She departed from the Norfolk Navy Yard recently for her first duty at sea. The "Langley" will operate in Chesapeake Bay and vicinity for the purpose of carrying on experimental work in connection with aircraft operations from the landing platform which covers the entire ship.



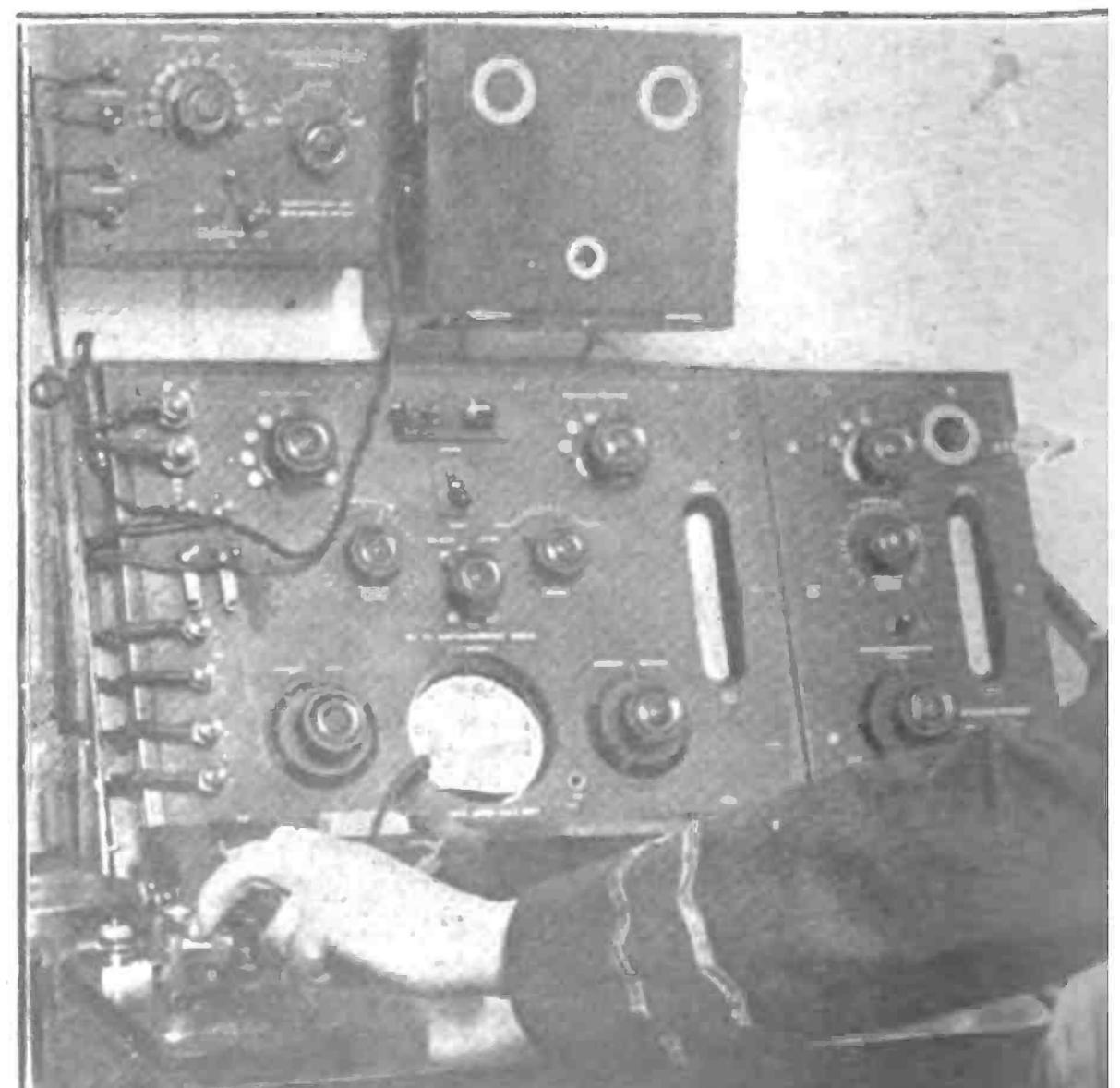
(C. Underwood & Underwood)



(C. Kadel & Herbert News Service)

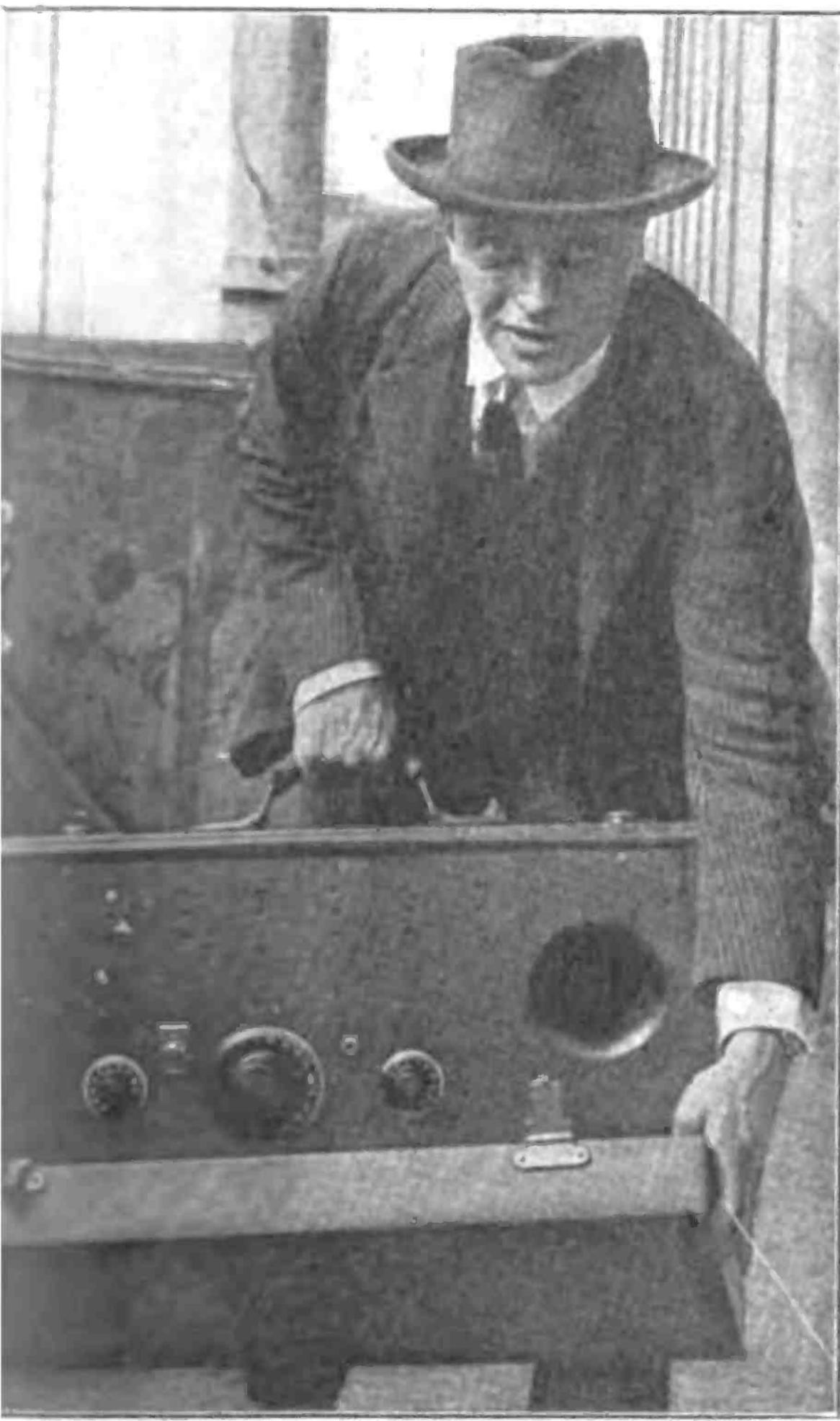
(Left) A. C. Brown, who, forty years ago, invented the street fire-alarm, has perfected a device which does away with the necessity of wires or even an aerial from the fire-box to the fire station. By means of Mr. Brown's apparatus a high-frequency current is conveyed along the public electric-light mains and collected by a simple apparatus at the fire station, which in its turn sounds the alarm, switches on the fire-station lights, and, what is more, writes on the tap machine the exact place of the fire. The object is for the device to be fitted to all hotels, theaters, and large premises. The call is made by pulling a lever in the usual way.

(Below) This is the new radio receiving set on board the ocean liner "Tuscania." It "hears" from a distance of 1,200 miles, and is one of the most modern of its kind. The chief operator, David E. Thompson, is photographed at the transmitter.



(C. Kadel & Herbert News Service)

The Past Week in Radio's Busy World

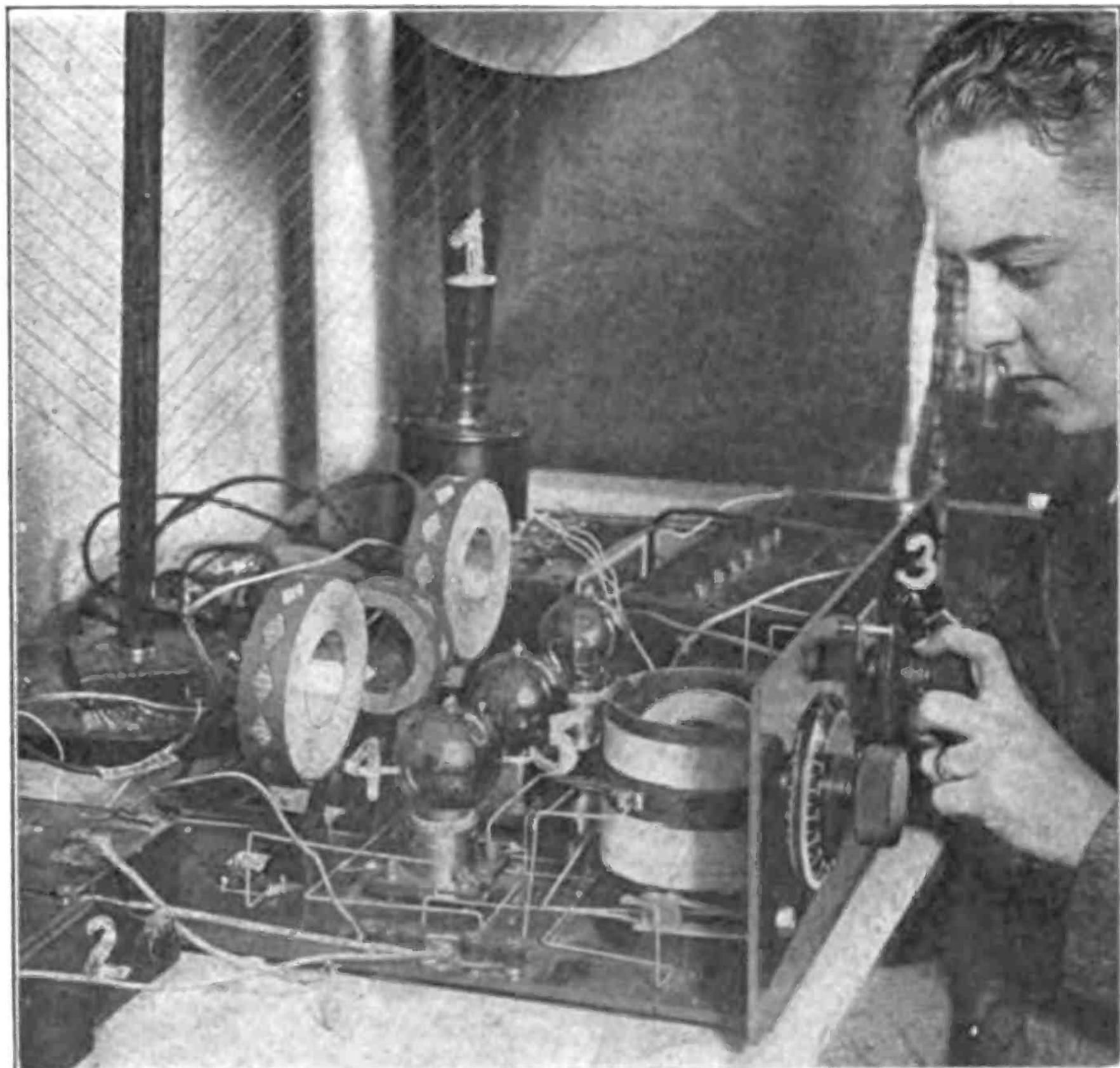


ns, N. Y.)

adio outfit snug in a valise. It will even receive while you the subway. And if you are riding in the subway and you music when a chap sits down beside you, and plants his feet, you never can tell what is in the valise. This radio can be carried in a valise, and if set to receive, even it will catch whatever part of the radio program is on. c, you'll hear it. It is a six-stage audio-frequency amplifier a complete sustained receiving apparatus, including loop series and loud speaker. It can be operated anywhere. Jerome J. Kimm is shown with the suitcase radio.



(Right) J. D. Freed, radiotrician, designing a radio-frequency receiving set to receive long distances on a loop aerial, and for modest distances without any aerial whatsoever. Mr. Freed (shown in the illustration at the right) claims that he has successfully overcome all the disadvantages of radio frequency circuits.



