

Out Every Seven Days

August 26
1922

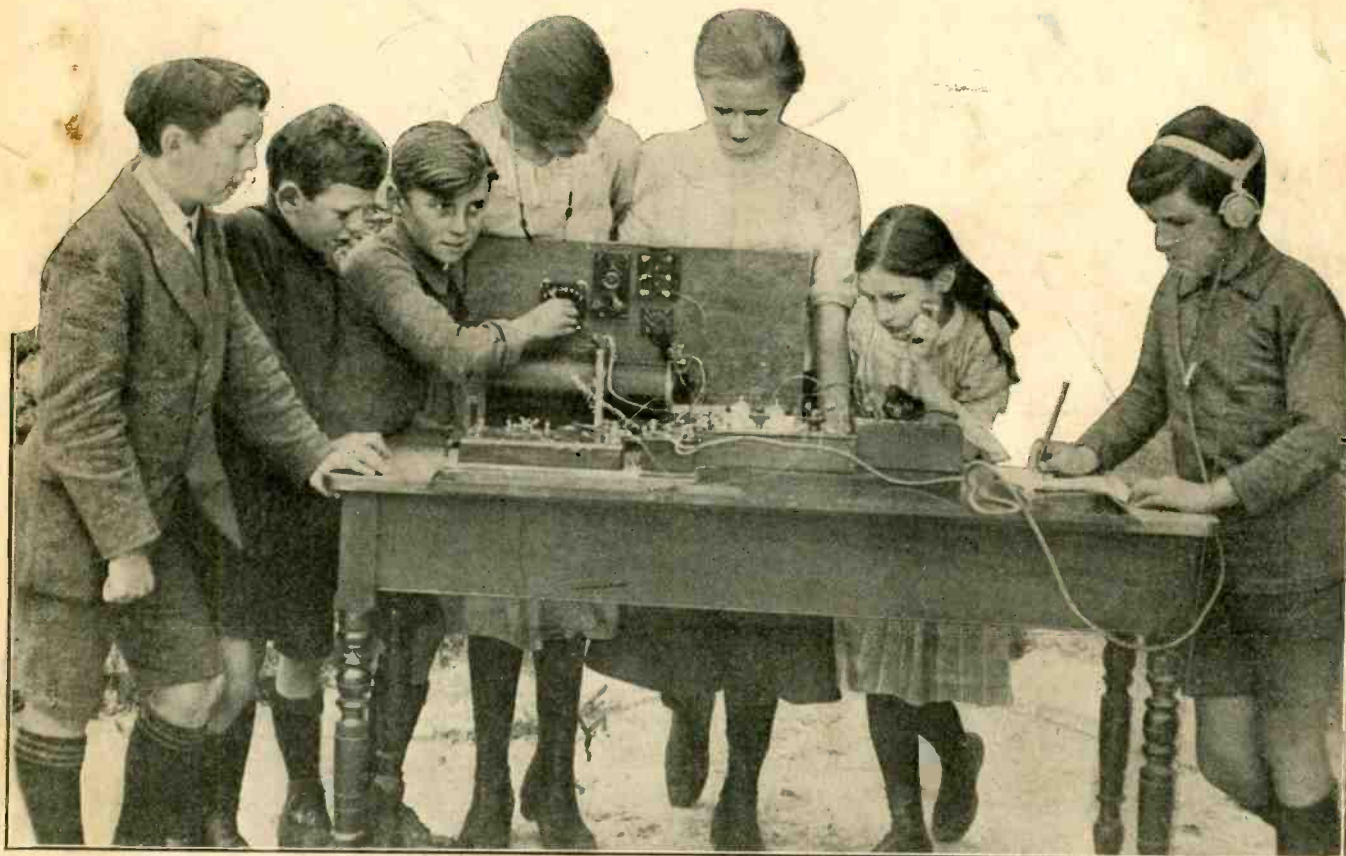
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RADIO WORLD

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I L L U S T R A T E D

Do School Children Take to Radio? Look at 'Em!



(C. Central News)

Radio receiving-set in the school at Foxhole, Cornwall, England. It is the first to be licensed and set up in a British primary-grade school. The apparatus was designed, partly made, and wholly assembled by two of the older boys. Clear spark-signals are received from ships at sea, and C-W on the longer wave-lengths. The boys and girls regret only one thing, it is reported; they are too young to be "night owls."

How to Build a Spider-Web Receiver

See
Page 4

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Special 10¢ Tins

Tea that has
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GOLD MEDAL San Francisco 1915



GRAND PRIZE San Diego 1916

RADIO WORLD

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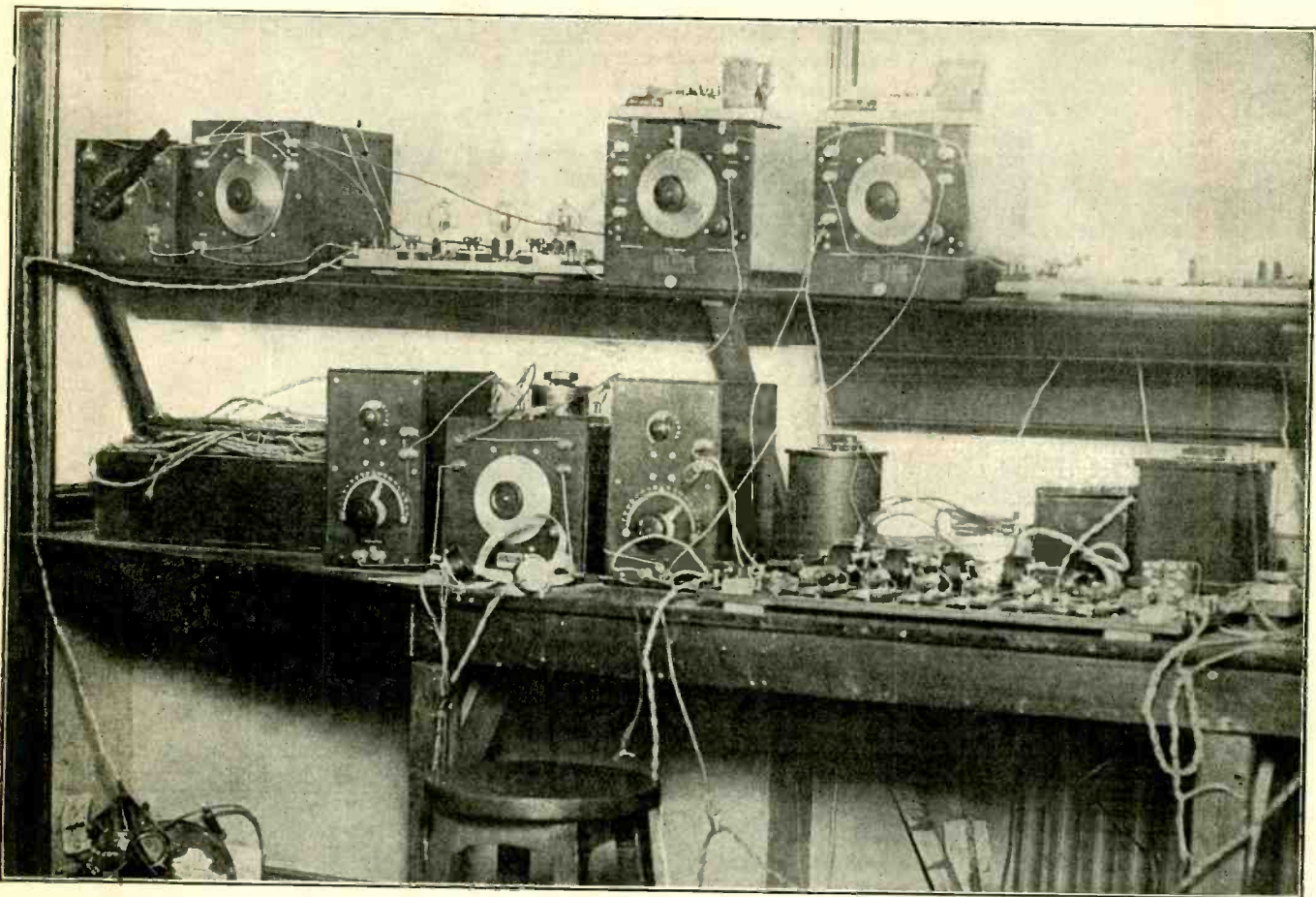
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Vol. 1, No. 22

August 26, 1922

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Radio Message Sent from Europe Received by This Set in New York



(C. Central News Photo Service.)

Six tuned circuits and twelve vacuum-tube amplifiers are required to give the transoceanic signals the necessary strength so that the ink recorder (on the flat elevation at the right) may make a permanent record of the signals, enabling the message to be read. It is a fine type of the powerful radio receiver.

Radio Exports, \$1,164,514 for Six Months

AMERICAN radio apparatus is beginning to be exported in considerable bulk. In June shipments amounted to over half a million dollars, which is the greatest value of radio exports for several months. Experts of the Electrical Division of the Department of Commerce say that radio is only a part of recent gains in electrical exportations which, for June, were \$2,000,000 greater than in May. This is regarded as indicative of our recovery of the export trade of the United States in electrical supplies and equipment.

Our total export values for radio equipment during the past six months, amounted to \$1,164,514. June being the best month with exports valued at \$547,364 and totaling nearly a million pounds of goods. The

value for June was almost three times the exports of radio equipment for May. A sort of boom in the shipment of American radio goods to foreign countries started in February, which month saw the exportation of \$283,950 worth. There was a slump in March, during which only \$21,180 worth was shipped out, but in April the figures rose to \$116,221, while for May they increased to \$186,364.

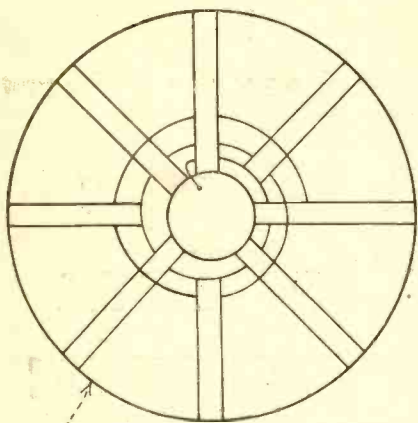
The fluctuation is said by experts to result from occasional big orders which are completed during certain months and shipped out, the orders keeping to a more regular curve. In February, for example, the bulk of the shipments went to Poland and Danzig, where big radio stations were being built, boosting the export figures by \$258,094.

The only other shipments of any size were to the British West Indies and the Philippines, which totaled, jointly, only about \$20,000. Britain, Panama, and Japan took most of the radio apparatus in March. In April, Poland and Danzig got \$12,790 worth, while Quebec, Ontario, Mexico, and Cuba imported about seven times that value. During May, Ontario received \$118,836 worth of radio goods, Mexico \$14,044, and England \$13,444.

Denmark has evidently caught the prevailing radio epidemic, as reflected in requests for American wireless-telephone apparatus, listed in trade opportunities filed with the Department of Commerce. Australia and Italy also have buyers seeking American electrical equipment.

How to Build a Spider-Web Receiver

By Frederick J. Rumford, A. M. A. I. E. E.



5" Diameter of either 9, 11, 13, 15 or 17 slots, always of an uneven number

Fig 1

Showing how the wire should be wound into the slots.

A SIMPLE and efficient, also inexpensive, receiving-set I will describe in this article. It is commonly known as the spider-web receiver. It will take the place of the loose coupler, the vario-coupler and the variometer. It may be used also as an inexpensive regenerative receiver. These spider-web coils may be made up for experimental and amateur purposes and uses; but under no circumstances may they be made up for commercial purposes. I am not giving any definite data, as I think it will be better for the person who is thinking of building this spider-web coil to experiment, as he will then arrive at a hook-up, or a coil with a definite number of turns, which will suit his own particular wants better than any which I could describe.

Figure 1 shows the method of winding the wire into the slots.

Figure 2 shows the hook-up for a three-circuit receiver with a vacuum tube for detection; namely, the primary, secondary, and the plate or tickler coils.

Figure 3 shows a hook-up for a two-circuit receiver with a vacuum tube for detection with primary and secondary coils.

Figure 4 shows the hook-up using a crystal detector for detection in conjunction with a phone condenser.

First, the builder must decide whether or not he wants a one-, two- or three-circuit receiver. For a single-circuit receiver, he must purchase a piece of heavy cardboard 5½ inches in diameter and give it several good coats of shellac. Put in a warm oven and bake it in order to avoid any possible chance for further shrinkage. A center must be left of about 1¾

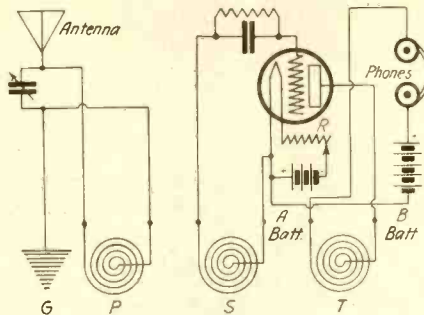


Fig 2

Hook-up for a two-circuit receiver with a vacuum tube for detection; namely, the primary, secondary, and the plate or tickler coils.

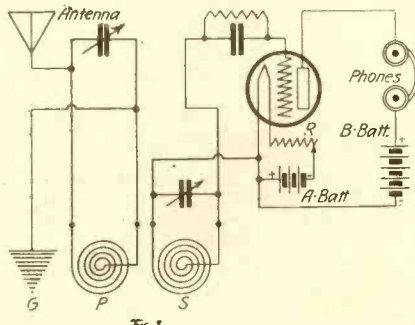


Fig 3

Hook-up for a two-circuit receiver with a vacuum tube for detection with primary and second coils.

inches in diameter. He should then wind this coil with about 60 to 75 turns of either 22-inch, 24-inch, or 26-inch silk-covered wire, taking a tap about every 15 turns. The contacts of a multipoint switch and the hook-up

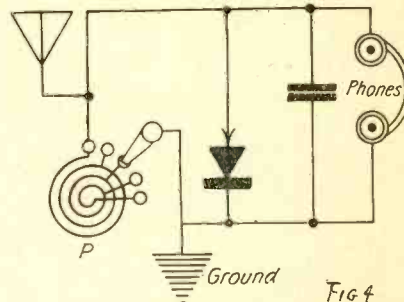


Fig 4

Hook-up using a crystal detector for detection in conjunction with a phone condenser. The contacts for a multipoint switch and the hook-up for this single-circuit receiver are also shown in this schematic diagram.

for this single-circuit receiver are shown in Figure 4.

If the builder wishes to construct a two-circuit receiver, he should follow exactly the directions for the single-circuit receiver with the exception of having the secondary coil wound with a smaller-size wire than that used on the primary.

If a three-circuit, or regenerative, receiver is desired, the primary should be wound with about 75 turns of No. 24 silk-covered magnet wire, and the second wound with about 75 turns of No. 26 silk-covered magnet wire. As for the tickler, it may be wound with about 50 to 60 turns of either of the above sizes of wire or of a smaller size wire, but silk covered magnet wire it must be. The centers of these three coils should have a small hole drilled in each of them so that the mounting shaft can be readily fastened to them. This mounting shaft should be about 8 inches long and so arranged that the coils may be moved in close relation to one another. The number of sections should be either 7, 9, 11, 13, 15, or 17 sections—always an *uneven* number.

The method of section wiring is shown in Figure 1. Bring the wire over one section and under the other section; over the next section and under the next section; and so on until the coil is wound with the desired number of turns. It is advisable to have at least ¼-inch space between each section.

This is what I mean by sections. After securing the piece of cardboard, divide it into whatever numbers of sections you wish, *unevenly*. This should be done with a pair of dividers and then slit with a sharp penknife.

It would pay an amateur to make up several sizes of spider-web inductance as they are inexpensive. It would be a good plan to get some of the 10-cent records. They would make perfect coil-forms and would be of considerable insulation strength.

Nightly Heir Schedule: "Tuning Up"

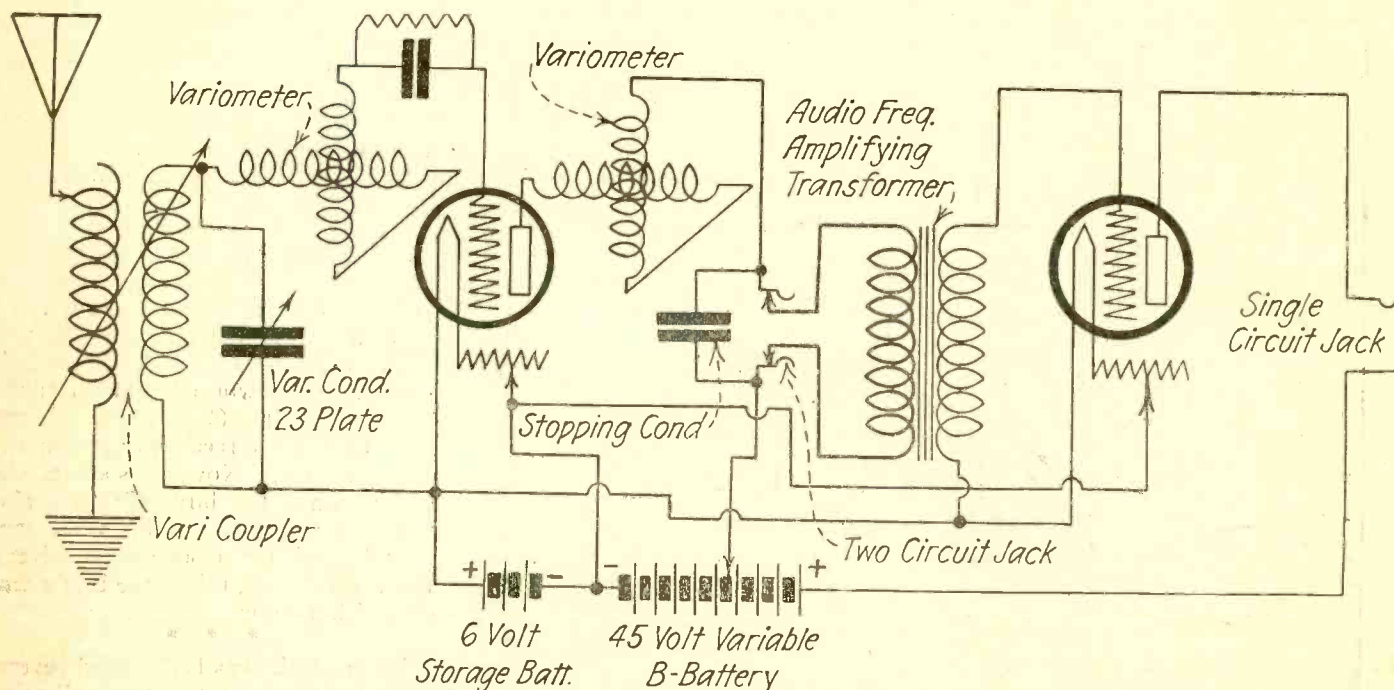


(From "Judge")

The day may not be far distant when a power line will be operated by radio.—Charles P. Steinmetz.

My Detector and One-Step Amplifier

By Fred. Chas. Ehlert



Schematic diagram of a regenerative set employing a detector and one-stage amplifier of the vacuum-tube type. Jacks are used exclusively in this circuit, enabling the operator to use a detector or amplifier. Suggested by Fred. Chas. Ehlert. Drawn by S. Newman & Co.

SO much interest has been shown by amateurs who have familiarized themselves with tube operation in receiving sets, that they are anxious to go ahead another peg and add another step of amplification. Irrespective of the circuit employed, this stage of audio-frequency amplification may be added. If by chance the receiver should happen to be of the regenerative type, most astounding results should be obtained.

The apparatus needed should be carefully looked over. It should consist of the following material:

- 1 audio-frequency transformer.
- 1 tube socket.
- 1 amplifying vacuum-tube.
- 1 45-volt B variable-battery.

Generally, the audio-frequency transformer has four connections. They are marked P, meaning primary; S, meaning secondary; F, meaning filament minus; FX, meaning filament plus.

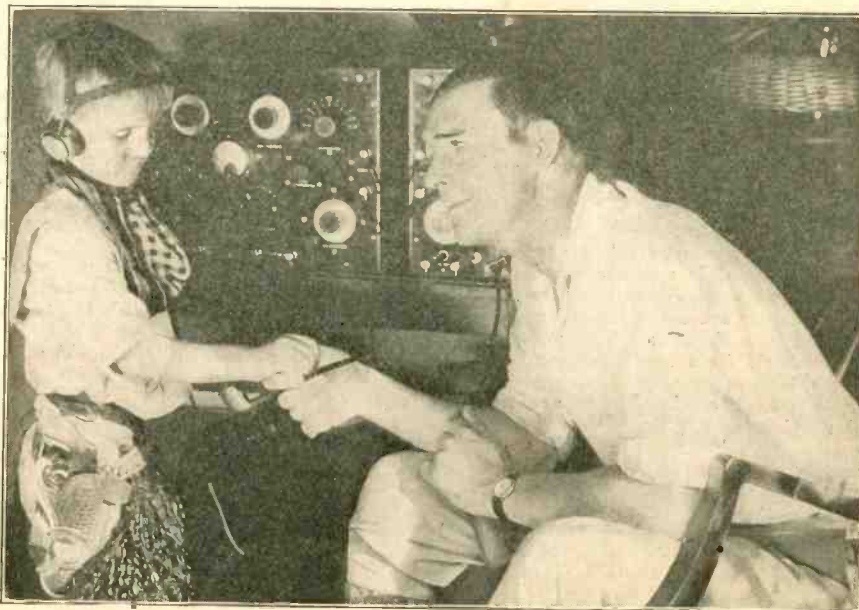
Other transformers, at times, are marked somewhat different, and if a few rules are observed, no trouble should arise. These transformers are marked Grid, Plate, Filament minus, and Filament plus. When they are marked this way, the Grid pertains to secondary; Plate pertains to Primary; and, of course, the Filaments are the same as in other transformers.

Always make the wiring so that when two wires run, or seem to run, in parallel try to have them cross each other, or at right angles to each other. This will help the set considerably.

