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RADIO WORLD

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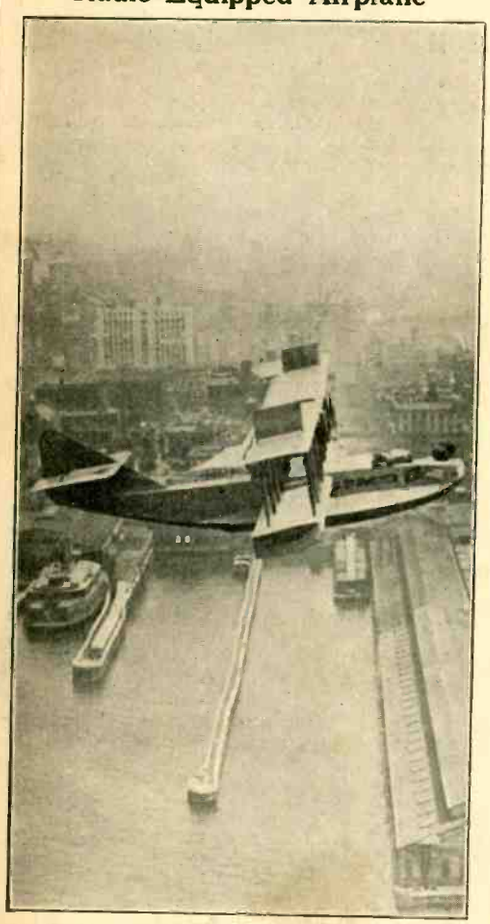
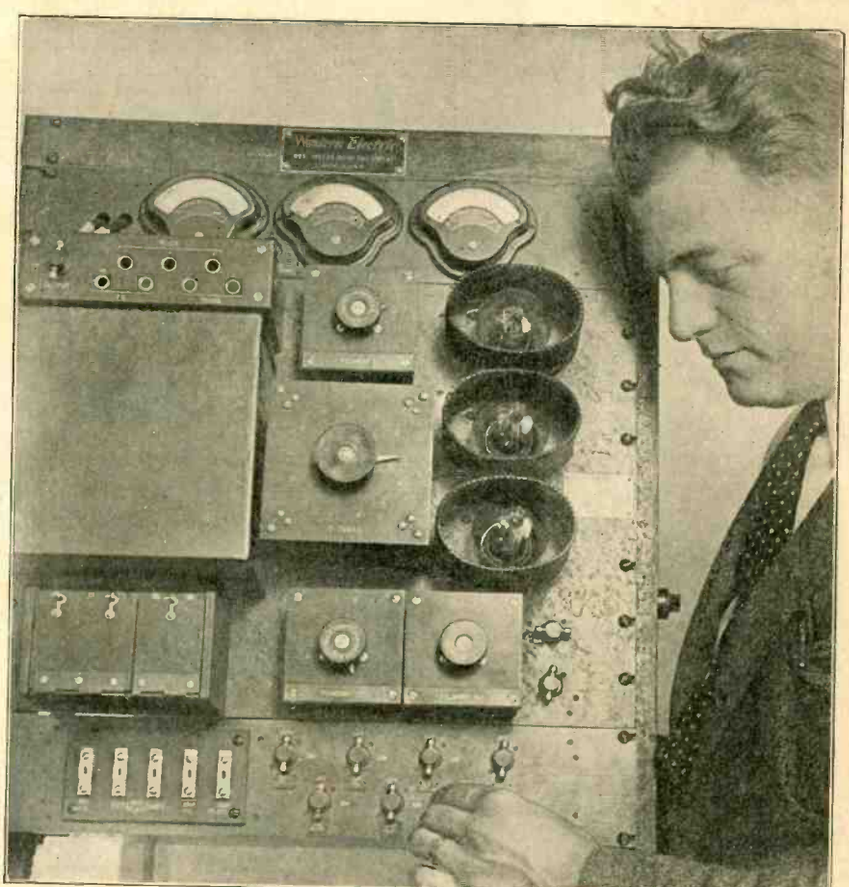
ILLUSTRATED

Radio-Equipped Airplane



(C. "P. & A. Photos")
The "Sampiao Correia," Brazilian airplane, flying over New York City on her start to Rio de Janeiro. This "ship" was equipped with a receiving set of the latest design.

Makes Broadcast Voices Sound Clear



(C. Kadel & Herbert News Service)
This is the latest radio device. It amplifies the voice for the transmitter. It is known as a speech imput amplifier. It enables the transmitting operator to hear more clearly. By so doing he is able to give better service. This amplifier is now in the laboratory of the College of the City of New York.

2 Circuits for Regenerating Loud Signals

See Page 8

He Tried to Stop a Radio "Fight"

A POLICEMAN in Pittsfield, Massachusetts, heard the shouts and curses of a fight in Schenectady, New York, and though it was many miles off his beat, courageously tried to mingle in the row and failed. It was a radio fight.

A. H. Everest, a Pittsfield man, has a radio receiving-set with loud-speaker attached. He was listening to "The Wolf," Eugene Walter's play recently produced by E. H. Smith and players at WGY, the broadcasting studio of General Electric at Schenectady.

In the big scene of the play "Hilda," a greatly misunderstood young woman, screams "Liar! Liar!" at her father. Mingled with the screams were the guttural curses and shouts of the rough men of the Canadian woods. It was these screams and shouts which the policeman heard at the home of Mr. Everest. The officer had been instructed to discourage fights even within the sacred precincts of the home when the fights tended to annoy the neighbors. He rapped at the front door and demanded, "What's the trouble?"

Mr. Everest pointed to the loud-speaker as the hysterical "Hilda" was becoming a bit calmer. The officer, sizing up the situation, sat down for the rest of the "fight."

The story was too good to keep, so Mr. Everest wrote to WGY, in part, as follows:

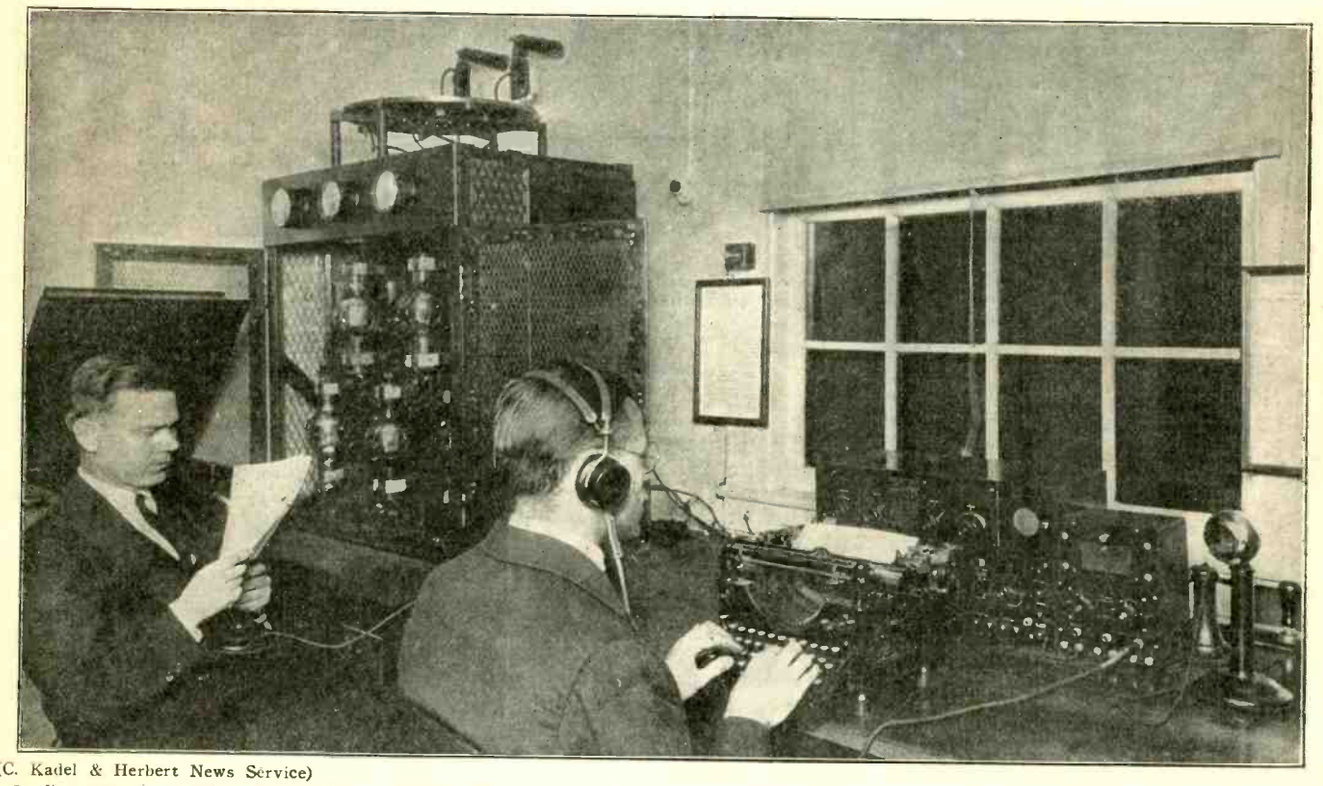
"'The Wolf' came over so realistic last night that in the third and final episode, a passing policeman thought my wife and I were fighting. He rapped at the door and when he saw what was going on, came in and listened to the rest of the performance."

RADIO WORLD

A Weekly Journal, Published Every Wednesday and Dated Saturday, by Hennessy Radio Publications Corporation from Publication Office, 1493 Broadway, New York, N.Y. Telephone: Bryant 4796

Vol. 1, No. 23 **September 2, 1922** **15c. per copy, $6.00 a year**

Sending Out the Weather Reports from WJZ, Newark



(C. Kadel & Herbert News Service)

Sending out the weather reports from WJZ, the big and busy broadcasting station at Newark, N. J., is a broadcasting feature of unusual interest. On weather forecasts depend the rise or fall in the values of commodities of every nature; for by foretelling what atmospheric changes may take place, the merchant is given a chance to buy or sell, the farmer to reap or sow, the jobber to arrange his prices—all of which has a direct bearing on the public. The apparatus in the left corner is a transmitter. The operator is broadcasting a report. His assistant at the typewriter is taking down what he says in order that the news may be checked up for absolute correctness. This is of vital importance. It is necessary to the general welfare of this country that all weather reports be correct to the last period.

Latest Important Radio News of the Week

Alfred Frankenthaler, lawyer, formerly assistant in the Alien Enemy Bureau, Department of Justice, says that the German Corporation, Telefunken, which owned and operated the Sayville, Long Island, station prior to the World War, expects compensation from the United States.

* * *

The copper and brass industries have been greatly aided by radio activities. Unusually large demands are reported by manufacturers of copper wire, sheet tube, and bar stock for copper for use in radio apparatus.

* * *

After conferring with Nathan Burkan, attorney for the American Society of Authors, Composers and Publishers, representatives of the radio broadcasting stations announce that they will pay royalty on the music they use, the amount to be determined later.

* * *

Competing with Great Britain, France, and Germany, America was successful, according to a radio message from E. F. W. Alexanderson, chief engineer of the Radio Corporation of America, in securing a contract with the Swedish Government to furnish apparatus for a high-power radio station to handle direct communications between the United States and Sweden. The total cost of the station erected will be over $2,000,000.

* * *

Joseph Santley of the "Music Box Revue" is preparing a one-act play to be presented entirely by radiophone. In addition to the dialogue, all the entrances and exits and all the mechanical effect will be reproduced by radio. Mr. Santley describes it as an "Ear-Play."

* * *

A man attacked several young girls in Union Hill, New Jersey, the other day and made his escape. Police Lieutenant Quilter immediately broadcast a description of the fugitive.

* * *

Defense of the Atlantic Coast is now assisted by forty-five radio compass stations, most of them located in groups near the chief American ports. There are four such stations near New York Harbor. Their main purpose is to detect the approach of hostile warships. In peace time they serve commerce.

Generating C-W for Transmission

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

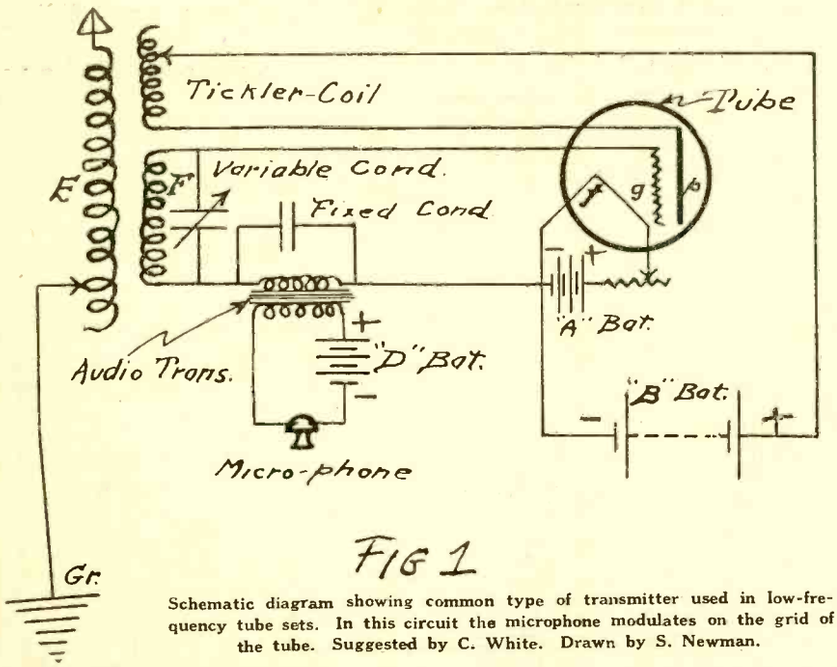


FIG 1

Schematic diagram showing common type of transmitter used in low-frequency tube sets. In this circuit the microphone modulates on the grid of the tube. Suggested by C. White. Drawn by S. Newman.

THERE has been much discussion recently between the old amateur and his brother novice concerning the interference of signals and concerts. The old amateur feeling that, because of his long standing in the radio field, he is much hurt to have his code impeded by strong radiotelephone broadcasting stations. On the other hand, the novice declares that if the "old-timer" should send on a different wave-length and interrupt a well-planned concert by code, he should be severely punished by law! The "key sitter," in most cases, is sticking to his wave band, but the trouble lies in the fact that most amateurs who transmit code still have the old-time spark station; and, as most of us know, the wave sent out by such a station is damped: that is, it contains virtually some of all frequencies.

It is difficult to fully understand this, but it is the underlying trouble of the damped wave. Of course, there is one predominating frequency which gives the maximum response in the receiver when it is tuned to that particular frequency. But it is the frequencies near this particular frequency that produce considerable interference in broadcasting. The solution to the whole problem lies in the gradual adopting of C-W for universal transmission of all wireless signals.

The adoption of C-W means that the wave bands need not be so wide because it is possible to tune very close with C-W since there is present but one fundamental frequency. It must be strictly observed that to fully accomplish such an ideal tuning condition, the users of this style of transmission must filter their wave to free it from kinks; or undesirable harmonics. He must also take strict precautions that his wave-length remains constant. Personally I notice, while listening, in that there are a number of C-W stations that do not hold their carrier-wave frequency constant. This makes it quite difficult for the operator at the receiving station to keep in tune especially if he is using a sensitive short-wave regenerative receiver. But if these two objections are removed, then there is no argument against the general use of C-W.

The vast strides in the advancement of the radiotelephone during the World War and, recently, because of the public interest taken in broadcasting has made the study of the various types of transmission in this particular use of C-W especially interesting to the amateur, although he does not intend to transmit messages or to broadcast.

Any type of radio transmitter operates on the well-known principle of radio dissipation of energy. To make the antenna radiate energy, the wave supply must be of a high frequency since, practically, no power may be radiated at frequencies as low as voice frequency. Therefore, we are accustomed to call the radiating frequency, "radio frequency," which ranges from 10,000 to 3,000,000 cycles a second. The C-W frequency in telephone work is known as the carrier frequency and on it the frequency of voice waves is super-imposed. This superimposition of the voice wave on the carrier wave is commonly called the modulation of the carrier wave; hence we can clearly divide a radiophone transmitter into two separate parts; or, at least, two separate functions which must be performed, namely: the generation of the carrier wave and the modulation of the same.

There are three ways of generating C-W oscillations:

1—The high-frequency alternator.

2—The Poulsen arc.

3—The three-electrode vacuum tube.

The high-frequency alternator, generally known by the names of their inventors, Alexanderson and Fessenden, is a mechanical electrodynamic machine designed to operate at a high speed and capable of generating a large amount of power at a frequency as high as 100,000 cycles per second. Of course such a machine is only practical for long-distance transmission at relatively high wave-lengths. The Poulsen arc is an oscillating arc, also capable of generating a large amount of power and, like the Alexanderson alternator, has only a commercial application. But the vacuum tube is an ideal generator of oscillations of any frequency. It generates a small amount of power in comparison with the two devices first mentioned.