(C. Kadel & Herbert News Service)

The accompanying illustration shows Rutledge R. Mayo, of the United States Navy, with an Armstrong super-regenerative set which he built himself. By means of a special type vario-coupler, constructed by himself and placed in a certain position in the circuit, he successfully overcame the trouble that is being encountered by amateurs—that is tube noises and that whistle which is sometimes discouraging. In this three-tube circuit Mr. Mayo uses no rheostats or potentiometers. 1, represents the Western Electric loud-speaker; 2, the high-voltage B batteries necessary for the plates of the tubes; 3, the control or condenser dial; 4, the E tubes (Navy type) used throughout the circuit; 5, the vario-coupler. The loop aerial can be seen to the left on the table. Mr. Mayo has received WWJ, Detroit.



Advertising Rates, Display, \$5.00 per inch, \$150.00 per page

Radio Merchandising

Classified Quick-Action Advertising, 5 cents per word

Telephone Bryant 4796

Uncle Sam's Foreign Trade Expanding Because of Radio

UNCLE SAM'S "sell-it-by-air" plan, the first practical application of broadcasting to business, is developing rapidly, Department of Commerce officials state. Following the broadcasting from Boston, of the Department's trade opportunities throughout New England, many Chambers of Commerce throughout the country have asked for similar service for their broadcasting stations. Several of the high-powered radio stations have offered their services to the Bureau of Foreign and Domestic Commerce for this new and unique method of making public trade opportunities in foreign lands.

The broadcasting station of "The Times," Ridgewood, L. I., is anxious to serve the territory around New York City. Another station, WFO, Dayton, Ohio, desires to receive information on the world's markets that it may be broadcast to the exporters in the Miami Valley. A station at St. Louis has already begun to broadcast foreign trade notes, and the Chamber of Commerce, Buffalo, wants the data for use in two of its local stations.

It is understood that the Bureau of Foreign and Domestic Commerce, Washington, D. C., is considering sending weekly data to other localities where it will be distributed by radio to interested manufacturers and exporters.

American Industry Best in Two Years

A RECENT business survey issued by the Department of Commerce states that American industry is now marking up the best record for production since the period of depression two years ago. This increased output is general with all industries. Factory employment is larger than since December 31, 1920, which is held to be the chief factor in a more even distribution of buying power.

Service Above Profits

THE business world is going to yield more happiness to those who are engaged in conducting business, when more business men develop the true scientific attitude of mind. Once upon a time an investigator used to try to keep the results of his studies to himself so that he personally might profit by them. Nowadays research specialists give freely to the world whatever they have discovered that is worth while. They have placed service to humanity above personal profit. Some may consider it too idealistic to be carried through in the world of business, but the curious thing is that the business men who are practising this high idealism are making greater profits than they ever could by using a more selfish system.—Tom Dreier, in "Forbes Magazine."

Measuring Shadows

Time was when men climbed the pyramids with great effort and sweating (for it is hellish hot in Egypt) and then after all this effort, often inaccurately, measured their height.

One day an old, lame man with a large staff hobbled out on the desert, stuck his support in the sand and measured its shadow. Then he measured the shadow of the pyramids and knew exactly their height.

Some men measure the value of advertising by the loss of much money, sweat and toil. They pick out the oldest radio publication, or the one that claims the largest circulation, or the one that jams the largest number of advertisements together, while all the advertiser is really seeking in spending his good money is to get consumer results: Orders, cash returns.

Let us tell you how to simply measure the value of your radio advertising dollar by the shadow method; that is, the result your competitor is getting from his advertising in RADIO WORLD—the results others have had from keyed advertisements where the same copy has been tested in each of the radio publications.

This shadow measurement will give you an accurate measurement in advance of just the kind of results you may expect from RADIO WORLD. We KNOW and you can know it is the best buy in the radio advertising field.

Write today to

RADIO WORLD
the only national illustrated weekly
1493 Broadway New York, N. Y.

Heard at the Radio Counter

A Conversation Between Customer and Radio Clerk

"I WOULD like to know the difference between a regenerative receiver and a non-regenerative?"

"Well—you see, with the regenerative receiver, the plate circuit is broken and a coil, known as a tickler, is inserted in series with the plate and telephone circuit. This is not in the non-regenerative."

"Then, please tell me, what is its advantage?"

"It makes possible the reception of C-W, or continuous waves, which cannot be received on the plain nonregenerative set. It also amplifies the signal immensely."

"Well, I have a vario-coupler of the nonregenerative set, and would like to make mine regenerative. What must I do? What do I need?"

"You need a vario-meter placed in the plate circuit. This will do the trick. You also need another vario-meter in the grid circuit. This will make your set regenerative."

"Will this work also with the crystal-type receiver?"

"No. This will only work with the vacuum tube."

"Well, if I use a vario-meter, what will the wave lengths be?"

"The wave lengths of this vario-meter receiver should range between two hundred and six hundred meters."

"Let me see. I guess I'll take the vario-meter and try it out."

"All right—sir. Let me know the results."

(To be continued)

New Firms and Corporations

(The firms and corporations mentioned in these columns can be reached by communicating with the attorneys, whose addresses are given whenever possible.)

S O S Radio Corp., Rochester, radio equipment, \$25,000; H. H. Servis, R. L. Curtis, (Attorney, J. J. McInerney, Rochester, N. Y.)

Radio Products Broadcast Advertising Corp., Wilmington, Del., manufacture, \$500,000. (American Guaranty and Trust Co.)

Cairns Radio Mfg. Co., Manhattan, 250 shares preferred stock, \$100 each; 130 common, no par value; active capital, \$10,000; T. Cairns, C. Edouard, J. Eaton. (Attorney, G. L. Hess, 469 Fifth Av., N. Y.)

Clinchfield Mica Corp., Wilmington, Del., \$1,000,000. (Corporation Trust Co. of America.)

Uruguayan Telephone Co., telegraph and telephone wireless company in Uruguay and elsewhere, \$1,000,000; Fitz J. Porter, Otis T. Bradley, Leighton H. Coleman, New York. (Corporation Trust Co. of America.)

Capital Increases

Radio Craft Co., Brooklyn, \$10,000 to \$800,000. Home Radio Corporation, \$10,000 to \$35,000.

Coming Events

The editors of RADIO WORLD will gladly publish news items of all contemplated radio shows and expositions. Keep us posted by mailing full information.

CHICAGO RADIO SHOW, Coliseum, Chicago, Ill., October 4 to 22. U. J. Hermann, managing director, 549 McCormick Building.

SECOND NATIONAL RADIO EXPOSITION, direction International Trade Exposition Co., Chicago, January 13 to 20, inclusive, 1923. George A. King, director of publicity, 417 South Dearborn Street, Chicago, Ill.

PERMANENT RADIO FAIR FOR BUYERS, Hotel Imperial, New York City. Open from September, 1922, to May, 1923.

AMERICAN RADIO EXPOSITION, Grand Central Palace, New York City, December 21 to 31, Company, Fisk Building, New York, N. Y.

TRI-STATE TOBACCO GROWERS' RADIO SHOW, Covington, Ohio, October 21 to 28, inclusive.

INTERNATIONAL RADIO SHOW, Madison Square Garden, New York City, November 20 to 25, inclusive. E. C. Buchignani, director of publicity.

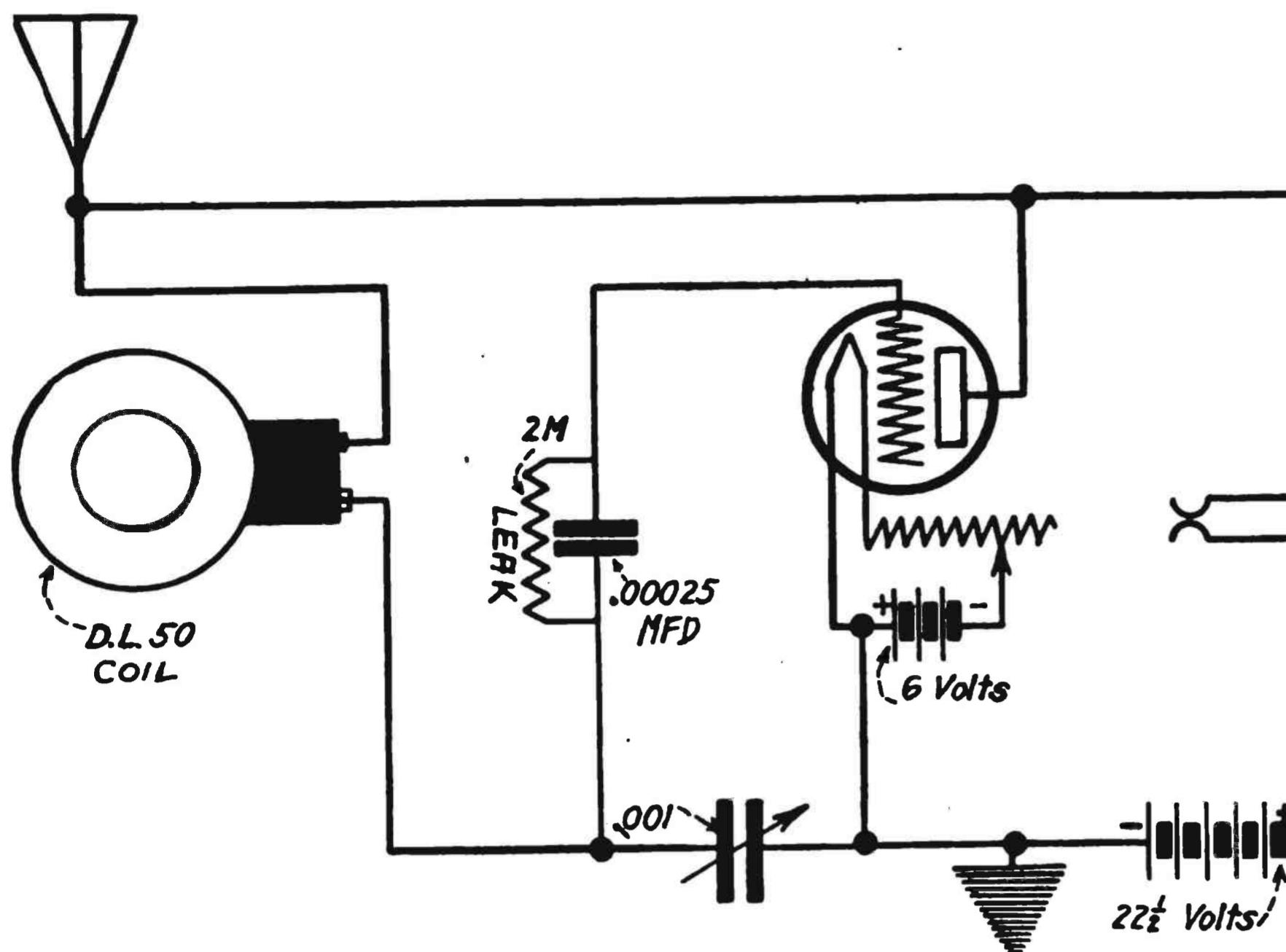
SOUTHEASTERN RADIO EXPOSITION, Auditorium Armory, Atlanta, Georgia, December 4 to 9, inclusive.

Jump in Radio Sales

ALFRED FANTL, financial writer for "The Tribune," New York, one of the close observers of commercial conditions in the United States, published the following in his department last week:

A sudden and large jump in radio sales occurred during the week, when many department stores sold as much in a single day as they had previously disposed of in the course of one week. The impetus, while in part due to fall revival of interest in radio, owes much of its suddenness to the enterprise of the press in reporting the world series via the air—a demonstration of radio's practical utility which could have no more susceptible portion of the public for the making of an impression at once instant and profound.

New Circuit for Experimenters



The above schematic diagram is a hook-up of a single-coil receiver. It is the work of Mr. W. Miller, Southern Methodist University, Dallas, Texas. The amateur who delights in experimenting should give this circuit a trial. A duo-lateral coil, No. 50, is inserted between the aerial and the ground. The grid condenser and leak are connected in the circuit of the coil and ground. The plate circuit is brought to one side of the aerial and, also, to one side of the telephone jack. Careful adjustment of the set is necessary. Radio World requests all amateurs experimenting with this circuit to make a report to its Technical Editor as to its receiving qualities as well as to the distance secured.

Facts You Should Remember About "Litzen Draht"

THE advantage of *litzen draht*, a wire made in Germany, for winding inductances with a very low resistance and having a large surface, is recognized. This wire is composed of a number of enameled copper magnet wires separately insulated from one another, and braided, the whole covered by a single-braided silk wrapper. *Litzen draht* is employed in research laboratories and particularly where high efficiency is required.

The following describes the number of wires, the size, and the number of feet per pound. These facts are of vast importance to every amateur.

4 Wires, No. 28 B&S (Brown & Sharpe gauge), made up in 4 strands of 6 wires each, enameled, with silk wrap. The strands are cabled around a hemp core and the whole covered with 2 wraps of green or white silk, 3835 C.M. (circular mill), No. 14 B&S; approximately 90 ft. to the pound.

30 Wires, No. 36 B&S, made up in 3 strands of 10 wires each, cabled and served with 2 wraps of silk, 750 C.M., No. 21 B&S; approximately 332 ft. to the pound.

90 Wires, No. 38 B&S, made up in 10 strands (3x3), enameled, with one wrap of white silk, 1415 C.M., No. 19 B&S; approximately 225 ft. to the pound.

48 Wires, No. 38 B&S, made up in 6 strands of 8 wires each, enameled, cabled with 2 wraps of natural, black or green silk, 775 C.M., No. 21 B&S; approximately 415 ft. to the pound.

48 Wires, No. 38 B&S, made up in 8 strands of 6 wires each, enameled, with 2 wraps of natural, black or green silk, 775 C.M., No. 21 B&S; approximately 415 ft. to the pound.