Care should be taken to see that all connections are correct and always soldered. The second tube is an amplifying tube. A detector tube should never be inserted, as poor results will be obtained. This will discourage the builder and probably convert him back to his old single-tube set. The plate of the second, or amplifying, tube should have, approximately, 45 volts;

but the detector tube should have only from 18 to 22 volts, according to the tubes used in the circuit. With the proper voltages used in the plate and filament circuit—remembering that the plates of both tubes need different voltages, and placing the phones according to the accompanying sketch—signal strength should be increased immensely.

Wallace Reid as a Radio Instructor

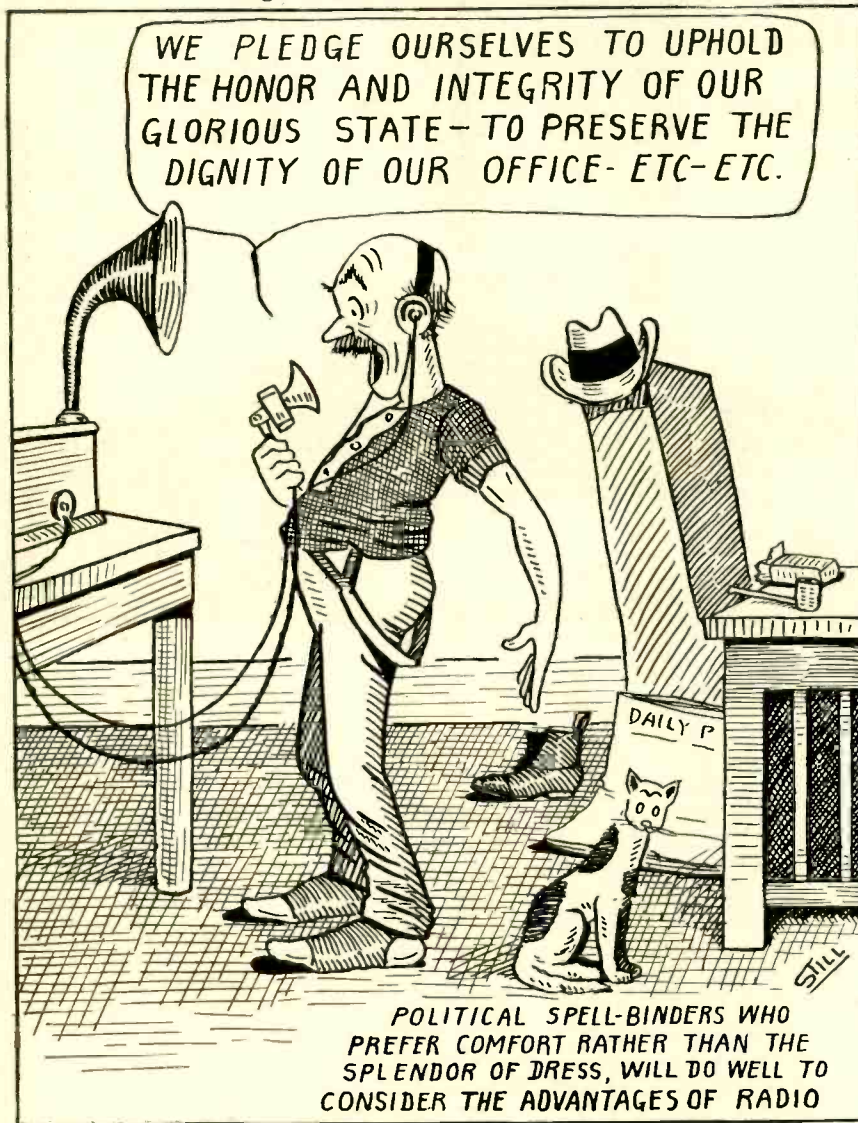


(C. Kadel & Herbert, N. Y.)

Wallace Reid, known to thousands of "movie" fans, is very much of a radio fan in private life. To keep his little son amused, he installed a radio set in his home at Hollywood, California, and is explaining "how it works."

Radio Doesn't Care Just How You Dress to Make a Speech

Original cartoon by Harry R. Stillman.



POLITICAL SPELL-BINDERS WHO PREFER COMFORT RATHER THAN THE SPLENDOR OF DRESS, WILL DO WELL TO CONSIDER THE ADVANTAGES OF RADIO

Hints for Fans

By C. F. Rye

WHEN fastening my variocoupler and variometers to my panel I used glue so as not to mark the face of my panel with screws. After having things set, I noticed, one rainy day, that the glue was soft again. After drying the joint and shellacking I had no further trouble. The shellac keeps out the moisture.

I have a crystal—like most amateurs within range of a close station—but could not devise any way to be notified when a lecture or a concert started. While experimenting I tried the following, and it worked well. I tuned the set for the 360 wave-length and hung one of my receivers up near the canary's cage. Now, as soon as the phones start, the bird will start also and sing at the top of his voice continually until we remove the receivers. For a crystal set, this is the best alarm of which I know.

When static was bad I tried several ways to cut it out. The following helped: I disconnected my aerial, connected my set to the heating system, and used a six-foot pipe in the ground for the ground connection. I was surprised to get satisfactory results—much better than I often secured in rainy weather. These two simple connections will be of great advantage to a fellow whose landlord will not permit him to string an aerial on the roof. Our heating system is in a large building, and acts as a splendid aerial. I do not know why it should, because it was connected with the water and heating system. The water pipe did not serve as a ground in this hook-up.

Radio Musts

- SEE that your set is kept clean.
- See that storage battery is charged.
- See that your aerial is not grounded.
- See that storage battery is not dead.
- See that all contacts are free from dirt.
- See that plates in battery are covered with water.
- See that the B battery is placed in the proper circuit.
- See that filaments of tubes are not burning too brightly.
- See that aerial is making good contact on receiving set.
- See that proper connections are made when using jacks.
- See that you are using a good ground connection on receiver.
- See that secondary variable condenser is of the right capacity.
- See the grid condenser and grid leak are of the correct value.
- See that variometers are in correct circuit for regeneration.
- See that caps on head sets are not too loose or too tight when receiving.
- See that telephones are making good contact when using a plug.
- See that taps on vario-coupler are properly secured and soldered.
- See that the correct polarities of the batteries are used in circuit.
- See that proper connections are made on detector tube and B battery.

Radio Don'ts

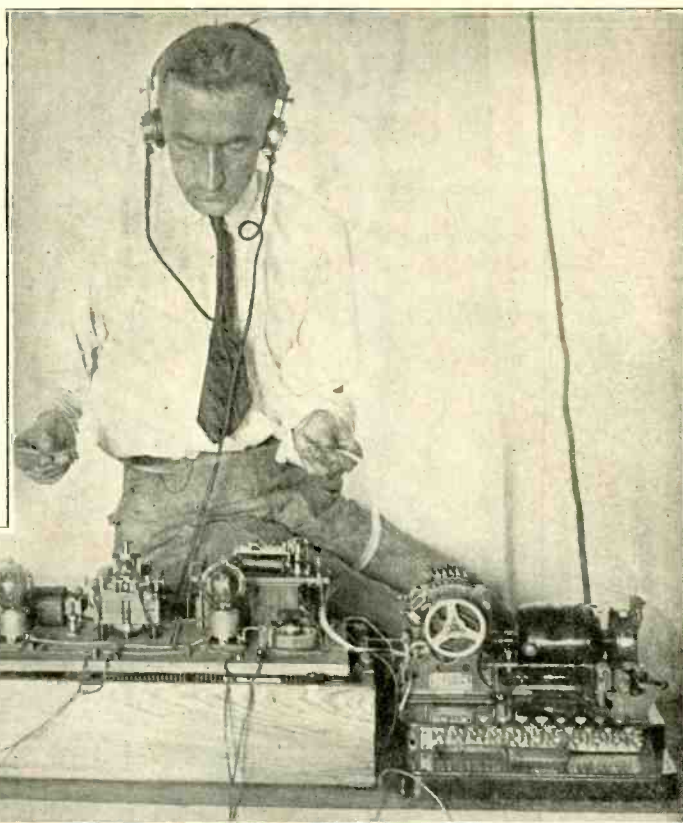
- DON'T turn rheostats too high.
- Don't allow battery to get low.
- Don't have any loose connections about aeriels.
- Don't work behind panel with a long-nosed screw driver.
- Don't allow the vacuum tubes to burn while making a repair.
- Don't leave your switch on aerial when closing up the station.
- Don't have your aerial too short. One wire 100 feet long is best.
- Don't use a soldering iron when making necessary repairs in rear of panel.
- Don't try to hear the short-wave stations when using a loading coil.
- Don't add a loud-speaker to a plain crystal receiver and expect results.
- Don't use dry cells for filament lighting. They are an expensive proposition used in this connection.
- Don't connect too many phones as they will decrease the signal strength considerably.
- Don't leave your switch on aerial when shutting down for the night. Always have it on ground.
- Don't use too much plate-current on the detector tube. Usually 18 volts will act satisfactorily on detector.
- Don't run your aerial too close to electric light wires. Have your aeriels at right angles to such power lines.

Amplification in Radio Frequency, by H. S. Potter, with Schematic Diagrams. In Radio World, No. 23. Next Week!

Typewriting on Airplane Received on Land by Radio

Machine's Keys Give Wireless Impulse and Are Easily Reproduced.

By *W. R. Service*



(C. "P. & A. Photos")

The operator in the United States Navy Yard, Washington, D. C., "reading" the messages on the receiving set, sent by radio from an airplane.

THE Bureau of Standards, Washington, D. C., recently explained some experiments by F. W. Dunmore, which indicated that a recently perfected radio-relay recorder might do away with code operators by printing the code message on a tape so that it could be read visibly by inexperienced men, but now the Naval Aerial and radio experts have gone the bureau one better—they print radio messages automatically on a typewriter.

Co-operating with the Radio Laboratory of the bureau, experts of the U. S. Navy, successfully tested the operation of the line—wire teletype by radio a few months ago, and succeeded in printing messages from a distance of nine miles. The radio circuit was established between the Bureau of Standards, near Chevy Chase, and the Naval Air Station at Anacostia.

More recent experiments have established the fact that teletype messages printed on a machine installed in an airplane and transmitted by radio may be recorded on a typewriter in a ground station. Future experiments will undertake the reversal of this operation; the sending machine being on the ground and the receiving apparatus installed in a plane in flight. Great interest is manifest by Naval experts as the new method will permit the sending and receipt of duplicate orders of record, eliminating errors and a knowledge of code, besides saving time of rewriting.

The practical tests made assure future commercial uses in aerial news re-

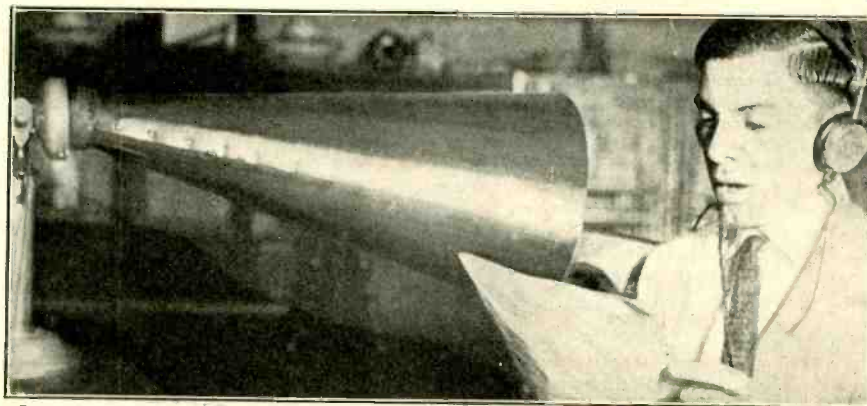
porting, when a correspondent covering an aquatic event, marine engagement or sea maneuvers can send his copy straight to the desk. Another value, if aerial passenger lines are extended, would be the receipt and dispatch of typewritten telegrams, stock reports, news dispatches, etc., ready for delivery.

The sending instrument of the teletype resembles in general the commercial typewriter, in that a keyboard having the alphabet and other conventional symbols is so arranged that it may be operated by hand. Each key is connected to the radio installation in the plane and when a letter is struck on the

keyboard a radio impulse is sent out from the antennae of the plane and is received at a ground station. The similarity to the typewriter is completed in the receiving device. When the letter A is struck on the keyboard in the air, a radioactive energy released travels to the recording instrument and selectively energizes the type-letter A, causing it to be reproduced on paper carried in the receiver.

The teletype has been in use for eight years in connection with land-wire operations, but its application to radio use is a recent development. The tests at the Naval Air Station are the first conducted in an aircraft.

After Motor Thieves by Radio



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

Motorcar thieves—most prolific of the many marauders now operating in the United States—have radio on their trail. They "worked" Washington, D. C., to such an extent that Inspector Grant, of the District of Columbia Police, ordered that news of such thefts be broadcast throughout the country. The photograph shows Anthony Ciaverella connected with the department's radio room, transmitting the report of a theft.

Radio World's Hall of Fame



(C. Keystone Co., Inc., of N. Y.)

PAUL FORMAN GODLEY

Paul Forman Godley was born September 25, 1889, at Garden City, Kansas. His interest in radio began when he entered Defiance College, Ohio. Being interested in communication, it was quite natural for him to become enthusiastic about radio and he studied all the available literature on radio communication published. In 1908, a commercial wireless station was built in Chicago, to which Mr. Godley was assigned as operator. In 1913, he was in the "Amazon-to-the-Andes" radio service for the Brazilian government. In 1914, he returned to his home, Leonia, N. J., and developed the short-wave regenerative receiver. In 1915, he opened a transmitting station, 2 ZE, and made many exceptional distance-records. During the World War, he served as designing engineer at the Marconi Wireless Company of America's factory. He was chosen by the American Radio Relay League to conduct its transoceanic radio tests, journeying to Scotland for this purpose.

Condensed History of Radio from the "Edison Effect" to Marconi's Directional Waves

By *C. D. Wagoner*

1883. Thomas A. Edison discovered what is now called the "Edison Effect," a phenomenon occurring in a burning incandescent electric bulb, in that an electric current can be made to pass through space from the burning filament to an adjacent cold metallic plate. While not applied to radio at this early date, the discovery was later used in developing the vacuum tube, now a veritable modern Aladdin's Lamp and the very heart of radio communication.
1885. Electric signalling through the air without connecting wires begins when an English experimenter stretches two lengths of wire, one-quarter of a mile apart, and by charging one with a local electric current is able to induce a response in the distant wire.
1887. Professor Heinrich Hertz, a German scientist, proves experimentally that electric waves are sent through space with the speed of light by the electric discharge that takes place when a spark is made by an induction coil or a static machine. These waves have since been called "Hertzian Waves."
1890. Professor E. Branly, of Paris, develops the coherer which considerably improves reception.
1894. British experimenters bridge a distance of $1\frac{1}{4}$ miles by means of improvements on the original induction system of 1885.
1895. Guglielmo Marconi proves that electric waves can be transmitted through the earth, air, or water by means of sparks producing high-frequency electrical oscillations.
1896. Marconi further proves that telegraph signals can be sent and received by means of Hertzian waves up to a distance of three miles.
1900. A. F. Collins bridges distance up to eight miles by means of his so-called electro-static system of wireless signalling.
1901. Marconi, spurred by his early success, finally succeeds in bridging the Atlantic Ocean from Poldhu, Cornwall, England, to St. Johns, New Foundland, by sending the historical series of the letter "S," the distance being 1,800 miles.
1902. Professor E. Ruhmer's photophone system of wireless covers a distance of 20 miles at Kiel, Germany.
1902. Wireless telegraphy is adopted on large transatlantic passenger vessels, the test being on the American steamer "Philadelphia."
1902. Professor J. A. Fleming, of London, England, invents the two-element thermionic valves-detector for radio reception.
1906. Professor R. A. Fessenden, an American experimenter, develops a high-frequency alternator system, having a range of 20 miles.
1906. The Telefunken Arc system of wireless telegraphy is developed and covers a distance of 25 miles.
1906. Dr. Lee De Forest, an American radio expert, improves the Fleming original vacuum tube by inserting the third or control element, known as the grid.
1908. Professor Poulsen perfects another arc-transmitting system which covers more than 150 miles on first test.
1908. Marconi transatlantic radio stations are opened to the general public for the transmission and reception of radiograms between Great Britain and Canada.
1908. Professor Marjorana perfects an arc oscillating-generator and liquid microphone-system, and bridges Rome with Sicily, a distance of 300 miles.
1911. The radiotelephone covers a range of 350 miles between Nauen, Germany, and Vienna, Austria.
1912. The International Radio Telegraphic Conference approves regulations to secure uniformity of practice in radio services.
1912. E. H. Armstrong, an American, invents the now famous regenerative vacuum-tube circuit while experimenting at Columbia University.
1913. The powerful radio station at Nauen, Germany, successfully bridges a practical telegraphing distance of 1,550 miles.
1914. Laws are formulated by foremost maritime nations requiring vessels of certain sizes and grades to carry wireless equipment and operators.
1914. The Marconi Wireless Telegraph Company of America inaugurates a new American transoceanic wireless service by opening its California-Honolulu circuit.
1915. The American Telephone and Telegraph Company, working in conjunction with the Western Electric Company, succeeds in telephoning by radio from Washington to Paris, a distance of 3,700 miles, and from Washington to Hawaii, a distance of 5,000 miles.
1916. President Wilson and the Mikado of Japan exchange radiograms at opening of newly established transpacific radio service between the United States and Japan.
1917. Dr. E. F. W. Alexanderson, consulting engineer of the General Electric Company, develops a 200-kilowatt high-frequency alternator now used almost exclusively in transoceanic radio communication.
1918. Both radiotelegraph and radiotelephone conclusively prove their tremendous importance in warfare in the World War.
1919. Canada and England are linked by radiotelephone for the first time, vacuum-tube transmitters being used.
1919. The Radio Corporation of America is formed, taking over the interests of the Marconi Wireless Telegraph Company of America and the radio activities of the General Electric Company in plans for a world-wide wireless system.
1920. The United States Government returns high-power radio stations, employed throughout the war, to the Radio Corporation of America.
1920. American radio amateurs reorganize their forces, now reinforced many thousands of times by war-trained radio men, and begin to turn their attention to amateur radio-telephone development.
1920. An American built and controlled station, to be known as Radio Central, is planned with facilities for simultaneous wireless telegraph communication to the entire world. To this end, a tract of land covering ten square miles is acquired on the northeastern end of Long Island, near Port Jefferson, and construction work begins.
1921. Popular radio-broadcasting begins.
1921. Twenty-seven amateur radiomen make history by transmitting across the Atlantic from the United State to Andressan, Scotland. The power used in the various stations averaged from 50 to 1,000 watts.
1921. President Harding formally opens Radio Central by sending a radiogram addressed to the nations of the civilized globe.
1922. Major E. H. Armstrong announces his superregenerative vacuum-tube circuit.
1922. Dr. Irving Langmuir, of the General Electric Company, announces a 20-kilowatt vacuum tube, the most powerful ever made.
1922. Marconi demonstrates to an American audience his radio searchlight, a means of directing radio waves.

"The radiotelephone will be an important factor in preserving the unity of nations and empires and strengthening the bonds between men and their governments."—Alfred N. Goldsmith.

Radiograms

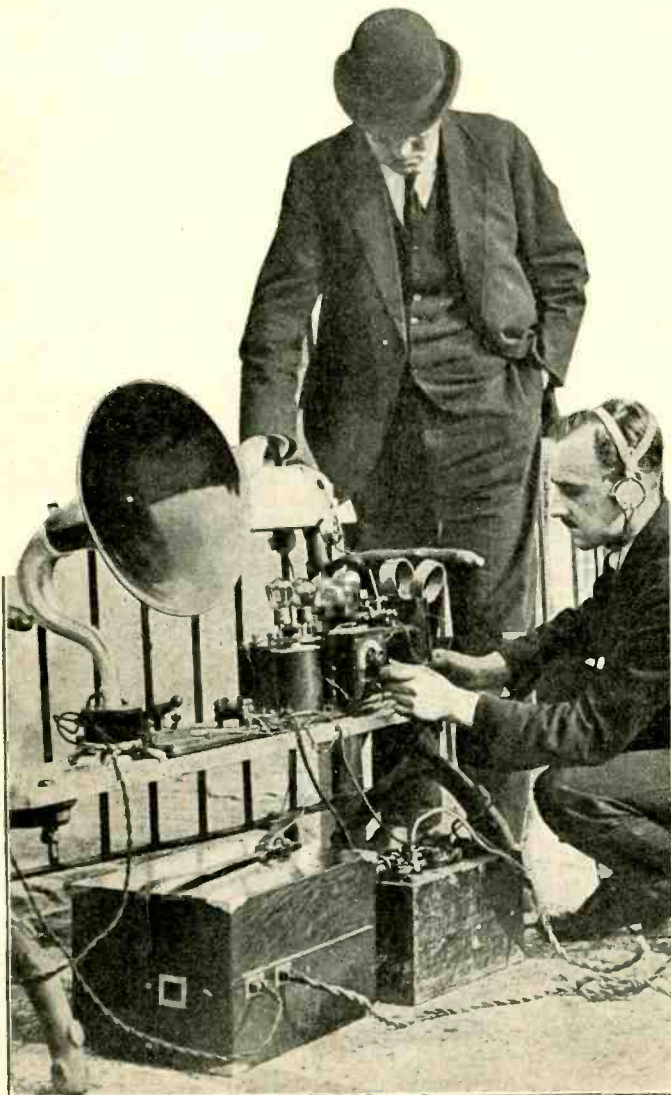
Latest Important News of Radio Garnered from the World Over, and Reduced to Short Wave-Lengths for the Busy Reader.

THE advent of a great New York symphony orchestra into the rapidly developing field of radio was marked, last week when the concert rendered at the Stadium of the College of the City of New York, was broadcast. The Philharmonic, Meliam Van Hoogstraten directing, sent its music by air waves as far as they would carry—perhaps over 2,000 miles.

Yale is arranging to broadcast reports of its athletic events, play by play. The publicity department of the University believed that such items would not only be of interest to a great many people, but would have great publicity value.