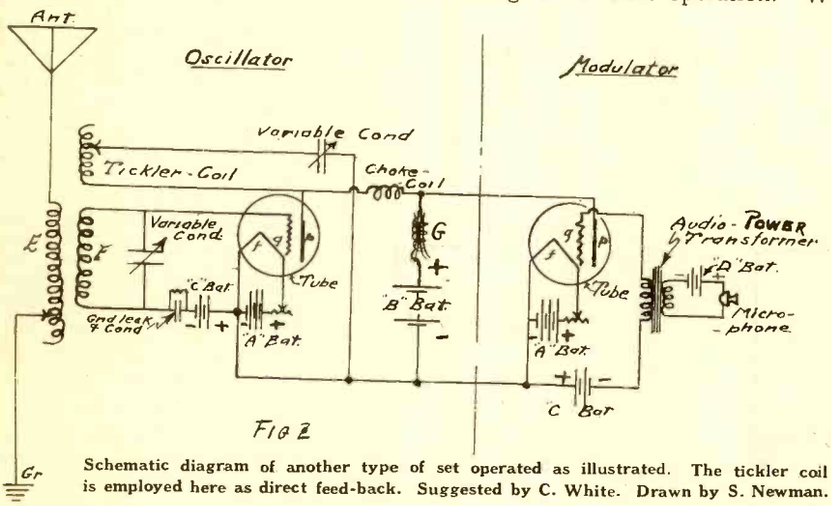
There are many possible ways of modulating the carrier wave depending upon the size of the transmitter and the type of high-frequency generator. One common method used with the alternator is to place the microphone on the field circuit of the alternator and thus modulate the amplitude of the generated wave by varying the strength of the magnetic field. Another method that may be employed either with this type of machine or the Poulsen arc is accomplished by placing the microphone in series with the antenna circuit. But since most C-W stations, either code or telephone, use vacuum tubes, I shall further illustrate and explain this type of station in detail.

In Figure 1 is shown the most common type of transmitter used in low-powered one-tube sets. In this circuit, the microphone modulates the amplitude of the oscillations by changing the average potential impressed on the grid of the tube. But although it has now become an almost general practice not only in large sets, but also in portable ones, to accomplish modulation by the use of a separate tube, the combined single-tube method will amply serve those who seek simplicity and are not particular about the maximum efficiency. To fully comprehend the action of this type of transmitter let us analyze the changes that take place

(*Continued from preceding page*)

when the operator talks into the microphone. First, before his speech starts, the vacuum tube is generating oscillations (carrier waves) in just the same action as a regenerative receiver, the frequency being determined by the relative value of the coil F and the variable condenser. The amplitude and constancy of the same are maintained by means of the regenerative tickler coil.

As soon as the voice waves of the operator impinge upon the diaphragm of the microphone an alteration of the current in the D battery circuit is immediately established. These current variations in the phone circuit are transferred by means of an audio transformer to the grid circuit, where they act directly by affecting the amplitude of the local carrier-wave oscillations generated by the tube. The fixed condenser is shunted across the secondary of the audio transformer in order to reduce the impedance of the grid circuit to the high-frequency carrier waves.



Schematic diagram of another type of set operated as illustrated. The tickler coil is employed here as direct feed-back. Suggested by C. White. Drawn by S. Newman.

The perfection and use of a separate modulating tube has been due largely to the persistent and efficient skill of Heising and a corps of very competent radio and telephone engineers. The multiple-tube transmitter possesses several advantages over the single-tube set, owing to the fact that flexibility of operation of the two separate functions is accomplished by means of an independent oscillator and modulator.

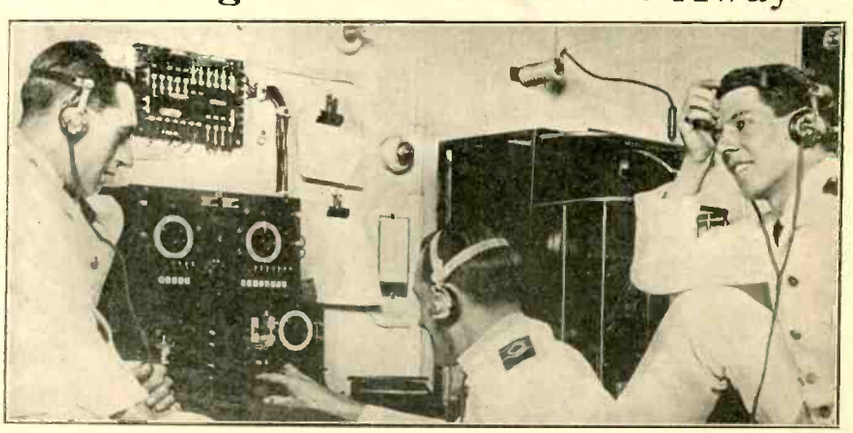
In Figure 2 one type of set operating on this principle is illustrated. The reader will note that the oscillator part is quite similar to the ordinary regenerative receiver circuit, except for the fact that the regenerative element, consisting of the tickler coil and its variable condenser is shunted across the B battery whereas, in the receiver, the tickler coil is not in series with a variable condenser and is in series with the B battery and receiving phones. The functioning of this set may best be visualized by considering silence to exist and studying the action of the oscillator unit in the steady state. In an exactly analogous method, local oscillations are generated as in the regenerative receiver—the frequency being maintained by the coil F, the variable condenser, and the tickler coil.

These high-frequency carrier waves are kept from going into the modulator circuit by means of a choke coil which has a high impedance to waves of radio-frequency and low impedance to waves of audio-frequency. In other words, the choke coil acts just the same as a mechanical check-valve on a water pipe, allowing current to enter the oscillator from the modulator but prohibiting the reverse operation. When the speaker causes the current in the grid circuit to be disturbed by talking into the microphone, there is a corresponding change in current, in the plate circuit connected with the modulating tube.

This rapid change of current in the plate circuit causes a varying electromotive force to be set up in the iron-core inductance G. Now, since, the B-battery circuit is common to both tubes, this varying electromotive force will be impressed on the plate of the oscillator, thus causing the amplitude of the locally generated oscillations to change in some manner proportional to the various sounds impinging on the microphone diphragm.

Of course the two types of transmitters I have just explained are only the very simplest forms. Many of our broadcasting stations not only have multiple-tube circuits but, also, filters of various kinds. The general use of filters in radiotelephony is to be encouraged, not only for the reasons I have previously set forth, but because their use makes it possible to transmit phonograph music and music played at a point quite remote from the broadcasting station where it becomes necessary to use a ground wire. As examples of the former there are many stations that now broadcast phonograph music by filtering out the objectionable needle grind, thus making it quite impossible for the listener to determine whether the music is real or reproduced. As an example, I shall quote the case of Gimbel Bros., department store, Philadelphia, where music is broadcast through their station from the L'Aiglon Cafe, about ten blocks from their store. This is made possible by placing the microphones at the cafe and sending, by means of a private land wire, to the radio station where the noises of the land wire are filtered out and the real music is successfully amplified.

Listening to Music 500 Miles Away



(C. International News Reel)

M. A. C. Lund, chief radio officer of the "Empress of France," and his assistants, W. J. Howlett and D. C. Nye, listening to the radio program of WGY, Schenectady, N. Y., while their steamer was at her dock in Quebec, 500 miles away. They are photographed listening to the opera, "Robin Hood." In her wireless work the "Empress of France" uses a 1½ quenched spark and continuous-wave-set receiver, with 14-electrode vacuum tube. Her range for picking up messages is 3,000 miles, and her sending capacity about 2,000 miles. In her trips from Great Britain to Quebec, Canada, she keeps in touch with the Leafield Station, Oxford, during the entire voyage. Many times Radio Officer Lund has picked up calls for medical assistance in mid-ocean, and when the case has been urgent has been able to give advice by wireless from the doctor of the "Empress" or arrange matters so that a doctor from the "Empress" could attend the case in person.

Wonders of Radio-Frequency Amplification

By H. S. Potter

MOST wideawake amateurs today are experimenting with radio-frequency amplification. A number who have not taken up this fascinating branch of radio are not fully acquainted with the subject. I hope to give them a few valuable suggestions in this article.

The several common systems are the resistance coupled, the air-core transformer coupled, the iron-core transformer coupled, and the tuned plate. Of these the resistance-coupled system works best on long waves, but is unsatisfactory on short wave-lengths.

The air-core transformer coupled system, excellent on short waves, seems to be neglected in favor of the system using transformers having iron cores. These iron cores are made with very thin laminations of soft iron, wound with two windings of wire, of the proper number of turns for the wave-length range to be covered.

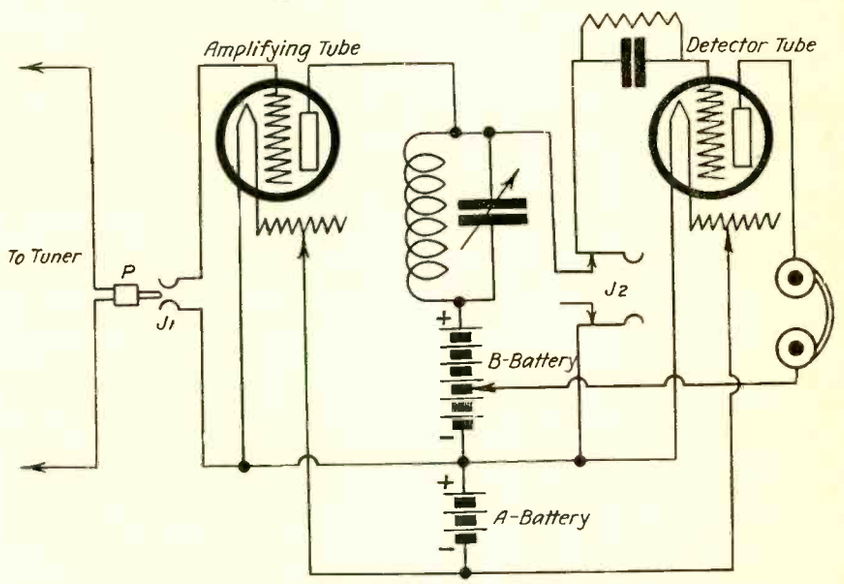
Unlike audio-frequency transformers, these transformers designed for radio-frequency work cannot be used on the whole band of wave lengths in use to-day; but must be designed for the particular class of work they are to be used on, since their wave range is limited. Those on the market are meant in most cases, to have a wave range from 150 to 500 meters, and will work most efficiently at about 350 meters—their natural wave length.

The last named system, the tuned plate, is, if well constructed and operated, the best of all for short-wave amateur work, but has the disadvantage of being difficult to tune. In fact, tuning becomes well-nigh impossible if several steps are used. In this system, a variometer, or a variable condenser and a tapped inductance, serve to tune the plate circuit to resonance with the grid circuit and the incoming signal. Such an amplifier greatly increases the selectivity of a set.

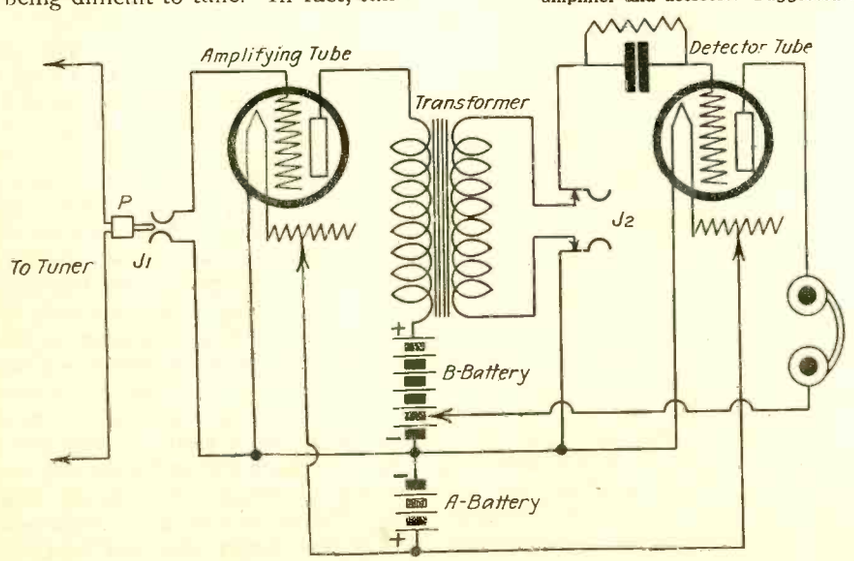
The value of short leads cannot be overestimated. Important in all radio work, it means the difference between success and failure in working with amplification on the enormously high frequency of short wave-lengths. All wiring should be done with No. 14, bare, copper wire with all joints soldered. Parallel leads of plate angle grid circuits should be carefully avoided. When using a tuned plate circuit amplifier great care should be taken to keep the plate inductance away from the grid or tuning inductance; otherwise, a feed-back which cannot be controlled will result.

Where a great number of steps of high-frequency amplification are used, the tubes should be shielded from one another by grounded metal partitions, and the back of the panel should be covered by tin foil, grounded.

In selecting a tube for use in radio-frequency amplification, care should be exercised. A very hard tube will give the greatest freedom from distortion.



Schematic diagram of a two-tube circuit showing the difference in the coupling between amplifier and detector. Suggested by Harold S. Potter. Drawn by S. Newman.



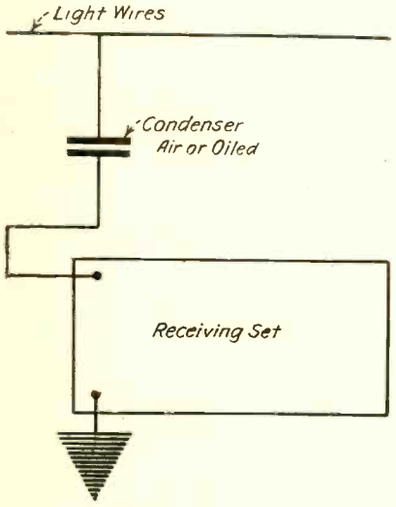
Schematic diagram showing the amplifier and detector with radio-frequency transformer. P is a plug from the tuning circuit, J-1 the jack of the amplifier. Suggested by Harold S. Potter. Drawn by S. Newman.

I have found a Meyers tube very satisfactory, while an A. P., is almost as good. If neither of these tubes can be procured a radiotron U-V 201, or a Cunningham amplifier tube, may be used with satisfactory results; but the current consumption of the two last named is high, making them less economical to use.

The proper regulation of the filament current of the amplifier tubes, especially the first arc, is of vast importance in the operation of a radio-frequency amplifier. While experimenting with a one-step tuned-plate amplifier using an A. P. amplifier tube, coupled to an audiotron detector tube, I found that a most careful adjustment of the amplifier-tube filament was necessary, while the audiotron detector filament, the adjustment of which was very critical in an ordinary one-tube circuit, needed very little adjustment.

How to Connect the Electric-Light Socket Aerial

By John Kent



Schematic diagram of the lamp-socket aerial. One wire only is used in the circuit. The condenser is connected between the aerial post of the receiver and the electric light wires. Drawn by S. Newman.

THERE is considerable unrest among amateurs who are still dabbling with their receivers trying to hear concerts by utilizing electric light power-lines as an aerial —that is, the wires or lamp-socket connections in the home used for lighting purposes, running vacuum cleaners, ironing, or other domestic matters. Major-General George O. Squier, of the United States Signal Corps, started many amateurs on this track when he announced its possibility, last spring.

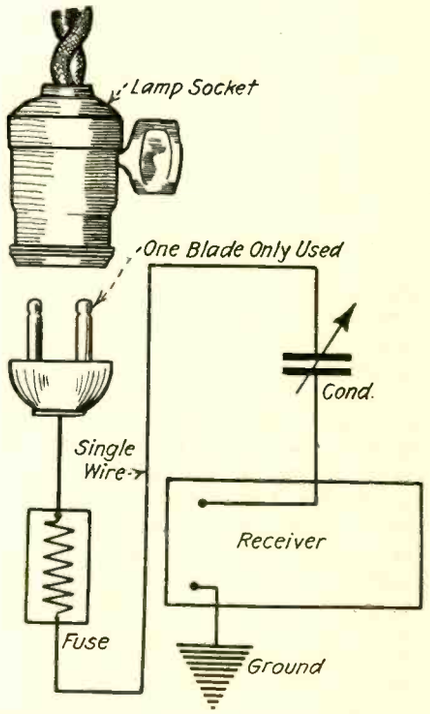
There is a lot yet to learn about operating an electric-light aerial. When using the socket, a few simple precautions must be taken in order that no trouble shall arise such as the burning out of tubes and probably no signals being received. The accompanying illustrations indicate how the set should be connected. Figure 1 is a schematic diagram of the lamp-socket aerial. Figure 2 shows the proper connections.

One factor is necessary—a good plug. The plug must be absolutely perfect, electrically. Usually, an ordinary attachment-plug is used; one with two blades, connecting the separated halves of the plug. One wire is all that is necessary; the other being left undisturbed.

The single wire used should be long enough to reach from the lamp-socket to the table where the instrument is to be used. It can be seen by the diagram that a condenser is used. This is essential for two reasons: First, to keep the current of 110 volts from your instruments; second, to effectively reduce the wave-length of the lighting wires, which are exceptionally long, so that it is possible to carry the shorter wave-lengths from the antennae.

No set should ever be used on this system without employing condensers with the aerial or ground circuit—the aerial circuit being preferred. Another hint to the amateur: Insert between plug and condenser, as shown in diagram, a one-half-ampere fuse which will benefit and protect the set.

When using the set, simply screw the attachment plug into the electric-light socket and start tuning as usual. If no results or poor results, should be experienced, simply reverse the bottom half of the plug. Amateurs endeavoring to use the lighting system as aerial should never hook-up direct to a lighting system without employing a means of safety, such as a condenser. Where no condenser is used, the fuses probably will blow out and leave the house in total darkness. Precautions should be taken so that no body contacts are made with power lines and the ground at the same time.



Schematic diagram showing the lamp-socket and plug. This is so simple that most any radio amateur can perform the operation. Do not fail to use the condenser in series with wires. Drawn by S. Newman.

(*Continued from preceding page*)

I was using 45 volts on the amplifier and 19½ volts on the detector.

The use of very high-plate voltages in a radio-frequency amplifier should be avoided, as no great increase in signal strength results, and the life of the tube is considerably shortened.

One of the things which stands in the way of most amateurs using radio-frequency amplification is the difficulty of using the desired number of steps, and cutting out those not necessary. To do this in one operation, some amateurs have adopted complicated switches; but these are expensive and inefficient, due to losses from capacity effect. Therefore, we must turn to the old reliable jacks.