10 Wires, No. 38 B&S, enameled, stranded, with one wrap of silk 155 C.M., No. 28 B&S; approximately 1600 ft. to the pound.

20 Wires, No. 38 B&S, enameled, strand-

ed, with one wrap of silk, 310 C.M., No. 24 B&S; approximately 800 ft. to the pound.

120 Wires, No. 40 B&S, made up of 3 strands of 40 wires each, enameled, with 2 wraps of black silk over all, 1200 C.M., No. 19 B&S; approximately 250 ft. to the pound.

32 Wires, No. 38 B&S, 4 strands of 8 wires each, enameled, with 2 wraps of black silk, 500 C.M., No. 21 B&S; approximately 605 ft. to the pound.

48 Wires, No. 38 B&S, made up in 3 strands of 16 wires each, enameled, with 2 wraps of natural silk, approximately 400 ft. to the pound.

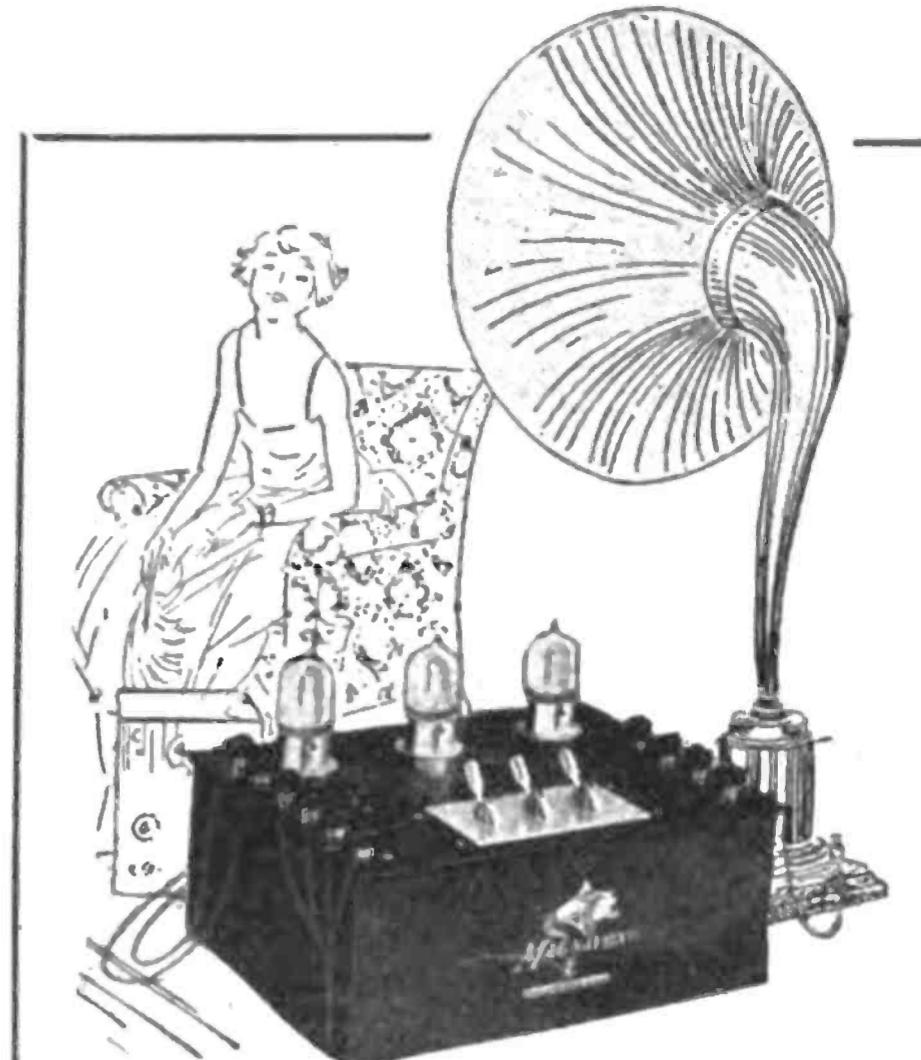
10 Wires, No. 40 B&S, stranded with 2 wraps of colored silk, 99 C.M., No. 30 B&S; approximately 3000 ft. to the pound.

162 Wires, No. 38 B&S, made up in 18 strands of 9 wires each, enameled, cabled, with 2 wraps of green or white silk, 2250 C.M., No. 16 B&S; approximately 125 ft. to the pound.

36 Wires, No. 38 B&S, made up in 6 strands of 6 wires each, enameled, cabled and served with 2 wraps of green or white silk, 566 C.M., No. 22 B&S; approximately 500 ft. to the pound.

Cleaning Files

MANY amateurs experience trouble when they attempt to use a file on some of the softer metals, such as lead, aluminum, copper, says "The Mail," New York. This is due to the metallic particles clogging the teeth of the file, thus rendering them ineffective in cutting the metal. In some cases the metal particles clinging to the file will scratch the object being filed, making a rough surface. This difficulty can be overcome by rubbing the surface of the file with ordinary stick chalk, such as is used for writing. The presence of the chalk on the surface of the file and in the crevices between the teeth is to prevent the filings from sticking and filling up the cutting surface. This same result can be obtained by dipping the file into hot water.



For best results equip your Magnavox Radio with

Magnavox Power Amplifier

THIS apparatus has been placed on the market in response to many requests for a power amplifier giving distortionless amplification of music and voice, previous amplifiers having been developed for signals only—where distortion does not show.

To accomplish the desired purpose, the Magnavox Power Amplifier had to be especially designed, and internal circuits, grid potentials and amplifying transformers are entirely different from those in other amplifiers. Any of the standard tubes can be used.

The use of the Magnavox Power Amplifier insures getting the largest possible power input for your Magnavox Radio. Switching from stage to stage is made easy by master switches, as illustrated.

Brushed bakelite panel, mahogany case, without tubes or high voltage batteries.

**3-stage, AC-3-C, Price...\$110.00
2-stage, AC-2-C, Price... 80.00**

The Magnavox Power Amplifier, Model C, was designed for use especially with the Magnavox Radio, and is made with the same insistence upon high quality and efficient service.

Magnavox products can be had of good dealers everywhere.

**The Magnavox Company
Oakland, Cal.
New York Office, 370 Seventh Avenue**



give clear, distinct tones, reproduce perfectly the most sensitive radio signals in music, speech and code.



No matter how perfect or expensive your apparatus; no matter how strong or perfect the waves; without "ECHO HEADSETS" your results cannot be perfect. We ship phones the day your order arrives. Every pair tested, matched and guaranteed as sensitive as the most expensive headsets made.

Sold with money-back guarantee.

Sent C. O. D. by express, who will hold money for 48 hours trial, if not satisfied express company will return money.

S. Pearson RADIO Co.

142 Maple Street

Richmond Hill Long Island, N. Y.

35¢ each, 3 for \$1.00
NA-ALD
GENUINE CONDENSITE
DIAL

The dial that runs true.

Numerals engraved on bevel and knob so shaped that fingers do not hide them. Thin edge with clear graduation make accurate reading easy. Concealed set screw in metal insert. Will not warp or chip. Finish and enamel permanent.
3" dial 35¢
2½" dial for rheostat potentiometer 35¢
3½" dial 75¢

Send stamps for complete literature.

ALDEN - NAPIER CO.
52 Willow St., Dept. L. Springfield, Mass.

If you did not get copies of Radio World No. 1 to No. 26, send us \$3.00. Or we will send you this paper for one year, (\$6.00 for 52 issues) and start it with our first issue, which will be mailed you as soon as possible after receipt of order.

Every Member of a Radio Set Is an Auxiliary Policeman

IT is announced that arrangements have been made to equip the metropolitan police force with a comprehensive radio outfit. This is the happening of the expected—not to say the inevitable, says Henry Smith Williams, in "The American," New York. Radio has such obvious possibilities as a police agency that its use in this field must become universal.

Already important beginnings have been made. Out in Chicago, for example, the police department has been using radio-equipped automobiles for some time. Patrol wagons have been equipped, experimentally, with wireless outfits that keep them in touch with headquarters at all times. It is reported that perfect communication has been established, the tests being satisfactory in every way.

When a crime or disorder is reported to headquarters by ordinary telephone, word can at once be flashed by radio in every direction and a universal alarm given in a fraction of the time previously required. The entire police force might thus be on the lookout for a criminal attempting to escape in an automobile, and the probability of interception of the fugitive enhanced enormously.

An obvious difficulty that suggests itself is that the ether may be vibrant with other messages. Broadcasting stations, for example, are busy at almost all hours of the day, to say nothing of commercial and amateur stations.

The difficulty is to be met in New York—and doubtless the same expedient will be adopted elsewhere—by allotting to the police department a special wave length that is not to be used by any other radio station in the vicinity.

The wave selected for the metropolitan district is 400 meters. It remains to be seen whether messages on this wave-length will interfere with the 360-meter wave used in general broadcasting. If it does, a larger wave, perhaps 500 meters, will be employed.

With radio-receiving telephones of the newer type, equipped with loose-couplers and condensers for accurate tuning, there should be no difficulty in shutting out the broadcasting program while listening to the police messages, or vice versa. But less elaborate sets, not being able to tune sharply, may mix up concert and lecture with reports of robberies and murders in distracting fashion. But at worst this will serve as an incentive to the radio fan to improve his apparatus.

Meantime, every owner of a receiving radio set becomes potentially a member of an auxiliary police force.

Radiofacts

Transmitting sets are essentially the same as receiving sets with the exception that they must have a source of power, and of course the apparatus must be so designed that it will carry this power.

The microphone is the most important electrical mechanism in the transmitting studio. It plays a part similar to the transmitter of the ordinary telephone by picking up sound waves, causing the diaphragm to vibrate and create corresponding changes in the current flowing through the circuit.

The capacity of a storage battery is governed very largely by the quantity and quality of lead and oxide of lead used in its construction.

Two things must happen to the radio frequency currents before they get to the phones. 1st—They must be allowed to move the diaphragm of the telephone. 2nd—They must move it at audible frequencies—below, say 4,000 cycles per second which is the

Reliable and Beautiful RADIO-A RE-CHARGER



THE RADIO-A is a highly efficient dependable piece of apparatus, absolutely fool-proof, easily attached by simply plugging into ordinary 110 volt lamp socket. In case of current failure, the unit cuts out automatically until current is resumed, without discharging battery.

It is designed expressly for re-charging radio filament batteries, but may be used for automobile or any other storage battery of reasonable size and capacity.

Price, \$18.50

Dealers and Distributors

Here's a Winner! Write us for full particulars.

Simply screw into any 110 volt lamp socket and connect the terminals to your battery. Impossible to hook-up wrong—RADIO-A charges either way.



A compact portable Re-charging Unit that will fully charge a 100 A. H. Battery overnight, for from 5c to 10c, according to prevailing rates.

LAST A LIFETIME

King Electric Mfg. Co., Inc.

1681 FILLMORE AVENUE

BUFFALO, N. Y.

NA-ALD
SMALL SPACE
V. T. SOCKET

95¢ each, 3 for \$1.00.
Moulded genuine Condensate. Requires but small space for mounting. Readily assembled binding posts. No excess metal to interfere with efficiency. Unaffected by heat of bulbs or soldering iron. Phosphor bronze contacts. Nickel plated brass binding screws. Slash cut slot. Price possible because of large production.

Special proposition for dealers and jobbers.

ALDEN-NAPIER CO.
Dept. L Springfield, Mass.
52 Willow St.

FOR SUCCESS
WITH THE
ARMSTRONG
SUPER
REGENERATIVE
CIRCUIT

which requires constant fixed capacities of .005 and .0025 m. f. d. use

MICON
Tested Mica Condenser
the only guaranteed noiseless condenser of absolutely constant capacity. Made in .005 and .0025 m. f. d. capacities, especially for this circuit. It may be had in all sizes from .00025 to .01. Our special process eliminates any possibility of error in capacity or loose plates. This renders MICON absolutely noiseless, which is essential with the Armstrong Circuit.

MICON .0025 m. f. d. \$0.50
MICON .005 m. f. d.75
If your dealer cannot supply you, send us his name and \$1.25 and receive the two MICONs postpaid, and a complete circuit diagram of the new ARMSTRONG Super-Regenerative Circuit absolutely free.

CHAS. FRESHMAN COMPANY, INC.
Sole Manufacturers
290 Hudson Street New York City

Twenty-One Stations to Broadcast Navy Numbers

In co-operation with the Navy League, 21 broadcasting stations will include special Navy numbers in their programs on Navy Day, Friday, October 27. At some stations, speakers will narrate on the history and the prowess of our Navy; at others, Navy musicians and vocalists will render musical selections, while a few will broadcast programs now kept secret in order to surprise the listening radio enthusiasts. The only government station on the list is the well-known NOF, at Anacostia, where most of the governmental programs, including the famous Marine and the Washington Navy Yard Band Concerts

are broadcast. The stations listed by the Navy League to date are: The four Westinghouse stations, Springfield, WBZ; Newark, WJZ; Chicago, KYW; and Pittsburgh, KDKA; General Electric, Schenectady, WGY; Detroit Free Press, WCX; Southern Radio Corp., Charlotte, WDT; Richmond-Crosby, Memphis, WKN; St. Louis Post Dispatch, KSD; Tulane Univ., New Orleans, WAAC; The Times Union, Jacksonville, WDAL; Reynolds, Denver, KLZ; Spokane "Chronicle," KOE; "Desert News," Salt Lake, KZN; Kansas City "Star," WDAF; Atlanta "Journal," WSB; Dallas "News," WFAA; Oakland "Tribune," KLX; Great Falls "Tribune," KDYS; Honolulu "Star-Bulletin," KDYX.