Radio had another big chance to prove its worth when the "Adriatic" encountered disaster in the Atlantic. Twenty-five years ago the passengers would have had to depend upon a few skyrockets and exploding shells to call aid. Now the silent call of radio blankets the entire ocean in less than a second. Hundreds of stations heard the "Adriatic's" emergency signals, and numerous vessels "stood by" ready to rush full speed to her

In Radio Touch with Motor Cars



(C. Central News)

Tests were made recently at Brooklands, England, to receive radio messages from motorcar racers who were attempting to break endurance tests by traveling for twelve consecutive hours. The photograph shows the receiving set at the edge of the race track where the tests were made. The voices of the motorcar drivers and mechanics were perfectly heard.

assistance. What a comforting sight the aerial between the masts of the "Adriatic" must have been to those on board!

Although radio has met more obstacles in establishing radio-
phone service on moving trains than it has on ships, it is safe to say that the day will come before long when a person can successfully talk from a Chicago express train to his home in any city of the United States or to a friend on a vessel far out in the Atlantic.

One of the excellent features of radio not possessed by either the telegraph, telephone or cable is the great speed of 186,000 miles a second, a velocity which carries a radio message around the world seven and one-half times in a second, in less time than a telephone receiver can be lifted off the hook to attract the attention of the operator. Another salient point is its ability to reach instantaneously an audience numbering into the millions. In the future, if a President of the United States has a vital message for the nation it will be possible for him to address Congress and at the same time let all Americans from Maine to California, as well as the ships at sea, hear his voice at the same instant it is spoken in Washington.

"Sampaio Correio," hydroplane, in its flight from New York to Rio de Janeiro, Brazil, was equipped with a radio-receiving set by the General Electric Company, capable of receiving signals for a distance of 1,000 miles. Special weather reports, daily, from American stations and from a new station recently opened in Brazil were of great help to the navigators on this long flight. They also received daily news reports from the United States Naval stations to the ships at sea. So that signals might be received while "Sampaio Correio" is at rest on the water, as well as when in flight, the aerial may be strung over the top wing, being attached to the skid fins. This provides a spread of about 90 feet. Ordinarily, with an airplane, the aerial is dropped from the body of the plane from a reel; but with a seaplane such an aerial would prevent use of the radio set except when in flight.

Dramatic productions by radio have become a possibility as a result of successful experiments made recently at WGY, radio broadcasting-station of the General Electric Company, Schenectady, N. Y. Eugene Walter's play, "The Wolf," was presented. The invisible audience found the story of the invisible players so interesting that many letters have been received at the G-E station proclaiming the success of the "production." The cast was headed by Edward H. Smith, who has been heard frequently in readings by the WGY audience. "The Wolf" was presented in three episodes and the scenes, period, costumes and the story of "before the play" were described briefly preceding the performance. By means of the description the attentive listener at his receiving set constructed his own scenery within the limits of his experience and imagination. To the man who can attend a theatrical production at any time the radio drama may lose something, the story may need the eye to give it full force. There are thousands in rural districts, many invalids, the blind and inmates of institutions to whom all entertainment provided by a broadcasting station is the only relief from monotony. To such as these a dramatic performance by radio has a special appeal.

A convicted life prisoner heard information by radio that, probably, will bring his freedom when George Rollins, convicted of murder, was listening in on his little radio set on the evening of August 10. Rollins, in his cell, was listening to the regular late news broadcast from the Amrad Station, WGI, at Medford Hillside, Mass. Announcement was made that Governor Sproul of Pennsylvania was to release Frank Smith, alias Jesse Murphy, who confessed some months ago to one of the two murders of which Rollins was convicted. The two killings occurred in February, 1917, for which no one has yet paid the penalty. Rollins and his brother, Charles, were both implicated and convicted. While George was awaiting sentence, Murphy, down in Pennsylvania, confessed to one of the murders. While he did not confess to the killing with which George Rollins is convicted, he has positively stated that Rollins did not do it, and that he, Murphy, knows who did. Naturally, George Rollins secured a new lease on life when he heard the news by radio that Murphy was about to be released from the Philadelphia Penitentiary and would be brought to justice in Boston. Boston officials went to Philadelphia to apprehend Murphy and bring him to Massachusetts.

Radio and the Woman

By
Crystal D. Tector

WELL, fellow radioists and friends, this is my last week at Lake Hopatcong. When this batch of "copy" for RADIO WORLD leaves the typewriter, I shall begin to pack my duds and Friend Husband's summer essentials and my good old receiving set, and hike back to the big city. It has been very pleasant up here despite an unusually rainy summer. I have made a lot of converts to radio, and every convert has smothered me with thanks.

The only "sour face" was a woman who took umbrage at the rain. She is that type of female who revels in the blues whenever a cloud obscures the sky; and she told me, with no little degree of genuine anger, that "if it were not for all this radio foolishness, there wouldn't be half so much rain!"

Of course that is all buncombe. Whoever started that report must have had some unusual convolution in what he calls his brain. F. H. says the hootch that is passed around nowadays will make some people say most anything. Be that as it may, when my belligerent neighbor appeared at my door with her tirade against radio, I quietly called her into the house, brought her a cup of my very best tea, and then began to reason with her.

"Do you know," I said, in my sweetest tones, "that radio isn't new, that it is as old as the world itself, that it has always been in the air?"

"No," she replied, her eyes bulging.
"Well, that's the truth," I went on. "Radio has always been; but it took mankind many centuries to discover its existence. And when it was discovered, it was put to use. The fact that is was put to practical use has no more to do with the fact that there is an unusual rainy season than it has to do with the dark side of the moon. There may be other phenomena beyond radio—phenomena even more potent and mysterious than radio will lead us into. We do not know where all this will end. Only fifteen short years ago, we would have been pointed at as foolish if we had dared to suggest things that are now matter-of-fact."

She looked at me almost blankly as she sipped her tea. "Why, I never heard a woman talk like that before," she remarked with trembling voice. She was stunned. I hope that she learned something.

I have not yet told F. H. about this incident. I want him to read it here first. But I ask you, my big family of readers: "Is my answer correct?"

F. H. and I were guests on a long motor tour last Sunday. We started early. The day dawned none too propitiously; but toward ten o'clock the sun came out and the east wind vanished. We motored as far as Philadelphia, where we had luncheon, and re-

turned to the Lake for dinner. But what I want to speak of is the unusual number of antennae I saw strung from the roofs of houses both in the country and the more thickly settled districts. It made me very happy to see this marked interest in the new science. Wherever I noticed a house that was not equipped with those long wires that catch the broadcast sounds, I just wanted to stop and find out why radio had been overlooked. Then I consoled myself that, perhaps, those homes were equipped with indoor aerials. Anyhow, I'll give them the benefit of the doubt.

I am told that the Christmas gifts for women, this year, will include a variety of handsome boudoir radio-sets in nickel and silver—also a few gold finished for those who wish to do something extravagant. When I return to the big town, I will have a chance to make a trip along the Avenue and pick up the latest in radio effects.

A friend writes me from Paris that Mme. Curie, the discoverer of radium, has become an ardent radio fan. They say that she is endeavoring to find out if there is any connection between it and the wonderful mineral that broadcast her name into the ages.

I am informed, also, that the queen of the Belgians is doing much to promote an interest in radio in her country—perhaps the most backward country, so far as all forms of wireless are concerned, of any in the world. The Belgian king, you know, is a keen aviator, and has taken the queen with him on many of his air trips. They say that, wishing to be up-to-date in something, she has decided that radio offers the greatest possibilities.

From my mail bag:

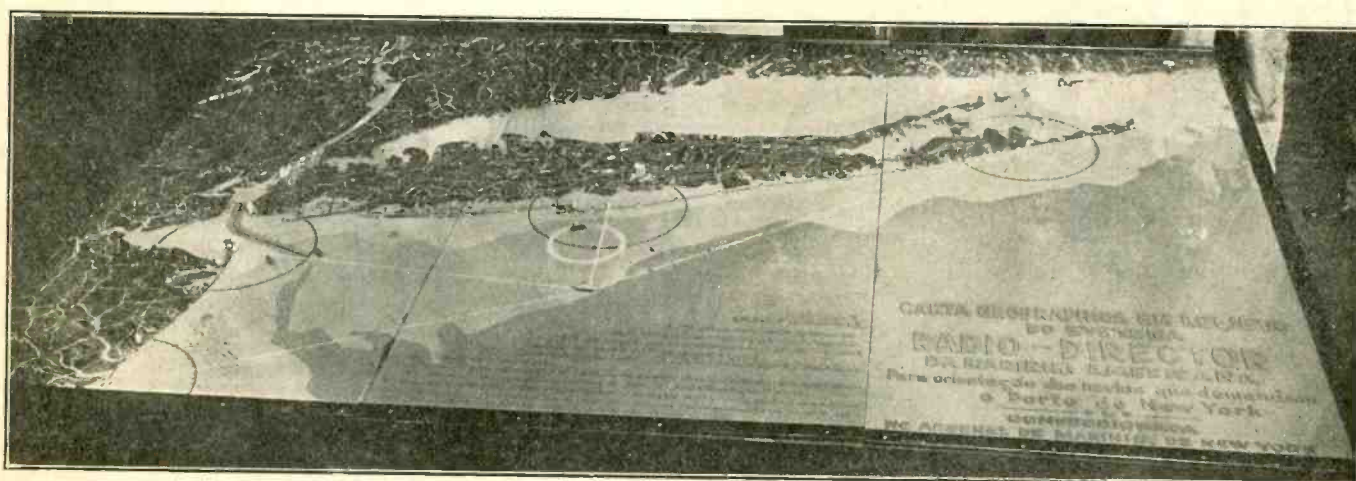
Miss D. E. R., El Paso, Texas.—"I am experimenting with the Armstrong superregenerative circuit as described in RADIO WORLD. It is exceptionally interesting. I was an ardent horsewoman until radio came along. Now 'Dobbin' has nothing to do but eat oats."

Mrs. O. L. I., Des Moines, Iowa.—"Don't think that New Jersey is the only State in which the school children are taking to radio in large numbers. Iowa boasts of just as keen an interest. I am a school teacher, and I should know."

Jane D., Holyoke, Mass.—"It must be bully to get along with him you call 'Friend Husband' so placidly as your articles indicate. Has radio anything to do with it? If so, I'll install a set at once."

Mrs. K. Y. J., Indianapolis.—"My boy has just left for New York to seek a position on an ocean liner, as radio operator. You can imagine what that means to a mother—to see her boy leave the old home and embark in a new field, with only his health and determination. I wish I could send him to you. He begs me not to worry and fret, and swears that he will succeed. He really knows a great deal about radio, so I have no fear if he does find employment. But—I am his mother."

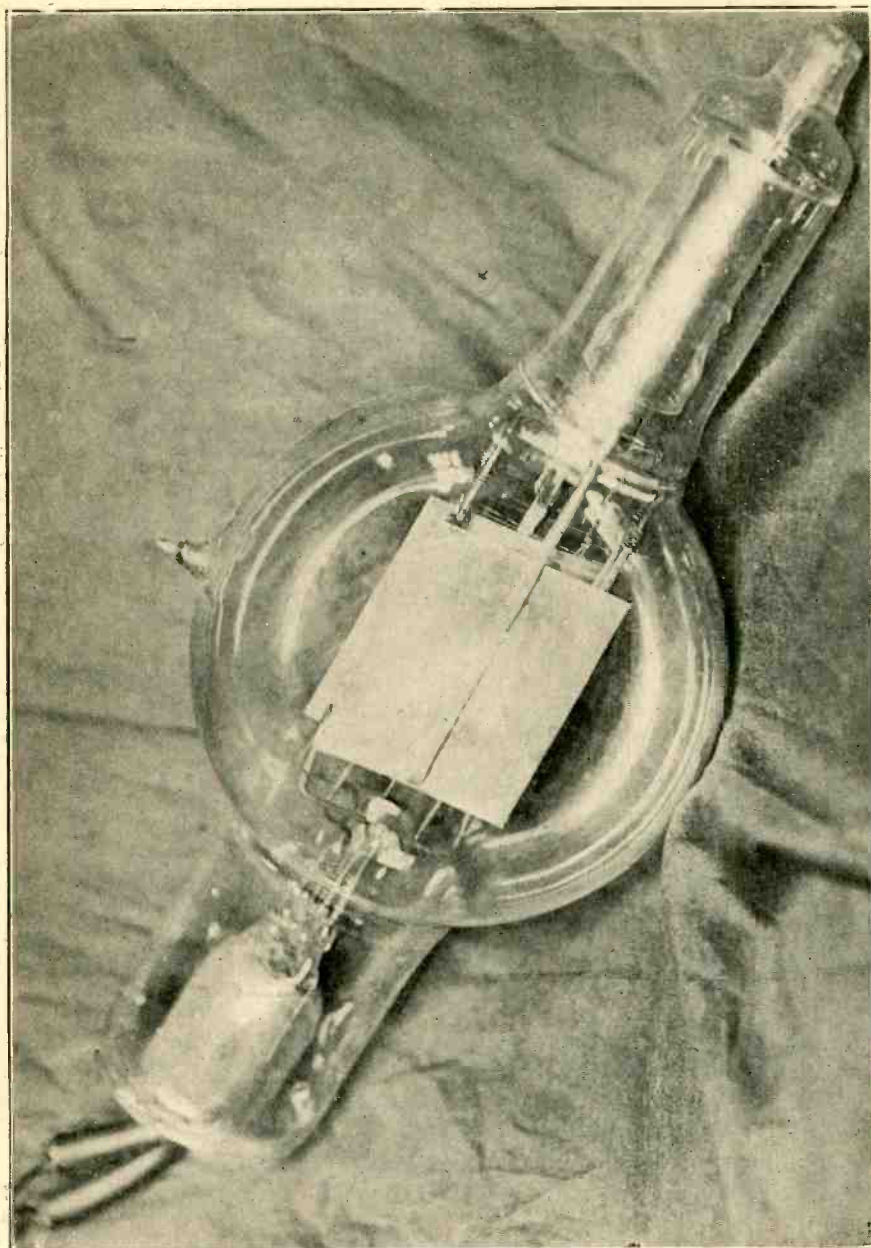
United States Navy's Radio Relief Map of New York Harbor



(C. International News Reel Photos.)

The above photograph shows the United States Navy radio-relief map of New York Harbor, recently finished at the Brooklyn Navy Yard, New York. This map is complete in every minute detail, even displaying the various lighthouses along the Long Island and New Jersey coasts as well as buoys, channels and shoals.

The Vacuum Tube and Its Evolution

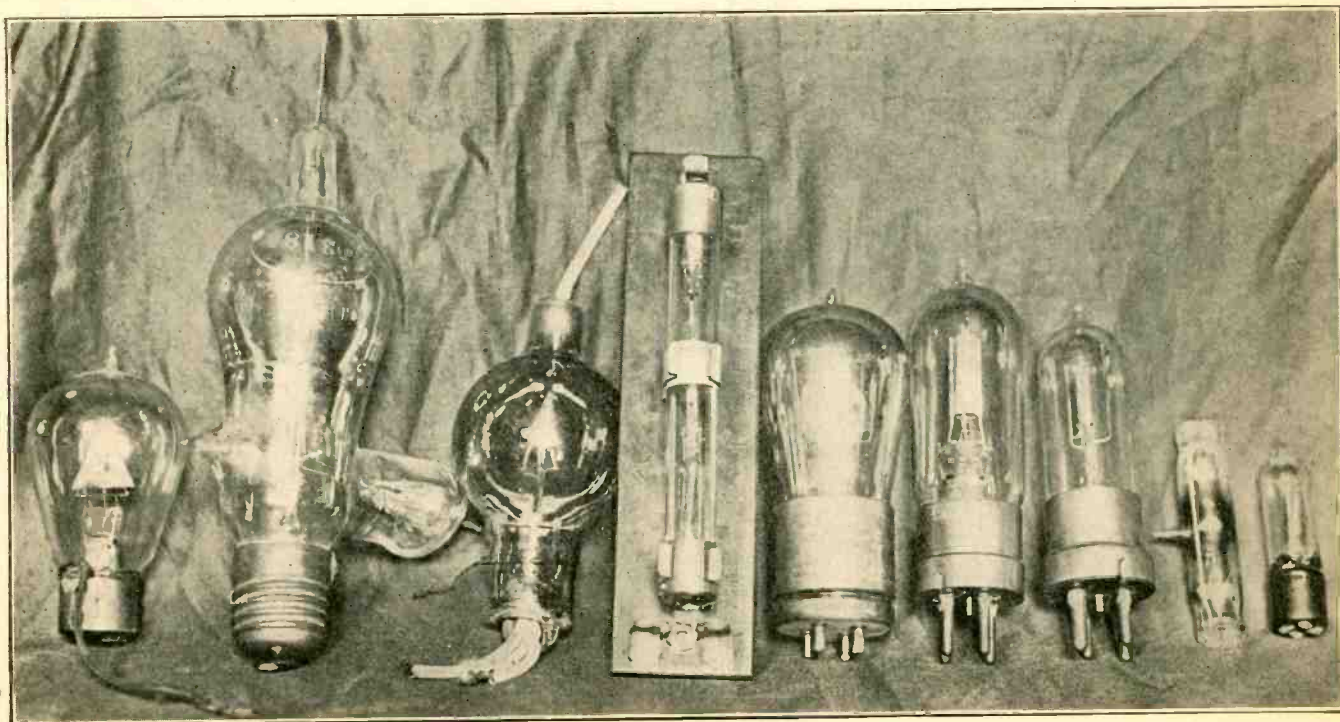


CONTINUOUS-WAVE telegraphy and telephony are now universally recognized as the best method of transmission. The difficulty of transmitting clearly through static interference is greatly overcome by the use of this type of signal. Prior to the introduction of the vacuum tube, the generation of continuous waves was extremely difficult. The introduction on the market of the tube known as the plotron, in the photograph at the left, has simplified and rendered possible this extremely valuable method of communication. This tube to-day is supplanting most of the high-powered radio stations and is taking the place of the old-time arc transmitter. It can be used either for continuous-wave telegraphy or telephony.

The photograph across the bottom of the page gives a clear idea of the evolution of the vacuum tube from Dr. Fleming's invention, the two-element electrode valve, to the de Forest invention, the three-element vacuum tube. They are all of the three-element type, but are the designs of different manufacturers.

Perhaps no particular item is as responsible for the advancement of radiotelegraphy and telephony as the vacuum tube. This instrument was perfected about 1910. Since that time it has been used with great care with wonderful results. It consists of an evacuated vessel somewhat similar in size and construction to a small incandescent lamp. Instead of two connections, as in the case of the electric lamp, the vacuum tube—or, more properly, the electron tube—has four. Two of these serve the same connections as that of the lamp, while the other two connections are for the leads to the grid and plate of the tube. There are, therefore, three elements in the vacuum tube: namely, filament, grid, and plate.

(Both photographs copyrighted by Central News Photo Service)



Real Test for Transatlantic Radio Circuits

Radio Corporation of America Expects to Handle Bulk of Messages, without Delay, While Cable Service Is Interrupted

By Carl Hawes Butman

WASHINGTON, D. C.—“An ill wind” may blow radio communication “some good.” In fact it is very likely that the seizure of ten transatlantic cables by the Irish irregulars, reported by the Associated Press, leaving but seven to carry all the Old World news and dispatches, may give radio communication the opportunity it needs to show what it can do, especially in an emergency. And, to date, it is reported that the Radio Corporation of America is clearing all its transatlantic messages filed between Great Britain and North America without delay.

Officials of the Radio Corporation of America, in Washington, say they welcome the opportunity to handle the increased traffic and feel that after two and a half years' operation they at least can handle their share. Ordinarily the R. C. of A. carries between twenty and twenty-five per cent. of the transatlantic traffic, but now it may get about seventy per cent.

The five commercial cables seized in Ireland terminate in Waterville, the four Western Union at Valentia, and the British cable at Ballinskelligs. The trouble seems to be that if the government forces attempt to regain the stations the rebels will destroy them, as was the case with the Marconi station at Clifden, which operated to Canada. The three remaining cables direct to Penzance, England, became overloaded at once and the only radio circuit in operation, that of Carnarvon, is busy day and night.

Radio Corporation officials admit, however, that the Carnarvon station must handle both Canadian and United States dispatches, although stations on this continent can relay messages between United States and Canadian points. The radio system is more flexible than cable communications, they point out, and when one station is loaded part of its work may be transferred to another. High-speed transmission will enable the radio stations to carry great numbers of messages in periods free from interference, and practically no delay is anticipated.

The only other means of communication between the old and new worlds are the three French cables which land at Brest, and one commercial cable to

the Azores and Lisbon, which usually serves the Mediterranean.

Radio stations in Europe and England are used for sending and receiving from specific sections. For example, the new station at Ongar, England, serves the Continent and Europe; while that at Carnarvon, Wales, operates to Canada and the United States and the British Postal Radio circuit, near Oxford, handles Egyptian traffic.

It would seem that the Radio Corporation of America can handle the American end of the transatlantic traffic, with little trouble, and the stations at Marion, Mass.; Tuckerton and New Brunswick, N. J.; and Port Jefferson,

L. I., will send; while the receiving station at Riverhead, L. I., will do the receiving from Carnarvon, Bordeaux, Stavenger, Norway and Nauen and Eilvesse, Germany.

Recently the French-American circuit was shifted from Bordeaux to St. Assise. After a test conducted with this country the station was opened for operation with co-operation of R. C. of A. stations. It is reported that the new radio-station just about completed at Bruges may go into circuit with the R. C. of A. stations; it is the first high-powered transmitting station in Belgium and may prove a valuable adjunct in the present emergency.