A plug and jacks cannot be used, as in an audio-frequency circuit, to place the phones in the plate circuit of any tube at will, since the unrectified plate current of the radio-frequency amplifiers would produce no sound in the phones. The problem now resolves itself into keeping the phones in the plate circuit of the last tube, and varying the number of amplifier tubes between the detector and the tuner.

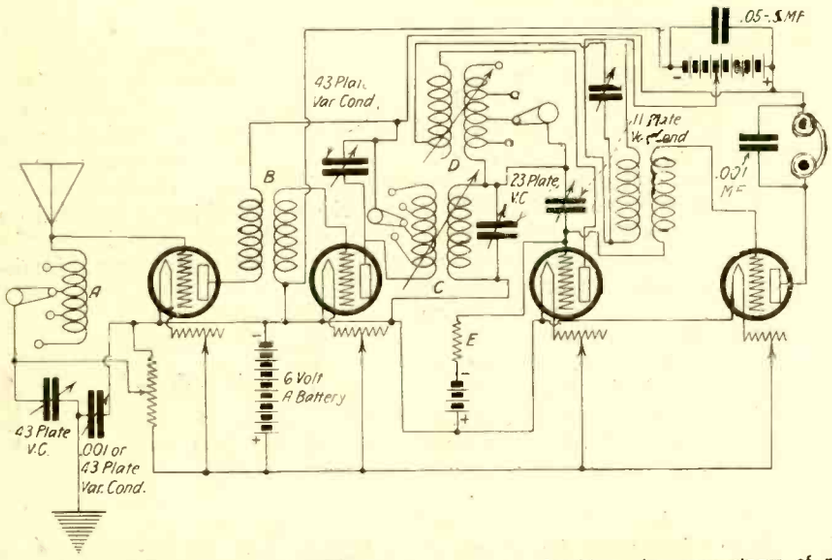
This may be accomplished by placing the jacks in the input circuit of the tubes, and connecting the plug to the tuner output. Figure 1 shows how this may be done in a transformer-coupled amplifier, using either air- or iron-core transformers. Figure 2 shows how jacks may be applied to a tuned plate circuit amplifier. J1 in each case is a single-circuit jack, and J2 a double-circuit. In each case a single A and a single B battery is used. In the second diagram it will be noticed that but one inside contact arm of J2 is used.

Although but one step of amplification is shown in each case, any number of steps may be added in the same manner. All the jacks will then be double circuit except J1, which will always be a single-circuit jack of the open circuit type.

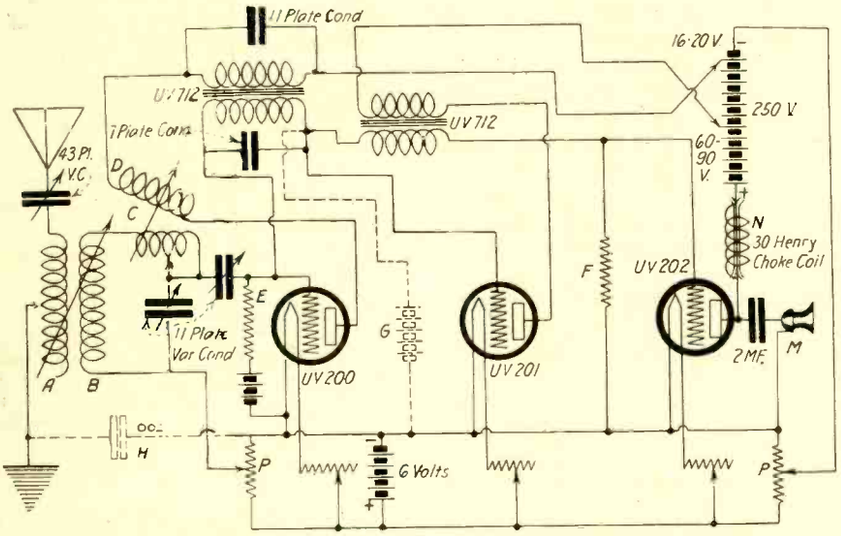
To minimize losses, the jacks should be so located that short, direct wiring may be used. The plug is connected by a flexible telephone cord to the tuner. All inside connections to the jacks should be carefully soldered, using resin as a flux, and pure metal solder. The use of special soldering compounds, which constitute flux and solder in one, should be carefully avoided, as they are apt to cause corrosion.

Practical Circuits for Regenerating Loud Signals

By O. S. Kelly



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 1½ to 3 volts 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.



Another schematic diagram of Dr. Kelly's practical circuit, employing the following apparatus: A-B is a vario-coupler; C-D is also a vario-coupler having a wave length from 180 to 600 meters. The tickler is wound with 125 turns of wire (bank wound). E is a variable grid-leak, 1½ to 3 volt bias. F is a fixed grid-leak of about 1 megohm. G-H shows optional connections, the grid bias being from 6 to 22½ volts. M is a loud speaker. N is a door-bell transformer (primary open) using 110 volts as choke. Suggested by Dr. O. S. Kelly. Drawn by S. Newman.

I DO not claim anything new regarding this circuit. In fact, it is the principle of Major Edwin H. Armstrong's invention. Inasmuch as it uses different methods, the principle is the same. Accompanying this are two schematic sketches of a circuit I have used through the terrific static we have in this section (Oklahoma City, Oklahoma). While it embraces the same principles, it is stable and may be operated by the average amateur without difficulty. This hook-up is available for use with a regenerative set, and is more a matter of the correct use of the regular equipment and its proper adjustment than of special coils and critical behavior.

In tuning this circuit the grid leak is the key to the entire circuit; therefore, an adjustable pencil mark, or variable grid leak, is absolutely essential. I use VT 1 for the detector, and either VT 2 or UV 201 for the amplifier; but VT 2 for the last stage makes things whizzle. In the radio-frequency circuit, UV 201 amplifying tube is used exclusively. The regeneration is carried out exactly as in the simple regenerative set.

When adjusting the operating stage of highest amplification and disturbance elimination, first set the condenser on the primary and secondary stage of the transformer and the tickler coil until the set howls violently. Lower the the grid-leak resistance until the oscillations practically cease and a high whistlelike noise is heard in the plate circuit of the second tube. The condensers may then be set on proper wave length and tickler rotated to the maximum of signal audibility.

This circuit is not easily paralyzed. The grid-leak condenser is the only instrument that will require a shield; for, while no hiss or howl is heard when in operation, the variable gird condenser sharpens tuning and eliminates interference to a marvelous degree. The following stations are heard: QSA (both telephone receivers and magnavox), KFAF, KSD, KNJ, KYW, WAAL, WDAF, WEAH, WFAV, WBL, WGAQ, WRR, WHB and many amateurs on CW in the Fifth District.

Watch for This

DOES this ever occur at nightime: Signals from distant stations "swinging" badly, or varying in intensity, then gradually becoming weaker and even fading out entirely, then reappearing with varying intensity? This phenomenon is known as "fading" or "swinging of signals," and is believed to be due to certain conditions of the atmosphere. Stations within reliable daylight range are seldom observed to fade appreciably. If signals from various broadcasting stations appear to swing or fade simultaneously, the receiving set should be examined. The cause is due, frequently, to an exhausted filament or plate battery. An irregular hissing or frying noise is frequently another indication of an exhausted B battery.

Radio Telephone Range Tests

THE Bureau of Standards is planning to conduct comprehensive tests to determine the effective working ranges of radiotelephone communication when using various kinds of transmitting and receiving sets. Preliminary plans have been outlined for this work, and some correspondence conducted in regard to it.

World Commerce Aided by Radio's Far-Reaching Weather Survey

By Carl Hawes Butman

WASHINGTON, D. C.—On August 16, there came to the United States Weather Bureau a radio message composed of curious code words and figures, which would mean nothing to the average fan but which mean much to the forecasters of the weather. It was the first daily European meteorological report from France, forwarded in exchange for a report on conditions in North America sent daily by the United States Weather Bureau since June 15.

Radio has taken a vital part in gathering and disseminating meteorological data for some time, especially in the United States, where the science is farther advanced and the speed of transmission higher than in any other country. Now radio has begun to serve the Old World with news from the New. Early in June, arrangements were made between Captain Wehrle of the French Meteorological Service and American Weather Bureau officials for the exchange of meteorological observations from about thirty main stations in the United States and Canada, and a similar report from 22 European stations—the exchange to be made daily by radio. Beginning on August 16, the United States Weather Bureau incorporated the French report in its daily statements which are broadcast from some 80 stations throughout this country.

In France, a daily broadcast from the Eiffel Tower now carries the American weather report to all radio stations within its range in Western Europe. Weather reports from the West are especially valuable to Europe, where meteorology is international, the weather in one country materially affecting that in another. As the course of most storms, as well as what are termed "highs" and "lows" of barometric pressure, is generally from west toward the east, European countries are vitally interested in the weather in North America to-day, since it will affect their country within a few days; storms and cyclones on our two coasts eventually reaching Northern Europe. By means of the newly arranged radio exchange, France collects the information from 22 European stations and sends a composite report from the Lyons station to our Naval station at Bar Harbor. The United States Government collects its local data and transmits a general survey every evening from Arlington to Bordeaux, so that it reaches its destination before the Europeans are awake on the next day, and gives news of a storm long before it arrives.

The development of the science of meteorology in the United States has been remarkably fine and its establishment dates back fifty years, when, with the aid of line telegraph, reports were received from as far west as the Great Plains. To-day, there are 210 weather-bureau stations in the United States and 30 in Canada, all of which cooperate in gathering weather statistics. Observations are taken twice daily, at 8 a. m. and 8 p. m. (75th meridian time,) but it requires a full hour and many telegraph lines to distribute all the information to Washington and 125 other weather-bureau offices, where the observations are charted and released to the public. Observations of the barometer, state of weather, wind velocity and direction are taken. When the reports are all received at Washington, the forecasting is done and the information disseminated.

Besides the stations in the United States and Europe, Washington gets advices from 36 stations in the West Indies, Cuba and Central America; 17 points in Mexico; 12 points in the Pacific, and 9 in Alaska; making a total of 336 reports including the United States and Canadian observations.

Radio serves many of the collecting and transmitting stations; for example, all European reports come in by that means, as well as 16 of the 36 West Indian reports, 12 from the Pacific and Far Eastern Stations, and 4 of the Alaskan stations. "Wireless" was first tried experimentally in 1900, and much progress was made by the Weather Bureau, the first of the Government departments to use it; but, in 1904, President Roosevelt's radio board recommended that the Bureau cease its experiments, assigning development work to the Army and Navy.

Radio reports from the Far East have the curious effect of reaching San Francisco before they start, due to the difference in time; messages sent at 8 a. m., standard eastern time in Japan, reach San Francisco at 5 a. m., three hours earlier, and Washington at 11 a.m.; but it is really about 12 hours after the observations are taken before they reach headquarters.

Officials of the Weather Bureau point out that radio has aided in the advance of the science of meteorology more than anything else in the past two decades, and they expect it to accomplish much more in the next few years. It serves especially in collecting weather data from vessels at sea, as well as making possible the sending of storm warnings and forecasts to the ships. Previous to the use of radio on the sea, no information of approaching storms was available. To-day practically every ship sends a full weather report twice daily, all of which are forwarded either to San Francisco or Washington.

The Navy cooperates in both collecting and disseminating this information, and broadcasts a weather report twice daily from Arlington, San Francisco, and the Great Lakes. Local services are broadcast daily by 36 Naval radio-stations on American coasts, primarily for ships.

Weather forecasts and warnings are sent by land telephone to approximately seven million telephone subscribers in this country, which is particularly valuable in the rural districts, but the latest and most complete service—thanks to broadcasting stations in all but one State—makes the weather reports available to nearly a million people who have radio-receiving sets, among them many isolated farmers who never before had the benefit of weather reports.

In the future, forecasters look for data from the most remote places sent by explorers via radio. Amundsen, who is sending reports from the Far North, almost daily, is the first to do this. It is a step toward an improved and complete weather survey of the World.

Radio Waves of Radium

By Harold Day

THE shortest X-rays now known are about one-tenth of a unit long. But there is still the shorter rays and the gamma rays given out by radium. These rays have, apparently, wavelengths of from .05 to .08 unit. They are the latest form of radiation to be discovered. As yet not much is known of them. But they are, like all the others, waves in the ether, just like the X-rays and light and radiant heat and wireless, except that they are shorter. They are the radio of the radium atom, the ethereal cry which goes out from the atom when it suffers the atomic explosion that causes radio activity.

The Radio Primer

A Weekly A. B. C. of Radio for the Beginner, in which Elementary Facts and Principles Are Fully and Tersely Explained and all Words and Terms Used by Amateurs and Experts Defined

The Beginner's Catechism

By Edward Linwood

CAN body effects be eliminated when using the variometer-type set? How far should they be spaced?

Body capacity-effects may be eliminated if the back of the panel is sheeted with thin copper and grounded. Copper sheeting also could be placed between the variometers, care being taken that the sheeting does not come in contact with any of the wires. The variometers should be spaced about four inches apart.

* * *

Of what use is the variable condenser in shunt to the secondary? Does this help the set any?

The variable condenser in shunt to the secondary of the loose, or vario-coupler of the receiver, serves to add capacity to the circuit and permits a finer degree of tuning in the secondary circuit than could be obtained merely by varying the value of the inductance of the secondary.

* * *

Can a vario-coupler or a variometer be made by an amateur?

A vario-coupler for short waves may be constructed of about 80 turns of No. 22 double cotton-covered wire wound on a tube four inches in diameter. This is called the primary, or stator. The next, or the rotor, may be either ball or tube type, and should be wound with 50 feet of the same size wire. The primary winding should be tapped, each turn, for the first 8 turns, and these turns connected to a switch. The succeeding turns should be tapped off in groups of 8, each attached to another switch. The variometer may be made in four sections, forming two coils each and comprising two windings. The stator winding should have about 25 turns on each section, and the rotor winding the same. Use No. 22 wire.

* * *

How may a test be made to discover if a variable condenser is short circuited?

An arrangement so built that a buzzer and battery, connected in series with the condenser, would tell if any part of the condenser is short-circuited.

* * *

What is a tuning coil?

A tuning coil is a length of wire wound around an insulated tube. The wire is copper, and ranges in size from No. 16 to No. 32, B. & S. The length of the wire depends on the number of turns required and the diameter of the coil. The tube may be made of pasteboard, fiber, bakelite, formica, or any other patented composition materials. Metal tubes should never be used. The diameter is from 3½ to 5 inches.

Radio World's Revised Radio Dictionary

By Fred. Chas. Ehlert

Tune In—To tune a receiver to the desired transmitting station, in order to receive the loudest signals.

Tune Out—To tune a receiving set so that the signals of all stations not wanted are weakest.

Tuned Closed Circuit—A circuit formed of a condenser, spark gap, and inductance for transmitter. Also, a circuit formed of a condenser, inductance, and a detector.

Tuning—The act of altering the capacity, or inductance, of a circuit so as to bring the circuit into resonance with an external source of similar character.

Undamped—A train of high-frequency oscillations of constant amplitude. Such waves are termed CW, or continuous waves.

Vacuum tube—(Abbreviated VT.) A form of detector making use of the electronic theory. The most efficient form of detector. In radio work, this term is applied to a glass tube exhausted of air and containing essentially a filament—for the creation of electrons. The vacuum tube plays three leading functions in radio work; namely. detection, amplification, and generation of high-frequency electromagnetic waves.

Variable condenser — An instrument that consists of a number of aluminum plates, one-half of which are stationary and the other half movable. It is used to vary the capacity of the receiver and will greatly aid tuning.

Variometer—Consists of a set of fixed windings and a set of movable windings, the latter being rotated on twin axes in the usual construction. This instrument serves to vary the inductance and wavelength of any circuit in which it may be used. When the coils are turned about so that the current flow in both sets of coils is in opposite directions, the coils are said to be bucking each other and the inductance and wave length at a minimum.

Vario-coupler—A tuning coil, or set of coils, that will tune the same as that of a loose coupler. Very efficient in a set using a vacuum tube if connected with a regenerative set.

Variable resistance—A device for regulating a current flowing in a circuit, as water resistance in the primary circuit or a potentiometer in the receiving circuit.

Valve amplifier—A three-electrode vacuum-valve tube of the audion type. Used either to amplify the incoming radio signals after rectification. Both rectification and magnification may be performed by the same tube.

Volt—The unit of electrical pressure. It is pressure that forces one ampere through a resistance of one ohm.

Watt—The unit of electrical power. To find power in watts, multiply voltage by amperage. Seven hundred forty-six watts equal one horse-power. One thousand watts equals one kilowatt (kw).

Wave changer—A switch by means of which the wave of a transmitter may be changed from one wave to another.

Wave length—The distance between the crests of each wave or series of wave trains measured usually in meters. Radio waves in their passage through the ether, travel in undulating form similar to waves at a seashore.

Wave-train frequency—The number of wave trains radiated per second by a transmitter antenna.

Wave meter—An instrument used for measuring the wave lengths of radio transmitters and receivers.

Wireless key—A device for making and breaking up a current into dots and dashes. A key for wireless work usually has larger contact than an ordinary telegraph key.

Wireless waves—Electric waves. The waves sent out through space by oscillating currents in an aerial wire.

Zincite—A deep red mineral used in connection with crystal detectors as a sensitive element. Zincite is very sensitive to electrical oscillations.

For Sensitive Reception

USING a fixed condenser across the telephones will have the effect of taking the weak impulses which have been rectified by the detector and storing them up in the condenser until the condenser is fully charged. It will then discharge the signals more evenly.

A variable condenser is an essential element for sensitive reception. In general variable condensers afford a reliable and simple method of altering the values of receiving circuits in order to bring about a point of resonance, thus enabling one to select at will stations on different wave lengths.

Radio World's Hall of Fame

(C. Underwood & Underwood, N. Y.)