Listening-In Association Formed

A DECIDED increase in popular interest toward radio is promised. The larger broadcasting stations have installed more elaborate transmitting apparatus and equipment; all stations have profited by their experiences the past few months. Listeners-in will increase in number. All listeners-in—dependent as they are on the nature and variety of broadcasts for their entertainment, and on the quality of the receiving apparatus used—would desire naturally a medium for the exchange of their views and comments.

The National Radio Listeners-in Association of America is an organization formed in Washington without capital and with no commercial interest. Its object is to encourage cooperation between operators of broadcasting stations and the greatly increasing numbers of listeners-in included in the term "general public."

The bi-monthly meetings have satisfactorily affected changes in such matters as increased range, improved modulation and details of performance pertaining to individual artists appearing on programs.

First results noted locally, encourage the members of the association to suggest similar action in other communities, welcoming any request for assistance and seeking helpful suggestion.

Comment or suggestion in the interest of the public and radio are cordially invited.

The officers of the new association are: L. C. Hedges, president; James W. Cook, vice president; O. J. Hodge, chairman, board of critics; M. D. Meyerson, chairman of publicity; H. W. Ennes, corresponding secretary; William A. Eaton, treasurer.

Address: 901 Varnum Street, N. W., Washington, D. C.

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will deliver RADIO WORLD to your home. In order to be sure of getting RADIO WORLD regularly, and of not missing a single issue, we suggest that you either subscribe direct or through your newsdealer at \$6.00 a year (52 issues) \$3.00 six months, and \$1.50 three months. Or instruct your newsdealer to deliver RADIO WORLD regularly to your home each week. Dealers will take standing orders and make deliveries of paper whenever requested. Radio World, 1493 Broadway, New York.

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RADIO WORLD

RADIO WORLD

Please send me **RADIO WORLD** for months, for which

please find enclosed \$

SUBSCRIPTION RATES:

Single Copy	.....	\$ .15
Three Months	.....	1.50
Six Months	.....	3.00
One Year (52 Issues)	.....	6.00
Add \$1.00 a Year for Foreign and Canadian Postage	.....

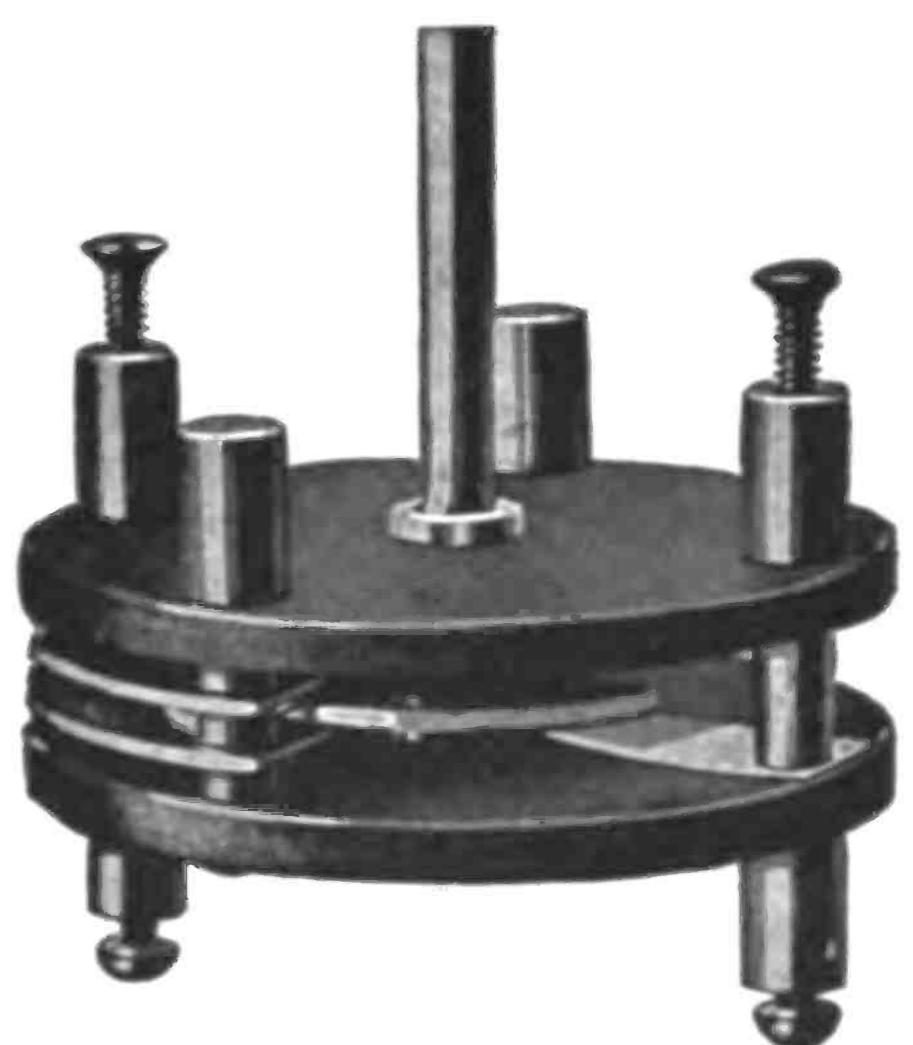
"RADIO"

VARIABLE CONDENSERS



These condensers are the Standard of Quality. Carefully tested, inspected, balanced and adjusted to give maximum satisfaction.

3 plate Vernier	\$1.50
23 plate	4.00
43 plate	5.00

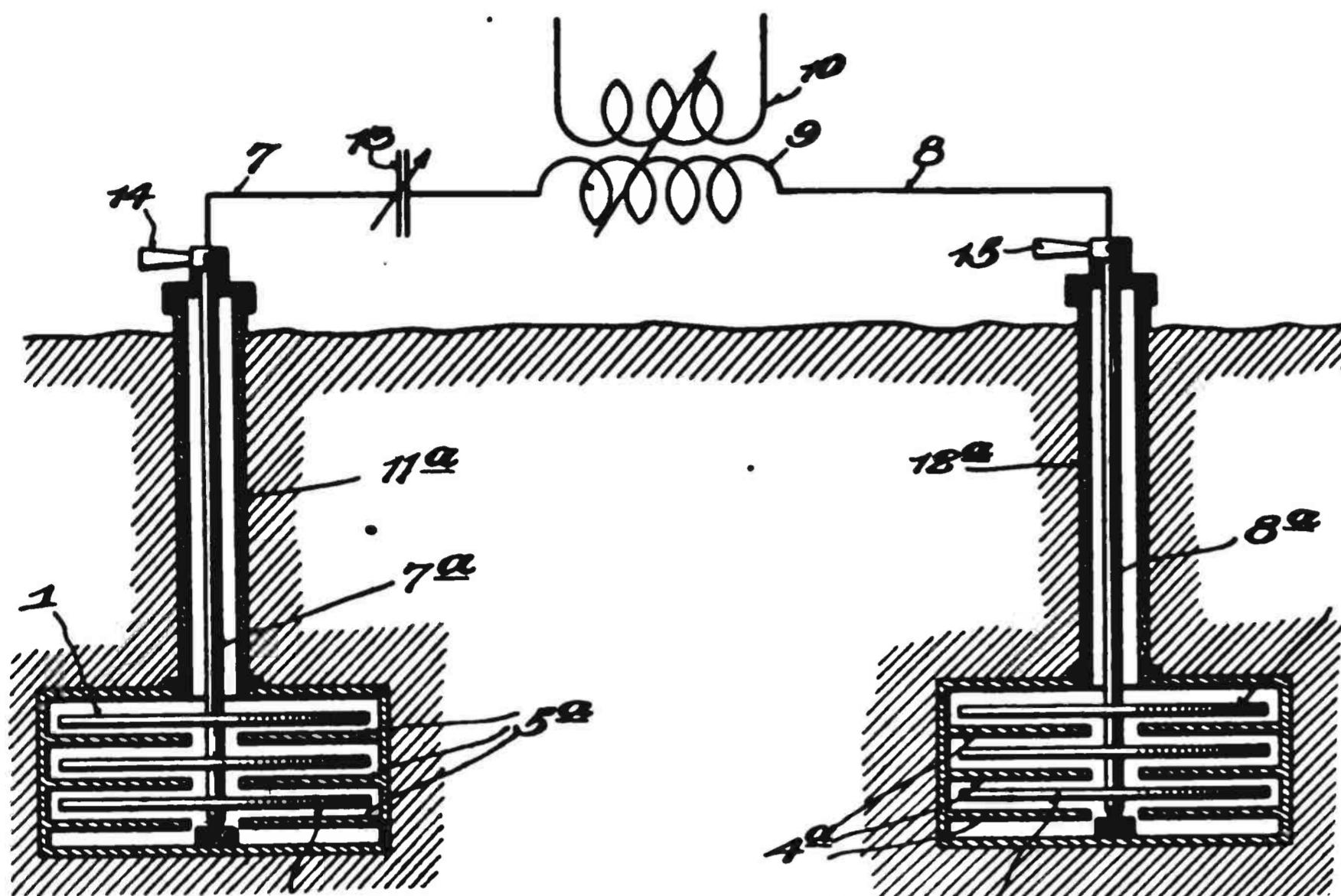


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INCORPORATED
LERNER BUILDING
993 Bergen Ave.
JERSEY CITY, N. J.

Radio Patents



Schematic diagram showing a modification of the ground antenna of the Hanson-Jones invention, with means for varying its capacity constant.

Underground Antenna

No. 1,429,240. Patented, September 19, 1922. Patentee: Earl C. Hanson, Washington, D. C., and Edward F. Jones, New Orleans, La.

THE object of this invention is to provide an underground, or subterraneous, antenna-system applicable for installation within a limited area; also, to provide for varying the constants of the antennae by directly modifying the capacity of the antenna collectors.

Experiments have determined that under-the-earth antenna construction, such as Mr. Hanson has devised, possesses feature of distinct advantage over underground systems heretofore employed. The concentrated capacity-area gives the same effective antenna-surface as long, buried single-wire conductors, and gives substantially the same signal energy as the long, buried conductors. It has been found that placing the capacity antenna areas a distance of, approximately, fifty feet apart, radio signals have been received from considerable distance and at high audibility.

Radio waves progressing in the earth's crust will induce a charge on the antenna capacity-areas due to the electrostatic component of the radio wave

and the antenna circuit will oscillate due to the phase relation of the charges impinging upon the capacity areas. Under certain conditions, satisfactory results are obtained by using smaller antenna capacity-areas and, therefore, the variable antenna capacity-system may be utilized for a wide range of wave lengths. Where stations are required for operation on predetermined wave lengths definite capacity areas may be employed. However, where it is necessary for stations to communicate with numbers of stations operating at various wave lengths the means may be used to change the effective area of the capacity to obtain syntony with the cooperating station.

In the practical operation of the Hanson system, it may be found advantageous to have the antenna capacities placed directly beneath the station and allow the rotating handles of the variable antenna-capacities to project through the floor so as to enable the operator to readily control the capacity values for various wave-lengths. The system is not limited to operation over only a small band of wave lengths, but is applicable for long-wave operation such as is employed by high-power oceanic stations.

attendant difficulty of preventing the output battery of one stage from affecting the input circuit of the succeed-

Low-Frequency Amplifier

No. 1,428,154. Patented, September 5, 1922. Patentee: Lloyd Espenschied, Hollis, N. Y.

THIS invention relates to the amplification of low-frequency signals, such, for example, as ocean cable, telegraph signals or those emanating from the propeller or engine noises in submarine detection. Such signals have a large, or predominating, direct current or very low-frequency component which is not transmitted or inefficiently transmitted through the ordinary repeating coils used in the local circuits of thermionic amplifiers. An object of the present invention is to provide an arrangement for amplifying signals of this character which will amplify all low frequencies, including the direct current, without the necessity of a metallic connection between the successive stages of the amplifier and without the

ing stage. The invention, in many of its aspects, is equally applicable to the amplification of signals in any order of frequency.

A further object of the invention is to increase the amplification to telephone currents, or to carrier currents, over that obtainable by the usual vacuum-tube amplifying circuits, by the use of feedback circuits.

In general, the invention consists in the modulation of an alternating current, of a frequency, say, of 1,000 cycles per second or higher, by the incoming signal impulses, the amplification of the modulated alternating current and the demodulation of the amplified current.

To Prevent Loss of Energy

No. 1,429,433. Patented, September 19, 1922. Patentee: Harold J. Power, Somerville, Mass.