Table Explaining the Units of Copper Wire

RADIO WORLD publishes herewith a table which should be of interest to all radio amateurs. It gives the necessary data for using copper wire from size 0000 to No. 40. This table gives the diameter of the various wires, also the capacity, ohms and feet per pound:

Gauge	DIAMETER	SECTIONAL AREA	CAPACITY	OHMS.			FEET		POUNDS	
				Per 1,000 Ft.	Per Mile	Per Pound	Per Pound	Per Ohm.	Per 1,000 Ft.	Per Ohm.
0000	.460	211600.	312.	.04906	.25903	.000077	1.56122	20497.7	640.51	12987.
000	.40964	167805.	262.	.06186	.32664	.00012	1.9687	16255.27	507.95	8333.
00	.3648	133079.	220.	.07801	.41187	.00019	2.4824	12891.37	402.83	5263.
0	.32486	105534.	185.	.09831	.51909	.00031	3.1303	10223.08	319.45	3225.
1	.2893	83694.	156.	.12404	.65490	.00049	3.94714	8107.49	253.34	2041.
2	.25763	66373.	131.	.1563	.8258	.00078	4.97722	6429.58	200.91	1282.
3	.22942	52634.	110.	.19723	1.0414	.00125	6.2765	5098.61	159.32	800.
4	.20431	41743.	92.3	.24869	1.313	.00198	7.9141	4043.6	126.35	505.
5	.18194	33102.	77.6	.31361	1.655	.00314	9.97983	3206.61	100.20	318.
6	.16202	26251.	65.2	.39546	2.088	.00499	12.5847	2542.89	79.462	200.
7	.14428	20817.	54.8	.49871	2.633	.00792	15.8696	2015.51	63.013	126.
8	.12849	16510.	46.1	.6529	3.3	.0125	20.0097	1599.3	49.976	80.
9	.11443	13094.	38.7	.7892	4.1	.0197	25.229	1268.44	39.636	50.
10	.10189	10382.	32.5	.8441	4.4	.0270	31.8212	1055.66	31.426	37.
11	.090742	8234.	27.3	1.254	6.4	.0501	40.1202	797.649	24.924	20.
12	.080808	6530.	23.	1.580	8.3	.079	50.5906	632.555	19.766	12.65
13	.071961	5178.	19.3	1.995	10.4	.127	63.7948	501.63	15.674	7.87
14	.064084	4107.	16.2	2.504	13.2	.200	80.4415	397.822	12.435	5.00
15	.057068	3257.	13.6	3.172	16.7	.320	101.4365	315.482	9.859	3.12
16	.05082	2583.	11.5	4.001	23.	.512	127.12	250.184	7.819	1.95
17	.045257	2048.	9.6	5.04	26.	.811	161.29	198.409	6.199	1.23
18	.040303	1624.	8.1	6.36	33.	1.29	203.374	157.35	4.916	.775
19	.03589	1288.	6.9	8.25	43.	2.11	256.468	124.777	3.899	.473
20	.031961	1021.	5.9	10.12	53.	3.27	323.399	98.9533	3.094	.305
21	.028462	810.	5.1	12.76	68.	5.20	407.815	78.473	2.452	.192
22	.025347	642.	4.5	16.25	85.	8.35	514.193	62.236	1.945	.119
23	.022571	509.	3.9	20.30	108.	13.3	648.452	49.3504	1.542	.075
24	.0201	404.	3.4	25.60	135.	20.9	817.688	39.1365	1.223	.047
25	.0179	320.	3.0	32.2	170.	33.2	1031.038	31.0381	.9699	.030
26	.01594	254.	2.6	40.7	214.	52.9	1300.180	24.6131	.7692	.0187
27	.014195	201.	2.3	51.3	270.	84.2	1639.49	19.5191	.6099	.0118
28	.012641	159.8	2.0	64.8	343.	134.	2067.364	15.4793	.4837	.0074
29	.011257	126.7	1.8	81.6	432.	213.	2606.959	12.2854	.3835	.0047
30	.010025	100.5	1.6	103.	538.	338.	3287.084	9.7355	.3002	.0029
31	.008928	79.7	1.4	130.	685.	539.	4414.49	7.72143	.2413	.0018
32	.00795	63.	1.3	164.	865.	856.	5226.915	6.12243	.1913	.0011
33	.00708	50.1	1.2	206.	1033.	1357.	6590.41	4.85575	.1517	.00076
34	.006304	39.74	1.1	260.	1389.	2166.	8312.8	3.84966	.1204	.00046
35	.005614	31.5	1.0	328.	1820.	3521.	10481.77	3.05305	.0956	.00028
36	.005	25.	0.9	414.	2200.	5469.	13214.16	2.4217	.0757	.00018
37	.004453	19.8	0.8	523.	2765.	8742.	16659.97	1.92086	.06003	.00011
38	.003965	15.72	0.7	660.	3486.	13772.	21013.25	1.52292	.04758	.00007
39	.003531	12.47	0.6	832.	4395.	21896.	26496.237	1.20777	.03755	.00004
40	.003144	9.88	0.5	1049.	5542.	34823.	33420.63	0.97984	.02992	.00002

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

WHAT is the advantage of overloading a power tube?

Most beginners are tempted to force the oscillator tube to generate higher power oscillations than were originally intended. This will weaken the life of the tube and, in the final run, it will burn out. You force the power tube when you increase the filament current or brightness and add voltage to the plate. The safest way to overcome this is to connect two oscillator tubes in parallel and then cut down the filament brilliancy a little.

* * *

Can a spark from a coil, or buzzer, be used in connection with tube transmitters?

In a radiotelephone transmitting circuit, a modulator tube is employed and a buzzer often substituted for the microphone when sending out ICW—interrupted continuous waves.

* * *

How are the filaments of power tubes excited?

The filaments of power tubes are usually, or preferably, energized by alternating currents. This prolongs the life of the tubes. If alternating current is not available, the filaments may be lit by a supply of direct current. The filament of a power tube will have its life prolonged if alternating current is used and particularly if the filament voltage is maintained at constant value.

* * *

What is the depending factor of a power tube?

The life of a power tube depends on proper operation. Do not use a greater voltage on the filament than that specified, and do not overload the plate by employing an excessive plate-voltage; that is, if you want long life. Power-tube filaments should be burned at constant voltage rather than constant current. This will prolong their useful life. It is also dependent on its temperature. A three per cent. increase will diminish the life of your tubes one-half, while a three per cent. increase will double the life.

* * *

How should power tubes be suspended when in use?

The life of a power tube may be prolonged if suspended in the proper position. Radiotrons, type UV 202 and UV 203, should be operated in a vertical position, whereas UV 204 may be operated in both a vertical and horizontal position. If mounted horizontally, the plates should lie in a vertical plane, with the seal off, tip down.

* * *

What care should be taken in insulating the grid and plate leads when transmitting?

Great care should be taken to thoroughly insulate the grid and plate leads to the tube and coils sectors connected to these leads. Where high-frequency potential rages, this must be done to secure safety and efficiency.

* * *

How are most of the power tubes burned out?

A majority of accidents to power tubes and their auxiliary apparatus occur during the development of circuits, testing, and adjustment, rather than during operation. If care is exercised in making these adjustments, probably the tubes will not burn out so readily, saving the expense of new tubes.

Radio World's Revised Radio Dictionary

By Fred. Chas. Ehlert

Tap—A steel tool used for inside threading.

Taper—Smaller at one end than at the other.

Taut—To stretch tight, as "A taut aerial."

Telephone Cord—A number of thin copper wires twisted together having a silk, or cotton, covering woven about them. Usually used to connect telephone receivers with receiver.

Telegraph Key—A device for making and breaking a circuit in a transmitting line. This action interrupts the flow of current for making dots and dashes in the telegraph code.

Thermo Ammeter—An instrument that employs two dissimilar metals; a heated junction which sets up an E. M. F., in which case it is measured by a D-C voltmeter.

Thermo-couple—A junction of two different metals.

Tickler Coil—A coil of wire placed in the plate circuit of a receiver which enables it to be fed back to the grid circuit. This produces regeneration and enables the tube to generate oscillations of high frequency.

Tone Frequency—Same as spark frequency.

Trains of Waves—Electric waves which follow one another at regular intervals. Each electric oscillation sends out an electric wave. Hence, as several oscillations take place before all the energy is damped out, an equal number of electric waves will be sent out. This makes up a train of waves.

Transferred Energy—The energy flowing in a primary circuit or coil which is changed over to current which is set up in the secondary coil or circuit. Induction takes place by transfer of energy.

Transformer—Any device used in electrical and radio circuits for the transferring of current from one circuit to another, with or without a change in voltage. There is the Power Transformer, Amplifying Transformer, Telephone Transformer, Tuning Transformer, Oscillation Transformer and others. These transformers have a primary and secondary winding. The primary winding receives the initial current which it passes on to the secondary winding with the same voltage, higher voltage, or lower voltage, according to the ratio the primary and secondary windings bear toward each other.

Tuned Open Circuit—A tuned aerial wire-system.

Table of Enameled Wire for Winding Coils

THE number of feet in each pound of enameled wire of various sizes is given in the appended table. The beginner will find this table useful when computing the data for winding coils.

No. of Wire B. & S. Gauge	Turns per Linear Inch	Turns per Square Inch	Ohms per Cubic Inch of Winding	Feet Per Lb.
20	30	885	7.48	320
22	37	1,400	1.88	509
24	46	2,160	4.60	810
26	58	3,460	11.80	1,286
28	73	5,400	29.20	2,042
30	91	8,260	70.90	3,240
32	116	21,000	7547.00	5,132
34	145	13,430	2968.00	8,093
36	178	31,820	109.80	12,813
38	232	54,080	456.00	20,274
40	294	86,500	183.00	32,107

Answers to Readers

MY aerial is 90 feet long, in the shape of a V, and, approximately 50 feet high. My set is a short-wave receiver of the regenerative type with one-stage of amplification. It has a wave length of 400 meters. I get all sorts of tube noises and howling, and plenty of CW and spark stations, yet I cannot pick up the stations I wish to hear. What is the trouble?—Arthur Rumshaw, Pittsburgh.

Your aerial should be erected so that one wire, about 100 feet long, is run out in one stretch. In case of an inverted L type the lead-in should be taken off the end that points towards the broadcasting station. The noises you are encountering are generated from your tubes and are laid to improper plate or filament voltages, more or less on the plate side of the tube.

* * *

What type set should I purchase between the prices of \$100 to \$300.—Maurice Bookmaker, Schenectady, N. Y.

A vacuum-tube receiver, including a two-step amplifier of the regeneration type, with a good aerial, should prove sufficiently efficient for your purpose. Be sure you get a regenerative set when you buy. Prices range from \$100 to \$300.

* * *

What is static?—K. L. G., Roslyn, L. I.

This question seems to puzzle many radio enthusiasts, though explanatory articles regarding it have been published from week to week in RADIO WORLD. The term, as used by radio engineers, refers to atmospheric and electric effects which produce, in radio-receiving circuits, currents of a nature which interfere with, or disturb, incoming radiotelegraph signals. The standardization committee of the Institute of Radio Engineers has defined static thus: Static is conduction, or charging current, in the antenna system resulting from physical contact between the antenna and charged bodies, or masses, of gas.

* * *

When a tickler coil is used, is it necessary to have it near the receiving coils of a loose coupler or may it be placed anywhere on the panel?—J. C. S., Boston.

The tickler coil should be placed, or mounted, so that the coupling between this coil and the secondary is adjustable.

* * *

Could AC be used for filament, or grid, of a 50-watt power-tube?—M. V. E., Amagansett, N. Y.

AC may be used to light the filament of a power tube, but a D-C voltage is needed for the grid voltage.

* * *

I have a loose coupler and galena detector. All I hear is code. Why? Am close to a broadcasting station.—Hiram Hopkins, Canastota, N. Y.

Put variable condenser in series with antenna and get a better crystal. Adjust your set properly.

* * *

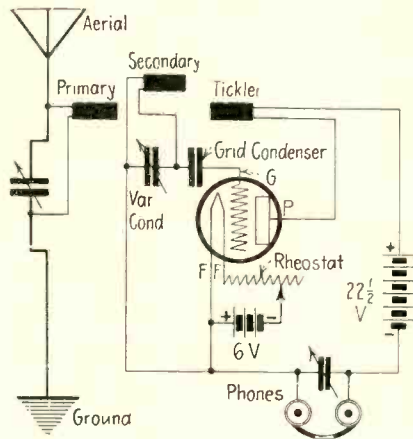
If a station broadcasts a message on a wave length of 600 meters and I tune up to 600 meters, can I pick up the message regardless of the distance between me and the distance station, even if it is a distance of 1,000 miles?—Reader of RADIO WORLD, Grand Rapids, Mich.

This question is difficult to answer as efficiency plays an important role. If you had your set tuned to the same wave

as that of a transmitting station, it is possible that you can receive the message provided that the transmitting station has enough power to cover a certain distance and that the receiver is such that it is able to pick up weak distance signals. Generally with a well-made regenerative receiver with two or three stages of amplification, signals are received over thousands of miles. While at a Naval Station I have received signals myself over two thousand miles, employing a regenerative receiver with three stages of amplification. Everything depends on the receiver, location, weather conditions, and the power of the transmitting station.

* * *

My set consists of three honeycomb coils, two variable condensers, one grid-condenser, one 22½-volt B battery, one 6-volt A battery, tube, socket and phones. What is the hook-up?—Ralph Robinson, Jamaica, N. Y.



The accompanying circuit shows the hook-up which you are desirous of obtaining. The variable condensers may be used in series, or parallel, which provides the tuning qualities of the coils to a given wave length.

* * *

I have a short-wave regenerative set with a two-step amplifier. Is there any way by which I could put a variable grid leak on it? Would a three-plate vernier condenser do for this purpose?—Richard Creter, Madison, Conn.

A variable grid-leak may be had at any radio shop and placed in shunt, or parallel, to the grid condenser at the grid of the first tube, better known as the detector tube. The vernier is of no use as a grid leak.

* * *

I would like to purchase a receiving set, but have no place to erect an aerial. Could I receive from Pittsburgh, 186 miles away, with a loop aerial?—Robert Delp, Carlisle, Pa.

Concerts have been heard over this distance using radio frequency employing a loop aerial. It is doubtful whether you can receive concerts, using audio frequency with the loop. We suggest that you do not attempt this. Use radio frequency and audio combined.

* * *

What are the number of turns of No. 24 D.C.C. wire to use on each side of stator of variometer and on each side of rotor? Number of turns on rotor of vario-

coupler? Is the variocoupler of 180 degrees better than the ordinary variocoupler in the supergenerative set? In the set shown in RADIO WORLD, dated May 20, can I use the Western Electric V.T. 1, (J) tube, or will I have to use a soft tube?—A. C. Thomas, North Birmingham, Ala.

Variometers are of different sizes. It is hard to calculate the exact number of turns for the stator and rotor. Usually the rotor has a few more turns than the stator. Thirty-five to forty turns should be used on rotor with approximately a few turns less on stator.

The number of turns on secondary should be in proportion to the primary and, also to what wave lengths desired. More data should be furnished on this variocoupler.

A 180-degree variocoupler is best as it affords closer tuning.

Yes. A J-tube may be used as a soft tube. These tubes are used at the Government stations as detectors and amplifiers.

* * *

Can I use an electric-light line as an aerial? If so, what do I need. Does Ducon answer this purpose?—George Sayers, Oconto, Wis.

You may use the ordinary electric-light if simple precautions are taken. The Ducon answers the purpose, but if other instruments are used be careful. Remember you are dealing with 110 volts of alternating current.

* * *

Can a B battery be made of a sufficient number of dry cells? Would there be a great deal of howling? If so, could this howling be overcome by packing, say 15 cells of 1½ volts each in a box of dry sand and then sealed air-tight with sealing compound?—Enno Schuelke, Greensboro, N. C.

B batteries may be made up in this manner but it would be a bulky job. Usually flashlight batteries are used because they occupy smaller space.

* * *

I am planning to assemble the following parts for a new regenerative radio-set and would like the best possible hook-up and panel layout with sufficient drawings for placing wires and apparatus properly.—Kenneth H. Jones, London Mills, Illinois.

The assembling of such a set was described in RADIO WORLD, No. 7, dated May 13, in "My Practical Detector and Two-Stage Amplifier," by Frederick J. Rumford.

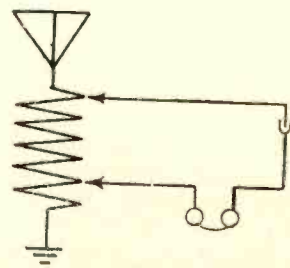
* * *

Can I connect a loop aerial with a crystal set? Can a variable condenser be used on a crystal set?—John Sinnott, Cleveland.

A loop aerial cannot be used with a crystal set. Use an outside antenna. Variable condensers may be used in your receiver. One may be used in shunt or parallel to the secondary winding of your vario-coupler or loose coupler which is .0005 microfarad capacity and the other in series with the antenna circuit which should be .001 microfarads.

* * *

Will you publish a diagram of a crystal receiver employing a single-slide or double-slide tuning coil?—Harold McCumber, St. Mary's, Ga.

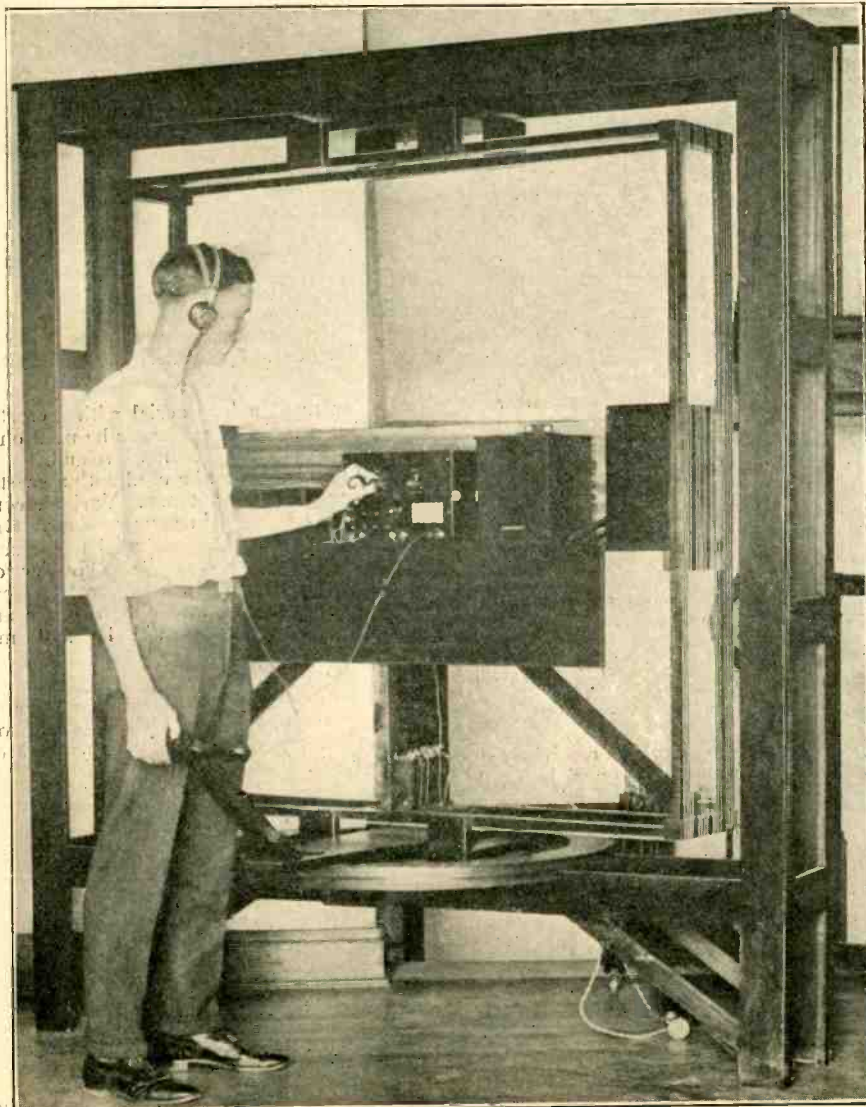


The accompanying diagram shows the necessary circuit you are seeking.

Uncle Sam Doing Big Things in Radio



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

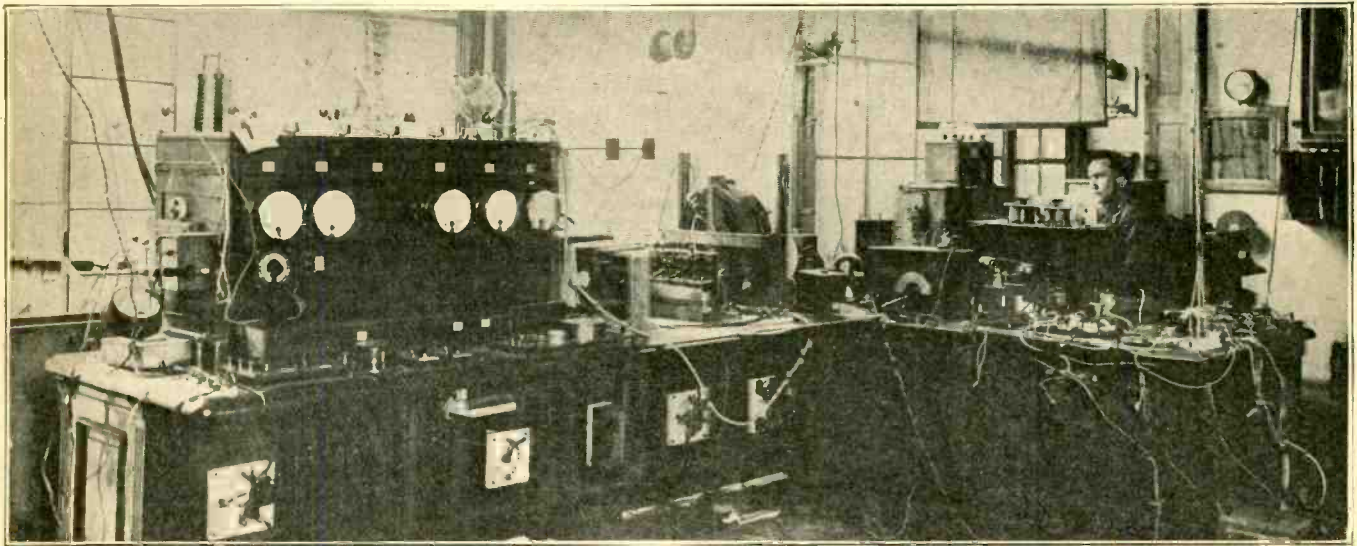


The United States Bureau of Standards, Washington, D. C., is undoubtedly the clearing house for radio in the United States. Its chief is Dr. W. S. Stratton. And he is the busiest chief this busy bureau ever had because radio is gaining in popularity at such a rapid rate. So far as radio is concerned, the Bureau of Standards is the connecting link between the American people and their government. Besides dealing in matters of an economic nature, the bureau is busy constantly with new apparatus. In the upper photograph, Dr. Stratton is shown receiving messages on a 9-inch coil-antenna and reading its position on the graduated scale. This apparatus may be used as a direction finder to determine the position of a transmitting station. The amplifier shown employs six tubes, so that stations several hundred miles distant may be received.