ELMER E. BUCHER

One of the youngest and most active men in radio. He is thirty-seven years old and has written several of the most practical books published on radio, also a number of important magazine articles. After being graduated from Oberlin Academy, Ohio, he joined the De Forest Wireless Telegraph Company as experimental engineer. To spread the gospel of radio, he became associated with the Y. M. C. A., and started a number of branch schools. Many people thought he was too far ahead of the times by doing this, but he had hundreds of young men prepared for positions when radio finally "arrived." In 1912, he became instructing engineer for the Marconi Wireless Telegraph Company. Mr. Bucher is now connected with the Radio Corporation of America.

Cleveland Bank Becomes Broadcaster to Increase Its Business

By H. K. Keyes

THE Union Trust Company, Cleveland, has installed one of the most complete broadcasting stations in the Middle West. It will have a range from 500 to 1,000 miles. This is the second broadcasting station in Cleveland. The antenna is 350 feet above the level of the street and is believed to be the highest in Northern Ohio. It is heavy copper cable. The station uses four 250-watt tubes and one 100-watt voice amplifier. Power is furnished by a five-kw. generator. There is, also, a two-stage speech amplifier. Stock market reports, live stock, grain and produce reports are broadcast every day at 9 a. m., 10 a. m., 2 p. m., and 3 p. m. It is planned to give concerts at least once a week. J. M. Thornburn will be the expert in charge. He formerly was in radio work with the Ford Motor Co., Detroit, the Detroit Edison Co.

A. E. Scoville, vice-president of the Union Trust Company, says that radio broadcasting is unquestionably in its infancy.

"The average man," says Mr. Scoville, "looks upon it as an easy means of listening to concerts, etc.

"For more than a year we have been watching radio broadcasting closely, contemplating its service possibilities with increasing interest and respect and awaiting the time when radio broadcasting and receiving could be said to have 'arrived.' To-day, at the Union Trust, we believe that, in radio, there is a tremendous potential use and in establishing our new broadcasting station we are going to attempt to demonstrate that radio broadcasting is an important cog in the industrial machinery of the country.

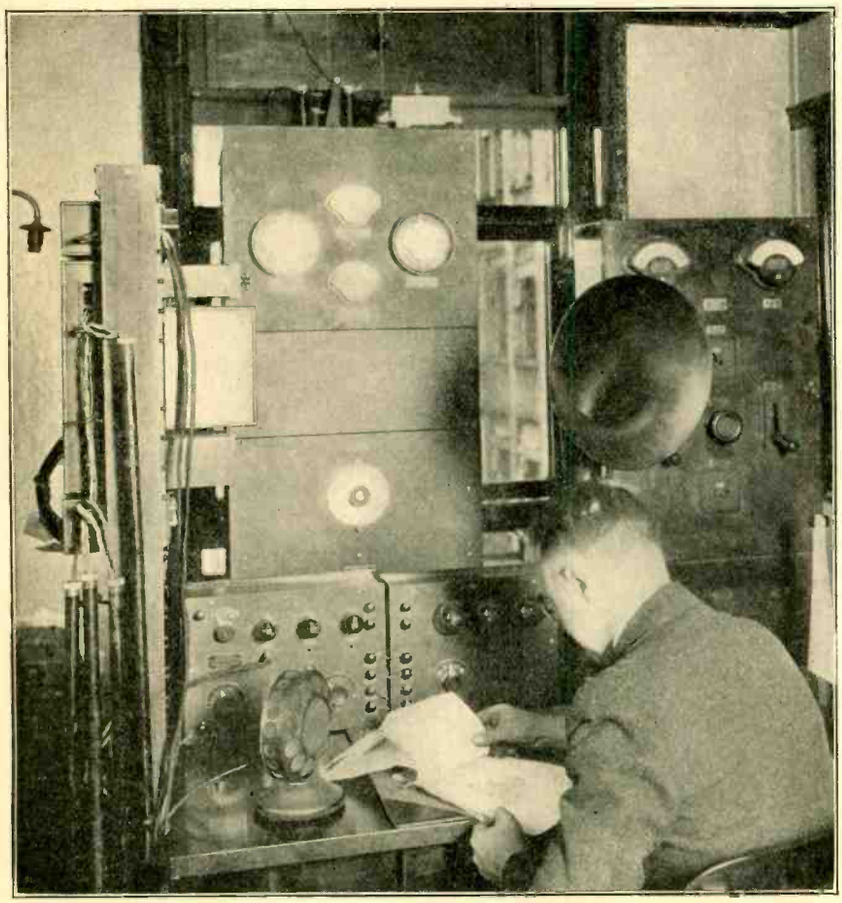
"I really feel that our broadcasting in its importance is second only to the introduction of rural free delivery for the farmer, and I make that statement advisedly, because through our radio broadcasting we will place the farmer in the position of a man with a private bond ticker in his office.

"Let me explain: Hundreds upon hundreds of farmers within the broad radius covered by our radio broadcasting already have receiving sets in their homes. Practically all of the banks of the Fourth Federal Reserve District will shortly include radio receiving sets as a part of their equipment. Four times a day we will broadcast the very latest prices upon farm and dairy products, with the results that the farmer, either through his own private receiving set or through his local banker, can obtain up-to-the-minute data upon the prices of farm and dairy products.

"In no lesser degree will our broadcasting be of benefit to the banker within a radius of four or five hundred miles, because the first thing in the morning and again early in the afternoon for a period of an hour and a half each, we will broadcast not only the interesting details and fluctuations of the bond markets, the government bond market, but the vast fund of information which accumulates so rapidly within a modern financial institution. This will, in effect, give every banker who has a receiving set the benefit of the vast machinery of the Union Trust Company an informative service which we find well worth a cost of $50,000 or more a year.

"In short, instead of regarding the radio as a toy, we conceive it as a tremendous help to thousands of banks and their customers. We look upon it as a means of knitting the Fourth Federal Reserve District, with all its banks and all its people, together into a compact whole, thoroughly informed at all times of the major news of the financial world. More and more are profits in business becoming a matter of seconds. Fluctuations and tendencies are comparatively violent and it is imperative that the business man not only in the city, but the modern business farmer, be in intimate contact with market tendencies and conditions.

"The stimulation of business which will inevitably result is self-evident, for only through an intimate knowledge of the situation can the modern business man and banker operate the economies and plans upon which business profits of today so largely depends. As a means toward this we are erecting what is the very last word in radio-broadcasting outfits. It incorporates every practical and beneficial improvement known to the science and art of broadcasting as it is to-day. To my knowledge we are the only bank in the country with its own private broadcasting station, and this will mean the vast fund of information and data now now being used by comparatively few individuals will be placed at the command of a wide circle, thereby multiplying the benefits of the modern bank many thousand fold."



A corner of the broadcasting room of the Union Trust Company, Cleveland, Ohio. A. E. Scoville, vice-president of this institution, explains in an interview on this page why radio is so necessary to successful banking.

United States Army to Be Enforced with Radio Tanks

By Washington R. Service

RADIO experts of the United States Corps have just perfected a new tube transmitting and receiving set for the "baby," or "whippet" tanks which will handle both telegraph and telephone messages. So successful was the recent demonstration at Camp Meade with the radio-directed tank which took part in the fight of "Hill 285," leading and directing its brother tanks, that from 30 to 40 new sets have been ordered for the master tanks of the Army.

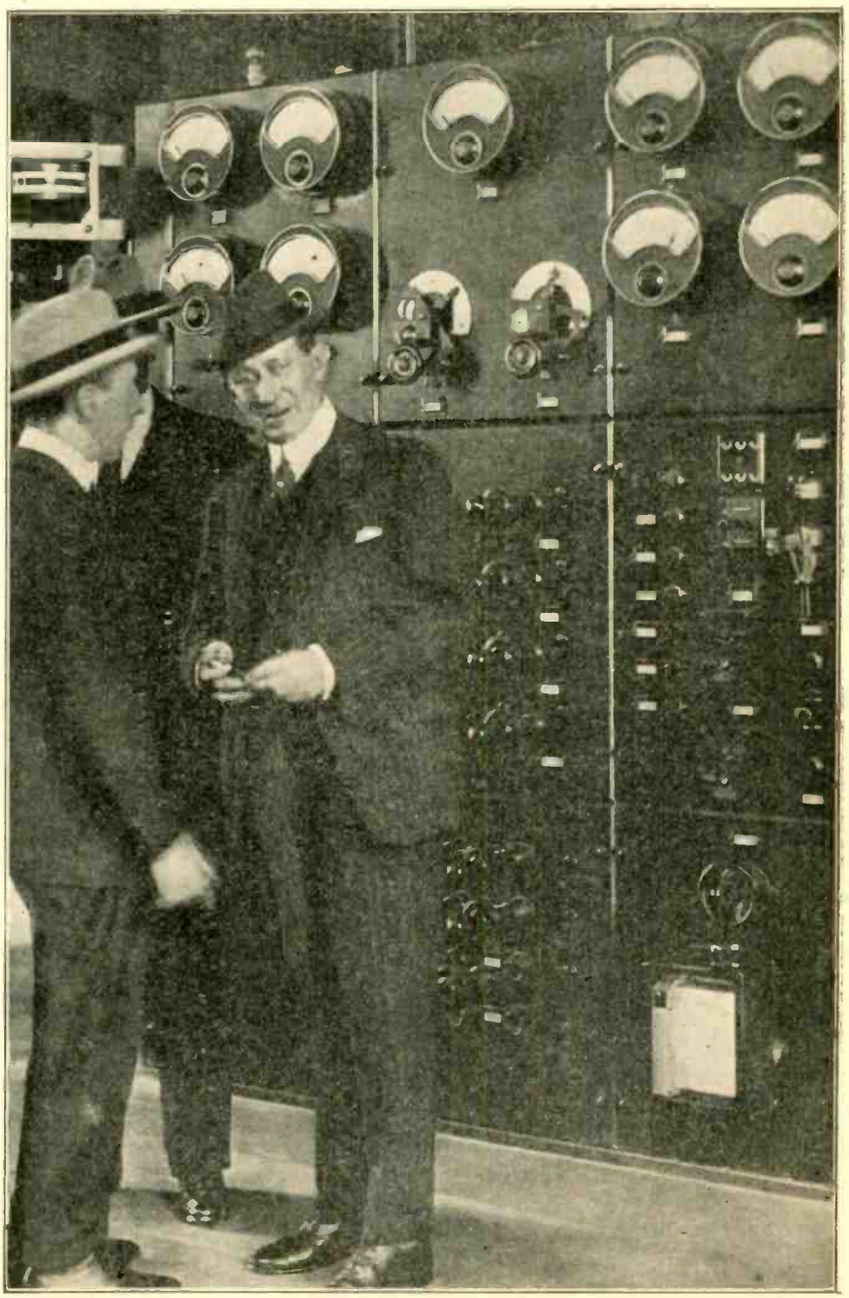
The specifications of the new tank equipment, known as S.C.R., 143, dual telephone-and-telegraph set, call for a strong and compact set of about 50 watts, which will withstand the jolting of a tank in action over rough terrain and preserve a good tone. It will have a range of from five to ten miles.

Plans of the infantry arm of the service, which includes the old Tank Corps, provide for one radio, or "signal," tank for each group of whippet tanks, which will serve as a message and control center for the group. The signal tank will be equipped with a six-foot aerial, the ground being the tank itself. Power for driving a small generator will be derived from storage batteries. A sound-proof helmet with phones such as air-pilots use, will be supplied for the radio man so he may hear despite the rattle of the mechanism and roar of the engine.

The first practical demonstration showed the value of radio-equipped tanks. They are not radio controlled, but radio directed. Captain C. H. St. Germain, signal officer of the tank school at Camp Meade, took his station on one side of the maneuvering ground, after the recent sham battle, and, with his head-set on and a transmitter in his hand, made the mechanical scout several hundred yards away go through its paces to perfection. At his radio orders, it "charged" the hill, executed "By the left flank," "To the rear" and "halt" performing most creditably, directed solely by radio, which might have been several miles away. In actual battle, however, the tank commander would attend to all details as to moving about, relying on battalion or regimental headquarters for such information as when to advance or retreat and where machine-gun nests were located. Such information would be conveyed to the other tanks in the group by visual signals or the movements of the master tank itself, just as in air-plane formations.

Future development is seen in the equipment of all tanks with receiving sets, so that intertank communication may be had in action, and some prophetic spirits of the corps foretell of radio control enabling an "Amatol." or "T. N. T." filled tank to be sent into enemy lines and exploded, a "creeping torpedo," in fact, which would undoubtedly carry fear and destruction into the enemy camp. But that is a subject for future development, although quite possible electrically and mechanically. It is not being sidetracked by the United States Army.

"It Is Simply GREAT!" said Marconi



(C. Central News)
The "Wizard of Wireless" had just returned from a tour of inspection of the vast radio center at Rocky Point, Long Island. He was visibly impressed with the far-flung antenna, the massive generators, the huge receiving sets ready to pick up signals from the ends of the world. Then he remarked with pride: "It's simply GREAT!"

Radiograms

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

PASSENGERS aboard the flying boat, "Buckeye," of the Aeromarine Airways, Inc., were entertained by radio during the ninety minutes' journey from Detroit to Cleveland recently. The entertainment was supplied by "aerial stowaways" who made the trip by proxy—by radiotelephony. The radio equipment, weighing 150 pounds, was placed in the large stern-cabin of the boat. While the noise of the "Buckey's" motors prevented the passengers from hearing clearly the program of the "stowaways" was greatly enjoyed. This the company intends to overcome with an ample loud-speaker.

* * *

The majority of the 1300 boys and girls of the Hebrew Orphan Asylum, 136th Street and Amsterdam Avenue, New York City, are radio fans. Classes of a dozen or more may be seen daily "listening in" at the receiving sets. International news and sporting events are the chief topics of interest to the young enthusiasts.

* * *

The Canadian public is looking to radio for much of its entertainment. Several theatres in Toronto and throughout the province of Ontario, have installed radio receiving sets in their buildings for the purpose of giving radio concerts each evening. They have secured the services of a number of artists who will perform in the Marconi Company's large new broadcasting station on the roof the Canada Cement Building, Toronto.

* * *

The history-crowned Red Sea—1450 miles long, between Arabia and Africa, and one of the hottest places on the globe—is said to be the most pronounced radio "dead spot." Radio operators claim that while passing through this inland body of water, they can read no signals. Even the station at Aden, Arabia, is silent. But on leaving the Red Sea, messages are picked up at full length.

* *

John F. Hylan, mayor of New York, is an ardent radio fan. He owns a muchly used receiving set. Perhaps that is why he is deeply interested in New York City's new municipal broadcasting station. In regard to this station, the mayor believes that broadcasting will be of real service to the various city departments, particularly the police, fire, and health departments. To the police, asserts Mr. Hylan, the radio will render a two-fold service. It will enable them to enlist the aid of many thousands almost instantly in an important crime hunt, instead of passing the warning to merely a few thousand members of the force.

* * *

A new radio record from Buenos Aires, Argentina, is reported by the Chicago "Tribune." the steamer "Almanzora" on its arrival there reported exchanges of messages with Cape Town, South Africa, at a distance of 3,457 miles; and with Leafield, England, 5,534 miles distant.

* * *

Radio is developing several new "professions," among the most important being that of the line-up man who repairs housetop aerials.

* * *

The effect radio will have on the literary style of the future may be analyzed in a measure by watching the development of the short stories and tales broadcast by the authors of juvenile books. Natural history, thinly coated, is absorbed liberally by the children. By the same token, selections from the tales of Hans Christian Andersen and Uncle Remus, although they are recited by announcers only, appeal to the heart of youth.

* * *

He proposed by radio, and the girl said, "Yes!" And when the liner "President Monroe" sailed for France, last week, Maurice G. St. Germain, an officer of the Paris branch of the Guaranty Trust Company, and his bride, formerly Miss Loretta Harvey, of 281 West 118th Street, New York City, started on their honeymoon. Mr. St. Germain, who had courted Miss Harvey for two years, proposed marriage by radio as he was arriving on the "Mauretania" last week. Miss Harvey accepted him and they were married. Cupid finds radio a willing ally.

* * *

Two of the motorcycle members of the police force of Santa Monica, California, have installed equipment for the entertainment of the officers at headquarters in their spare moments. It is expected that it will prove to be a practical adjunct in receiving clews and running down criminals. A wire L flat-top aerial, eighteen feet high, has been erected on top of the Santa Monica City Hall, with detector and two-step amplifiers.

* * *

Colorado is planning to have a comprehensive system of radio communication, which is now being evolved by the police and military authorities. Every sheriff's office is to be equipped to listen in under a regular schedule, and word of escaping criminals or fugitives from justice will be broadcast.

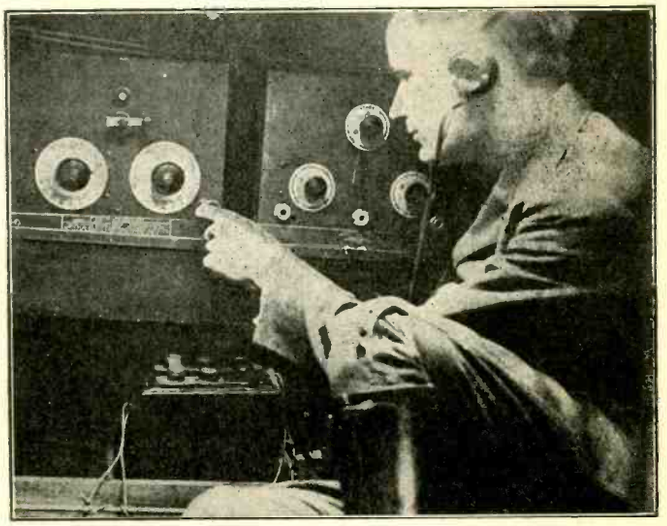
* * *

The American Code Company has issued a system simplifying the Morse Code for amateurs. The set consists of easy memory-words formed from the component parts of their letters. As a means of assistance to the beginner, two gramophone records which reproduce exactly the various Morse signals, as they should be in the receiver, are used.