HAROLD J. POWER, vice-president of the American Radio and Research Corporation, Medford Hillside, Massachusetts, has been granted letters patent on an inductance device which should prove useful in that important phase of radio. In certain electrical current carrying instrumentalities, of

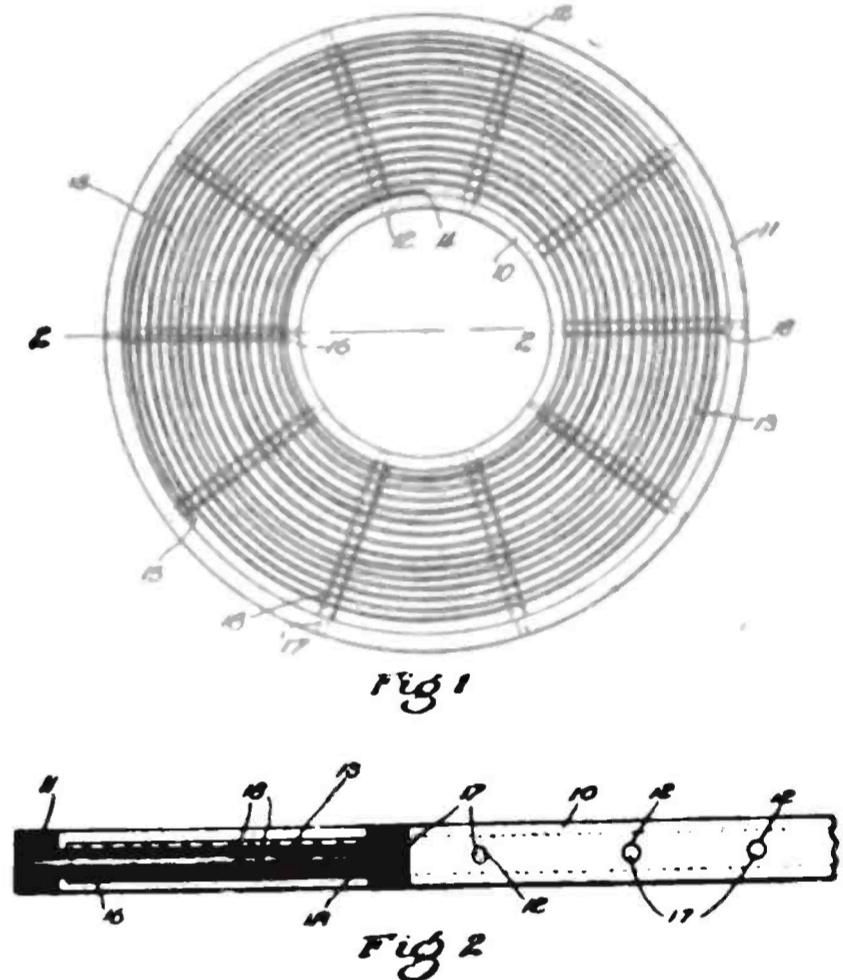
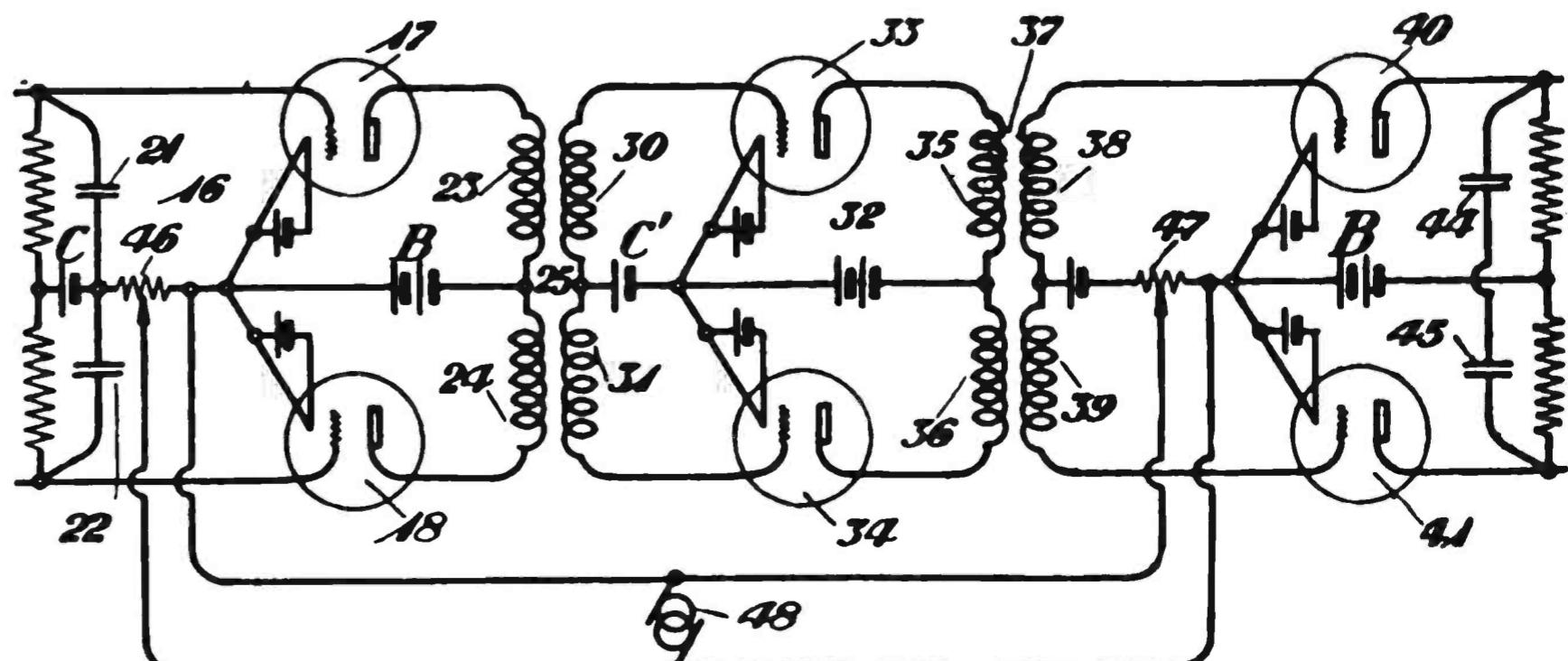


Figure 1 is a top plan view of an inductance device arranged in accordance with my invention, and Figure 2 is an enlarged vertical section on the line 2-2 of Figure 1. At 11 and 12 are shown inner and outer supporting members of any suitable insulating material.

which inductance devices furnish an example,—and especially those employed in connection with such high-frequency currents as are present in wireless or radio installations—it is important to prevent the loss of energy from the conductors through their insulating supports, and to so compactly arrange the devices that little space is occupied and, further, so that two or more of the devices may be brought into close relation to produce a mutual effect.



Schematic diagram of Mr. Espenschied's low-frequency amplifier.

Cut Out This Radio World

Do you like clear tone—sharp
and distinct—if so try

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Vernier Variable Condenser, Capacity
.00057 to .00078 mfd.

Fully Guaranteed

This 23 plate condenser lists at \$5.50.
To place before the Radio audience a
limited number will be sold at \$4.75.
Complete—Dial Knob and Screws.

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New Haven, Conn.

To F. P. Marsh, 145 Nicholl St.,

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DE LUXE
V. T. SOCKET

Contact strips of laminated phosphor bronze press firmly against contact pins, regardless of variation in length. No open circuit trouble possible. Socket moulded from genuine Condensite. Practically unbreakable. Special pre-tested slot, with exterior reinforcement. Unaffected by heat of bulbs or soldering iron. All excess metal eliminated, aiding reception. May be used for 5 Watt power tube. Highest quality throughout. Price, 75c.

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enables them to use the Aeriotron WD-11 dry cell tubes in any socket without re-wiring.

Eliminates the storage battery.

Send for circular W containing full description. Your customers will want this.

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**Guaranteed
2500 Ohm Head Set**



\$4.75 Complete

Attractive discount to manufacturers,
jobbers and dealers.

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Radio Will Write History

ACCORDING to Mr. Lloyd Jacquet, writing in the "Evening Mail," New York, history will be written during the three weeks from December 12 to 31, by the members of the American Radio Relay League, when the second attempt will be made to "speak" across the Atlantic Ocean. During that period, writes Mr. Jacquet, we "shall probably see amateur radio assuming international proportions."

A series of preliminary tests for the purpose of determining what American and Canadian transmitters shall be given a place in the final tests with an individual schedule and code letters, will be conducted from October 25 to November 3, inclusive. To qualify for the final tests a transmitter must cover a distance of at least 1,200 air line miles during the preliminary tests.

The preliminary tests will cover a period of two and one-half hours (9.30 p. m. to midnight, central standard time) which is divided into ten periods of fifteen minutes each. Transmission will take place by inspection districts. One district transmits at a time, and all others remain silent endeavoring to copy as many of the transmitting stations as possible. After the tests each night, the receiving stations are to send a confirming record to all transmitters heard at a distance of 1,200 air line miles or over.

When filing application for entry in the final tests, a transmitter shall include at least one 1,200-mile record, or show documentary evidence that its signals have reached out 1,200 air line miles during the months of September or October.

The amateurs who succeeded in being heard in Ardrossan, Scotland, where the official listening post was installed, constitute a memorable and historical list. They were:

Spark stations—1 AAW (not yet located). 1 ARY, Burlington, Mass. 1 BDT, Atlantic, Mass. 2 BK and 2 DN, Yonkers, N. Y. 2 EL, Freeport, L. I. 3 FB, Atlantic City, N. J. 8 BU, Cleveland, O. 9 ZJ, Indianapolis, Ind. 3 BP, Newmarket Ontario.

United by Radio

A remarkable incident was credited to radio when two old army pals were united and an old debt "paid in full," through WGI, the high-powered broadcasting station of the American Radio and Research Corporation, Medford Hillside, Massachusetts—adds one more laurel to her long list.

When Professor Connor, of Emerson College, Boston, gave a reading by radio from WGI, last week, he was not aware that among his audience was a man he had been seeking for over three years, a pal of his army days. They had parted at the Army Hospital, Staten Island, New York, and had gone their separate ways without an opportunity to strike hands in parting. Neither had heard of the other until Sergeant Kepple, listening in at Wilkensburg, Pennsylvania, to the radio program from WGI, heard the voice of his army chum with the result that the following night-letter was received by Mr. Connor the next morning:

Professor Joseph E. Connor,
Mansfield, Massachusetts.

Been trying to locate you since discharged from Army. Last night heard your radio readings. Am sending postal order amount one hundred dollars paying your kind loan at Army Hospital, Staten Island. Many thanks, old son-of-a-gun. Didn't know you were professor. Would have borrowed two hundred. Your erstwhile sergeant.

KEPPEL

Professor Connor says he is going to use the hundred dollars for expenses to Wilkensburg to visit Sergeant Kepple.

OUR SPECIALS

Call and Look Over Our Most Complete Stock of Radio Equipment

IT WILL PAY TO BUY NOW**Armstrong Super-Regenerative Complete Parts**

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for
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50c

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DL 25065c.
DL 1250	\$1.35
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VARIOCOUPLER

Special, good type	\$4.50
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AUDIO FREQUENCY TRANSFORMER

General Radio	\$4.00
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VARIABLE CAPACITORS

.001 Mfd., 3 at ea	\$2.55
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FIXED CAPACITORS

Best Mica, .005 Mfd40c.
Best Mica, .0025 Mfd40c.
Best Mica, .001 Mfd30c.

B BATTERIES

Best Guaranteed, 22 1/2 V	.....	.65c.
Large size, 22 1/2 V	\$1.85
45 Volt	\$2.25

SOCKETS FOR VACUUM TUBES

Bakelite Base60c.
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UV 200	\$5.00
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A 10% Discount is Allowed on Tubes

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6 ohm, with Moulded Knob50c.
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Best grade nickel, with brass nut	10c. doz.
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Fits any phonograph and phone75c.
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SAMPLE SETS AND PARTS, slightly shop-worn, some like new, on our **BARGAIN TABLE**.

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Detector Units.....	\$6.00 to \$13.00
Amplifier Units.....	13.00 to 30.00
Tuner Units.....	16.00
Detector and 1 Stop.....	26.00
Detector and 2 Stop.....	39.00
Detector and 3 Stop.....	52.00
Tuning Unit Detector and 2 Stop.....	62.00

Dealers write for proposition

Immediate Delivery

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1133 Broadway, New York City

TUNE IN DISTANT STATION

F. R. S. Complete Two-Stage Long Distance Receiver

Set includes two Federal Transformers Condenser, two variometers, varicoupler, three V. T. sockets, filament rheostats, dials. Read 'Em binding posts, switch points; in attractive cabinet and drilled panel; complete, ready to hook up. A \$125 Radio.

For \$40

F. R. S. All-Wave Combination

Molded Variometers \$6.00

Molded Varicouplers \$5.00

Molded Bank Winding \$5.00

Bank winding is interchangeable for use with either Variometer or Varicoupler.

This is the only all molded universal combination giving five units in three.

F. R. S. RADIO CORP.

409 East Fort St. Detroit, Mich.

NOVO "B" BATTERIES FOR RADIO

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DEPENDABLE
GUARANTEED
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NEW YORK

531 SO. DEARBORN ST., CHICAGO

Creed System to Speed Up Code

RADIO code-communications from ships and land stations, which radiophone users frequently hear as they tune in the broadcasting concerts, are transmitted by hand, generally at a speed ranging from twenty to thirty words a minute, says "The Times," New York. Since the early days of wireless various methods of automatically recording messages at high speed have been developed in order to facilitate the clearing of heavy traffic in the shortest time possible, especially between long distant points. The high-powered trans-Atlantic transmitters and receivers are in constant operation, day and night, handling the hundreds of radiograms and press reports between Europe and the United States. To use a speed of thirty or even forty words a minute would require many hours to get the latest press news and business messages across the sea. One of the latest methods of speeding up radio communication is known Creed system, which is applicable at the present time for commercial work at a speed of 180 words a minute.

One of the greatest problems in the operation of printing or recording radio apparatus is the necessity of accuracy of the signal form; that is, the duration of the dots and dashes. The accuracy required for mechanical or automatic receiving must be carried to a much higher degree than if the reception is through a headset and the human ear, and more particularly so when high telegraphic speeds are used. For the operation of the high-speed mechanism it is necessary to insert a mechanical relay between the valve circuits. A relay in this case is an instrument actuated by the radio currents after they are amplified to sufficient strength to cause the relay to operate and control other instruments in the circuit. The new relay used in connection with the Creed system was developed in England and has features which overcome many of the difficulties and deficiencies existing in mechanical relays. Its salient points are: stability of adjustment, firmness of contact, pressure and absence of rebound, sensitivity, shortness of transit time and ability to work at high speeds.