The photograph at the lower left-hand corner is that of a giant direction finder which, it may be said, turns eyes into ears. F. H. Engel, of the bureau, has been active in the development of the big 5-foot coil-antenna and direction finder, before which he is standing. This type of antenna eliminates from radio the necessity of an elevated antenna outdoors. By rotating the coil, positions may be determined with a high degree of accuracy. Such a device enables a ship to safely enter a harbor in the densest fog—the pilot steering by sound.

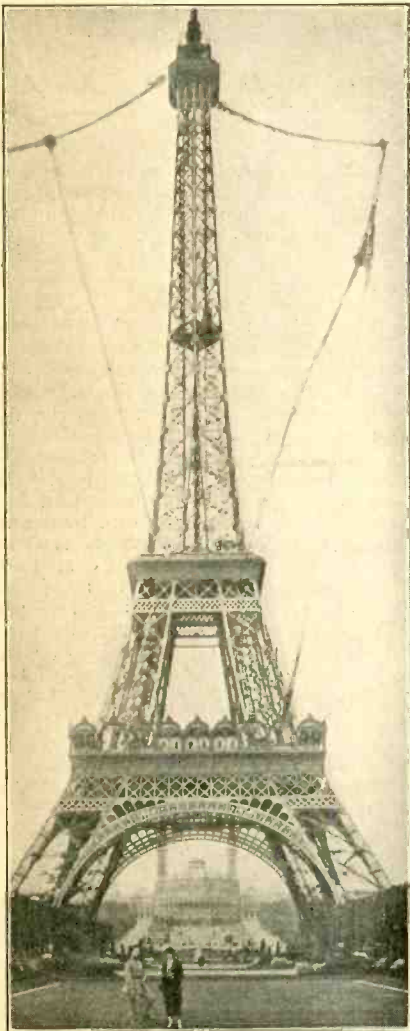
These loop aeriels are used exclusively in all radio-compass stations of the United States Navy. Compass bearings are furnished to prove the exact position of vessel at the time the vessel's bearings were taken. This can be accomplished by the aid of the loop aerial. The marked advantage of the loop aerial is the eliminating of a large percentage of undesired traffic and the lessening of static to a certain degree. Some very good work has been done by compass stations situated at the entrance of New York Harbor.

Eiffel Tower's High-Power Station—FL



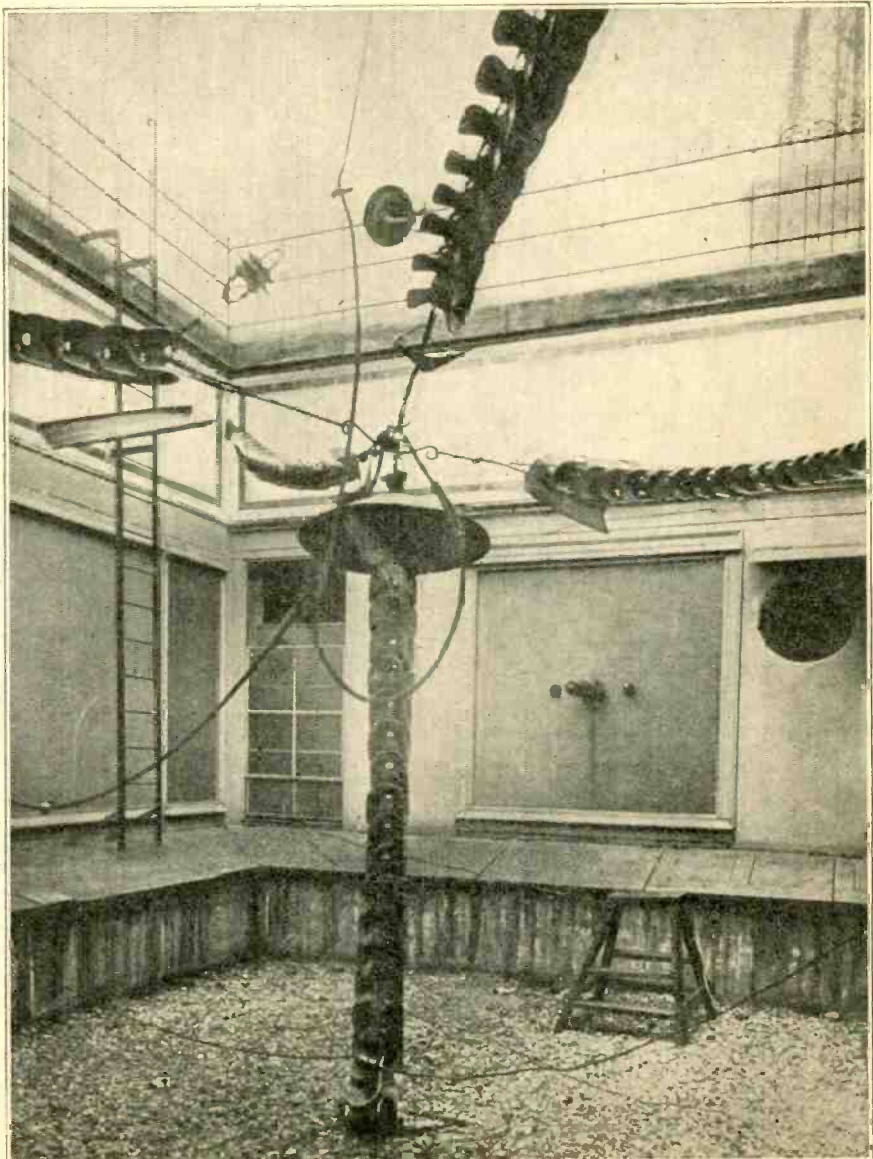
(C. Central News Photo Service)

Interior view of an important section of the great radio station installed on top of the world's highest structure, the Eiffel Tower, Paris. This station is under direct control of the French government. It played an important part during the World War. This photograph is the first taken since 1914. To the left is the tube-transmitting set. At the right is the powerful receiving-equipment. Time signals and news are broadcast daily. All vessels equipped with radio are familiar with its call letters—FL. It is the only high-power station in the world with a two-letter call.



(C. Kadel & Herbert News Service)

The Eiffel Tower and its famous station—FL. At the top of this great tower are the aerials which enable the radio operators to keep in constant communication with vessels at sea. Its time signals have been copied over a thousand miles away.



(C. Central News Photo Service)

Massive insulators used in connection with the lead-in wires. These need not be very large for receiving purposes, but should be to preserve the transmitter.

Radio Patents

Roy Weagant Invents Important Device for Reducing Static Interference

No. 1,425,154. Patented August 8, 1922.
 Patentee: Roy Alexander Weagant, New York City.

MR. WEAGANT'S present invention is based on observations made by him and described at length in his patent No. 157,594, wherein he states that the so-called static disturbances act as if caused by electromagnetic waves, or impulses, propagated perpendicularly to the surface of the earth, and almost without horizontal components.

"Whether or not this is a correct statement of the facts," says Mr. Weagant, "I find that by proceeding on this assumption and by screening an aerial collector by placing such collector beneath a metallic, or other conducting screen, I am able to very largely

grounded. Experience shows, also, that grounding the screen does not decrease the effect of the signal waves on the receiving apparatus. This is in accordance with my observations to the effect that commercial signal waves extend a material distance beneath the surface of the ground with small diminution in strength."

Mr. Weagant claims that his latest device may be used with any form of antenna. "Moreover," he states, "I do not find it necessary to arrange the loop antenna in a vertical plane when such is used, although the vertical arrangement is preferable."

* * *

Three-Electrode Tubes as Amplifiers

No. 1,422,013. Patented July 4, 1922
 Patentee: Laurence Beddome Turner, Cambridge, England.

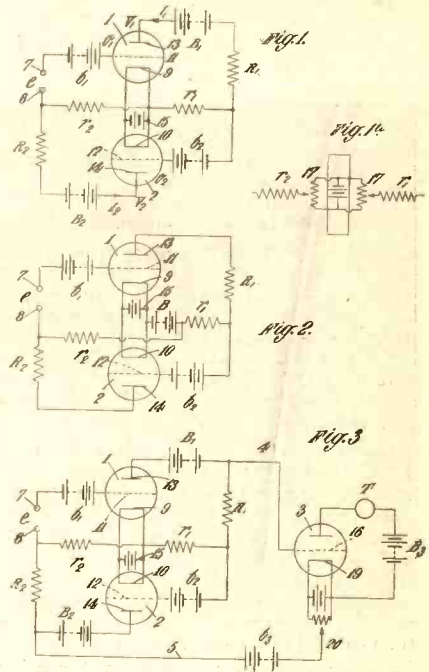
MR. TURNER is the inventor of improvements in thermionic apparatus applicable for wireless telegraphy and other purposes.

His invention relates to methods of using three-electrode ionic tubes as amplifiers or relays, and as rectifiers and generators of alternating currents. Such tubes contain a cathode, or electrode, otherwise made to emit a stream of corpuscles; a repeat-electrode or anode; and a control-electrode or grid; all contained in a vacuous or nearly vacuous envelope.

A simple method of obtaining amplification by such a tube consists in impressing the incoming signal on the grid circuit, an amplified signal being thereby set up in the anode circuit. Unless there is retroaction between anode and grid circuits, the ratio between the repeat and control electromotive forces or currents is limited by the characteristics of the tube. When, however, the signal is of a periodic character and suitable retroaction is provided between the anode and grid circuits in the well known manner, the amplification may be increased indefinitely.

One way of regarding the action of such a retroactive amplifier is to conceive that negative resistances are introduced, so that the net resistance of a circuit is the algebraic sum of the inherent (positive) resistance and the added (negative) resistance due to retroaction. Under suitable conditions the net resistance is thus reducible toward zero by any desired amount. In the well known circuits for periodic currents which are used to a considerable extent in wireless telegraphy, where the retroaction is commonly by magnetic or electric induction, the resistance of a circuit is thus reducible at will for the particular frequency or frequencies to which the circuits are tuned.

Negative resistance may be introduced into a circuit by another ionic tube device, already known under the name of "dynatron," in which the result is effected, not by external retroaction between the control and repeat electrodes of the tube, but by the emission of secondary corpuscles from an electrode subjected to violent bombardment by primary corpuscles. The dynatron is applicable to periodic and to aperiodic circuits and



Three schematic diagrams of Mr. Turner's invention in which vacuum tubes are used as rectifiers and generators of alternating current for wireless telegraph signals.

may be used for amplifying electromotive force or current of any form.

The present invention consists of a combination of circuits including two ionic tubes in which secondary emission of corpuscles does not occur, or plays no important part, whereby the same result of negative resistance is obtained as is obtained in the dynatron by dependence or secondary emission. The resistance of a circuit may, by means of the present invention, be approximated as closely to zero as may be desired; and the circuits may be such that substantially the only impedances concerned in the retroaction are resistances, so that the impedance is reduced as far as desired for currents of any form, including steady currents.

The result is attained by resistance retroactions between the anode of a tube and the grid of a second tube, and between the anode of the second tube and the grid of the first tube. A rise of potential of the grid in the first tube produces a rise of current to anode of the said tube, which effects a fall of potential of the grid in the second tube and a fall of current to anode therein, with a consequent rise of potential of the grid in the first tube. Thus any change of potential of grid or anode may be made more or less to sustain itself.

* * *

Veterans' Bureau Training in Radio

ALREADY the Veterans' Bureau has rehabilitated a large number of veterans in radio. To date, 282 are in training. Some of these new operators have secured sea employment in the Shipping Board and on privately operated vessels, while others have entered various commercial companies through "Radio Want Ads" broadcast through NOF, Anacostia. The bureau now expects to furnish radio operators for land service from the surplus of radio men trained, which threatens to accumulate. One hundred men have been trained in radio at the Nola Radio School, New Orleans; forty at Loomis Radio School in Washington, and seventy at the Service Radio Institute also in Washington.

Fig. 1.

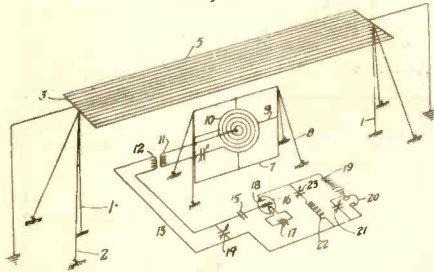
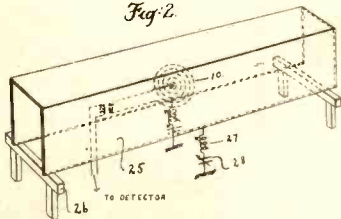


Fig. 2.



Schematic diagrams of Roy A. Weagant's invention for reducing static, for which he makes the following claims:

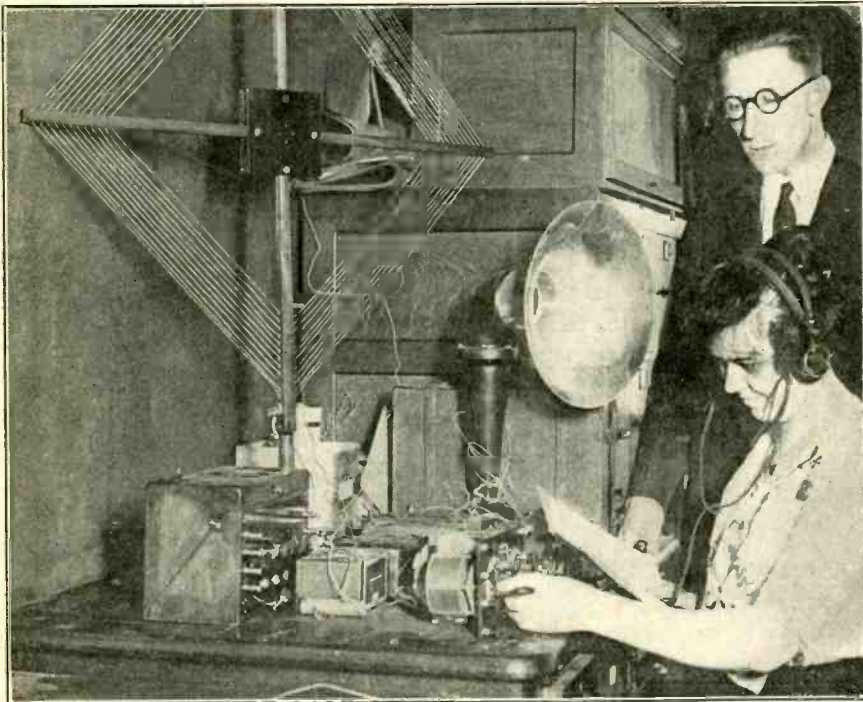
Figure 1—In a radio-signalling apparatus, the combination with an antenna of an open ended inverted trough-shaped screen for protecting the collector from electromagnetic waves moving vertically downward and along a given horizontal line in either direction.

Figure 2—In a radio-signalling apparatus, the combination with a collector of an open ended inverted trough-shaped screen covering said collector above and on two sides, and adjustable grounded circuits connected to the lower edges of said screen at the midpoints thereof.

overcome the interference with the reception of radio signals caused by the most objectionable forms of atmospheric disturbances, the static waves being absorbed by the screen and, consequently, the collector shielded therefrom.

"On the other hand, commercial radio-signal waves travel horizontally or have a large horizontal component of motion, so that by leaving the collector unscreened on the side from which the signal waves approach the receiving station there is practically no change in the effect of the signal waves on the receiving apparatus. I have found, moreover, in practicing this invention that the effectiveness of the screen in absorbing and preventing the passage of static waves is increased if the screen is

Not Necessary for this Sherlock Holmes of the Air to Wear Disguise



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

Edward A. Beane, formerly Federal radio inspector of the Second District of New York, has been appointed radio inspector of the Ninth District of Chicago, where he has every known mechanical device with which he can locate the radio operator who is either unlicensed, or who has "jumped" his wave length—which is somewhat similar to speeding in motoring. He is a Sherlock Holmes of the air. The Federal department is trying, also, to safeguard the public against the many fake wireless instruments being placed on the market. The photograph shows Inspector Beane in his office operating with a direction finder.

Million Marmots Will Whistle for Radio

THE next number on to-night's program will be a piccolo imitation entitled "The Whistling Chorus," by the Rocky Mountains Marmot Singing Society of one million voices."

Such may be the announcement to astonish the ears of any number of listening radio fans in the near future, says an Associated Press dispatch to "The Times," New York, if a proposal before the National Park Services of the Interior Department is carried through. It will be possibly the most novel treat that the numberless radio amateurs could ask, whose apparatus would tune in with a broadcasting station in Glacier National Park, in the heart of the Rockies, which would catch and transmit the shrill whistling of these small doglike animals.

Within fifty miles of the park, in the northern part of Montana, near the Canadian border, resides the largest colony of the animals on the North American continent. It is estimated there are close to a million of them, living in dense population. On still nights the wonderful shrilling chorus of the piccolo-like voices is carried miles on the rare mountain air, and tourists in the camps enjoy the evening programs immensely.

It has been proposed that a receiving set and broadcasting station of 200-watt capacity, sending at a 360-metre wave length, be installed close enough to catch the voices clearly. Such power would be capable of sending throughout a radius of 1,500 miles and could be picked up almost from coast to coast.

The perfection of the radio now suggests the idea of broadcasting this volume of weird, whistling music, which has a tone all its own, to radio receivers as far as the waves will carry.

When the full chorus is on it sounds as if a whole city of people were playing piccolos in concert. The radio fan who is lucky enough to listen in will not have a bit of trouble in recognizing the marmot voices, even though no preliminary announcement is made from the broadcasting station.

Choice of Two Broadcasting Stations

A CHOICE of "listening in" to either of two of the big broadcasting stations will be a feature of a radio system to be installed in a seventy-two-family apartment-house in Newark, New Jersey. Two complete receiving sets will be installed, each with a large loop or directional antenna, so that each may be pointed to a particular broadcasting station and receive the programs without interference.

Each of the two aerials will be connected directly to a G-E receiving set, equipped with detector tube and two steps of audio and two steps of radio frequency. These sets will be located in a special radio room in charge of a licensed operator. From this room will emanate two complete circuits to each of the seventy-two apartments so that the tenant may plug in his receiving set to whichever of two programs he prefers. The apartment operator will tune in each evening to the two stations that offer the best programs.

MAGNAVOX Radio

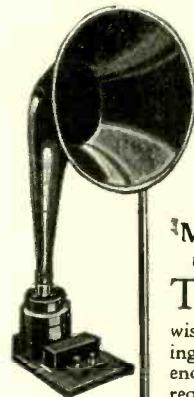
The Reproducer
Supreme

An essential
part of every
receiving set

BEFORE you pack up your receiving set for that vacation in the woods or on the water, be sure to equip it with a Magnavox Radio, the reproducer supreme.

R-3
Magnavox Radio
with 14-inch horn

SAME in principle and construction throughout as Type R-2, and is ideal for use in homes, offices, amateur stations, etc.
Price: \$45.00



R-2
Magnavox Radio
with 18-inch horn

THIS instrument is intended for those who wish the utmost in amplifying power; for large audiences, dance halls, &c., but requires only .6 of an ampere for the field.
Price \$85.00



Magnavox
Power Amplifier
Model C

INSURES getting the largest possible power input for the Magnavox Radio. Can be used with any "B" battery voltage which the power tube may require for best amplification.

AC-2-C, 2 Stage \$80.00
AC-3-C, 3 Stage 110.00

Any radio dealer will demonstrate for you, or write to us for descriptive booklet and name of nearest dealer.

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Oakland, California
N.Y. Office: 370 Seventh Ave.
Penn. Terminal Bldg.

Radio brings it
MAGNAVOX
tells it



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

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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. We are doing this for the benefit of the radio trade in general.

Goodman Three Coil and Mounting

(L. W. Goodman, 10 Forrest Ave., Drexel Hill, Pennsylvania)

THE Goodman 3-coil inductance unit with mounting was tested out in various circuits. The coils are neatly made, having a bakelite frame upon which is wound enameled copper-wire. Due to its peculiar winding, its effective distributed capacity loss, which, in turn, makes the coils and mount, is so arranged that contact is permanent, with the market advantage of shifting coils in a moment's notice. All parts are nicely nicked and of neat appearance and well constructed. In the circuit the coils functioned best. Better results were obtained than with a set employing variometers. Due to the close proximity of high-powered stations, the coils averaged, approximately, from 150 to 580 meters, while the 600-meter stations could be heard, as if working with an expensive receiver. With the proper condensers, they make up a nifty short-wave regenerative receiver.

Allied Radio Panel-Board

(Allied Radio Corporation, 444 Seventh Ave., New York City, N. Y.)

A PIECE of Allied radio-panel was tested and found to stand up under a strain of 75,000 ohms resistance. It is manufactured

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 DAY," Pittsburgh, Westview Park, August 24. Under auspices of Radio Engineering Society. C. E. Urban, 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.

from a composition of hard rubber, with highly polished surfaces. Drilling becomes an easy task, avoiding all burrs, and comes ready to be cut for panel-board use. Comes in three sizes: 7x10x3/16 inches, 7x18x3/16 inches, and 12x14x3/16 inches.

Galena Stands Test

(Charles L. Cassidy, Marion, Kentucky)

TWO pieces of Galena (crystal) were tested in various circuits. The crystal was found to be uniform over the entire surface, with extra sensitivity. Signals were loud, clear, and distinct. The material was good.