* * *

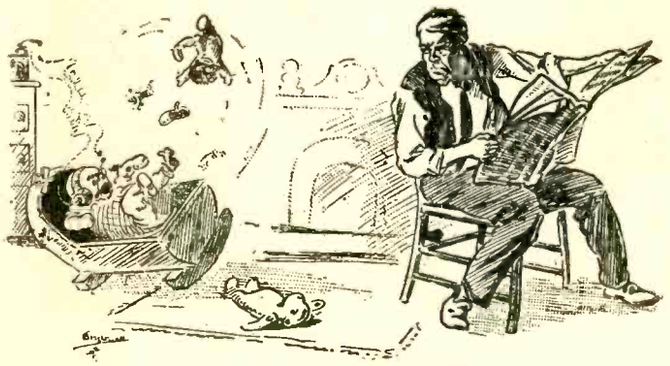
Radiotelephony has been applied to the motor-car. The first experiment of this kind was made on a car equipped with a three-tube amplifying apparatus, which gave street-corner concerts and provided other forms of entertainment. Intercar radiotelephone communication is simple to carry on, provided the apparatus is sufficiently rugged to withstand travel.

Radio Set Aboard the "Sampaio Correio"



(C. International Newsreel Photo)

The big Brazilian seaplane, piloted by Lieutenant Walter Hinton, U. S. N., was fully equipped with a radio set prior to her long voyage. The photograph shows the operator tuning in just prior to flight from New York. The receiver is a General Electric set donated by the Radio Corporation of America.



WIRELESS IN THE HOME

Harassed Parent: "Good heavens! I suppose I must have switched the little beggar on to that political meeting at Limehouse instead of the lullaby concert at the Linoleum Hall." —From London Opinion.

Radio and the Woman

By Crystal D. Tector

I HAVE never boasted prophetic vision; but, as a student of things feminine, I believe that radio will be the prevailing fad with the fair sex this winter. There is an old saying: "Woman's personality is revealed by her clothes." This year—when we have settled down to the things that make winter a long spell of pleasure—it may be changed to "Woman's personality is revealed by her radio set."

* * *

I say this without trepidation. I have chatted with my sister-radioists and non-radioists—and what I write seems to be overly possible. And, why not? Radio is just one vast fun-producing pastime. There is fun even in the more educational numbers of the programs; for, according to that sage of ancient days, Epictetus, we get joy out of all things that broaden and enlighten our minds—and joy is but the outcome of all fun.

* * *

Many of my friends have asked their husbands, already, to give them receiving sets for Christmas. Several young matrons of my immediate acquaintance have told me that they are to have these Christmas presents installed at once, and not wait for the night when they hang up their stockings to come. "Why miss all that is going on till then?" as one tersely asked. "And I promised my little husband," said another, "that I positively—*positively*—would not ask for anything else for Christmas if he would put in a radio set now."

* * *

And several women are planning radio parties. Radio dances are to be part of the scheme of things. Radio dinners will figure prominently in the society news. In short, as I see things shaping socially for the coming season, if you want to be in the swim, in all that term implies, you must become a radio fan. It looks to me as if the home without a radio set, this winter will be like one without some music-producing article. You know, my gentle audience, play is a very important factor in our lives. We must take time out to enjoy ourselves—and as one of the first women to take an interest in radio, as one of the first to see its possibilities and go deep into it, I am convinced that radio contributes to life more genuine fun—at least, to me it does—than any other thing I know of.

* * *

Now I am studying code. I find that it has tremendous possibilities for the amateur. I will tell you more about it later. Friend Husband says that he does not care how far I go so long as I don't become a genuine "night owl." Those, you know, are the real bugs who find radio reception so fascinating that they sit up till very late—some of them even sit up all night, I am told—waiting to pick up some far away station and get some mysterious message out of the ether.

* * *

This is one of the most fascinating things in the world. Really it is more fascinating than bridge or golf or any other hobby. And it is as romantic and mysterious as it is fascinating. It "gets you" if anything does. I am told by an old "night owl" that he has frequently stayed up till dawn, sending the dots and dashes to a "friend" a thousand miles away—a friend he has never seen—and waiting for that friend to send an answer—they have wonderful conversations. Imagine when half the people of the United States will be conversing with one another by radio!

* * *

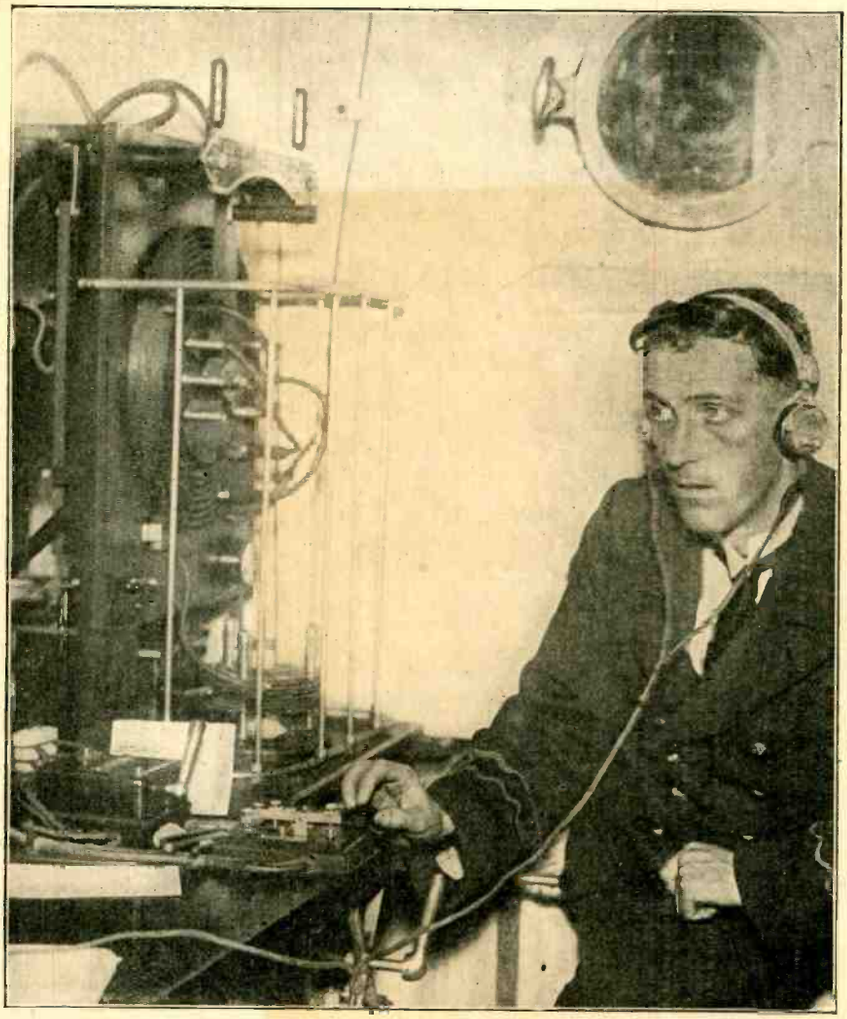
It seems evident that if radio is to be used for advertising purposes, all the good work that has been accomplished in providing pleasant entertainment and giving valuable information will be destroyed. Advertising would go directly into the home and invade domestic privacy. Realizing that her home should be free from commercial cares, Mrs. Average Citizen won't relish what the butcher, the baker, and the rest are announcing about their wares.

How One Mother Found a Way to Amuse Her Baby

(C. Central News)

This photograph speaks for itself. Radio has been put to use in thousands of homes for certain purposes. Entertainments and concerts are broadcast, as well as weather and crop reports, and other information. Here a mother has taken the ear-pieces, which permit one to listen to what the waves are saying, and has placed them on her baby's head. According to the photograph, a good musical concert must be "coming through." We all agree that the baby does not really understand what it is, nor what is going on, but it proves that a baby realizes it is something pleasant. Many an amateur has provided means whereby the children could listen to the concerts as well as the operator. To the left of the baby is the back view of the receiver used with its necessary equipment.

Radio News
Told by Latest Ra

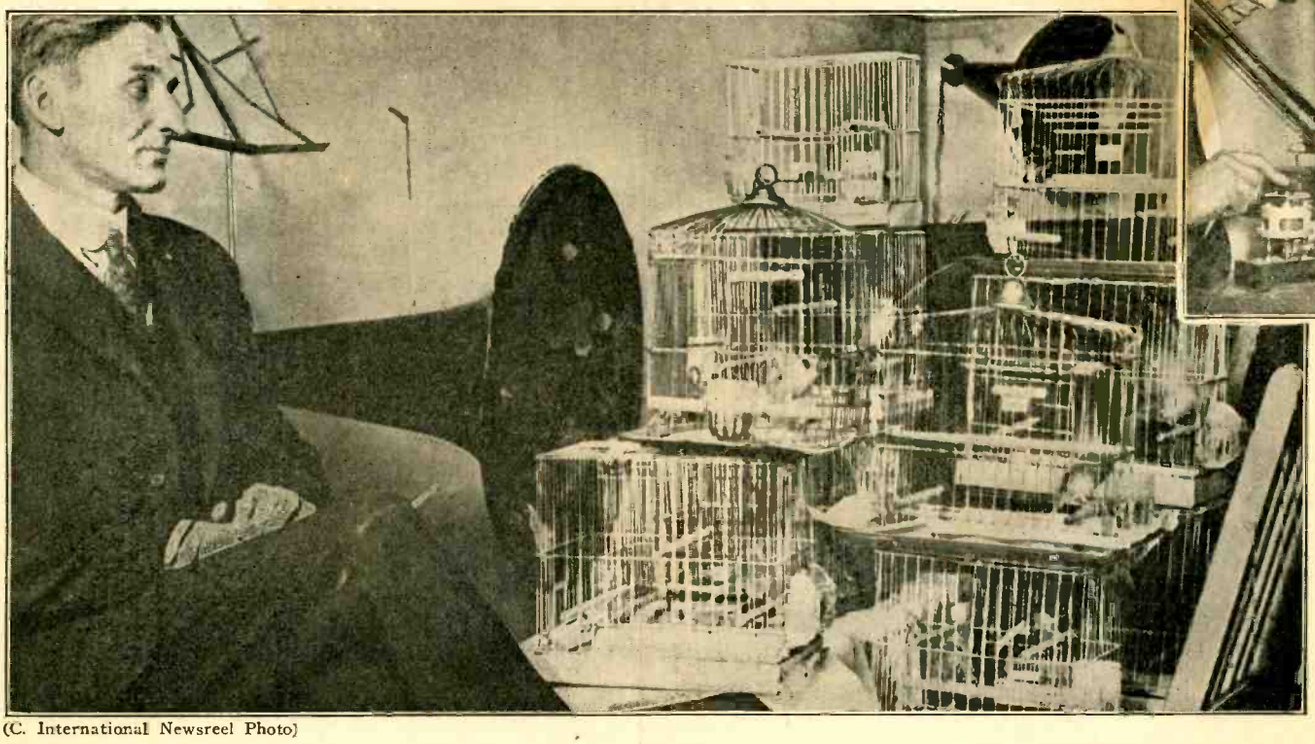


(C. International News Reel)

(Above) Fred Peever, second assistant radio operator, who was on duty when an explosion occurred aboard Atlantic liner "Adriatic" on a recent trip to New York. Mr. Peever sent out the SOS call, and the fact that an accident of some portent even momentarily endangered the big steamer was known all over the world—the wings of radio, which are as the wings of speed incarnate, having carried it everywhere! Compare this with the old-time method: A few skyrockets, a continued sounding of the siren, frightened passengers, doubt everywhere!

(C. International)

(Right) David Sonkin (left) and Abraham Ringel (right), two ambitious radioists of the College of the City of New York, making tests with a modern loop-receiver. They report that some of the results they have attained are unusually satisfactory—even inside a steel-walled room. Splendid radio work is being done at this big college in America's metropolis.



(C. International Newsreel Photo)

(C. Kadel &

(Left) Now th
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of the Week
adio Photograms

(Left) The younger generation made radio popular, and the younger generation will continue to do its share to keep radio popular. Did you ever talk to a crowd of youngsters who have the real radio enthusiasm—boys like those in the photograph who find it just the thing to fill in an evening at home? It is marvelous—their complete understanding. They seem to take to it, and to enjoy its educational advantages more keenly than any other thing that has become an integral part of boy life.

(C. Underwood & Underwood, N. Y.)

(Above) Radio is to be utilized by the United States Post Office in connection with the fast planes that carry the mails by night. These planes will be directed over their routes by radio. Experiments are producing such satisfactory results at Bolling Field, Washington, D. C., that it is evident this important and speedy branch of the service will be increased in value to the public and in safety to itself over a hundred per cent.

Herbert News Service)

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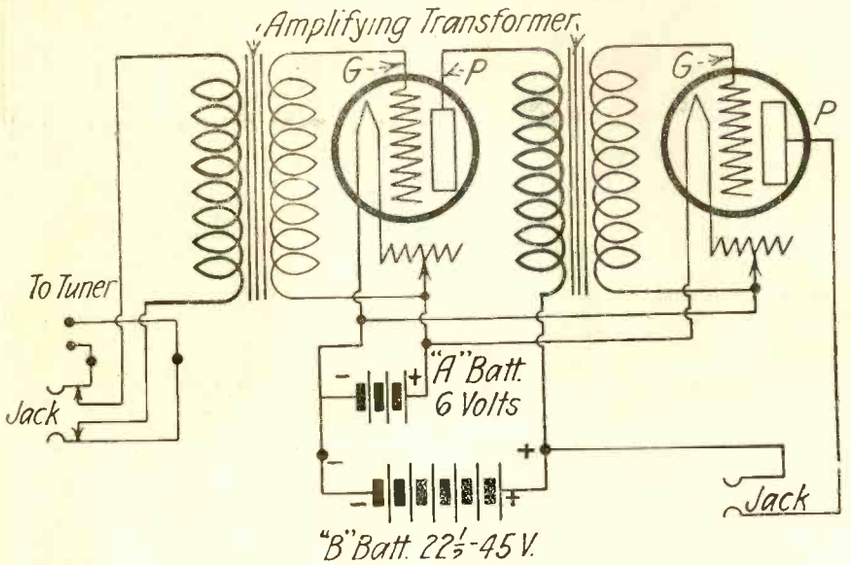
(Right) With the Stars and Stripes and the Union Jack fluttering on either side, the grave of the late Alexander Graham Bell, inventor of the telephone, on Beinn Breagh Mountain, Baddeck, Nova Scotia, promises to become a point of interest to future generations. Dr. Bell's great invention was a step toward the discovery of radio; therefore, he will always be revered by the radiotrician. There was no doubt in his mind that radio would some day supplement the telephone—that the great trinity of communication would be the telephone, the telegraph, and radio.

(C. Underwood & Underwood, N. Y.)

Answers to Readers



Hook-up published in reply to question asked by H. S. Houston, Buffalo, N. Y.

I HAVE the typical single-tube, two-variometer set, with the identical hook-up as shown in RADIO WORLD, No. 20, dated August 12, 1922. I get the KYW concerts very well, but both variometers apparently fail to function in the least. In fact, I can cut the grid variometer out entirely and hear just as clearly. There appears to be no regenerative action in either of the variometers—they pass the current and concerts well enough, but it makes no difference how I turn either of them, no varying density is noticed in the phones. These variometers are of a standard make—made with No. 20 D. C. C. wire. I've checked over all connections many times and find them well soldered. There is practically no capacity effect when I put my hand on them.

I've connected them up further away from the other instruments thinking that possibly there was interference, but no better results were obtained. They are apparently lifeless, except that they will pass what is tuned in on the variocoupler. Am using a standard variocoupler, frost 3,000-ohm phones, a 23-plate vernier variable condenser in the aerial circuit, Cunningham det., .0005 grid condenser, and both A and B batteries up to the required voltage. Fifty-foot double-wire aerial and grounded on the radiator which is, apparently, O. K. Tell me why these variometers are not responsive or offer what suggestions you may that might help eliminate the trouble.—J. D. Farquharson, Chicago.

Your variometers are at fault if all the connections are O.K. Sometimes the tube does not function properly, allowing only a certain percentage of volume through to phones, we advise you to look over the variometers in order to see if the rotor and stator are wired correctly. Remove the variometer from the plate circuit and try another variometer in the same circuit. When tuning with the grid and plate variometer, turn each of the knobs slowly until the critical point of howling takes place. This is to determine if the tube is oscillating. If this happens, then the tube is working properly. Don't expect too much from one tube.

* * *

I have a short-wave regenerative set with a range of about 1,000 meters. I would like to take in the concerts given by the Fort Wood station, Bedloe's Island, New York, on 1,450 meters. How may I increase my wave length in order to hear these concerts? —Harry Schuma, Nyack, N. Y.

Use a duo lateral coil, size 100. It will cost about $1.75. Connect it in series with antenna.

* * *

I have a two-stage amplifier and am having some trouble. Will you please publish a hook-up of a complete two-stage amplifier with jack for detector and jack for the two stages?—H. S. Houston, Buffalo, N. Y.

The schematic diagram herewith shown answers the complete question showing in detail transformers, jacks, batteries, and tube sockets.

* * *

Inform me if circuit is capable of 360- to 600-meter wave for reception work. Variocoupler is made as follows: Stator, 4 inches in diameter and 4½ inches long, wound with 155 turns of No. 2 hard-drawn copper enameled wire. Rotor is 3 inches in diameter and 1¾ inches long wound with 40 turns of No. 24 hard-drawn enameled copper wire. I have shunted variable condenser most everywhere without voice reception, but spark signals come in clearly.—H. G. Cornell, Danbury, Conn.