In connection with the Creed system the signals are transmitted in the ordinary continental Morse code. The impulses are picked up by the antenna, wires are passed through special vacuum tube amplifiers which build up the signal strength sufficiently to actuate the relay, capable of following the dots and dashes perfectly up to 200 words a minute with a current as low as one-quarter millampere. The relay in turn operates a perforator which punches the dots and dashes on a paper tape. This tape is run through an automatic typewriter which records the messages in print on another tape. The new features of this relay are ability to follow at high speed and at the same time work with entire fidelity on such a feeble current. The inertia of all the mechanical parts as well as the electrical magnetic circuits have been so finely calculated that the maximum efficiency, theoretically possible, is produced.

That Armstrong Circuit

So much interest has been displayed in the special article, "TESTED INVENTION OF MAJOR ARMSTRONG AMPLIFIERS SET 100,000 TIMES," by John Kent, that appeared in RADIO WORLD No. 13, dated June 24, 1922, the publisher decided to put aside a number of copies for those who were not able to get this issue when published. Copies will be sent, postpaid, on receipt of 15¢ or send in your subscription, \$6.00, for one year (52 issues), \$8.00 six months, or \$1.50 three months, and subscription will be started with the issue containing the article about Major Armstrong's Amplifier.—RADIO WORLD, 1496 Broadway, New York.

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Mirad Detector Unit.....	20.00
Mirad Two-Step Amplifier.....	20.00
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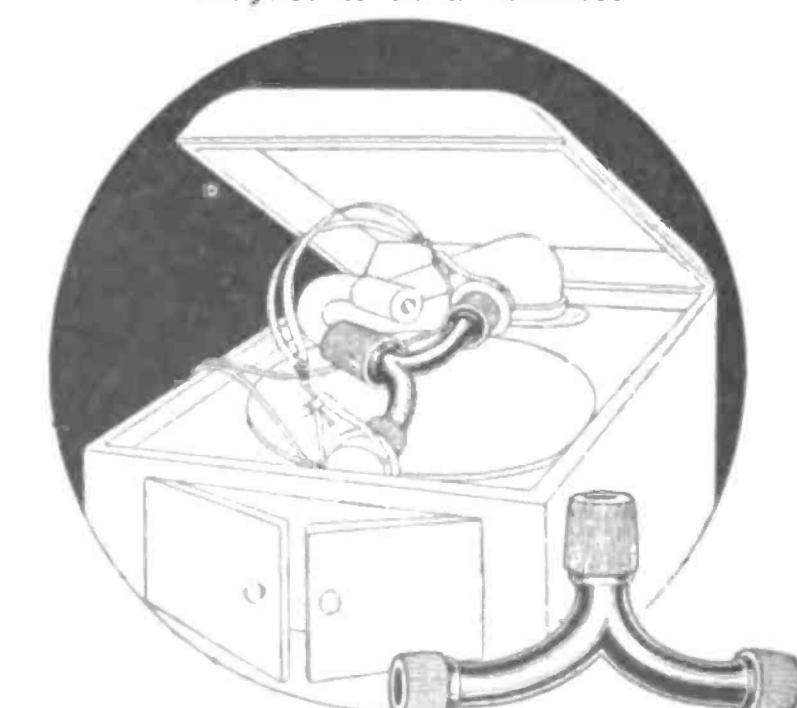
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Adjust it in a minute.



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at a very low cost
The PHONOTACH connects the receiver with the tone arm of your phonograph.

Utilizes the scientifically designed tone amplifier of the talking machine to secure mellowness and beauty of tone.

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Send for one today—At your dealer, or by mail.

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103 Park Ave., New York, N. Y.

The "Why" of the Farmer's Happy Life

FER years an' years th' most serious drawback t' farmin', next t' th' hard work an' element o' chance, has been that it isolates a feller an' keeps him out o' touch with th' affairs o' th' world.

For many years most farmers had t' manage t' git along fer weeks an' months without hearin' from th' outside world.

It wuz hard fer 'em t' remember who th' president o' th' United States wuz, an' they didn't know whether ther friends an' relatives wuz dead or alive unless a letter or newspaper wormed thro', or by chance they got t' town.

Then come th' telephone an' rural free delivery, an' th' farmer wuz fairly able t' keep a line on his relatives, European affairs, and th' price o' eggs.

Then th' automobile bobbed up an' is a big factor t'day in bringin' th' farmer's relatives t' his very door, an' also in whizzin' him an' his family t' town for a band concert or a hall show.

But drivin' t' town ever' night, or havin' th' home full o' relatives soon gits t' be a chestnut, an' besides it eventually runs into money.

We believe that next t' th' harvestin' machine an' a pump in th' kitchen th' best an' so fer th' cheapest thing that's happened fer th' farmer in many a day is th' invention o' th' radio 'phone.

The radiophone's performances already have proclaimed th' end o' isolation. Th' farmer no longer has t' drive t' town, or entertain a house full o' hungry relatives, or depend on a day-old newspaper fer his news o' th' outside world.

Th' seas an' lakes an' continents, burnin' deserts, frozen wastes, an' mountain peaks, have all been over passed.

Th' farmer an' his family may now know when a car is stolen from in front o' th' courthouse, or when a schoolhouse is burnin' up, or when a treaty is signed, as soon as th' ether waves kin deliver th' news t' ther vocal loud, or speech amplifier.

After a hard day o' toil th' farmer, without even changin' his collar, or rollin' down his sleeves, kin tune in an' take his pick out o' ever'thing in th' air.

An' all about him sits his family t' hear what's goin' on in th' world in th' way o' news, singin', music, an' oratory.

If they tire o' th' 'Wabash Blues,' they kin tune in a lecture on onion culture, or th' treatment o' hog cholera, by some expert in Detroit.

Maybe he kin pick up a saxophone solo from Hurley, Wisconsin, or a bagpipe sextette from fer-away Scotland.

Maybe his congressman is sendin' out words o' cheer, or there is a fire in town.

It's no uncommon thing t' jest innocently tune in on a fine helpful sermon from Pittsburgh, or Wheelin', an' it's no trouble t' tune off o' it.

But ther's no longer any excuse fer folks that are imprisoned on remote farms t' git behind on th' affairs o' th' world—not t' be able t' whistle th' latest airs, t' know when th' President misses a chance to play golf, t' keep track o' th' bonus bill, an' all th' latest gossip about prosperity.—Abe Martin in "Farm Life."

Experienced Stage-Fright When Broadcasting

WHEN the red light is turned on you'll know 'you've got the air,'" said Herbert S. Houston, publisher of Our World, on his return to New York from a trip West, to the Advertising Club News." "This was the signal," he went on to say, "for my first experience in broadcasting an address. It was in the big radio station of the St. Louis 'Post-Dispatch' and I was broadcasting an address on 'What Europe Means to the Mississippi Valley.' I think I can truly say that the only time I was ever

seized with stage-fright was this particular time when I wasn't on the stage—but instead, talking through a microphone to a vast invisible audience.

"A few minutes after I concluded my address a telephone bell rang and an attendant said that I was wanted on the phone, much to my surprise. George Burbach, the advertising manager of 'Post-Dispatch,' had called in from many miles out in the country to say that he had just heard my radio address and that he heard every word distinctly and perfectly. It all seemed most marvellous—even in this age of marvels—that one could broadcast an address by radio and then be called on the long-distance telephone to be informed that the address had carried across."

A B C Standardized Radio

Sectional Receiving Units and Radio Parts give unequalled satisfaction at low cost. Write for catalog.

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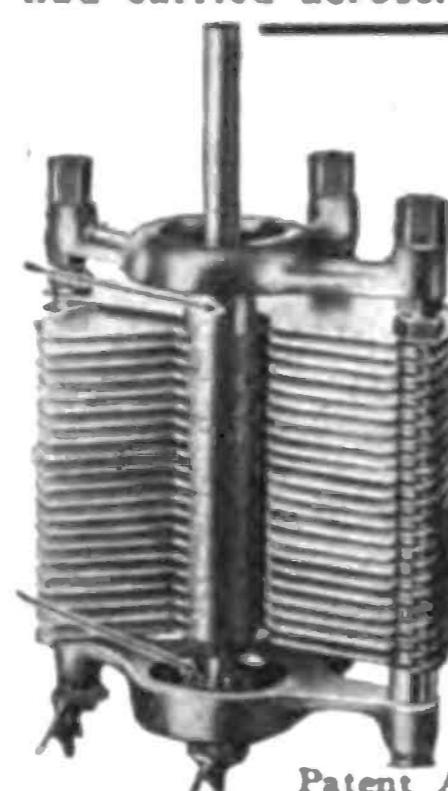
WELCOME! COME IN AND HEAR THE CORACO RADIO CONCERT

Daily, 8 A. M. to 5 P. M., 18th Floor, 220 W. 42nd St., next to Amsterdam Theatre. The Coraco Super-Radiophone is the latest and greatest improvement in radio. It has no outside connections—no installations expense—is as simple to operate as a phonograph. If you cannot call, write for full information.

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Standard sizes, 7x12x3/16, 7x12x3/16, 7x26x3/16, 14x12x3/16, and 12x14x3/16, in stock for immediate delivery. Orders for special sizes received in the morning, shipped the afternoon of the same day. Binding posts, dial, and knobs to match. We have a complete line of Cells, Variometers, Varisenders, Sockets and Rheostats.

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We have been exceptionally careful to see to it that every Manufacturer, Jobber and Dealer is listed and under the PROPER CLASSIFICATION. Most mailing lists charge more than \$100 for a list of this kind and, as a rule, these supplied are far from being correct. Compare this list with any other, and you will find it to be the very best obtainable anywhere at any price.

October issue ready for distribution September 25th. Price \$5.00 per copy, or \$10.00 per year (now less), including monthly supplements which keep the list absolutely correct and up to date at all times. October edition limited. Send your order with remittance today.

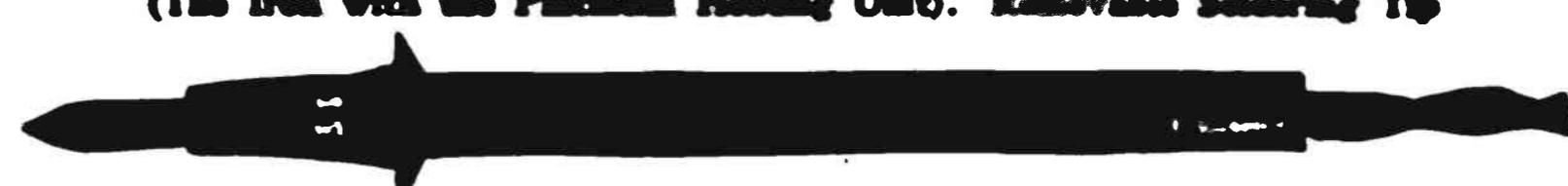
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"POST SOLDERING IRON"

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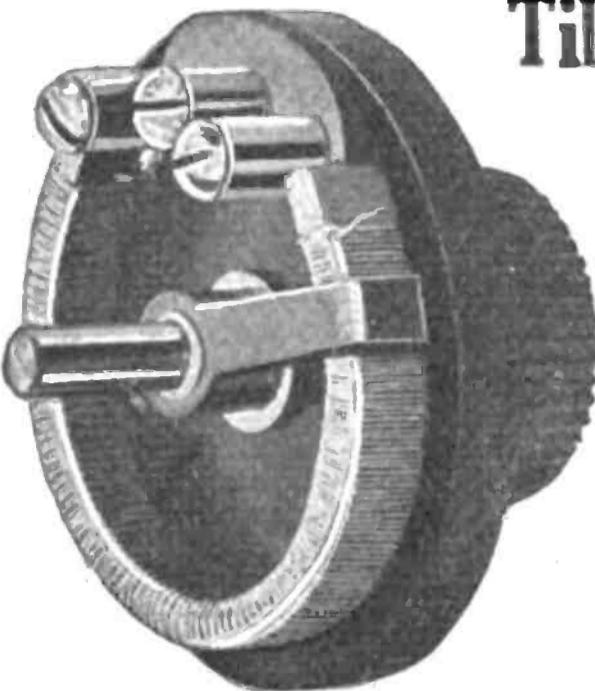
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Four Tubes good for 900 miles on Loud Speaker, Completely Assembled..... **\$95.00**
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Always Set
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Glass Encased

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PATENT PENDING**THE COMPLETE LOUD SPEAKER**

No "units," headsets, extra batteries or adjustments required.
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Answers to Readers

I have a three-coil regenerative set. May both variable condensers in this set have 43 plates? Is there any difference in the primary

condenser if placed in the aerial, circuit instead of the ground lead? Will a plate battery having variations of $1\frac{1}{2}$ volts give sharper tuning?—Joseph Lamkin, Minneapolis.

The variable condenser in the aerial circuit works best with a 43-plate variable condenser which is .001 mfd., capacity. The other variable condenser is of the 23-plate type with a capacity of .0005 mfd. It makes no difference whether the 43-plate variable condenser is placed in the ground or aerial circuit; both function the same. A variable plate-battery may increase the signal strength, but it will not give sharper tuning.

* * *

I notice in all schematic diagrams that the secondary circuit is connected to the negative side of the A battery. Diagrams that I have received from the De Forest company connect the side to the positive pole. Which is correct? I also note that the phones are connected to the positive side of the B battery. Can you explain this?—Paul Keller, Springfield, Mass.