* * *

Variometer Stands Test

Star Radio Mfg. Co., 122 Fifth Ave., New York City, N. Y.

A VARIOMETER of neat construction. Tested in two circuits. When placed in the aerial circuit of an oscillating receiver, it was found to respond to a wave-length range of approximately from 150 to 500 meters. When connected into the plate circuit of a regenerative receiver, it oscillated over the entire scale of wave lengths: 150 to 450 meters. The rotor is mounted carefully on a 1/4-inch brass rod, between springs which keep it in proper position. Fahnestock clips are used for the connections. Construction and appearance are very neat. These variometers are ready for panel mounting.

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.

World Trade-News to Be Sent by Radio

SINCE the recent decision of the Department of Commerce to have foreign commercial data broadcast from radio stations in the neighborhood of its thirty four district offices, schemes for the improvement of this service, particularly in the saving of time, have been received from several sources. One of the recent suggestions is that radio receiving-sets be installed in all the branch offices of the department so that commercial data broadcast from Government stations in Washington and other important centers may be received without delay and rebroadcast locally. The plan is now being considered by the Bureau of Foreign and Domestic

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.)

Cleartone Radio Co., Cincinnati, O.
Radio Parlor, 2671 Broadway, New York, N. Y.

Comal Radio Laboratory, 702 San Antonio St., New Braunfels, Texas.
North American Radio Corporation, 2333 Sherbrook St., Pittsburgh, Pa.

United Radio Co., Columbus, O.
Holland Briggs and Maurice Purdy. Radio supplies, Howell, Michigan.

The Globe Radio Company. K. V. Tadlock, Phoenix, Arizona.

Midwest Radio Central, Inc., 59 East Van Buren St., Chicago, Ill.
East Radio Company, Belfast, Maine.

Phoenix Radio & Parts Co., 119 West 4th St., Cincinnati, O.
The Hub City Cycle Co., Centralia, Wash., has added a line of radio supplies to its sporting goods business.

Charles Freshman Company, Inc., 290 Hudson St., New York City. Manufacturers of Micron Fixed Condensers and Antenna.

Perfection Radio Corporation of America, Manhattan, \$20,000; A. G. Solomon, B. Graubard, M. Blauck. (Attorney, L. H. Solomon, 200 Fifth Av., N. Y.)

Eastern Radio Corporation, Manhattan, \$75,000; S. M. Knapp, I. Demaree, J. J. Stankiewicz. (Attorneys, Reit & Kaminsky, 35 Broadway, N. Y.)

Radio-Tone Commercial Company, Manhattan, \$100,000; E. G. Coudjjeris, B. G. Mangunaris, E. G. Manias. (Attorney, L. Blecker, 249 West 34th St., N. Y.)

Vulcan Radio & Electric Corporation, Manhattan, \$100,000; P. R. Basset, C. S. Ashley, T. O. Hall. (Attorneys, Ashley & Foulds, 156 Broadway, N. Y.)

Autler Electric Co., Manhattan, sell current and appliances, \$30,000; L. and A. and B. Autler. (Attorney, B. B. Greiler, 299 Broadway, N. Y.)

Radio Chain Stores Co., Trenton, supplies, \$125,000; Leon Abrams; Abraham Young, New York; Maurice Abrams, Newark, N. J.

National Radio Products Co., New York. Radio apparatus, \$100,000. (N. S. Corp. Co.)

Continental Electric Co., Newark, manufacture machinery, \$100,000; Mauritz Larsen, North Arlington; Eric H. Anderson, Wallford A. Peterson, Belleville; John Aanensen, Arlington, N. J.

Radio Static Tube Mfg. Co., Rochester, N. Y., has increased its capital from \$10,000 to \$100,000.

Commerce, and if a favorable report is made, the department may be in the market for thirty-four A-L receiving sets. It is readily admitted by officials that much time would be saved in relaying the information from the Washington headquarters and getting a wide broadcast for the whole country, but fears are entertained that an appropriation for purchasing the receiving sets might not meet with the approval of an economically inclined Congress.

A great mass of foreign trade-information is received by the department daily.

Fraudulent Radio Stock-Jobbing Attacked

Better Business Bureau Issues Warning to Public and Manufacturers, After Invest- igation Following Many Complaints

Radio Development in Strong Hands

THE prediction made recently in the press that the radio industry would soon attract flocks of fake promoters and financial parasites has come true, according to the findings of the Better Business Bureau of New York City. This organization had been in operation for only a few days when it began to receive complaints against alleged wild-cat radio companies that were hawking their securities throughout the city, fleecing small investors out of their savings by high-pressure stock-selling methods, utterly false representations and ridiculous promises of fabulous future earnings.

The bureau has just made public a report of the investigation of what it terms one of the most reprehensible of these blue-sky, mushroom companies, organized a few months ago with an authorized capital of \$4,000,000, the par value of the stock being \$1. The sales organization of the company has been active in hawking stock and has already taken in many thousands of dollars from small investors, so the bureau reports.

According to H. J. Kenner, manager of the Better Business Bureau, radio get-rich-quick schemers are running true to form. They organize their corporations on a shoe-string and induce the public to finance their ventures and pay for manufacturing or distributing experiments. Having launched their stock-sales campaigns, the wild-cats take care of themselves first, by fat salaries for services, which consist principally in selling to the public more stock through wild promises followed by little or no performance. The cost of promotion is prohibitive, forty to ninety per cent of the money paid for stock going to the sales organization.

"Their cupidity stirred by the popularity of radio, professional promoters—and others—are attempting to broadcast among wage earners and other uninformed investors millions of shares of stock in enterprises alleged to be formed for the purpose of manufacturing and distributing radio apparatus for amateur uses," says the special report of the Better Business Bureau, in discussing the first get-rich-quick radio scheme it has investigated. Right at the beginning of its investigation the bureau recognized, in the leading spirit of this particular outfit, a professional promoter whose methods in promoting a motor-stock last year called for action by the National Vigilance Committee of the Associated Advertising Clubs of the World.

"In line with the usual practice of vendors of blue-sky securities, this radio stock was recently advanced in price from \$1 (par value) to \$1.50," says the bulletin, which quotes an official of the company as saying that this boost was justified as the company had been making big profits all the time, 300 per cent being the average made on most of the products turned out.

But the trouble with the 300 per cent profit, the bureau found, was that it existed mostly on paper. The company was producing so little that its profits from merchandise sales were almost negligible. Nevertheless, an executive of the company stated

that because of enormous profits, shares would be selling for \$4 each, before the snow flies.

But, according to the Better Business Bureau Bulletin, the leading promoter of the company admitted, under cross-examination, that his concern would be insolvent if he did not feed it money constantly from stock sales. Another official of the company admitted early this month that his company was insolvent; that it had not operated at a profit and that the unfilled orders, which stock salesmen said were piled up in the offices of the company, amounted to only a few thousand dollars.

During the past few months, the bulletin states, the radio company in question has been flooding the United States mails with stock-selling literature of the wild-cat variety. Thus, the officers, members of the board of directors and others connected with the company were described in glowing terms as world leaders in their line who had forged their way to the top in this new industry.

One of the directors is described as the former financial advisor of one of the most famous banking houses of the world, who had been the associate of J. P. Morgan, Cornelius M. Bliss, Jr., Governor Benjamin Strong, Jr., J. D. Rockefeller, Jr., the late Henry P. Davison, Herbert Hoover, and others.

The bulletin states that the director in question promptly denied that he had ever achieved these financial honors and then severed his connection with the radio company. It states also that the promoters claimed a vice-president of one of the best known and most reliable banking houses of New York City had joined their Board of Directors, but that this also proved false.

"In order to impress prospective stockholders with the flourishing condition of the corporation," the bulletin continues, "Salesmen said that enormous profits were being made, that forty to fifty men were at work in the factory leased by the company in New Jersey, and that its products had been bought by the De Forest Company and by Butler Brothers' mail-order house.

"Investigation showed these statements to be false. According to an official of the

company, not more than twelve people, mechanical and clerical, were employed in the company's so-called plant at Newark, at the time these statements were being made to credulous prospects. Officers of the prominent companies named as customers deny that they have purchased goods of this radio products company."

Another advertising claim stated that the output of four factories had been taken over by this flourishing radio concern, but according to the Better Business Bureau bulletin, "This representation narrows down to the fact that contracts have been made with two small factories to take their products at prices which a consulting engineer of the company has admitted to be "high."

The Better Business Bureau found further that an invention exploited eloquently by the radio company as one that would revolutionize the industry had not been patented, so claimed by the company, but that applications for patents were merely pending, and that the control of the patent was the subject of a court dispute between the radio company and the inventor.

The Better Business Bureau is not a profit-making organization. It is a membership association which will be supported by representative firms in this business community. It will have no clients except the public and legitimate business at large. Its aims are constructive and its efforts will be dedicated to service to the public. It will seek to increase public confidence in business while fighting fraud in financial and merchandise advertising and selling practice. It will not attempt to advise investors. By handling specific cases involving the selling of questionable securities, it will give definite help to the 'Before you Invest, Investigate' campaign in which legitimate business is participating throughout the country. Its activity will be continuous, not sporadic.

The board of directors of the bureau are: D. F. Houston, president, Bell Telephone Securities Company, Inc. president; R. T. Halsey, Tefft, Halsey & Company; Lewis E. Pierson, chairman of the board, Irving National Bank; John J. Pulleyn, president, Emigrant Industrial Savings Bank; Gates W. McGarrah, chairman of the board, Mechanics and Metals National Bank; George W. Hodges, Remick, Hodges & Company; H. S. Houston, chairman, Board of Vigilance Trustees, Associated Advertising Clubs; J. G. White, president, J. G. White & Company; William H. Barr, president, National Founders' Association; H. D. Robbins, chairman National Vigilance Committee, Associated Advertising Clubs; Russell R. Whitman, publisher, "New York Commercial."

The Armstrong Super-Regenerative Circuit

The Only Authentic Book Published.
At your dealers, or direct if he cannot supply you. Mailed on receipt of one dollar.
KING RADIO CORPORATION, Dept. F.
122 Fifth Avenue New York City



Hard Rubber Composition PANELS

Conform to Navy Specifications

A High Resistance Panel, Guaranteed Not to Warp, and Drilled Cleanly Without a Burr. Highly Polished—Edges Ground to Size.

Standard sizes, 7x10x3/16, 7x18x3/16, 7x24x3/16, 10x12x3/16, and 12x14x3/16, in stock for immediate delivery. Orders for special sizes received in the morning, shipped the afternoon of the same day. Binding posts, dials, and knobs to match. We have a complete line of Coils, Variometers, Variocouplers, Sockets and Rheostats.

Largest Discounts.

Jobbers and Dealers! Write for proposition and Free Sample!

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TO ALL RADIO ENTHUSIASTS

ALLIED RADIO COMPANY, INC.

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WANTED—A Reliable New England Representative.

PATENT
Your Radio Ideas.
Call or Write
FREE ADVICE

ASK MANUFACTURERS
PATENT CO.
FOR
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AGENTS

Wanted in every city and town to sell radio apparatus. Good commissions. A few stocking agencies open to reliable parties.

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Learn to Receive Code Messages
Standard Regulation U. S. Army
Field Message Book

Purchased from Signal Corps, U. S. A.
Pocket Size: 4 1/2 x 6 3/4, Cloth Bound, Hard Board Cover, 104 Pages.

CONTAINING:
MORSE CODE SEMAPHORE CODE
INTERNATIONAL CODE
Carbons and Blanks for receiving, etc.
MAILED POSTPAID **20c.**
ACORN TRADING CO., Inc.
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No Aerial No Loop
No Lamp Socket Attachment

ONLY—

RADIO-DUCT

—AND A GROUND CONNECTION

Sold in 10-Foot Rolls
At \$1.00 per Roll

IF YOUR DEALER HAS NOT
GOT IT WE WILL SHIP
DIRECT UPON RECEIPT OF
YOUR REMITTANCE.

Columbia Electric Motor Co.

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Telephone: 3731 Hoboken

**KEYSTONE
FILAMENT RHEOSTAT**



RESISTANCE 6 OHMS.
CARRYING CAP., 1 1/2 AMPS.
LIST PRICE, \$1.00

DEALERS AND JOBBERS
Wire or Write for Discounts.
Immediate Delivery
Manufactured by

Keystone Radio Company
Dept. W. GREENVILLE, PENN.

The Radio "Colyum"

FRENCH scientist claims to have invented a device which will send perfume by radio. Fellow in New York can buy nickel's worth of sniff water at five-and-ten-cent counter and spray his best girl out in Chicago.

"Since Mame and that beau o' hers get chewin' the rag on a long wave, every night, there's no gettin' the dishes done," wailed Mrs. McGinnis to her neighbor.

Some of our New York telephone operators say they won't care if radio does supplant the telephone, because there can be no harm then listening in.

Conan Doyle's latest message from a departed spirit read: "It's so lonesome up here, I wish I had brought my radio set."

Radio is improving. The day will soon come when the wife who induces her husband to stay home and hear a fine concert won't have to explain why a market report tuned in instead.

*Carry me back to Old Virgin-gin-ginny;
back where the corn and the sweet
potatoes grow,
An' I'll be satisfied with my gin-gin-ginny,
as I sit all day by my rad-i-o-o-o-oh!
Latest Barbershop Harmony.*

TO ANXIOUS READER: If there are no bedsprings in your apartment, use the fire escape for an aerial.

Margie—And he had radio eyes!
Sue—What do you mean, radio eyes?
Margie—Oh, just eyes with a broad cast!—C. H. Dillinger, in "Radio Journal."

No, Rollo, the author of "What Are the Wild Waves Saying?" was not the first radio bug.

It is said that "B. y. o. h." soon will take the place of "R. s. v. p. on soiree invitations. It means "Bring your own headpiece."

Have you heard the latest radio ballad: "Home Is Where the Hook-up Is?" And he wondered why "The Blue Danube Waltz" didn't sound just right. He was using a two-step amplifier.

Our Own Broadcasting Station

OUCH for week beginning August 28, 1922
7:00—Dumbwaiter Tales or Listening In While the Ice Man Makes His Morning Rounds.

7:23—Didymous debate: "Why Do Twins Dress Alike?"

7:42—Arithmetic Lesson for Restaurant check adders.

8:01—Foolish question No. 822,743: "Why did one hundred American passengers on a British liner drink \$10,000 worth of champagne while crossing the Atlantic?" Answer will be furnished by the Anti-Saloon League.

8:17—Study in Futuristic Art: "Man Trying to Send Alimony by Radio."

8:46—That Subway Lullaby:
"Never invite me to dinner if you're going to serve sardines; I pity them poor little fishes; I would rather have water and beans."

9:00—"Bathing Suits I haven't Been Able to See This Season," by a One-Eyed Censor.

9:30—First sad thought of winter: "How Can I Separate Last Year's Overcoat From It's Moth Ball."

10:00—Correct time from the Three-Mile Limit.

ROBERT MACKAY.

The Nelson Radio Parts Co.

Manufacturers and Distributors of

RADIO APPARATUS

Write for Catalog.

89- ACADEMY STREET, NEWARK, N. J.
Tel. Market 4066

RADIO MAILING LISTS

6900 RETAIL RADIO DEALERS covering the United States, by states, price per thousand \$7.50
838 Radio Manufacturers, per list 10.00
1022 Radio Supply Jobbers, per list 10.00
260 Owners of Radio Stations, per list 4.00
14000 Radio Amateurs and Managers of Radio Stations, per M 7.50
These are neatly typewritten and ready to send on receipt of remittance covering the amount. Guaranteed 98% correct.
TRADE CIRCULAR ADDRESSING CO.
166 W. ADAMS STREET CHICAGO, ILL.

READ RADIO BOOKS

By JAMES R. CAMERON

HOW TO BUILD YOUR OWN RADIO SET \$ 2.25
RADIO DIRECTORY 50
RADIO FOR BEGINNERS 1.00
Buy them to-day from your dealer or direct from
TECHNICAL BOOK COMPANY
130 WEST 42nd STREET NEW YORK

Our Free Catalogue

Is Yours For the Asking—It Tells All About Our Wonder Sets, Vacuum Tube and Loose Coupler, also

Little Wonder Crystal Set

A Practical Receiving Set Within Reach of Everybody's Purse.

\$2.50 Unmounted Mounted, \$4.00

Radi-O-Plate Panels to Order.
All sizes cut as specified.

Holloway Electric Supply Co.
238 THIRD AVE. NEW YORK
Phone Gramercy 5628

The
GOODMAN

Is the Niftiest Short Wave
Tuner on the Market

Only \$6.00 & PP on 1 lb.

Send for pamphlet.

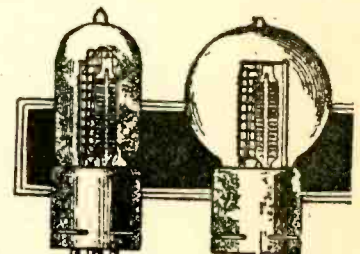
Order through your dealer.

L. W. GOODMAN

Manufacturer

DREXEL HILL, PA.

Dr. Miller, of Chicago, writes: "My perfectly good variometers and vario-coupler now go into the discard."



V-T 1 at \$7.54
V-T 2 at \$8.45

These are the Tubes for which so many are inquiring and that are still difficult to find anywhere. There being very few of these tubes on the market, and after present supply is exhausted, mere will not be available at any price, as they are to be made exclusively for the U. S. government, sure long life.

FULL LINE OF SUPPLIES. LOWEST PRICES ON STANDARD MERCHANDISE. GET OUR PRICES BEFORE PLACING YOUR ORDERS.

Amalgamated Radio Supply Co.
EXPORT AND IMPORT
193-A William Street New York City

GOING—and Going Fast

We have only a few left and they are going fast, but while they last we will continue to sell them at the reduced price.

- VT 1 Detector and Amplifier.....\$7.50
- VT 2 Detector and Amplifier.....\$8.00

The above tubes are the genuine army J's and E's, respectively.

"RADIO BUILDER" PLANS FREE!
By Mail, 5c.

LIBERTY RADIO CO.

106 Liberty Street New York City

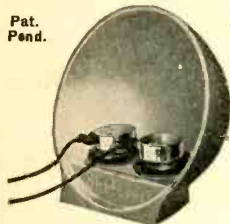
BUY "RITE"

\$5.00 Variometer	\$3.20
\$5.00 Variocoupler	3.20
Firth S. C. Jack55
Rite Rheostat75
Klosner Rheostat	1.00
Rite Detector Units	5.50
Rite Amplifier Units	11.95
1250 Honeycomb Coil	3.30
1500 Honeycomb Coil	3.80
CRYSTAL RECEIVER complete—Aerial, Lightning Arrester—Phones, ready to op- erate	20.00

Dealers write for Catalogue

"RITE" RADIO SHOP

4th Ave. and Pacific St., Brooklyn, N. Y.
Sterling 8513



DIFFERENT

and better than others. No tubing or horn to distort delicate notes. Swells every sound into full richness!

Low in Price!
High in Quality!

\$5.00 AT ALL GOOD DEALERS
OR DIRECT BY MAIL

WITHOUT RECEIVERS

**SHELTONE
LOUD SPEAKER**

THE SHELTONE COMPANY
20 Clinton Street Newark, N. J.

Latest Foreign Radio News

THE British annual Colonial report for Gambia mentions the completion of wireless telegraph and telephone stations in that colony at Bathurst and at McCarthy Island, 176 miles distant. These stations are intended for internal communication, as the colony has no organized telegraphic wire system.

Work is in progress on the first large radio-station for international traffic in Belgium. Up to the present time, the Belgian wireless service has been limited to reception from the high-power stations of other countries and distribution to points in Europe via land wire. The fact that the circuit was available only to traffic in one direction has prevented the development of the service. The completion of this new station at Bruges will make it possible to handle a considerable volume of the foreign communications of Belgium by radio.

The Eiffel Tower radio station, Paris, is preparing to send out telegraphic weather reports and forecasts three times daily. A suggestion has been made that radio receiving sets be installed at central points in the various country communes and that the information thus received be signaled to the farmers by a code of sound signals from the church bells. For example, no signal if no change in the weather is forecast; three strokes of the bell if rain is expected; six strokes for frost, and ten strokes for wind or hail storms.

Consul Wesley Frost, Marseilles, states that owing to governmental restrictions, the development of radio amateur clubs in France has been so retarded that few are in existence outside of Paris. The Radio Club of France has recently established its first branch office at Marseilles, and its local representative has opened offices at 44 Rue des Abeiles and in the grounds of the French National Colonial Exposition. The program of the club provides for lectures, exhibitions, and advice to amateur radio operators and to commercial operators as well, the idea being to foster the development of the radio art.



Dealers All Over the Country
Handle Our Standard Radio Goods.

**OUR TRADE PRICES
AFFORD GOOD MARGIN.**

Write for catalogue and price list.

**WIENER WIRELESS
SPECIALTY COMPANY**

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NEWARK NEW JERSEY

**GITHENS TRUTONE RADIO
HORN—LOUD SPEAKER**

First one to sell
on ten day trial
Money back
Guarantee



Retail Price
\$21.00
Includes
Loud Speaker

Trutone has been pronounced the best on the market by experts. It has a clear true tone. Every radio fan should try Trutone and compare it with others.

If YOU don't find Trutone the best, your money will be refunded. It is sold on a ten-day trial money-back guarantee. If not carried by your dealer write us.

Distributors and Dealers, write!

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1815 Trombly Ave., Detroit, Mich.

CASTINGS

BRASS, BRONZE, ALUMINUM

**Our Motto
"SERVICE"**

THE ANCHOR BRASS & ALUMINUM CO.

Ninth and Freeman Sts.

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

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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.

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.

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

PATENTS—Electrical cases a specialty. Pre-war 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.

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

THE AUTOVOIX LOUD SPEAKER

The clearest and best loud speaker on the market for the money. As good as the higher priced instruments. Price, \$22.50 delivered. Thousands now in use. Send money order, cash or check to PAUL ENGSTRUM, 630 Southern Building, Washington, D. C.