Your circuit is O. K.; but suggest that you insert a variable condenser in series with primary. Experiment and use few turns of primary. Evidently you are too high for voice reception.

* * *

I have a short-wave regenerative set with a two-stage amplifier. Is there any way I could use a variable grid leak? Can a 3-plate variable condenser be used for this? Richard Creter, Madison, Conn.

Variable grid leaks may be purchased at any radio store. A variable condenser cannot be used for this purpose.

* * *

Which do you consider the best make phones—X, Y, or Z? In building a detector and two-stage amplifier, will I need a grid leak and condenser for each tube? —Maxwell K. Murphy, Eastport, Maine.

Regarding the phones, we suggest that you secure phones marked Y. In reference to grid leak and condensers, only one condenser and leak is needed for the detector circuit only.

* * *

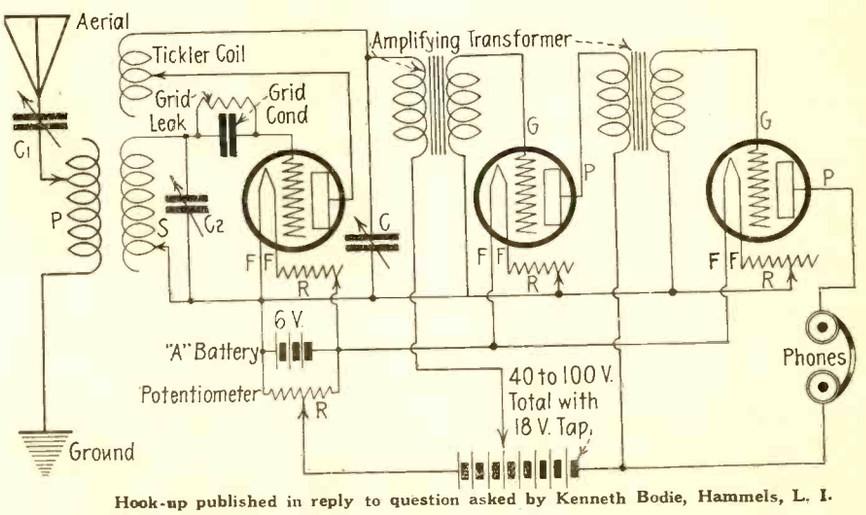
I want a hook-up for a honeycomb set with a two-stage amplifier, audio frequency. I intend to use a 35-50-75 De Forest coil-outfit. Which coil should I use as primary, secondary, and tickler? How far should I be able to hear a voice broadcast? Have a single-wire aerial, 120 feet long and 60 feet high. Where are the following stations located: 9DIH, 9DDS, 9DTE, 9DTT, WGY? —Frederick Kerridge, Minneapolis.

Your question pertaining to hook-up will be answered in RADIO WORLD, No. 24, dated September 9, in a special article. Use L-35 for tickler and L-50 or L-75 for both primary and secondary with a .001 variable condenser in shunt to the secondary. Your antenna should be left alone. Your query regarding the distance you should obtain is complexing. Distance depends on the operator, static, and antenna. However, with this layout of apparatus good results should be obtained. The stations are as follows: 9DIH—G. H. Bochus, 1409 Como avenue, S. E., Minneapolis; 9DDS—H. W. Meincke, Box 188, Riverside, Ill.; 9DTE—J. E. Finch, 1158 Ogden street, Denver, Colorado; 9DTT —D. R. Hinkston, 1020 Magnolia street, St. Paul; WGY—General Electric Co., Schenectady, N. Y.

* * *

Please show a hook-up of a complete regenerative set, with tickler coil and two-stages of amplification. This is to be enclosed all in one cabinet.—Kenneth Bodie, Hammels, L. I.

The accompanying diagram shows the necessary equipment, also the proper connections to be made when wiring. Be very careful when connecting batteries to tube.



Hook-up published in reply to question asked by Kenneth Bodie, Hammels, L. I.

Broadcasting a Symphony Concert by Telephone

(C. Kadel & Herbert News Photo)

By a special radio, installed at the stadium of the College of the City of New York, the open-air philharmonic concerts have been broadcast over an area covered by 75,000,000 people. Never before has a great symphony orchestra had its music broadcast. The music is recorded by a special type of microphone. This device (shown in the column-width photograph below), in appearance is a small black cylinder, 4 inches long and 4 inches in diameter, suspended in view of the audience at an elevation of about 25 feet. It is supplemented by a second microphone located just above the orchestra leader's platform for the purpose of recording a soloist. These microphones convert the music—as well as the applause that follows—into electric currents of strength and character of sound waves that impinge upon the diaphragm. The photograph shows H. E. Hiller operating a new audio-frequency vacuum-tube amplifier microphone on a land-live circuit to the transmitting station WJZ, Newark, where the concert is broadcast.

A VALUABLE radio experiment was conducted at the stadium of the College of the City of New York the other day. A symphony concert was played by the New York Philharmonic Orchestra in the open air. By means of the telephone the music was heard in the Westinghouse broadcasting station at Newark. From there it was sent out by radio 2,000 miles.

The possibilities from combining the telephone and the radio are vast, says "The Mail," New York. The restriction on radio broadcasting has been the mechanical need for having the original sounds made in the broadcasting station. The music, speech, play, or whatever was to be sent out had to be given at the station within the scope of the apparatus.

By combining the telephone with the station any music, speech, or play can be sent to all the receiving sets within the territory covered by the station.

When President Harding spoke at the memorial exercises over the Unknown Soldier, the address was heard distinctly in Madison Square Garden, where amplifiers had been connected with a direct telephone wire from the Arlington Cemetery. The speech was also heard in other cities, but only where similar arrangements were made and amplifiers had been provided. If the same means had been used and connections made as with the symphony concert at the stadium, the ceremonies at Arlington could have been heard by every radio receiver.

This latest development will enable people who so desire to hear the proceedings at a national convention or the speeches in Congress. Perhaps that will not prove a blessing; it may only increase the proverbial long windedness of the political orator.

(C. Kadel & Herbert News Photo)

Putting the microphone transmitter, the black object near the ground, in place.

King Radio Takes Soundings

THE gentlemanly navigator of tomorrow, says "The Outlook," is a radio engineer. He sits at a mahogany table in a comfortable office on his modern ship, smoking fat cigars, pressing neat pearl-topped buttons and letting King Radio do the rest. One button tells the depth of water under the keel, another the distance and direction to the nearest ship, and of all ships within a radius of twenty-five miles.

Radio Patents

Lee de Forest's Subterranean Signaling System Based on Radiotelegraphy

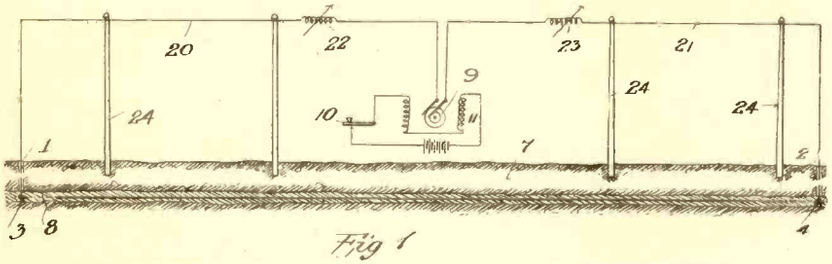
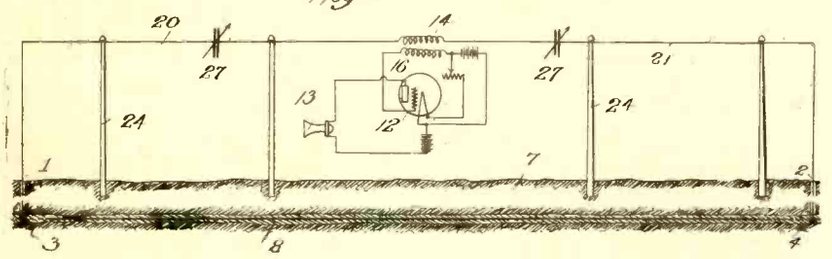


Fig 1

Schematic diagrams of Dr. de Forest's new signaling system. Figure 1 (above) describes the transmitting station. Figure 2 (below) describes the receiving station.

Fig 2



No. 1,424,805. Patented August 8, 1922. Patentee: Lee de Forest, New York City, N. Y.

LEE de FOREST, eminent radiotrician and inventor of the phonofilm by which the actors appearing in moving pictures may speak to their audiences, announces what appears to be a practical invention to produce subterranean signaling—more particularly in electrical systems. One will secure a clear idea of Mr. de Forest's device by studying the accompanying diagrammatic views.

Figure 1 represents the transmitting station, as above outlined and, in the form shown, is a telegraph transmitting-station wherein any suitable source of current may be employed, such for example, as the alternating current dynamo 9. This generates alternating current preferably of sustained waves and of frequency low as compared with those now used in radiotelegraphy, that is, from 500 to 25,000 per second. The current thus generated may be controlled in any desired manner, for example, by the Morse key 10, located in the field circuit 11, of the dynamo.

"While I have shown the system as a telegraph system," says Mr. de Forest, "it is obvious that with but slight modification the system may be employed for telephone signals, and many of the improved apparatus, well known in the art for use in connection with either of the telegraph or telephone systems, might be readily employed without departing from the scope of my invention. The earthed circuit is preferably attuned to the generator frequency by suitable means. I have discovered that for the frequencies above described the earth offers comparatively little impedance so that relatively large amounts of energy are radiated or sent out in the form of conduction currents so that great distances can be covered by this means of signaling, comparable even with those attained in radio communication with smaller amounts of energy at the transmitter. By this system I am enabled to avoid the interferences caused by atmospheric disturbances which so frequently interrupt aerial radial-communication."

The problems of interferences between several stations are similar to those in the present radio art and are overcome in the same manner as in the present art for example, by tuning to resonance between stations.

At the receiving station shown in Figure 2, the source of alternating current 9 is replaced by a detector and telephone receiver for example, by the audion detector 12 associated with the overhead line 20, 21 by the transformer 14. 16 as shown. The receiver 13 is included in the usual audion receiving system well known in the art.

* * *

Hydrometer to Measure Density of Liquids

No. 1,424,730. Patented August 1, 1922. Patentee: Charles E. Linebarger, Chicago.

THAT class of hydrometers which have both constant weight and volume and are not provided with a linear scale, will be improved by the application of Mr. Linebarger's invention, which consists of a transparent container in which are confined solid bodies having different specific gravities so arranged as to float or sink when liquids of different specific gravities are introduced into the container.

It further consists of solid bodies within a containing vessel, each of which has a homogeneous composition, so that if one be broken, its fragments, all having the same specific gravity, will function as well as the integral solid body.

Homogeneous solid bodies are, also, confined in a vessel, these bodies being composed of materials that have practically the same coefficients of expansion to the end that changes of temperature may affect the specific gravities in practically the same way.

"As there are comparatively few chemically pure substances having properties that render them suitable for use as such solids," says Mr. Linebarger, "I combine certain substances in order to produce solids that may have a desired specific gravity and may not be affected physically or chemically by the liquids in which they may be immersed. For use in liquids, the main ingredient of which is water. I melt together Trinidad Lake asphalt with other substances of similar nature, or origin, such as gilsonite,

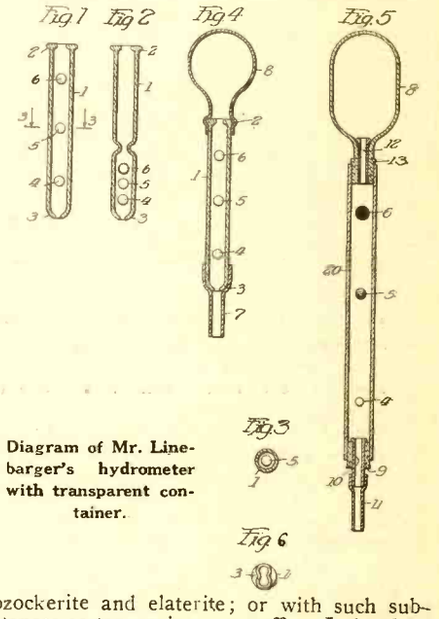


Diagram of Mr. Linebarger's hydrometer with transparent container.

ozockerite and elaterite; or with such substances as tar, rosin, or paraffin. I also fuse together various varnish gums, such as kauri pontinak, shellac and damar gums, with different waxes or other organic substances of different specific gravities. With such fused mixtures I incorporate, in case the mixtures themselves are not heavy enough, finely powdered solid substances such as soapstone, mica, graphite, or silica. The proportions of such ingredients vary according to their own specific gravities as well as the desired specific gravity of the blended product. In order to distinguish the solid bodies from one another, I make them, as the case may demand, of different sizes, shapes and colors."

* * *

Commandments for the Owner of a Loud-Speaker

1. Don't use more amplification than is necessary.
2. Don't force the loud-speaker to the limit.
3. Don't forget that careful control of the regeneration will permit the use of less tube amplification.
4. Don't overload the plates of your amplifier tubes.
5. Don't let the tube and socket contacts become dirty.
6. Don't expect the loud speaker to do the work of a one-step amplifier.
7. Don't allow sloppy soldering of amplifier connections.
8. Don't attempt to use run-down B batteries.
9. Don't try to use an amplifier tube as a power amplifier.
10. Don't forget that clearness is as important as volume.—"The Mail," New York.

Radio Manufacturers Form New Sales Combine

MANUFACTURERS of radio equipment in the United States have formed a sales combine. The new organization will act as a distributor for the firms comprising its membership.

The name of the new organization will be Fourar Radio, Inc. Its officers and directors comprise the chief executives of concerns engaged either in production or in merchandising on an extensive scale.

Fourar Radio, Inc. will act solely in a distributive capacity. It will draw for its supplies on manufacturers who rank as the oldest and most dependable. It will supply the public through department stores. Its claim is that it will meet the demand for standard radio equipment by dealing with firms defined by such representative bodies as the National Retail Dry Goods Association.

The first vice-president is William Dubilier, president of the Dubilier Condenser & Radio Corporation. The second vice-president is Frederick Dietrich, president of C. Brandes, Inc.

The third vice-president is Maurice C. Rypinski.

The secretary and treasurer is Arthur Wiesenberger, general manager of the Alfred Fantl Buying Organization, and formerly Director of Research of the National Dry Goods Association. It was Mr. Wiesenberger who represented the National Retail Dry Goods Association at the conference in Washington with the Bureau of Standards which resulted in the adoption of the first official method for determining the practical service values of all radio appliances to be put on the market. Mr. Wiesenberger is also author of the first book on radio merchandising, published several months ago by the association.

The lines handled are the products of the Radio Corporation of America, the standard of this country, embracing complete receiving sets, tubes and all equipment; the Dubilier Condenser & Radio Corporation, manufacturers of Dubilier condensers; C. Brandes, Inc., manufacturers of Brandes Matched-Tone head sets, and the National Carbon Company, manufacturers of American Ever-Ready Batteries.

The National Retail Dry Goods Association, composed of some 2,000 leading department stores, and specialty shops in the country handling close to 50 per cent. of the $7,000,000,000 annually of department store sales, realized months ago that radio, if it is to be commercially on a plane with the phonograph, must be standardized and must be sold by retailers of resources which qualify them to guarantee to the public radio sets and equipment of merit and service comparable with the phonograph, the piano, and with every other article that enters into general consumption.

They will endeavor to maintain a standard which will render service completely satisfactory to the public, to sell at prices which will enable manufacturers to guarantee deliveries; to provide a discount for the retailer that will permit of profitable merchandising, and to remove the complications now besetting the sale of radio so effectively that its sale to the public shall be established on a sound, profitable basis.

A Radio Necessity!

Latest broadcasting map 15c. That is, a complete broadcasting map appeared in Radio World, No. 8, dated May 20. Mailed on receipt of 15c. Radio World Company, 1493 Broadway, N. Y. C.

"Welcome Home from Your Vacation!"

Cartoon by Harry B. Stillman

Let Radio World Test Your Goods Free of Cost

Manufacturers, send a sample of your goods to our Technical Editor, Fred. Charles Ehlert, 9006 Pleasant Street, Queens, Long Island, N. Y. It will be carefully tested and returned. If your goods satisfy our experts, RADIO WORLD'S endorsement will be published in our merchandise department without charge or obligation of any kind on your part. This is a free service on the part of RADIO WORLD, calling for no expense whatsoever on the part of the manufacturer, except the sending of a sample of his goods.

Variable Condenser of 21 Plates

(Radio Stores Corporation, 218 West 34th Street, New York City)

A 21-PLATE variable condenser of neat construction with a capacity of .00052 microfarads. The plates, which are of aluminum, are secured and held firmly in their proper position by lead pillars. The dial, which is furnished with the condenser, is of pressed metal, provided with a lead counterweight which counterbalances the movable plates. The knob is held to the shaft of the condenser by a set screw and made adjustable so it can fit any size panel. Molded insulation is used. All burrs have been carefully removed from the plates so as to keep the leakage problem down to a minimum. Good contacts are provided for.

* * *

Variometer in Two Circuits

(Star Radio Manufacturing Co., 122 Fifth Ave., New York City, N. Y.)

STAR variometer has been tested out in two circuits. On one circuit it was placed in the aerial circuit of an oscillating receiver. In this circuit, it was found to have a wavelength range of 500 meters. When placed in a regenerative circuit, it was found to respond to a wave-length range of 400 meters.

The rotor and stator are turned mahogany. Rotor is wound with cotton-covered magnet wire, also the stator. The rotor is supported on a quarter-inch brass shaft mounted on brass bearings between springs, which tend to keep it in proper position. Fahnestock clips are used for the connections. Construction and appearance very good. Nicely finished for panel mounting.