It makes very little difference with which side of the A battery you connect the secondary circuit, but it seems to function best on the negative side. It makes no difference which side of the B battery the phones are connected in.

* * *

I have a home-made crystal set, an 80-foot aerial, and 2,000-ohm receivers. Sometimes I can hear the concerts clearly; but, at other times, nothing is audible excepting code. Is my circuit O. K.? Can you suggest any changes?—Russell Williams, Jacksonville, Fla.

Your set is not connected in the most efficient manner. Connect one end of the coil-winding to the ground lead, and, also to one end of the phone condenser. Connect the other side of the phone condenser to one side of your detector, and the other side of the detector to one side of the slides on the tuning coil. The other side of the tuning coil goes to the aerial lead. This circuit will prove more satisfactory. Of course the telephones must be connected across the phone condenser to make things audible.

* * *

Where can I buy "peanut tubes"? Can they be used in a regenerative set, using spider-web coils? What causes the regeneration in a plate variometer since there is no inductive relationship with the secondary of the vario-coupler as with honeycomb coils?—James Cudahy, Williamsport, Pa.

"Peanut tubes" may be used in any place where any detector-tube may be used. In the variometer type of a regenerative set, re-

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generation does not depend on an inductive relationship but does depend on simply tuning the plate circuit to exact resonance with the grid circuit. When the two circuits are in resonance, the high-frequency resistance is greatly lowered with the results that much more energy is allowed to circulate.

* * *

Who is WCG, 2 AKH, 2RM? What is the meaning of QTA?—Samuel Lebowitz, New York City.

WCG is the Bush Terminal station, 36th Street and Second Avenue, Brooklyn, New York; AKH is the station of D. Hopkins, 450 East Fourth Street, Brooklyn, New York; 2 RM is the station of F. A. Mayer, 828 55th Street, Brooklyn, New York. QTA means, "Kindly repeat your message."

* * *

Would four wires, 25 feet long, amount to the same and give the same results as one 100-foot aerial?—Bob Moore, Brooklyn, New York.

Using four 25-foot wires will not give you the same results as a hundred-foot aerial in one stretch. Change from the 25-foot aerial. Erect the hundred-foot aerial in one length.

* * *

I would like to see a diagram of a single-slide tuning coil showing the connection and slider.—Harold Kent, Kingston, New York.

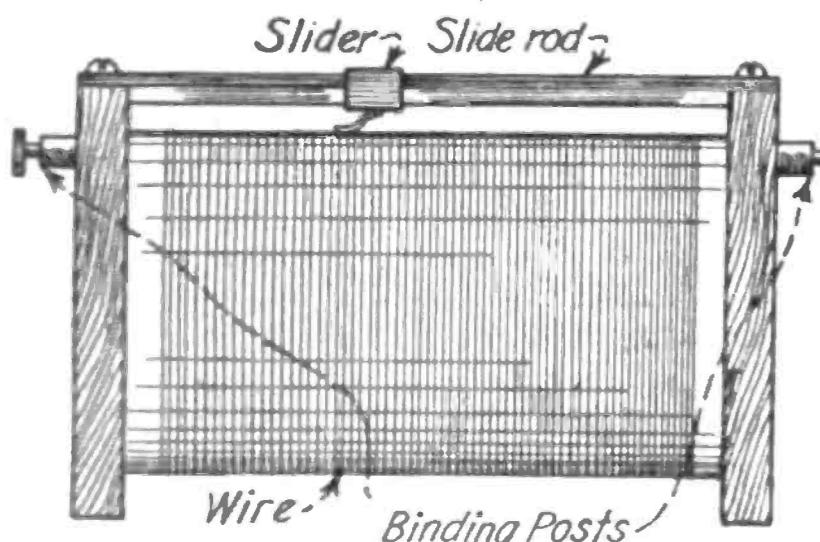


Diagram of single-slide tuning coil requested by Harold Kent, Kingston, N. Y.

The above diagram shows a single-slide tuning coil with a slide rod and two connections. This is used in conjunction with the crystal detector.

* * *

On what schedule and wave does the Anacostia station operate?—Harry Leary, Hillside, New York.

The Anacostia radiophone station, Anacostia, D. C., operates on two schedules a week, Wednesday and Friday. Both schedules are transmitted on 412 meters commencing at 8.30 p. m. Eastern standard time and ending about 10 p. m.

* * *

I am enclosing a circuit to which I would like to add two stages of radio frequency and two stages of audio frequency now in use. Please furnish wiring diagram as mentioned, recommending the transformers to be used. This is a wonderful circuit, and, I believe, second to none. As a detector, I have heard voices from stations a thousand miles distant.—W. Miller, Dallas, Texas.

Applying radio frequency would mean that a complete change of equipment and wiring would have to be done. Why employ radio frequency when you can hear the distance you mention? Probably radio frequency will not give you this range. Stick to what you have and do not bother with radio frequency at present.

* * *

To receive continuous waves, do I need the rectifier—crystal or vacuum-tube? Should it be audible in the phone receiver without rectifying the wave received? If not, why?—Frank Pasceta, Buffalo.

You cannot receive continuous waves with a crystal detector unless you have an external heterodyne-system in order to make the received signals audible in the telephone. It cannot be done with a vacuum tube unless you use a regenerative receiver with a

production which will create waves of radio-frequency either just below or just above the frequency of the incoming wave. The two waves will then clash or, in other words, be out of phase with each other 500 times every second. This will produce an audible note, corresponding with the dots and dashes in your telephone receivers, of a frequency of 500 cycles per second.

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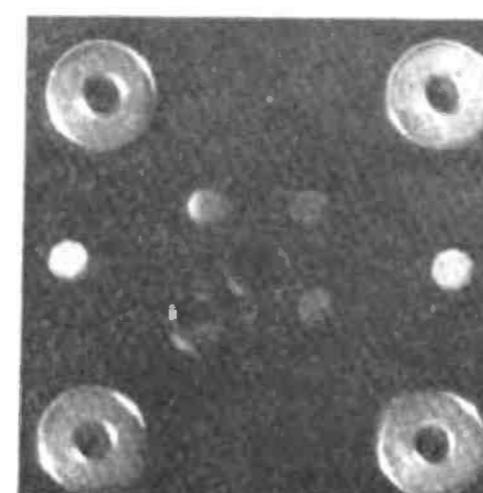
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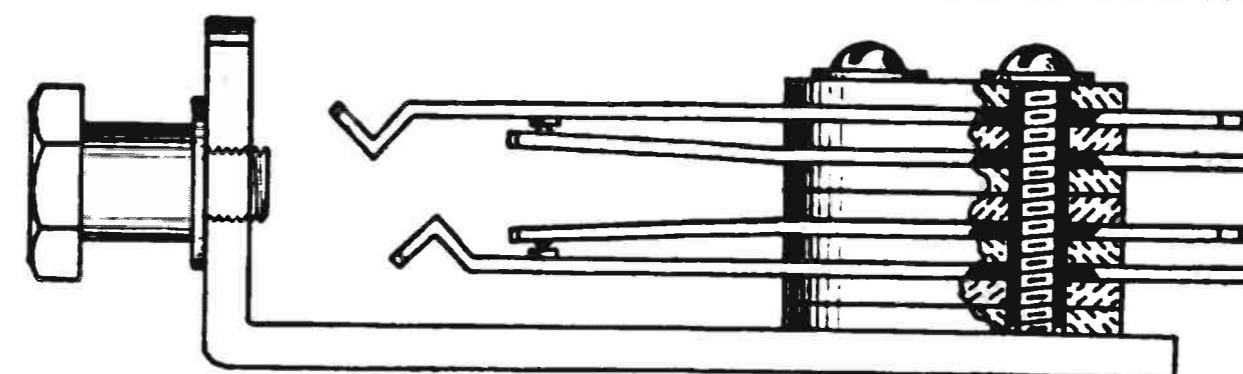


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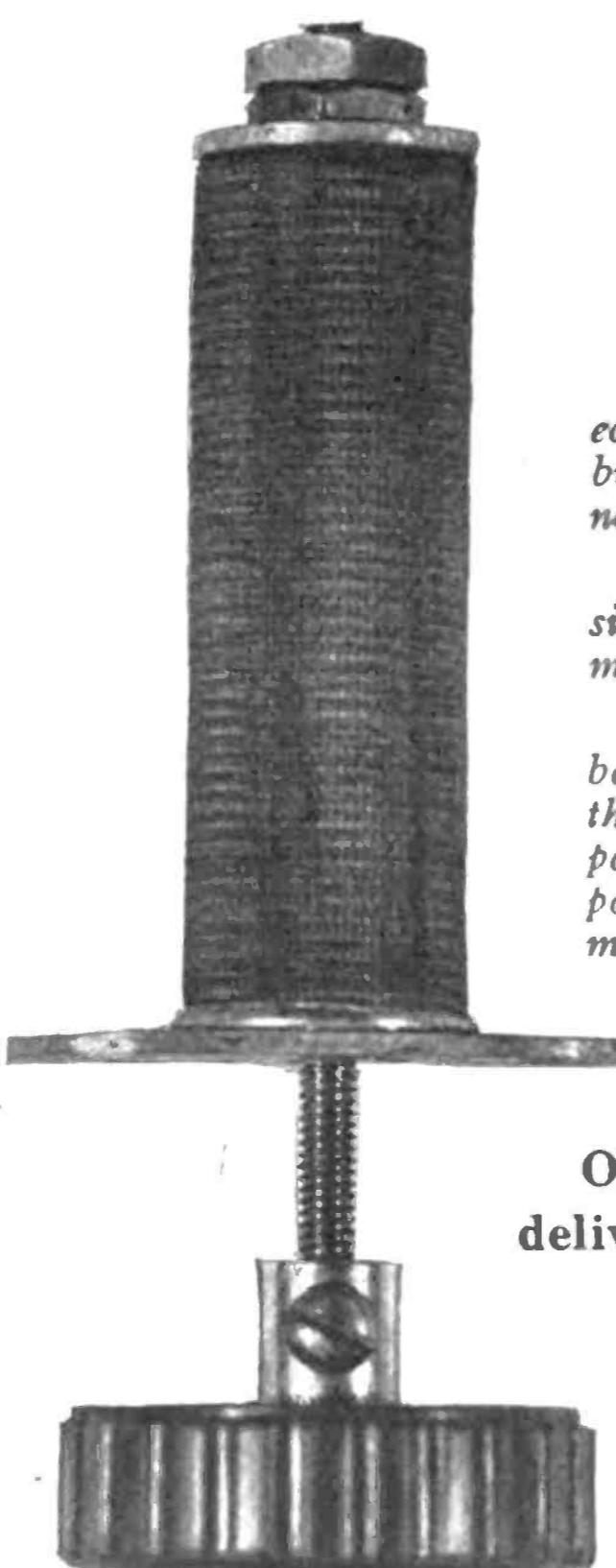
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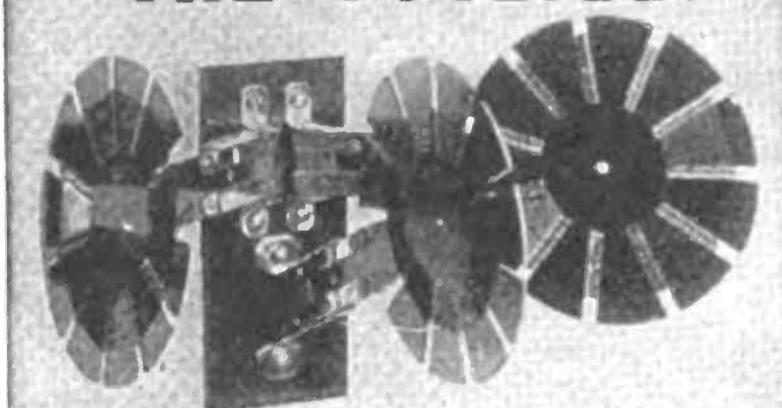
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Every One On His Own Wave Length

WITH the advent of cooler weather, which is to bring with it tremendous demands for radio broadcasting, there is arising a certain amount of bitter feeling against the amateur who either is transmitting code or testing his home-made broadcasting station, says "The World," New York. In the larger cities these amateurs are becoming so numerous, and are in many cases so disregarding the government regulations regarding wave lengths, that they rapidly are becoming hindrances to the thousands of persons who desire to listen to the programs being broadcasted by the larger and more efficient stations. Now there is no getting away from the fact that the amateurs have as much right to operate as have the broadcasting stations; they have as much right to fulfil their desires for pleasure as have the owners of receiving sets, and have as much right to improve their work as have the more powerful plants. But it must be remembered by them that there are government regulations forbidding them operating on other than certain wave lengths and that when they violate these regulations the chances are they are infringing upon the pleasures of their neighbors. No one believes any of the amateurs who are preventing others enjoying concerts are doing so intentionally, and it has been proven that a call on the air or on the wire phone will result in the amateur either returning to his correct wave or standing by until after the close of the program with which he is interfering.

Identifying Mark for WGY

THOSE who have listened in recently on the programs of WGY, the General Electric Company's radio-broadcasting station at Schenectady, New York, have observed a whistle between numbers. Some fans have thought the whistle was due to an imperfection in their receiving outfit; others, observing that the whistle came only from WGY, were convinced that there was something wrong with the transmitting outfit. Neither theory is right.

The whistle, or musical note, is caused by an audio-frequency oscillator used at the transmitting source for the convenience of the audience. The oscillator comes into play by means of a relay which is operated when the studio switch is thrown off. The instant a musical number is ended in the studio, the whistle starts.