ACMEPHONE RECEIVER Detector, two-stage, three bulbs and B Batteries. Loud speaker. Price, \$80.00—express paid. John Exton, Adamsburg, Pa.

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., 310-18 Victor Building, Washington, D. C. (Successors to business established 1891 by A. M. Wilson.)

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

RADIO DRILL SET—Ten sizes especially adapted for hooking up instrument boards, making various sizes wire holes, etc. \$1.00 postpaid. BOX 326, Baltimore, Md.

MOUNTED CRYSTALS

Fifty cents in coin or stamps will bring you three selected crystals by return mail. Sensitiveness guaranteed or money refunded. Special prices in larger quantities. Thousands in use permit this unusual offer. Lynch & Co., 333 Warren St., Harrison, N. J.

YOUNG MAN, age 19, Graduate Electrician, and Radio "Bug," desires position with high-grade Radio Manufacturer or Distributor. Will accept anything at any wage to start, except commission selling. Write Route 2, Box 133, Portland, Tenn.

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 Hipodrome Bldg., Cleveland, Ohio.

STORAGE BATTERY BUILDING FOR AMATEURS, by R. H. McConnell and P. G. Sullivan. It tells you how to build that storage battery you have been wanting. Price 75c. postpaid. H. H. McConnell, Ravenna, Neb.

RADIO SUPPLIES—Murdoch 56, 3000 ohm Receiver, \$5.25; Radiotron Amplifier UV201 tubes, \$5.50. Send for list of supplies, sets, etc., at reduced prices. All sent prepaid. Wesley Robinson, Jr., St. Marys, Ga.

TEN non-regenerative guaranteed receivers on formica panel, \$10.00 each. A. Piepkorn, 5610 Washington Blvd., Milwaukee, Wis.

For Sale—Complete two-inch spark set. Mesco Coil, condenser, pancake helix, gap, key. \$10.00. F. W. Frost, Prospect Ave., Princeton, N. J.

QST de 3AEO—Equip your sets with YRLS loading coils and get what you're missing. For crystal or tube sets. Range to 3000 meters. Price, \$4.00. The Yardley Radio Laboratory, Yardley, Pa.

"ARCO" MAGNET WIRES bring 'em in loud. Low prices. (See August Radio News). Quick deliveries. Free 10 per cent. premium coupon with orders over \$1.00. Send now 8c for complete bulletin, listing hundreds of parts and sets. AMERICAN RADIO CO., Box 133, Baltimore, Md.

FOR SALE—New and used tubes, and accessories of all kinds. Write for prices to W. C. HAIGH, 58 Newfield Street, East Orange, N. J.

Model STEAM ENGINE, bore 1 1/4", stroke 2 1/2"; price \$20.00. Never has been used. Express prepaid. John Exton, Adamsburg, Pa.

Radio May Yet Turn Wheels of Industry

(From an address by Dr. Charles P. Steinmetz, before the International Radio Congress, Chicago.)

THERE may be a time when power to turn the wheels of industry will be furnished by radio. In some respects radio power transmission exists today, for the message you receive by radio has been carried by the power of electromagnetic waves from the sending to the receiving station.

The problem of power transmission essentially differs from that of the transmission for communication in that in power transmission most, or at least a large part, of the power sent out by the generating station must arrive at the receiving station to make it economical to transmit the power.

Hence the problem of radio power transmission is that of directing the radio waves

so closely that a large part of their power remains together, so as to be picked up by the receiving station. Much successful work has been done in directing radio waves, and, for instance, our transatlantic stations send out most of their power eastward.

But still, even as directed, the power scatters over the coasts of Europe from Norway to Spain, so that it is impossible to pick up an appreciable part of it.

The second possibility of radio power transmission—at least theoretically—is by resonant vibration or standing waves.

A station tuned for the same wave length as the sending station would resonate with the standing electromagnetic wave issuing from the sending station, thereby stopping its passage by absorbing its energy. It would, as we may say, punch a hole in the standing wave sheet coming from the sending station. Power would then flow into this hole; the sending station would begin to send out additional power to maintain the wave.

Apparatus of the New Radio Plant at Sainte Assise, France

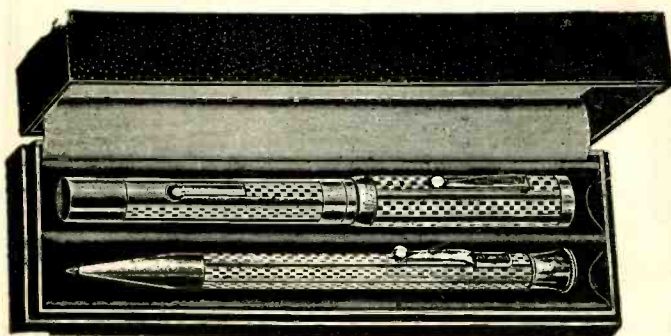
THE transmitting station of the new French radio plant of the Centre Radio-electrique de Paris is situated on the plains of Sainte Assise, forty kilometers southeast of the French metropolis. The apparatus consists of two high frequency alternators of 500 kilowatts in the antenna, each driven by two direct current motors of 450 kilowatts. These groups can function together or separately, either affecting a single transmission with a power varying from 250 to 1,000 kilowatts in the antenna or affecting two simultaneous transmissions with power permitting each between 250 and 500 kilowatts in the antenna.

The receiving station has been erected at Villacresnes, half way between Paris and Sainte Assise. It consists of six receiving units supplied with the most up-to-date apparatus. Normally the messages are received directly at the Central Bureau, Paris, by means of special high-speed machinery.

The Central Bureau, the hub of control and coordination of the network of this vast organization, is located at 79 Boulevard Haussmann, in the center of Paris. It is connected by direct wires with the general telegraphic administration of the Government and also with Sainte Assise and Villacresnes.

"And what did the poor little dog do when you brutal boys tied the can to his tail?"
"Oh, he just went broadcastin' down the road."—Philadelphia Retail Ledger.

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



Special Offer TO Radio World READERS

RUSH your name and address and we will tell you HOW you can get this handsome 14k. Gold Filled Fountain Pen and Pencil Set.

Absolutely Free

REMEMBER, with our plan it WON'T cost you a cent. The set comes to you in an elaborate plush box. Fill out the coupon herewith and mail at once for our FREE PLAN.

Publisher's Promotion Bureau, 120 Patchen Avenue, Brooklyn, N. Y.
Gentlemen: Without any obligation on my part, please send me particulars of the above offer.

Name
Street City

Stop, Look and Listen In!

Manufacturer, retiring from radio line, will dispose of stock of single, double and triple Sockets, Rheostats and Binding Posts, in either large or small lots, at a great sacrifice.

C. R. BAIRD COMPANY
243 East 151st Street, New York

FORMICA RADIO PANELS

3/16" thick, cut to size, per sq. in. \$0.02
VARIABLE CONDENSERS
 43 plate "Elite" condensers, Cap. .001 M. F. 4.00
VACUUM TUBES
 U. V. 200 detector tubes..... 5.00
 U. V. 201 Amplifier tubes..... 6.50
 Brandes "Superior" phones, best by test..... 8.00
HUGHES ENGINEERING CO.
 P. O. Box 57 Terrace Park, Ohio

RADIO SUPPLIES

Complete Sets Made to Order.
 Only standard made goods carried in stock.
HENRY C. SCHENKER
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LOMBARDI

Vernier Variable Condensers
 Best on the Market. Fully Guaranteed.
 All Sizes. Dealers Write!
THE PLYMOUTH ELECTRIC CO.
 155 Court Street New Haven, Conn.

"If it's RADIO—We have it"

K. D. Vario-couplers.....\$1.00
 K. D. Variometers (with winding form)..... 1.75
 Pioneer Wonder Brand Head Phones (2200 Ohms)..... 4.50
 Condensers..... 1.50
PIONEER WIRELESS PRODUCTS CO.
 329 East 29th St. New York

A Wise Judge

A LEGAL decision in the matter of radio not being a nuisance was rendered by Chancellor J. E. Martineau of Pulaski Chancery Court, Arkansas, who had refused to restrain two radio enthusiasts, father and son, from operating their wireless outfit at Little Rock between 9 p. m. and 7 a. m. The restraining order was asked by several persons who complained of buzzing noises caused by the radio set interfering with their sleep. The chancery declared that the noise is one that persons must become accustomed to, just as they have become accustomed to noises of street cars, whistles, etc.

Why Forget Radio?

Legacies amounting to 5,000,000 francs were left to various French scientific organizations by the will of the late Prince Albert of Monaco. Among them were the following: A million francs each to the French Academy of Science, the Academy of Medicine, the Institute of Paleontology in Paris and the Oceanographical Institute. A million francs was also left to the Oceanographical Museum at Monaco.

SO MANY READERS ARE

disappointed in not receiving their copies of RADIO WORLD on the newsstands regularly, from week to week—due to early selling out by dealers—that we suggest that you place a standing order with your newsman. Ask him to save you a copy of every issue.

Even the Sigh of a Raccoon May Be Heard

THOSE who are leading blighted lives because they have never heard a marmot whistle to his mate will be cheered to learn that the Department of the Interior is considering a proposal for broadcasting the shrill evening chorus of thousands of the little fellows who are residents near Glacier National Park, says "The Tribune," New York.

Let us hope that the Department of the Interior will not fail to accept this proposal. It points the way to a broadening of the educational influence of the radio. If the wireless can diffuse the love plaint of the woodchuck, why cannot it also bring us the well chosen words of other animals? The radio program of the future may include the yap of the coyote, the chirr of the Kansas grasshoppers, the zing of the New Jersey mosquitoes, the singing of the Connecticut clams. Maybe—for the sake of our little ones, of course—Bossy will moo into the ether, Biddy cackle her paen of achievement and Rover bark his honest welcome in 360-meter wave lengths.

Nor must it be overlooked that there are other natural sounds of cultural influence. The roar of surf and waterfall and tornado, the crash of hailstones as large as eggs, the creak of our forefathers turning over in their graves—all these and more will no doubt be broadcast for our enlightenment some day. And then how gratifying it will be to the patient people of the East to hear the rumble of California's earthquakes and the steady pitter-patter of California's wet season rains!

Try This on Your Crystal Set

Sometimes it is very difficult to get a sensitive spot on your crystal. Try the following plan: Take a discarded crystal, and pulverize it, but not very finely. Put some of this inside a metal casing and screw it into the cup of your detector. You will be surprised to note how quickly you can locate a good spot.

Attention

Vacuum Tube Users

SAVE \$1.50 ON DETECTORS SAVE \$3 ON AMPLIFIERS

REPAIRING

Marconi, Moorhead, Electron Relay, A. P. Radiotron UV200—UV201
 Cunningham C-300—C-301
 Detectors for \$3.50 Amplifiers \$3.50

Prompt Deliveries, Satisfactory Results Reasonably Guaranteed

GEO. H. PORELL CO., INC.
 CUTTER SQUARE WEST SOMERVILLE, MASS.

Subscribe direct or through your news dealer. \$6.00 a year, \$3.00 six months, \$1.50 three months. Radio World, 1493 Broadway, N. Y. C.

RADIO SENSATION!

Invincible Radio Crystal { \$5.00
 Sliding Tuner Receiving Set }
 Invincible Head Phones (3200 Ohms)..... 6.00
 Ducon Plug 1.50
 Necessary aerial and ground wire, ground clamp25
 Wonderful Invincible Crystals, all sensitive, each30
 Invincible Pneumatic Head Phone Cushion, per pair 1.00

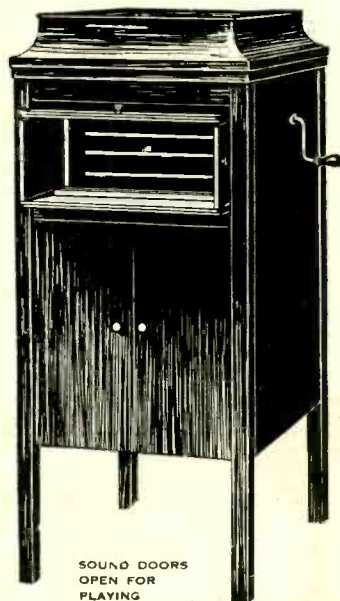
Regular Price \$13.75
 This set complete ready for instant use. No outside antenna—F.O.B. Chicago..... \$12.25

Guaranteed one year, also to receive as far as any crystal set.

Our new and original ear cushion gives solid comfort. No more irritation. No pressure, keeps in sound.

Keeps out noise. Avoid imitations. Agents and Dealers write for terms and territory.

Invincible Products Co., Inc.
 159 N. State Street
 Chicago, Ill.



SOUND DOORS OPEN FOR PLAYING

LUNDSTROM STANDARD CABINET FOR RADIO SETS

\$14.50

This Rock Bottom Price on Lundstrom Standard Cabinets in Oak or Mahogany, should attract every

RADIO DEALER

It is of proper size and construction and well adapted to receive a complete outfit, and radio fans can easily install their sets in them.

At this price it will be to your interest to order at once and be prepared for fall trade.

CURTIS N. ANDREWS

COURT AND PEARL STS.

BUFFALO, N. Y.

The Possibility of Combining Advertising with Broadcasting

RADIO is a medium by which millions of people can be reached. One of the problems in broadcasting is the station conducted solely for advertising purposes and which is operated with little regard for other stations or the public.

Many a concert or lecture has been spoiled by a station broadcasting advertising information such as the price of eggs or the bargains at some store, says "The Times," New York. The operator usually is compelled to alter tuning adjustments so as to pass over the advertising, and at the same time the concert is hushed.

It is hoped by many radio followers that a way will be found to associate advertising with radio in a manner which will not des-

stroy the enjoyment of listening in. When a family is gathered at home listening to a speaker or an orchestra and its pleasure is interrupted by the voice of a butcher announcing the prices to prevail in his shop on the following day, it is just as objectionable as if the butcher had entered the room himself and proclaimed his price.

Broadcasting at present is far from perfect, and the conflict of programs between stations is chiefly caused by the bid for popularity. There are approximately 400 licensed broadcasting stations in the country today and it has been said that a number of them are operated for advertising purposes. These stations frequently interfere with large broadcasting stations. Many of

the programs consist of phonograph music, in no way comparable to a well-balanced program rendered by artists of skill and reputation.

One well-equipped, standard broadcasting station to cover a radius of 100 miles would be sufficient to serve the public, according to some experts, with minimum interference, instead of five, ten, or fifteen stations all grouped within a few miles of each other, as in some cities at the present time. Observers believe that manufacturers would profit far more by cooperating to support one high-powered station in each district. If the present growth of low-powered radio broadcasting stations continues as rapidly as in the last few months, radio is threatened with a loss of popularity. If radio is to operate on a high standard, the "spark coils" of radio-telephone broadcasting must be limited and regulated, say the experts.

You Need All These!

Technical Articles Published in Radio World to Date

APRIL 1.

A 500-Mile Radiophone Employing a 5-Watt Tube, by Frank A. Hahnel.
"Tell Me, Please, How Will This Set Receive?" by E. L. Bragdon.
Short Cuts in Receiver-Circuit Design, by O. C. Roos.
Making a Short-Wave Regenerator, by Fred. Chas. Ehlert.

APRIL 8.

Do You Know Your Receiving Equipment, by James D. Gordon.
Why a Crystal Is Called a Rectifier, by Walter Emmett.
Is Radiotelephony Dependable? by O. C. Roos.
Mounting Crystals in Your Detector, by E. L. Bragdon.
Storage Batteries for Radio, by Fred. Chas. Ehlert.

APRIL 15.

First Principles of Electricity as Applied to Radio, by John P. Miles.
Your Storage Battery, by E. L. Bragdon.
What Makes Radio Possible, by Edward Linwood.
Ground Connection as Vital as Antenna, by Fred. Chas. Ehlert.

APRIL 22.

Solving the Puzzle of the Honeycomb, by Fred. Chas. Ehlert.
More About Your Storage Battery, by E. L. Bragdon.
Vacuum Tubes as Applied to Receivers, by Walter J. Howell.
How to Build the Loose Coupler and the Variometer, by Frederick J. Rumford.
The Best Aerial for a Receiving Station, by Edward Linwood.

APRIL 29.

Valuable Pointers on Aerial Construction, by Edward Linwood.
What is Meant by Tuning, by E. L. Bragdon.
Radio-Frequency Amplification and Regeneration, by Frank Armstrong.
Honey-Comb Coils and Condensers, by Edward Linwood.
Charging the Storage Battery, by E. L. Bragdon.
How to Construct the Variocoupler, by Frederick J. Rumford.

MAY 6.

The Advantages of Radio Frequency, by Harold S. Potter.
How to Construct, Protect and Operate a Storage Battery, by George W. May.
The Beginner's Catechism, by Edward Linwood.
Tuning and What is Meant by It, by Fred. Chas. Ehlert.
New Frequency Amplifier Brings Faintest Waves in Strong, by G. W. May.

MAY 13.

My Practical V. T. Detector and Two Stage Amplifier, by Frederick J. Rumford.
The Principles of Radiotelegraphy, by Walter J. Howell.
The Reason for the Loop Aerial, by George W. May.
Tuning and What is Meant By It, by E. L. Bragdon.
The Beginner's Catechism, by Edward Linwood.

MAY 20.

The Design of an Amateur Receiving Set, by C. White.
The B Battery and the Plate Current, by George W. May.

Radio Terms at a Glance, by Fred. Chas. Ehlert.
The Beginner's Catechism, by Edward Linwood.
Fire Undewriters' Rules, by Fred. Chas. Ehlert.

MAY 27.

The Beginner's Catechism, by Edward Linwood.
How to Make Your Own Condenser, by George W. May.
Tuning as Applied to Telegraphy, by Walter J. Howell.
Why the Condenser Doesn't Condense, by E. L. Bragdon.
Making Signals Louder with Two-Stage Amplifier, by George W. May.

JUNE 3.

The Cost of a Single-Circuit Receiver, by Howell W. Miller.
The Beginner's Catechism, by Edward Linwood.
How to Compute and Build a Fixed Condenser, by E. L. Bragdon.
Design for an Amateur's Receiving Set, by C. White.
Simple Method of Recharging a Storage Battery, by John Grayson.

JUNE 10.

Radio Receiver for Short Waves, by George W. May.
How to Filter Atmospheric Conditions, by C. White.
The Messenger Boys of Broadcasting, by E. L. Bragdon.
Are You a Member of the N. O. D. C.? by E. L. Bragdon.
The Beginner's Catechism, by Edward Linwood.
How to Construct One- and Two-Slide Tuning Coils, by George W. May.

JUNE 17.

The Vacuum Bulb's Start in Life, by C. White.
How to Select the Right Set, by E. L. Bragdon.
The Beginner's Catechism, by Edward Linwood.
Test of Inductance Coils, by Fred. Chas. Ehlert.
Short Waves from a Simple Receiver, by Stanley Bryant.

JUNE 24.

How to Make Your Radio Cabinets, by W. S. Standiford.
How the Crystal Detector is Used to the Best Advantage, by C. J. Williams.
How to Construct a Long-Wave Regenerative Receiver, by George W. May.
Tested Invention of Major Armstrong Amplifies Set 100,000 Times, by John Kent.
Repairing Cracks in Hard-Rubber Storage Battery Jars, by W. S. Standiford.
The Beginner's Catechism, by Edward Linwood.

JULY 1.

Novel Unit-Detector and Amplifier, by Frederick J. Rumford.
Why You Must Use a Condenser, by C. J. Williams.
How Wave Lengths Travel, by Fred. Chas. Ehlert.
Radio World's Revised Dictionary, by Fred. Chas. Ehlert.
The Beginner's Catechism, by Edward Linwood.
Use of the Vacuum Tube Detector, by George W. May.

JULY 8.

Radio's Place in the Phenomena of Nature, by E. L. Bragdon.
The Function of the Loose Coupler, by Charles H. Plath.
Armstrong's Superregenerative Amplifier Fully Explained, by John Kent.
Operating a Transatlantic Station, by Fred. Chas. Ehlert.
The Beginner's Catechism, by Edward Linwood.
Reducing Strays and Static, by Fred. Chas. Ehlert.

JULY 15.

Assembling a Detector and Two-Stage Amplifier, by H. S. Stanford.
Combined Radio and Audio Frequency Amplification, by C. White.
The Beginner's Catechism, by Edward Linwood.
Locating Your Aerial, by Harold Day.
Facts for Beginners, by Fred. Chas. Ehlert.

JULY 22.

When Your "Movies" Come by Radio, by Stanley Bryant.
Underlying Principles of the Vacuum Tube, by George W. May.
Practical V-T Detector Panel, by Frederick J. Rumford.
Revised Radio Dictionary, by Fred. Chas. Ehlert.
The Beginner's Catechism, by Edward Linwood.
Importance of Aerials to Radiation, by C. White.

JULY 29.

The Vacuum Tube as a Transmitter, by Charles H. Plath.
My 20-Kilowatt Tube and its Uses, by Irving Langmuir.
Importance of the Capacity Switch, by E. L. Bragdon.
The Truth about Lamp-Socket Aerials, by Harold R. Hart.
The Beginner's Catechism, by Edward Linwood.

AUGUST 5.

How to Construct and Operate the Armstrong Superregenerative Circuit, by John Kent.
Using Radio Frequency to Extend Range, by George W. May.
Things Every Radio Fan Must Know, by E. E. Hawley.
Revised Radio Dictionary, by Fred. Chas. Ehlert.
The Beginner's Catechism, by Edward Linwood.

AUGUST 12.

The Work of the Audio-frequency Transformer, by George W. May.
Practical Measurements of Capacity and Inductance, by W. A. Dickson.
Experimenting with Armstrong Circuit Produces Unusual Hook-up, by Dr. O. S. Kelly.
How to Secure Perfect Regeneration, by Fred. Chas. Ehlert.
The Beginners' Catechism, by Edward Linwood.

AUGUST 19.

How to Build a Portable Field Buzzer, by De Witt H. Thompson.
Using Two Tubes for Receiving, by C. White.
The Storage Battery as an Important Factor in Radio Reception, by Donald Van Wyck.
The Use of Capacity in a Circuit, by George W. May.
The Beginner's Catechism, by Edward Linwood.