* * *

43-Plate Variable Condenser

(Fett & Kimmel, Radio Instruments, Bluffton, Ohio)

A WELL-DESIGNED and constructed 43-plate variable condenser, the capacity of which was found to be .001 microfarads. The construction of this condenser is as follows: End plates are of pure bakelite, with edges and faces highly polished. All plates are of the best grade, even-gauge hard aluminum with edges so cut as to allow no burrs. The stationary plates are mounted, on three brass posts and equally spaced with micrometered separators. The movable plates are mounted on a solid brass shaft, accurately spaced and locked to correct position. No counterbalance is used as the rear end of the movable plate-shaft projects beyond the frame and makes contact with an adjustable tension-plate that may be tightened with a screw to prevent the plates from turning after the desired wave length has been obtained. The condenser is nicely finished and when used in a set comprises a satisfactory receiver ready for panel mounting.

New Firms and Corporations

Notices in this department are considered as purely interesting trade news and published without compensation to us. We welcome trade news of this nature. All notices having an advertising angle are referred to our Advertising Department, and are placed under Classified Advertising at 5 cents a word, or as Display Advertising at $5 an inch.

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

North American Radio & Supply Corp., Delaware. Representative: H. Goldman, 5 Columbus Circle, New York, N. Y.

The Electrical Societies and Construction Company of New York has increased its capital from $1,000,000 to $2,000,000.

Nicholson & Loertz, radio, Vincennes, Ind.

The Electric Specialty Co., 83 East Long St., Columbus, O., has added a radio department.

Original Marconi Apparatus to Be Seen

THE American Radio Exposition will be held in Grand Central Palace, New York City, from December 21 to 31, under the direction of the American Radio Exposition Company, 120 Broadway. Radio apparatus, accessories and materials will be exhibited by manufacturers and dealers and there will be daily orchestral concerts, numbers by grand-opera artists, broadcasting, illustrated lectures and other entertainment and educational features.

The practical uses of radio and the principles on which it operates will be explained through the medium of motion pictures and by actual demonstration of apparatus. There will be a lecture by a prominent engineer on Senator Marconi's latest development in directional wireless. Senator Marconi has loaned his original equipment, and a duplicate of it will be exhibited and demonstrated in conjunction with the lecture.

Sound-proof rooms for the demonstration of loud-speaking devices will be constructed by exhibitors, each room to have a window opening on the street or areaway so that it may be ventilated without interfering with the demonstration of other apparatus.

Various other activities are being planned by the officers and directors: Frank Hitchcock, president; Walter Gordon Clark, consulting engineer of New York, vice-president; Harold Bolster, Bolster & Co., New York, secretary and treasurer; George Brokaw Compton, of Peaslee & Compton, lawyers, New York, and Chester Humphrey, vice-president of the Old Colony Trust Company of Boston, directors.

Permanent Radio Fair for Buyers

SINCE New York City is the largest buying center in the United States, there has been a growing need for a centralized exhibition of radio apparatus where merchants and purchasers could go to view representative apparatus. Such an exhibtion to be known as the Radio Fair has opened in the Red Room, Hotel Imperial, 31st and 32nd Streets and Broadway, New York, under the direction of Raymond F. Yates.

The radio fair will be open to buyers only during the morning and business cards only be accepted for admission. An expert radio engineer will be in attendance to explain and demonstrate apparatus to buyers. In the afternoon and evening the room will be open to the general public. The fair will close in May, 1923.

Clark Says—

TO merchandise radio goods successfully and in a big way, three classes of people must be not only reached but sold; i. e.: Radio Dealers, Electrical Dealers, and—most important of all—the ultimate consumer.

If my advertising appropriation were limited, I would select only one—the one I considered best in each of the three fields, Electrical, Dealer, and Consumer. As to space, I would use not less than four-inch double column, for four consecutive issues, and increase the space as business would warrant in these three publications until I became a page advertiser before adding other publications.

It is not hard to select the two best dealer-publications. Their rates are low on account of their necessarily limited circulation, as there are less than 5,000 legitimate radio-dealers in the United States. With the fan or consumer publications the choice is more important, as there are several excellent radio monthlies but only one national radio weekly.

RADIO WORLD is the one and only national illustrated weekly with a distribution from Coast to Coast. It offers advertisers these advantages:

First, quick results; advertising copy received on Wednesday is on newsstands the following Wednesday.

Second, RADIO WORLD, as a weekly, is truly a Radio NEWS paper. For instance: When the Armstrong superregenerator first came out, it was fully illustrated and described in four successive issues of RADIO WORLD before the monthlies had it.

In fact, the marvelous new things in radio coming out each week is "old stuff" before the monthlies can publish it, as RADIO WORLD has it four to six weeks in advance.

Third, and most important of all, is size. A weekly is less bulky than a monthly, so even a small advertisement is next to reading matter and is seen and read in our weekly. What chance has a small advertiser sandwiched in between a hundred pages of solid advertising that some of the radio monthlies carry?

Thousands of dealers, too, buy RADIO WORLD each week, as they realize the necessity of keeping up to date and knowing "what's new" quick.

RADIO WORLD has been tested with keyed advertisements time and time again in competition with the best and most expensive radio monthlies, and each time has brought more actual results—orders. These result tests are available for the asking. Seventy thousand radio fan readers, the buyers, the ultimate consumers of radio goods, can be reached each week by RADIO WORLD at a cost of $4.25 per inch on a yearly advertising contract. Our advertising rate in 60 days will probably be $10.00 an inch; and, by spring, if increase in circulation maintains, will be $15.00 an inch.

Write Fred S. Clark, Manager,
RADIO WORLD, 1493 Broadway, New York City, N. Y.,
for "Brass Tack" Facts on Radio Merchandising.

Quick Radio Service Helps Farmers Sell Crops

THE New Jersey State Bureau of Markets, at Trenton, has announced that the perfection of the radio service of the bureau now enables a New Jersey farmer whose home, farm, club, or bank is equipped with a radio-receiving outfit to have actual up-to-the-minute information on prices at which his crops, shipped into New York, Newark or Philadelphia that day, are bringing in the city markets.

The advice flashed to him each morning, with an afternoon and evening supplemental service, will permit him to make a wiser choice of shipments and in the event of sudden gluts in certain markets, will enable him to select more satisfactory destinations for his quickly perishable products.

In collecting the information, which necessarily must be accurate. Burton W. Sherburne, market crop reporter of the State Bureau of Markets, who is directing the radio service, will have the cooperation of the Federal Bureau of Agricultural Economics and the Pennsylvania Bureau of Markets. Many farmers are said to be installing receiving apparatus in order to get the reports in their own homes. Banks, newspapers and boards of trade are also taking the reports and posting the information in bulletins or relaying it to distant farms by telephone.

New Broadcasting Wave Planned

WASHINGTON, D. C.—The Department of Commerce contemplates inaugurating a new class of license for broadcasting stations which can meet certain requirements. These stations will be known as Class B stations and will be authorized to use a wave length of 400 meters. The qualifications necessary for obtaining this class of license will be ready for distribution within a few days, and will also be published in the September issue of the Radio Service Bulletin. The new wave length may be used only with specific authority of the department in special cases.

British Engineer Studies American Radio Progress

GREAT BRITAIN will solve the interference problem in radiophone broadcasting by government control and regulation," according to A. P. M. Fleming, C. B. E., manager of the research and educational department of the Metropolitan-Vickers Electrical Company, Manchester, England. Mr. Fleming represented England at the international convention of the Institute of Electrical Engineers and the International Electro-Technical commission at Niagara Falls.

"We have learned many valuable lessons from the broadcasting experience of the United States," said Mr. Fleming to a reporter for "The World," New York, after his visit to KDKA, pioneer broadcasting station of America, located in the East Pittsburgh Works of the Westinghouse Electric and Manufacturing Company. "One of the things we have learned is to avoid the establishment of innumerable radio-stations, with no plan of cooperation between them. Eight one-and-a-half kilowatt stations are contemplated and some of these will probably be built this year. These stations will be located in the principal cities throughout the British Isles and will be operated so as to eliminate the chaos usually found where no rules are in force.

"We have no such things as broadcasting in Britain at present in the same sense as the term is used in America," he said. "Government restrictions have prevented it, on account of the possible interference with the requirements of the navy, mercantile, marine, war services and aeroplane traffic. But the largest manufacturers of radio apparatus have cooperated with the British Government officials in working out plans for the proper control of broadcasting."

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.

ANNUAL SHOW OF THE ST. LOUIS RADIO ASSOCIATION, St. Louis, Mo., October 4 to 7, inclusive.

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

INTERNATIONAL RADIO EXPOSITION, Grand Central Palace, New York, December 21 to 30.

KANSAS RADIO EXPOSITION will be held at the Kansas State Fair, Hutchinson, Kansas, September 16 to 22, inclusive. A. L. Sponsler, secretary.

RADIO CLUB OF AMERICA. First autumn meeting will be held the last Friday in September. Renville H. McCann, secretary, Columbia University, New York.

CLEVELAND RADIO AND ELECTRICAL EXPOSITION, Cleveland Public Auditorium, Cleveland, O., August 26 to September 4, inclusive.

CINCINNATI RADIO-AND-ELECTRICAL EXPOSITION, Music Hall, Cincinnati, O., October 7 to 14, inclusive.

NEW YORK ELECTRICAL AND INDUSTRIAL EXPOSITION, Grand Central Palace, New York City, October 7 to 14, inclusive.

NEWARK'S SECOND ANNUAL RADIO SHOW, Robert Treat Hotel, Newark, N. J., October 4, 5, 6 and 7.

SECOND NATIONAL RADIO EXPOSITION, direction International Trade Exposition Co., Chicago, January 13 to 20, inc., 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, inclusive. Direction American Radio Exposition Company, 120 Broadway.

BOSTON RADIO EXPOSITION, AND NEW ENGLAND AMATEUR CONVENTION, Mechanics Building, Boston, October 30 to November 4, inclusive.

Radio News, Not Criticism

EDITOR RADIO WORLD: As a subscriber to your magazine since its conception, I have been an interested reader and look forward each Wednesday to its coming. I cannot, however, say that I admire the stand you have taken in regard to the new broadcasting schedule in the Metropolitan district, nor do you gain any new admirers by the publication of such an article as appeared in your August 5 issue under "Radiograms."

The article I refer to is that having to do with one "recalitrant" member who was finally persuaded to agree to the new schedule and your hope that it would not be necessary for the Radio Broadcasting Society of America to publish the name of the concern. This article without any doubt, whatsoever, must have been penned by someone who has a grudge against the Westinghouse organization, or does not possess a receiving set.

Some time has now passed with the new schedule in operation and the radio fan has a pretty fair line on the new layout; he has seen whole evenings, not to mention many, many hours of the day, wasted by stations which, while demanding a place in the schedule, cannot get programs beyond their lot line; if it is the society's idea to permit the so-called broadcasting stations to experiment on the public, the new schedule is an immense success; if, on the other hand, it is their desire to improve broadcasting, it would be much more to the point to reduce the list of stations engaged in this work to a matter of three or four and make the newcomers prove that they can deliver the goods before assigning them several hours out of the day and evening. The Westinghouse concern has done more for the wirless enthusiast than all the rest of them put together. Little wonder that the rest of them are so dissatisfied, but their dissatisfaction savors very strongly of the "dog in the manger" idea. If their equipment is not such as can render a real broadcasting service, they do not want those who are in position to do it.

Why hold back the name of the concern? Why not publish it and make known to your readers that there is at least one *real* station which stands for *real* broadcasting? Why not come out into the open and give your readers the facts?

In prohibition, and other so-called reform movements, we have the blue-nosed Johnnies and the long-faced Annies; it is only a matter of time before they will enter the radio field. Pussyfoot Johnson admits he likes a drink now and then, yet he goes out in the land and, for personal gain, does everything he can to take a drink away from the other fellow. Real Americans do not like hypocrisy, and no one ever got anywhere in this country practicing it. Webster defines hypocrisy as "pretence." The concern which pretends to give a broadcasting service and asks for a place in the so-called new schedule and, because of inadequate facilities, cannot render such service, when others can, is scarcely the concern which should be lauded in your magazine, and most especially not at the expense of an organization which has been, and is now, giving the listening-in-public a *real* service.

In conclusion, let me say that I have only a small, inexpensive set—the same as possessed by thousands of other radio fans in New York City. Although small and inexpensive, I have had over fifty stations on it since its installation May 1, among these being Schenectady and other stations at some considerable distance.

Instead of wasting good space in your interesting magazine by publishing such an article referred to, why not devote your energy and influence along lines which will result in the right kind of support for those few stations whose equipment means better broadcasting; devote the same amount of space to a sharp criticism of the bird who persists in sending code during the broadcasting of an opera and other programs, and particularly land on the rank brass-pounder who keeps his key wide open for two and three-minute intervals? You would then be doing something really constructive and of real benefit to the listening public.—FRED E. REID, 138 Haven Avenue, New York City.

(RADIO WORLD has never had the slightest intention of publishing anything adverse regarding the broadcasting efforts of the Westinghouse Company; or any other concern, for that matter. In fact, we have published several very complimentary special articles explaining the work of the Westinghouse Company in its effots to promote radio. "Radiograms" is a weekly record of radio news, and when the item Mr. Reid criticizes us for publishing came to the office the name had not been made public. It was printed merely as news matter and not as editorial criticism.—THE EDITORS).

Crystal Detector Coming Back Into Favor

THE much maligned crystal detector seems to be coming more and more into popular favor, says William F. Crosby in "The Globe," New York. From actual observation in the radio stores, it has been found that these little instruments are gaining steadily in popular favor not only with the novice but with some of the old-time amateurs themselves. For broadcast reception the crystal detector is pretty hard to beat when it comes right down to clear and undistorted speech or music. A great many owners of radio sets seem to be going in for a detector of this type, sometimes connecting it to a two- or three-stage amplifier. If a good piece of mineral can be secured, and this detector connected up to the proper amplifier, it has been found that the music, while not as loud as with the vacuum tube detector, is very much better in other ways.

No Free List

RADIO WORLD has no free list. The only copies sent out by the publishers are to fill the ever-increasing orders of the American News Company, the large numbers of subscription orders received at the office of publication, and one voucher copy to each advertiser and advertising agent represented in current issues.
RADIO WORLD, 1493 Broadway, N. Y.

Subscribe for Radio World, $6.00 a year, $3.00 six months, $1.50 three months.

Amateur Radio Work Restricted in Germany

GERMAN manufacturers of radio apparatus are not in a position to make extensive deliveries of their product, according to Vice-consul Nathaniel B. Davis, Berlin, in a report to the Department of Commerce. This is due to the fact that the demand has not been sufficiently great to warrant the manufacture of radio instruments in large quantities.

Amateur radio work is not popular in Germany and stations are not numerous. Radiotelephony in particular is almost an unknown science except to engineers, professional operators, and experimenters. The principal reasons given for the lack of interest in radio on the part of the general public are that amateur stations are a luxury beyond the means of the average German, under present economic conditions, and official restrictions on their use.

All radio communication in Germany is under the control of the Federal Post Office Department, which operates the commercial stations. Private installations must ordinarily be made by the department. In exceptional cases private companies or individuals may be authorized to erect their own plants, but they must first obtain a license from the Post-Office Department. The fee for such a license varies according to the size of the plant, with a maximum of 2,000 marks a year.

At present, only one station in Berlin is licensed to broadcast. This station broadcasts market and exchange quotations. Subscribers to their service are permitted to install receiving stations upon payment of the license fee and the monthly subscription rates which vary at present from 1,000 marks to 7,500 marks according to the class of subscription. Subscribers may rent receiving sets from the Post Office Department for 2,500 marks a month if they do not desire to build their own.

Notwithstanding the lack of demand for short-wave amateur apparatus there are a number of firms in and about Berlin which manufacture receiving sets.

Pictures and Facts About Armstrong Amplifier

Radio World has published a number of pictures, diagrams and descriptive articles regarding the New Armstrong Super-Regenerative Amplifier. The numbers containing this material are dated June 24, July 8, July 15, and August 5. They will be sent postpaid on receipt of 15 cents each, the four copies complete for 60 cents. Or you can subscribe, $6.00 year; $3.00, six months; and have your subscription start with the number dated June 24. RADIO WORLD CO., 1493 Broadway, New York.

The Radio "Colyum"

LEADING newspaper in New Jersey town recently announced it would receive a running account of an important prize fight on radio apparatus installed for the use of its readers. Not long before event took place, local authorities interposed. Announcement of event then ran something as follows: "The prize fight program this evening has been changed to a sermon."

* * *

Roy K. Moulton informs that the only lightning to fear these summer days is the brand that comes in quart bottles.

* * *

Surprised at the careworn expression on the usually gleeful radio operator's face, his friend asked, "Why so glum?"

"I m-m-mixed the A and B leads to my power tube," was the reply.

* * *

Lady walking along Fifth Avenue turned to her pet poodle and called, "Hear, Radio! Hear, Radio!" Dog responded with alacrity.

* * *

"Ancient Order of Night Owls" is name of Western radio club. Can't join unless you're able to prove you've actually sat up till breakfast with the old head clamps on.

* * *

Again, Rollo, we must set you right: A radio "ham" is not a porcine edible, but a human being. And you will not find in any ornithological tome that "hoot owl" and "night owl" belong to the same family. You're dumb when it comes to beasts and birds, Rollo!"

* * *

Colonel Edward H. R. Green, son of the late Hetty Green, multi-millionaire, has turned his beautiful country home, Round Hills, Mass., into a veritable radio palace.—*Newspaper report.*

(*With radiopologia to the late Mr. A. C. Swinburne, we tune in thusly:*)

If you were some fair goddess and I were Colonel Green,
We'd have a radio outfit if it cost me every bean;
We'd sit all day and broadcast—from dewy morn till e'en—
If you were some fair goddess and I were Colonel Green.

If I were Colonel Green, dear, and you some goddess fair,
We'd have ten Armstrong circuits and corner all the air;
I'd call my dog, "Galena"; put permanent wave-lengths in your hair—
If I were Colonel Green, love, and you some goddess fair.