This musical note, or whistle, will become characteristic of WGY—an identifying mark, if the audiences approve. If listeners dislike the device, it will be discontinued. Many people have reported that they have lost the station between numbers, and before tuning in again the next number is well underway and they have failed to get the announcement. There is sometimes a slight delay between selections, a delay which seems minutes to the man at the receiving set though it is actually only seconds. He thinks he is out of tune and begins to retune. The musical note persisting during the intermission enables him to know whether he is still in tune with the station.

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**Fans Crowd to Hear Talk
on Superregeneration**

In all of the annals of amateur radio clubs, the most crowded meeting ever held by any of these clubs came off last Monday night at the meeting of the Radio Association of Greater New York, says "The Globe," New York. At this particular meeting, R. W. Tait gave a highly interesting talk and demonstration of his super-regenerative set. The meeting place was full to overflowing and it is understood that a hundred or more people were turned away.

It is generally recognized that the broadcast listener is sadly in need of education, and the only way that this can be accomplished is through the radio clubs. The Radio Association of Greater New York has set the pace in this matter for the New York district and will, from time to time, arrange other talks of equal interest to every one who has a radio set.

The club in particular is affiliated with the American Radio Relay League and is also connected with the Second District Executive Radio Council. It has been in existence for several years and has a very large membership. This club is probably the only one that has a real dyed-in-the-wool lady operator for a secretary. This young lady, Miss Marguerite M. Powers, has, we understand, a commercial license and is the proud owner and operator of a C. W. transmitter, call letters 2BVX.

If you are interested in radio you should investigate this live organization with the object of becoming a member. The dues are almost nothing, and a club set will undoubtedly be installed in the near future, all of the necessary apparatus having been donated, but no suitable place for installation has as yet been secured. The Radio Association of Greater New York numbers among its members some of the best known radio men and amateurs in New York City, and the beginner will probably be able to secure a valuable radio education by joining the club. Meetings are held every Monday night on the top floor of the

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Will Trains Be Controlled by Radio?

ALTHOUGH it does not come directly under the matter of train control, radio train dispatching really comes under this classification, writes Raymond Francis Yates in "The Evening Mail," New York. As early as 1910, Earl Hanson, who is a very-well known radio inventor, was employed by the Santa Fe Railroad to perfect a system of this nature. Hanson rigged up aerials on the cabs of a number of locomotives, and the engineers were communicated with en route. Although very encouraging results were obtained, the railroad officials are hard to please and the experiments were abandoned. With our modern radiophone equipment it would seem that there shouldn't be much of a problem to radio train-dispatching at the present time. The engineer at all times could be within listening distance.

Numerous attempts have been made to establish direct telephonic communica-

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BROADCASTING STATIONS: Letters and addresses of broadcasting station to-date appeared in Radio World for Oct. 7. Sent on receipt of 15¢. Also a broadcasting map appeared in Radio World No. 8. Sent on receipt of 15¢. Radio World, 1493 Broadway, N. Y. City, N. Y.

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IF YOU WANT AUTHENTIC RADIO FACTS consult "The Radio Telephone Handbook," by H. G. Cisin, Radio Engineer, former instructor Cornell, Stevens, John Hopkins; also former U. S. Naval Officer. Sent postpaid, \$1.00. Allied Engineering Institute, 1400 Broadway, New York.

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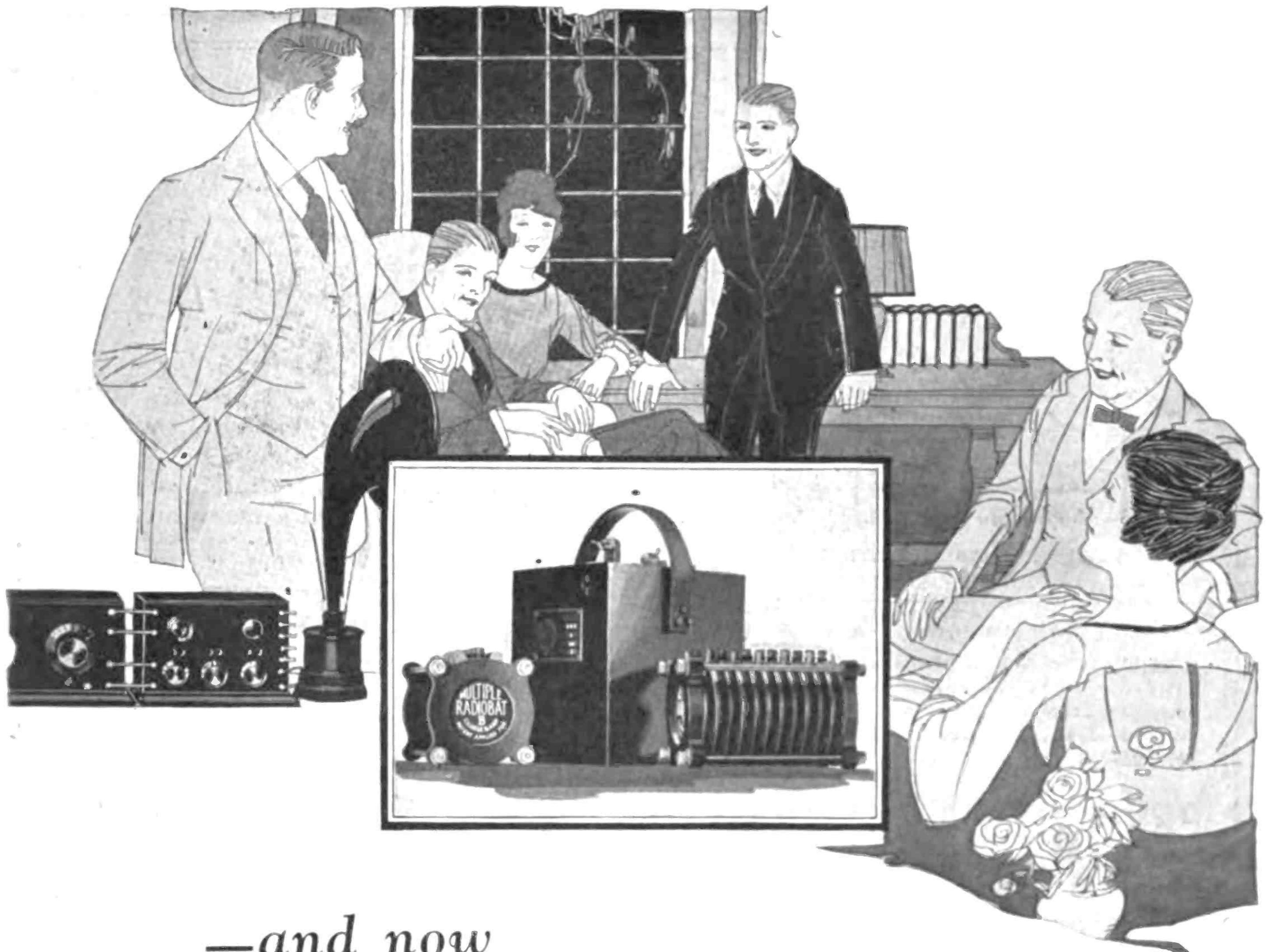
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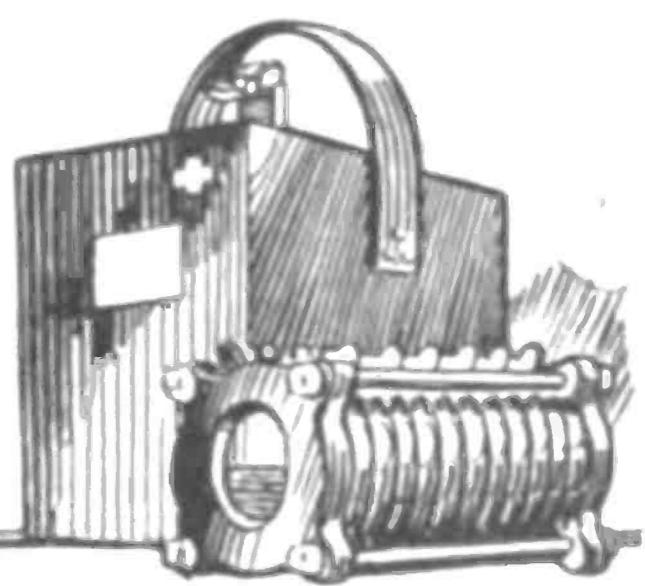
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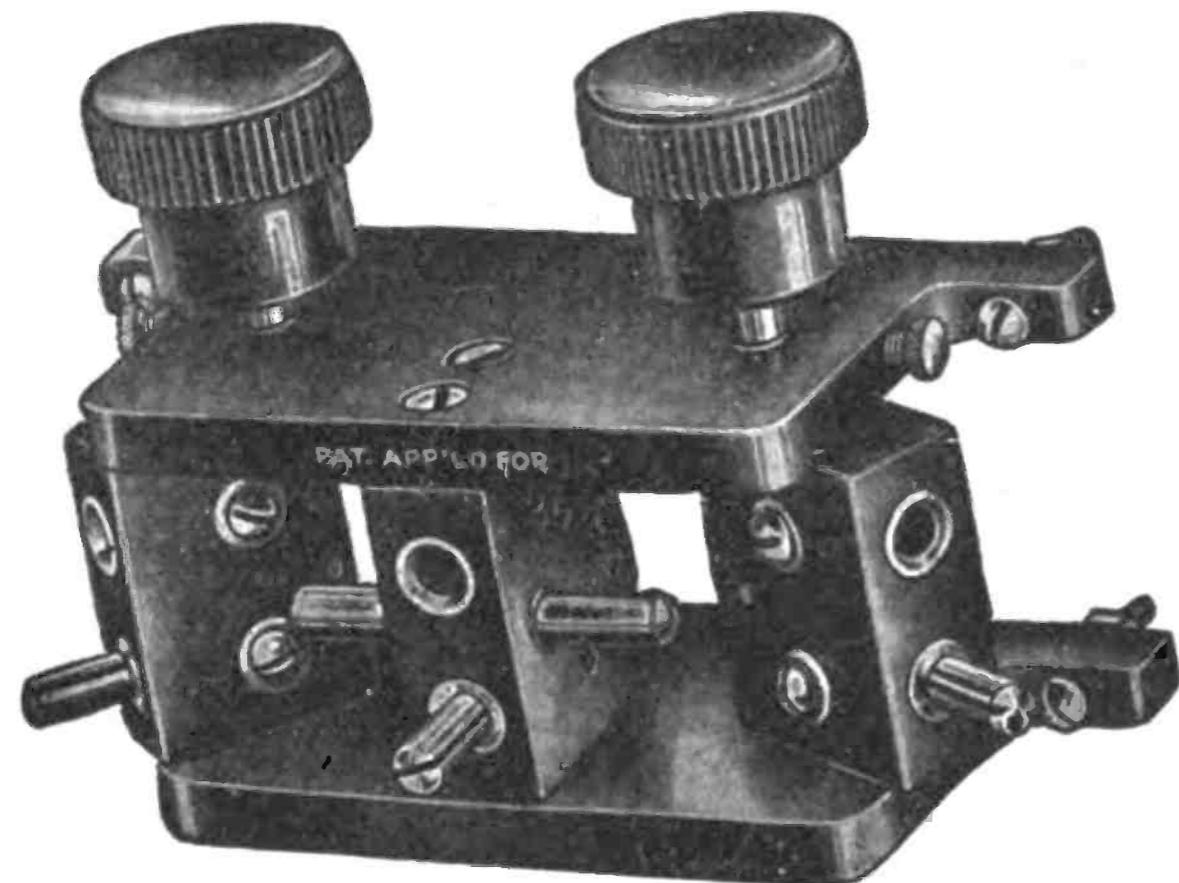
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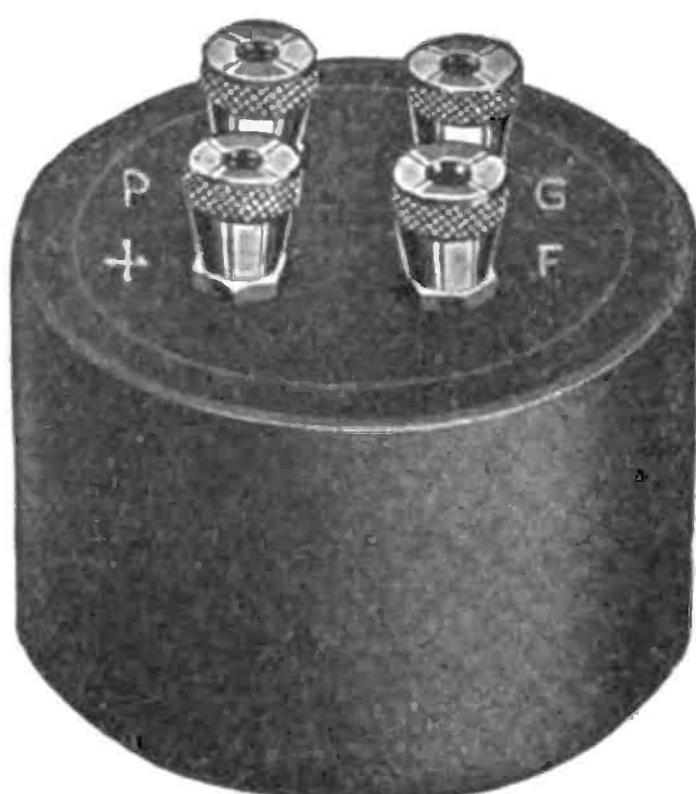
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