Any single copy of Radio World, beginning with No. 1, mailed on receipt of 15 cents postpaid. Any seven issues for \$1.00. The full 21 numbers sent for \$3.00. Or send \$4.00 for 7 months (30 numbers), or \$6.00 for 1 year (52 numbers) and have your subscription start from No. 1. Radio World, 1493 Broadway, New York

Variable Air Condensers

(Knock-Down Only)
 Made with Pure Aluminum Die-Cut Plates
 43-Plate\$2.25
 23-Plate\$1.85
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 Includes all necessary parts, with instructions for assembling.
THE EDDY-MARSH COMPANY
 95 Westminster Street Providence, R. I.

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Constant voltage, large amperage. Will run two months without recharging.
 Attractive Dealers' Discounts
 Write for Details
WILLIAM LAW COMPANY
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GUARANTEED RADIO SETS & ACCESSORIES
NORTHERN RADIO SUPPLY CO., Inc.

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 Mail orders promptly attended to

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"EVERYTHING IN INSULATION" VARNISHES, COMPOUNDS, PAPERS, ETC.
MITCHELL-RAND MFG. CO.
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BUILD YOUR OWN



Complete 50c. instruction book for 20c. only on radi reception and how to make eight classes of crystal and vacuum tube receiving sets. Wonderful information makes you understand radio. With every order we send free our price list of parts prepared especially for the several sets described. Buy direct from factory and save many dollars. Both instruction book and price list sent on receipt of 20c. only. Money back if not pleased.
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NOVO "B" BATTERIES FOR RADIO

22½-45 & 105 VOLTS

NOISELESS DEPENDABLE GUARANTEED

ASK YOUR DEALER

NOVO MANUFACTURING CO.
 424-438 W. 33rd ST.
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531 SO. DEARBORN ST., CHICAGO.

United States Navy Leads in Radio Development

Considerable credit is always given the United States Navy for its pioneer work in many lines, among them electrical development; but a recent conversation with an officer of the radio section revealed the following items which are not generally known:

In the electrical field, the Navy was the pioneer in many lines. Starting with the incandescent lamp, every new electrical discovery was fathomed and adopted by the Navy before its commercial use had been found practicable or profitable.

The Navy Department enabled the General Electric Company to produce the first electrically propelled ship in the collier "Jupiter," now the airplane carrier "Langley."

The radiophone which, through broadcasting, has become the talk of the country, is simply the coming into commercial use of a development that has been in general use in the Navy for the last five years. It was installed, experimentally, in 1907 for communicating between the ships of a fleet.

Many of the great radiotelegraph plants that now encircle the globe are owned and operated by the Navy. Without the Navy's interest, experiments and research, as well as their substantial contracts for apparatus, the radio industry in this country, it is said, would be in foreign hands.

The radio compasses that flank our great seaports are owned and operated by the Navy; but through their use any vessel can be told to a degree what her direction is from any station within call and thus fix her position whether in fog or storm. This makes for better navigation and saves many a big liner from disaster as well as delay in making port.

Static interference is an element to be reckoned with in all phases of radio work and has never been entirely eliminated. The Navy Department, however, has been engaged in research work looking to the elimination of static for a longer period than any other Government department. While results have been attained which have reduced interference from this source to about half, it has not yet been completely removed.

New Broadcasters

SIX limited broadcasting stations were licensed by the Department of Commerce on August 11:

WJAQ—Capper Publications, Topeka, Kansas.

WAJT—Kelley-Vawter Jewelry Co., Marshal, Mo.

KFBH—Thomas Musical Co., Marshfield, Oregon.

WLAJ—Waco electrical Supply Co., Waco, Texas.

WAJU—Yankton College, Yankton, S. D.

WJAS—Pittsburgh Radio Supply House, Pittsburgh.

An American has invented a radio receiving set which fits into a finger ring. We await with interest the announcement that another American has invented one which is only visible through a microscope.—The Passing Show (London).

Superior Radio Products

All Parts, Receiving Sets Complete and in Units. Send for Description and Prices. Prompt Shipment on Mail Orders.

Dealers Write for Proposition

RADIO OUTFITTING CORP.

Mfg. High Grade Radio Apparatus
 410 East 34th St. New York, N. Y.

Rocky Mountain Crystals

BETTER THAN GALENA

The most sensitive mineral rectifier known. Can also be used with one or more stages of amplification.

Mounted, 35c.; Unmounted, 20c.; Postpaid
 Manufacturers, Jobbers, Dealers, Clubs,
 Apply for Special Trade Prices

Rocky Mountain Radio Products, Inc.

9 CHURCH ST., NEW YORK, N. Y.

RADIO BOXES

All radio carpentry work our specialty. Write for SPECIAL PRICES

JOE MIFSUD & CO.

373 Canal Street New York City
 Telephone—Canal 9475

THE BEST LITTLE THING IN RADIO

EBY

BINDING POSTS

Place your fall orders now

Latest reductions enable us to quote attractive prices.



Corporal



Ensign "H"

H. H. EBY MFG. CO., PHILA., PA.

Your Opportunity To Profit

because of the Tremendous Wave of Radio Enthusiasm now Sweeping over the World, is at hand.

"Sparks," a publication devoted to the outlook for the

Acme Battery and Radio Corporation

an established, growing concern, clearly outlines the Profit Possibilities of the company's shares.

Send for "Sparks" at Once. There is no charge.

Industrial Expansion Service

No. 1674 Broadway New York

This Fall and Winter The BIG Thing will be

RADIO!

Every radio expert—from Marconi down—who has analyzed the situation says that radio will take the predominant place over all other matters that may occupy the public mind. To keep thoroughly posted, subscribe for

RADIO WORLD

Subscribe direct or through your news-dealer. \$6.00 a year, \$3.00 six months, \$1.50 three months.

AND YOU WILL RECEIVE RADIO WORLD EVERY WEEK.

RADIO WORLD

1493 Broadway New York

ADVERTISING SOLICITOR WANTED

High-class advertising man, acquainted with agencies, wanted by successful radio weekly. One with experience on radio or electrical publication preferred. Give full details as to past experience and salary or commission expected. Letters will be held in strictest confidence. Address: Publisher, 30 Fifth Ave., New Rochelle, N. Y.

Fifty-two issues for \$6.00. Sub. Department, Radio World, 1493 Broadway, N. Y. C.

The Octagon Elec. Co.

We Make and Install Complete Radio Sets.
Full Line of Accessories Carried in Stock.

The Octagon Elec. Co.

219 West 14th St. New York City

RADIO SUPPLIES— RADIO SUPPLIES

We carry a full line of Radio Goods
**Dictograph Head Sets, Vario
Couplers, Everett Head Sets,
Variometers, Transformers,
1700 Meter Loose Couplers,
Dials and Knobs.**

Send 50c for 20 Blue Print
Hook-Ups

Radio Sets Made to Order
SUNBEAM ELECTRIC CO.
71 3rd Ave., New York City

DOUBLE HEAD
PHONES



BOYS! A REAL RADIO SET ABSOLUTELY FREE

RUSH your name and address
and we will tell you HOW you
can get this RADIO SET
ABSOLUTELY FREE. RADIO
SET comes to you complete,
with single slide tuning coil,
crystal detector and phone
condenser, AND DOUBLE
HEAD PHONES. No batteries
required; no experience
required. Write to-day for Free
Radio Plan.

HOME SUPPLY CO.
110 Nassau St., Dept. 557
New York City

“Fading” and How to Detect It Easily

MOST every amateur is striving for efficiency whereby signals may be brought into the receivers at their loudest signal-strength. In order to accomplish this we must have a set that is well designed, not merely thrown together.

One thing of great importance should be particularly avoided, and that is resistance. There are two kinds of resistance that effect a receiving circuit. One of these is termed low frequency—the kind with which we generally deal in usual forms of electrical work, and the other high-frequency resistance—the kind that makes itself manifest only in radio and other high frequency circuits. Resistance of any kind in a radio circuit tends to damp out the waves. We then have broad tuning. If the resistance becomes too great it will be impossible for the circuit to operate at all.

Low-frequency resistance is caused chiefly by using wire that is too small for the circuit; also by poor connections and unsoldered joints where, probably, grease and dirt have collected. The aerial system should have wire that is larger than that needed for the other circuits. Nothing smaller than No. 14 should be used.

High-frequency resistance is usually caused by employing wire having too small a carrying surface.

YOU NEED THESE—

To Complete Your
**ARMSTRONG
SUPER-REGENERATIVE
CIRCUIT**

We have for immediate delivery:

- 5 M. H. Choke Coils.....\$2.50
- 100 M. H. Choke Coils.....\$3.00
- 12000 Ohm Resistances.....\$3.00
- .005 MFD Tested Condensers.....75c

The above parts have been tested in our Demonstrating Set, and are made of the best material and guaranteed.

SEND CHECK OR MONEY ORDER—
MONEY WILL BE REFUNDED if the material should prove defective after 6 days' trial.

Durham & Company

RADIO ENGINEERS
1936 Market Street
PHILADELPHIA, PA.

New Laws Would Improve Broadcasting

By Harold Day

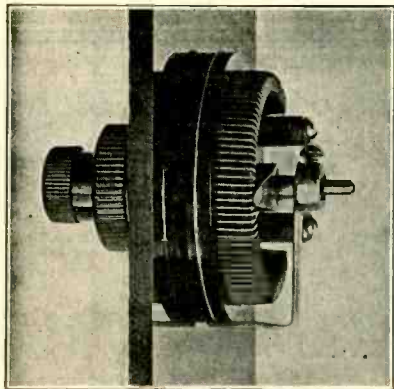
IT is a truism that needed legislation nearly always lags behind the heels of progress, but it is to be hoped that radio will mark a new era in this respect. The Government has already taken official cognizance of the new science in so many ways, particularly in respect to its value as a life and property saver, that perhaps means can be found to urge upon it the crying importance of speedy attention to the broadcasting situation.

At the present time, as is well known, all the numerous existing stations and the ever-increasing number of new ones are all allotted 360 meters for their programmes, with permission to send out official reports at 485 meters. This might have been found satisfactory when stations were few and far apart. But now that broadcasting has become nearly, if not quite, the most important phase of radio and surely the most active, it is imperative that this narrow restriction be speedily removed. In the larger areas there has been some friction between stations and much earnest effort at mutual accord. Nevertheless, interference continues, and at times reigns supreme.

It is obvious that since broadcasting is in so high favor with the public, that the number of stations will and should increase indefinitely. One station is no more adequate to serve the varied needs and tastes of a large community than one theatre. If the government would immediately recognize the new conditions, increase greatly the wave hands assigned to broadcasting, and make possible an allotment of wave-lengths rather than of hours among the stations, the entire quality of broadcasting would soon improve, competition would compel the best sort of programme, since the listening public could tune out the weaker sisters rather than, as now, listen indifferently or wearily shut off the current when the material on the air failed to satisfy.

Improved Vernier Rheostat

An absolute necessity in the new Armstrong
Regenerative and in Radio Frequency
Amplification



VERNIER

- With Dial\$2.00
- Without Dial\$1.50

REGULAR

- With Dial\$1.50
- Without Dial\$1.00

We are the only manufacturers
selling a regular rheostat with dial
for \$1.50.

MAXIMUM DISCOUNT TO DEALERS

THE TECo RADIO Co.

P. O. Box 3362, Boston, Mass.

Factory: 165 High St., Waltham, Mass.

Radio World, 52 issues, \$6.00.

Subscribe direct or through your
news dealer. \$6.00 a year, \$3.00 six
months, \$1.50 three months. Radio
World, 1493 Broadway, N. Y. C.

Last-Minute Radio News!

*Important Items Tuned in by Radio World Reporters
Just Before Going to Press*

Lee de Forest, American radio expert, exhibited several reels of moving pictures in Berlin, Germany, in which the photographed persons actually spoke to the audience. One even played the violin, and it sounded as if the player were in the same room.

The powerful radio-broadcasting station now being erected on the Municipal Building, New York City, will have a range, approximately, of 1,250 miles. Its power will be equal to that of any privately owned broadcasting station in America. It will cost close to \$50,000. Programs will embrace entertainment and information of the type now sent out by the various broadcasting stations, as well as educational lectures on health, fire, and crime prevention and municipal government. The location is ideal. There is situated on the twenty-fourth story of the Municipal Building a suite of rooms almost ideal for broadcasting purposes. Commissioner Whalen states that without tearing down a single partition it will be possible to install a generator in one of these rooms and equip the other as a studio comparable to the best in the country. The power for the station will be furnished from the city's own plant.

The first radio theatre will soon occupy a room in the Grand Central Palace, New York City. The theatre will seat over a thousand persons. There will be a dancing pavilion in connection.

The use of radio in mine rescue work has been suggested and it is probable that this method would assist mine safety. Rescue cars and trains stationed at various points throughout mining districts are to be equipped with apparatus to receive broadcasted messages in case of disaster.

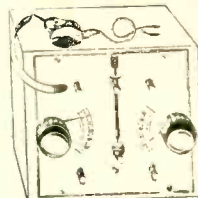
Nearly 7,000 persons have already answered the Chicago "Tribune's" call for a radio caucus. Some of them submitted interesting ideas for radio broadcasting while others submitted their names and addresses to the radio editor.

A new record in summertime radiotelephone feats has been attained by the broadcasting station of the Atlanta "Journal." Despite static, the radio operators of the Georgia newspaper using a Western Electric transmitting set, broadcasted a concert recently that was heard distinctly on the "Oneonta," a river tug, anchored at Columbia River Harbor, Astoria, Oregon.

Great Britain expects to build eight broadcasting stations, to cost about \$100,000 each. To support these the government will charge a "listening in fee" of \$2.44 for each receiving set.

The new broadcasting station in Aeolian Hall, which is intended for commercial broadcasting, has been assigned, for the present, by the United States Department of Commerce, a wave length of 360 meters.

COMPLETE RADIO SET READY TO LISTEN IN



\$14.50

C. O. D.

FOR THE COMPLETE

SET,

INCLUDING AERIAL

(Regular price: \$25)

This outfit is intended

for the fan that appreci-

ates a good thing. It in-

cludes a high grade tuner with a 40 to 60 mile radius, 1100 ohm phone, insulators, and complete aerial set.

SEND NO MONEY unless you wish. Simply send us your name and address, and we will mail immediately. You pay Postman on arrival, our price, plus postage. Satisfaction guaranteed, or money refunded.

THE UNWIN TRADING CO.

55 BROADWAY NEW YORK

For Finer Tuning Use a



Every-Wire-Contact Coupler
LIST \$7.50

Write for Pamphlet

MORELAND SALES CORP.
30 OGDEN ST.

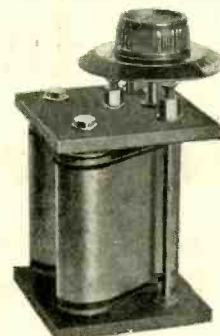
Newark New Jersey

The

"VARIO-PERM"

(TRADEMARK)

The Sensitive Variable
Condenser for Radio.



(Licensed under
Gernsback patent)

**NO SHORT-CIRCUITING
POSSIBLE**

**NO LOOSE ELECTRICAL
CONTACTS**

**Twice as Sensitive as Plate
Condensers.**

PERMANENT SATISFACTION

This UNEXCELLED TYPE OF
CONDENSER is now offered for
the first time at popular prices.

Mail orders filled.

Dealers write for terms.

Rating	List price for panel mounting without dial.
.001 mfd (43 plate)	\$5.00
.0005 mfd (23 plate)	\$4.25

**THE A. D. & S. RADIO
COMPANY, INC.**
SCARBOROUGH, N. Y.

Subscribe for RADIO WORLD. \$6.00 a
year, \$3.00 six months, \$1.50 three months.

Col. E. H. Green's Home a Radio Palace

ROUND HILLS, the country home of Col. Edward H. R. Green, son of the late Hetty Green, at New Bedford, Mass., sounds like a haunted estate since its owner has been bitten by the radio bug, says "The World," New York.

In the sun room of the house stock quotations, weather reports, music and speeches flow all day from the receiving station there. In the boat house come the booming tones of the amplifier with which Col. Green expects to entertain the crowds at the coming boat races.

That's all there is now, but Col. Green has not done yet. Within a few days his new six-room studio, housing the most complete broadcasting station in the country, will be finished.

Col. Green is not enjoying his radio pleasures alone. The first tryout of his truck was made last Thursday and it went rolling about the neighborhood reeling off concerts and talk from Newark and Schenectady for the delighted farmers.

But the amplifier is the Colonel's pet. This is just such a machine as was used to make President Harding's inaugural address audible to the 125,000 gathered about the Capitol. At Round Hills the sound will be plainly heard over a radius of five miles, and Col. Green will place his apparatus at the disposal of the Commodore to issue instructions and announcements at the boat races.

"Anybody who has a set of two good ears has all the required receiving apparatus," the Colonel says, "I'm so interested in this thing that I haven't time for anything else. I'm like a child with a new toy, who can't be induced to put it down."

FOR SUCCESS

WITH THE
**ARMSTRONG
SUPER
REGENERATIVE
CIRCUIT**



AN
ABSOLUTELY
NOISELESS
CONDENSER

The new Armstrong Super-Regenerative Circuit requires constant fixed capacities of .005 and .0025 m.f.d.—to be efficient, these condensers must be absolutely silent. Such is the—

MICON

Tested Mica Condenser

the only guaranteed noiseless condenser of absolutely constant capacity. Made in .005 and .0025 m.f.d. capacities, especially for this circuit. It may be had in all sizes from .0001 to .005.

MICONS are manufactured in a seamless metal case, over the entire surface of which an even pressure has been applied. For this reason MICONS remain at correct capacity.

Our special process eliminates any possibility of loose plates. This renders MICONS absolutely noiseless.

MICON, .0025 m.f.d.	.50
MICON, .005 m.f.d.	.75

If your dealer cannot supply you, send us his name and \$1.25 and receive the two MICONS postpaid, and a complete circuit diagram of the new ARMSTRONG Super-Regenerative Circuit absolutely free.

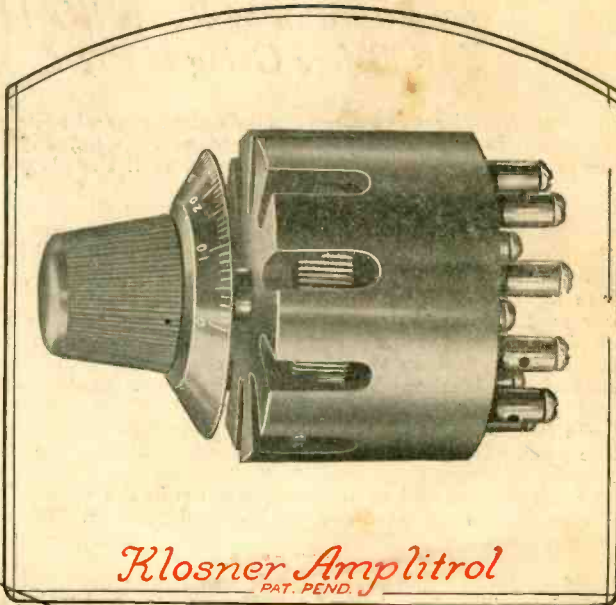
Chas. Freshman Company, Inc.
Sole Manufacturers
290 Hudson Street, New York City



The ideal combination for VT control without the use of jacks or plugs.

We are the inventors and sole manufacturers of the famous Klosner Vernier Rheostat Model 100 still being sold for \$1.50.

Write for interesting literature on the "Amplitrol" and the Klosner Rheostats. Address Dept. SO1.



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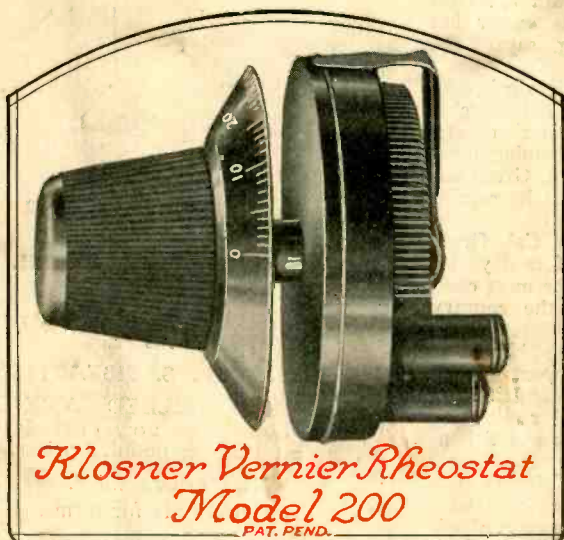
THE long looked for has at last arrived. The new Klosner "Amplitrol" fills that long felt radio want—that of controlling the vacuum tube circuit without the use of jacks, plugs or any additional switches. A real radio necessity. Each of your amplifier tubes deserves one. No more plugging in from one stage to the next. Simply attach your phone or loudspeaker to binding posts and turn on any stage at will.

The "Amplitrol" not only adjusts the filament to its maximum efficiency, but it automatically controls the plate circuit at the same time, thus eliminating an extra operation. Unlike an automatic filament control, the "Amplitrol" does not put a sudden strain on your filament. It provides a gradual current increase for the filament, thus prolonging its life.

Made of moulded condensite. Contacts of phosphor bronze. Exposed metal parts highly nickel plated. New style tapered knob, and dial correctly numbered in white lettering. Price, \$4.00.

What the "Amplitrol" is to the amplifying tube, so the Klosner Rheostat is to the detector tube. The new improved Rheostat Model 200, embodies some vast changes and improvements. These are too numerous to list, but your inspection will immediately win your approval. The "Amplitrol" and the new improved Klosner Rheostat are the ideal combination for your vacuum tubes. Klosner Rheostat Model 200. Price, \$1.80.

The "Amplitrol" and the Rheostat do not employ the graphic disc principle, but that of wire wound. This feature insures perfect contact at all times, making tuning quicker and louder and giving greater range. See them at your dealers or write for literature.



Klosner Vernier Rheostat
Model 200
PAT. PEND.

Klosner Improved Apparatus Co.,
2024 Boston Road
New York City