* * *

Our Own Broadcasting Station

OUCH for Week Beginning September 4, 1922

7:00—Stories heard at the weekly meeting of the Women's Bridge Club. (Limited to one hour.)
8:00—Why We Protest Revolving Barber Poles, by the Home Brewers' League.
8:31—That Lullaby of Uselessness: "When Father Shampoos His Toupee."
8:47—Will Hays, Judge Landis and Augustus Thomas reciting, "Three Wise Men Who Went to Sea in a Boat."
9:02—Reading: "Thank Heaven, We Have Prohibition." From a bootlegger's library, and not censored by Mr. Sumner.
9:30—How to cook storage eggs that have not been vaccinated.
9:47—Pullman's upper-berth stories. (Rigidly censored by Mr. Sumner.)
10:01—Why I Am Greater than Houdini. By a man who has dodged motorcars in New York City for ten years.
10:22—Correct time from some one who loaned you a ten-spot.

ROBERT MACKAY.

Has Your Set Been Idle All Summer?

Here Is a Bit of Advice

NO doubt many radio sets have laid idle all summer, owing to the absence of their owners, or the lack of enthusiasm of the owner for sitting indoors listening to the program when he might have been off in some park listening to a real band.

It is going to be quite a job getting these sets back into condition again this fall, says "The Globe," New York, and a few hints relative to the several small points will not be out of place at this time. Already the cooler nights are with us, and listening to radio is not half as hard as it was a month ago.

One of the most serious troubles that may have developed during the summer is in the storage battery. If this has been left in a discharged condition, or if the electrolyte or liquid has become low, the battery may have sulphated to a certain extent, and consequently will not hold its charge when the time comes for recharging. The beginner may learn a lesson in this way, and it may be possible that a new battery may have to be purchased. A storage battery is a delicate piece of apparatus despite the fact that they seem to weigh a lot, and it does not take very much to make them useless. Sulphating of the plates is caused very easily by improper care and cannot be very well overcome. Another bad thing that may happen to a battery that has been standing all summer is the short-circuiting of the plates. It seems that there is a tendency for part of the element to fall down to the bottom of the battery and this element being metallic, it will surely form a circuit between the plates and kill the battery as dead as it is possible for one to become. It will also prevent the recharge of the battery owing to the fact that the current will simply take this shortest route and not charge up the plates at all.

Joys of a Radio Editor

WE have been very busy in the office, these days, sorting out and classifying the questions, and preparing the answers therefor as they arrive, writes Harry La Mertha, in the "Globe-Democrat," St. Louis. Some of the diagrams that come in are beyond all hope. They look like the mad ravings of a deep-sea diver who is trying to chart the possible location of Captain Kidd's gold, after a tip given by a Wellston trance juggler. Hetty Rodyne opened the mail this morning and after working four hours and eleven minutes said she would rather work in a field than help any overworked radio editor.

Accordingly we assigned her to Charlie Morton's carrier wave and told her to get out and look over some of the country it covered. She set her course southeast, a half south, and in due time, possibly two seconds, having been delayed by heavy cross seas from the Granite City gang who were stirring it up in great shape with spark and (CW) Hetty was in the area bounded by the four lines of Williamson County, Illinois.

Things were a little wobbly in the ether here (due no doubt to unsettled conditions below) and she paused to take hearings.

"I noticed lots of commotion off to the westward and I turned in that direction." Hetty modulated upon her return to-day.

"I got a lift from KDKA's carrier wave here and rode smoothly across 9 WZ's wave and ran into a whole flock of the Egyptian Radio Bugs in Marion. I listened for a while and saw them laying dark plans to mobilize the whole flock and move in formation on the Radio Show at St. Louis this fall. They are a live gang, these nights of the Sacred Scarab. In addition they are preparing to organize the whole Egyptian territory."

Hetty left 9 WZ's wave here and climbing up to 360 she caught the full effect of WKN, and in one 1300th part of a second found herself in the presence of 9 BVW in Webb City, Missouri.

Right here she found another argument against the spark transmitter. 9 BVW was raising so much fuss with the outfit as he swung the 2s, 5s, and 8s into line for card mailing that the paternal side of the house threatened demolition of the whole ding-busted business and all was closed down.

"I had a heck of a time getting out of there with my last resources blasted," said Hetty, "but thank my royal wave meters, I just managed to hook onto 9 SN who was working clearly away down the scale, and by a wee bit of tackling at the right time I hove into St. Louis after a delay of only one and one-third seconds."

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ROLAND BURKE HENNESSY, Editor,
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FRED S. CLARK, Manager,
1493 Broadway, New York

ASSOCIATE EDITORS:
Robert Mackay Fred. Chas. Ehlert

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IMPORTANT NOTICE:

While every possible care is taken to state correctly matters of fact and opinion in technical and general writings covering the radio field, and every line printed is gone over with a scrupulous regard for the facts, the publisher disclaims any responsibility for statements regarding questions of patents, priority of claims, the proper working out of technical problems, or other matters that may be printed in good faith and on information furnished by those supposed to be trustworthy. This statement is made in good faith and to save time and controversy in matters over which the publisher cannot possibly have control.

13 More Broadcasters Licensed

THE limited commercial broadcasting stations licensed between August 12 and 19, 1922, by the United States Government are as follows:

WKAN—Alabama Radio Mfg. Co., Montgomery, Ala.

KFBJ—Boise Radio Supply Co., Boise, Idaho.

WKAP—Flint, Dutee Wilcox, Cranston, R. I.

KFBK—Kimball-Upson Co., Sacramento, Calif.

WKAQ—Radio Corporation of Porto Rico, San Juan, P. R.

KFAY—W. J. Virgin Milling Co., Central Point, Oregon.

WKAG—Edwin T. Bruce, M.D., Louisville, Ky.

WJAZ—Chicago Radio Laboratory, Chicago.

KFBM—Cook & Foster, Astoria, Oregon.

WKAJ—Fargo Plumbing & Heating Co., Fargo, N. D.

KFBL—Leese Bros., Everett, Wash.

WKAH—Planet Radio Co., West Palm Beach, Fla.

WJAX—Union Trust Co., Cleveland, Ohio.

U. S. Navy Radios 7,000 Miles Direct

THE Naval Radio Station at Cavite, Philippine Islands, now transmits directly to the Pacific Coast by means of a newly installed "barrage" receiver at San Francisco, thus covering a distance of about 7,000 miles without relaying. Previously trans-Pacific messages, eastward, were relayed from Cavite by Pearl Harbor, Hawaii. The new receiver, designed by the radio-research section of the Navy, is expected to save approximately $20,000 a year in coal and power bills at Pearl Harbor as well as considerable time, and will also aid in clearing Pacific traffic. The perfection of the "barrage" receiver thus makes for far greater efficiency in Pacific radio circuits.

52 Weeks for $6.00
Complete Your File of RADIO WORLD
Copies of Radio World No. 1

If you did not get a copy of Radio World No. 1, send us $6.00 and we will send you this paper for one year, and start it with our first issue, which will be mailed you as soon as possible after receipt of order.

Radio Aids Secretary Hughes

Will Keep in Touch with State Matters While on Voyage to and from Rio Janeiro

DURING his trip to Rio Janeiro, as the representative of the United States to Brazil Pan-American Exposition, Charles E. Hughes, United States Secretary of State, is in constant touch with his government by means of a special radio-set installed in his suite aboard the steamer "Pan-American."

Practically, the Secretary of State will maintain a "floating department" throughout his trip—although technically "at sea." Official communications from the "Pan-American" will be cleared immediately and received with "right of way" either at the Naval Radio at Bar Harbor or the Radio Corporation's stations at Port Jefferson or Riverhead, Long Island. Messages will be forwarded from either the Naval Station at Annapolis or commercial stations on the coast.

The special radio-equipment, which was rushed from Washington to New York by a special messenger—who stored the apparatus in an empty berth rather than trust it to the baggage car—will be capable of sending from Rio Janeiro to Bar Harbor. It comprises a Federal Telegraph arc-transmitter with universal amplifiers, used in conjunction with tuners consisting of three stages of radio amplification and an audion detector with two stages of audio amplification. This set is capable of using wave lengths varying from 150 to 30,000 meters, but, probably, about a 2,400 wave-length will be used for transmission. In sending, the shore stations will use longer wavelengths, possibly as high as 9,100 meters.

The steamer "American Legion" on which Secretary Hughes will return, has also been equipped with similar radio-apparatus so he will be in constant communication with the State Department on the home voyage.

Radio in Literature

BOTH publishers and authors are banking on the belief that radio will aid their crafts and bring more books and magazines to the evening lamp, because it keeps the family at home, says John Walker Harrington in "The Times," New York. Therefore, for the present, they are appearing in the broadcasting programs without charge. The indications are, as far as the present state of radio-telephony is a guide, that this is a good theory. Certain works of lighter literature have received direct promotion in this way, for many wireless enthusiasts, after they have tried to see in their minds the characters of their favorite fiction, want to glance at the illustrations and confirm their suspicions.

The owners of the broadcasting stations respect the rights of authorship in every way and do not have distributions of literary wares without the permission of the authors or the publishers. As the radio receivers are manned by curious human beings who have a deep interest in hearing the voices of well-known persons, comparatively few of the stories and poems and tales which now are thrust into the ether are released by any other than their producers.

First Radio Song Arrives

RADIO songs, we are informed, will be plentiful this fall. The first to reach "ye editor's" heavily burdened desk is "Over the Radiophone," music by William F. Holliday; words by Richard W. Pascoe. It seems to have considerable lilt and charm, and a real southern melody. Just the sort of a song to add a little variety to a radio evening.

DO YOU WANT TO BUY, SELL OR EXCHANGE RADIO OR OTHER GOODS? TRY THIS DEPARTMENT AT 5c A WORD

RADIO WORLD'S QUICK-ACTION CLASSIFIED ADS

This department is intended for everybody who wants quick action on short announcements covering the buying, selling, exchanging or general merchandising in the radio field. Readers of RADIO WORLD will find that it pays to read these columns every week. Advertisers will get a ten-day service here—that is, copy received for this department will appear in RADIO WORLD on the news-stands ten days after copy reaches us.

The rate for this RADIO WORLD QUICK-ACTION CLASSIFIED AD. DEPT. is 5c. per word (minimum of 10 words, including address), 10% discount for 4 consecutive insertions, 15% for 13 consecutive insertions (3 months). Changes will be made in standing classified advs., if copy is received at this office ten days before publication. RADIO WORLD CO., 1493 Broadway, N. Y. C. (Phone, Bryant 4796.)

Manufacturers of Rogers Radio Receivers and Rogers Receiving Radiometers. Rogers Radio Company, 5133 Woodworth Street, Pittsburgh, Pa.

TO THE TRADE—Fixed Phone and Grid Condensers. Write for price list and sample. SALKEY RADIO CO., 2378 Eighth Ave., New York City.

WANTED
Representatives in the South and Middle West to handle our line of condensers and dials. Bunting Stamp Co., 713 Liberty Ave., Pittsburgh, Pa.

PATENTS—Electrical cases a specialty. Prewar charges. B. P. Fishburne, Registered Patent Lawyer, 386 McGill Bldg., Washington, D. C.

Exchange jolly interesting letters through our Club! Stamp appreciated. Betty Lee, 4254 Broadway, New York City.

CRYSTAL DETECTOR SET, from aerial to phones, complete. Big bargain. Send for circular. Salkey Radio Co., 2378 Eighth Ave., New York City.

Triple mounted SHAMROCK CRYSTALS—50 cents—galena, silicon and iron pyrites mounted in one. Will fit any standard detector cup. Tested and sold under replacement guarantee. Mailed to any address on receipt of price in coin. Bathgate, 120 Autumn St., Passaic, N. J.

PATENTS
Protect your invention today. Write for 1922 Illustrated Book Free. Radio, Electrical, Chemical and Mechanical experts. Over 30 years' experience. A. M. Wilson, Inc. (Radio 3 ARH), 310-18 Victor Building, Washington, D. C. (Successors to business established 1891 by A. M. Wilson.)

CASH FOR OLD GOLD, Platinum, Silver, Diamonds, Liberty Bonds, War, Thrift, Unused Postage Stamps, False Teeth, Magneto Points, Jobs, Any Valuables. Mail in today. Cash sent, return mail. Goods returned in ten days if you're not satisfied. OHIO SMELTING CO., 337 Hippodrome Bldg., Cleveland, Ohio.

High Grade Antenna Wire. Best quality 7 strand No. 22, tinned copper, non-corrosive antenna wire. Only 1c. per foot. The Kehler Radio Laboratories, Dept. W., Abilene, Kans.

WANTED
Representative for New York district to handle our Vernier-variable condenser made by the Bunting Stamp Manufacturing Co., 713 Liberty Ave., Pittsburgh, Pa.

BOYS—Write for our offer whereby you can secure a complete Audion Bulb Outfit and Amplifier FREE. LEE RADIO CORPORATION, Haddonfield, N. J.

FORMS for winding spider-web coils, especially adapted for panel mounting, 3 for $1.00. Clarence Johnsen, 2051 North Cicero Ave., Chicago.

BLADES SHARPENED — Single edge, 2c.; double, 3c. New York Edge Co., Glen Cove, N. Y.

FOR SALE—Radio set consisting of tuner, detector, and one-step, beautifully mounted on panel and engraved dial; includes three tubes and Baldwin loud speaking phones. First check for $70.00 takes entire equipment. R. W. F., 64 Hinsdale Place, Newark, N. J.

Dealers and Salesmen wanted to handle Shamrock Crystals. See other ad. Good proposition to dealers. Send 50 cents for sample. Bathgate, 120 Autumn St., Passaic, N. J.

REGENERATIVE RECEIVER, detector and two-step amplifier for sale. Price, complete, with A-P tubes, $75.00. Receiver guaranteed. E. Noble, So. Brownsville, Pa.

DON'T BUY A BICYCLE MOTOR ATTACHMENT until you get our catalog and prices. Shaw Mfg. Co., Dept. 71, Galesburg, Kan.

BOYS AND GIRLS EARN CHRISTMAS MONEY
Write for 50 sets AMERICAN CHRISTMAS SEALS. Sell for 10c. a set. When sold, send us $3 and keep $2. Neubecker Bros., 961 E. 23rd St., Dept. 64, Brooklyn, N. Y.

Radio Will Make the Movies "Speak"

Lee de Forest's "Phonofilm" Photographs the Voice and Reproduces It by a Converter and Telephone Amplifier

CHARLES GILBERT, president of the De Forest Telephone and Telegraph Company, announces that he has received a letter from Lee de Forest explaining that the phonofilm, Dr. de Forest's invention by which the persons appearing in moving-picture productions may actually speak to their audiences, has been made possible by the audion lamp—the three-element vacuum tube now used in radio—on which Dr. de Forest took out patents in 1906.

"In the talking picture," said Mr. Gilbert in an interview with "The World," New York, "the sound waves (the voice of the actor) are translated into electrical waves. The electrical waves are translated into light waves, and these are recorded on the edge of the film.

"In reproducing the picture the light waves are translated back into electrical waves, which waves are translated back into sound waves, and these are amplified with loud speakers placed near the screen for the audience.

"The whole process is performed in the audion tube, which is exactly the same tube employed in radio, except that the elements may be larger or smaller, as required by the individual operation."

Lee de Forest has been working on this revolutionary invention for over three years. He has used standard moving picture cameras and projecting machines in his experiments. It is predicted that the new invention will not only revolutionize the motion picture industry but will surpass even the adaptabilities of the radio telephone. He recently gave a successful exhibition in Berlin.

After a motor tour of Austria, Dr. de Forest will bring his phonofilm to America.

NOW THAT YOU ARE BACK FROM YOUR VACATION—

Be sure to see that your file of RADIO WORLD is complete. There will soon be so great a demand for back numbers that the supply will not be sufficient to cover it. RADIO WORLD has been issued every week from April 1 to date (22 numbers up to August 26th issue). Mail, postpaid, for 15c a copy; any seven copies for $1.00. The first 22 copies sent on receipt of $3.00. Or send $6.00 for one year (52 issues) and have your sub start with No. 1.—RADIO WORLD, 1493 Broadway, New York City.

How One Newspaper Broadcast the Leonard-Tendler Fight

IT was the first time in the annals of the sporting world that an attempt has been made to cover an event of this magnitude by radio, says "The Record," Philadelphia, in describing how the Leonard-Tendler fight was broadcast to waiting thousands of spectators. By this arrangement the details of the fight were received and broadcast as fast as they happened. The sporting editor's room of "The Record" was transferred into a temporary broadcasting studio, where, by the use of a microphone connected with a special cable of the Bell Telephone Company, the bulletins and detailed information from Jersey City were relayed into the powerful transmitting station of the Philadelphia Radiophone Company, known as WCAU, and the amplifier in front of "The Record" office.

From WCAU station it was "laid on the air" for the benefit of the many stores, hotels, clubs and theatres that had arranged to receive the news and deliver it to all listeners. The same process was followed in city and country within the radius of 800 miles, and it was estimated that more than 500,000 people received "The Record" fight reports simultaneously.

At the broadcasting station word was received that the details of the fight had been picked up and heard distinctly at points in western Kentucky, Michigan and southern Alabama.

WARNING TO OUR READERS!

RADIO WORLD accepts subscriptions thru the American News Co. and its branches, the regular news trade and subscription agencies. No others have any right to solicit or to accept payment for subscriptions unless they can show a properly signed subscription authorization from this publication.

RADIO WORLD, 1493 Broadway, N. Y. C.

Now on Press. Will be released about the middle of September. The most up-to-date treatise on the subject

Textbook on Radio

By JAMES R. CAMERON

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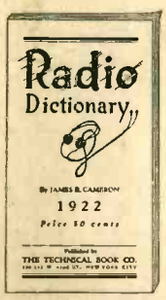

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