

RADIO FAN AT OAK GROVE INSTALLS NEW APPARATUS

BEN F. LILLS Able to Use Handsome Phonographic Cabinet Either for Playing Records or Picking Up Tunes.

Editor Radio Waves and Rippler: I am using a ground consisting of a pipe 6 1/2 feet long driven into the ground. Is this a good ground or can you suggest a better one? Cannot see why you don't use the nearest water pipe which is the best ground that can be found in the city. Solder an large wire water meter has been used for water and you will get much better results than the pipe driven into the ground.



Unusual receiving set owned by Ben F. Lills of Oak Grove, Or., which can be used either as phonograph or radio by making a slight change. Concerts from all over the Pacific coast are heard with this set.

BEN F. LILLS of Oak Grove, Or., is an enthusiastic radio fan for several months. And no wonder. With a receiving set like his, who wouldn't be an ardent devotee of the radio art, after he had listened to a perfect reproduction of a concert broadcast from a station way down in California? Mr. Lills' set is unusual in several ways. In a handsome phonographic cabinet, he has assembled three stages of audio and one of radio frequency amplifiers with all the various tuning and battery units. Only three controls are necessary to adjust the receiver to its best operation. One control does the tuning. The other two take care of the radio frequency potentiometer and tube filament current, respectively. Another particular feature of the set is the arrangement whereby either the phonograph or the radio can be used as desired. The change from one to the other is simple and can be done in a minute's time. For radio work, a special "loud-speaking" Western Electric phone is attached in place of the regular phonographic diaphragm. When there is nothing in the "air" and someone wants to play a record or two, the phone is taken off and the diaphragm is returned to its usual place. With this set the Lills family gets a good deal of music one way or the other. Nearly all the Pacific coast stations are heard clearly and with perfect modulation. Concerts from the Oregonian tower and other Portland stations roll in with considerable volume, declared the Oak Grove fan.

Editor Radio Waves and Rippler: I do you think it very good for a "peanut" like me to have received music from Salt Lake City, Great Falls, Mont., and Los Alamos, Cal.? What is the highest voltage which can be used as a B-battery? Where is the best place to put a potentiometer in the circuit, and why? It is necessary to be used on account of the filaments in the bulb? 1. Yes. 2. Would not advise the use of more than 22 1/2 volts for a detector tube and 25 volts for an amplifier. 3. A potentiometer is placed across the filament battery circuit with the pointer connected to the grid circuit through the secondary of the vario-coupler. A voltmeter is also placed across the battery circuit. Both of these units are not necessary but if used will give you a finer adjustment of the filament current and will protect your tube from crowding too much battery voltage.

RADIO QUERIES AND ANSWERS

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Editor Radio Waves and Rippler: Can you give me any information whereby we can locate the source of telephone conversations which we heard through a small radio set at our home? As we have not heard of a radio picking up telephone calls we would like to know if this is a common occurrence or is it a freak condition? We have been in the vicinity of these phone conversations for several nights. B. M. Ions, Or. Picking up telephone conversation on a radio set is not unusual. Such cases have often been reported by experimenters. It is usually due to the antenna or lead-in wires being in close proximity and running parallel to the phone wires. The fluctuating currents set up by the speech traveling through the wire induces a current in the radio antenna which is reproduced in your telephone receiver.

Editor Radio Waves and Rippler: Please tell me through your columns what is the best way to make a variable capacitor? I have an AMATEUR, Portland, Or. The only stations near Glendive, Mont., are KJVS at Great Falls, Mont., and WDAY at Fargo, N. D. It will be very difficult to say what equipment is necessary to pick up these stations from Glendive as reception will depend on many things such as atmospheric conditions, topography of the country, ground conditions, etc. Would suggest, however, the use of the standard type receiver with two stages of audio amplification which will cost in the neighborhood of \$150.

Editor Radio Waves and Rippler: I have a No. 15 channelled wire in use for a primary of a loose coupler. It is proper to use a No. 24 for the secondary? If so, what size tubes should I use? I have a crystal set and would like to know if it is feasible to use a No. 24 speaker. Up to a distance of 12 feet I can hear music plainly, but beyond that I can only hear faintly from the receivers. G. S., Portland, Or. 1. A No. 20 wire should be used for the secondary where the primary is of No. 15, because the larger wire will afford much sharper tuning. Best results can be obtained with a four-inch tube as the primary and a two-inch tube as the secondary. 2. A loud speaker is hardly feasible with a crystal detector as the signals received have not power enough to operate the loud speaker. If you connect two stages of amplification to the detector, you will be able to get good results with a loud speaker.

Wireless Waves Are in Many Different Sizes.

Marconi Gets Impulse Estimated at 93 Miles Long.

In the family of wireless waves there are many different sizes. The most common of these are the waves ranging from 100 meters to 10,000 meters. Those of the 33-mile length, or of 150,000 meters, are only used for long distance work. Marconi recently reported having received an impulse from a radio wave which he estimated to be 93 miles long. Outside of his report, nothing is known of this giant.

At the other extreme in the radio broadcast family, the waves of the smallest scientists have so far been able to measure. In hanging down the line from these midsize radio waves come the heat, light, violet-ray, X-ray and gamma-ray waves. They become so tiny that scientists have had to devise a special method of denoting their measurements. Meters and fractions of meters are too cumbersome, so they use the Angstrom unit, which is one ten-billionth of a meter. In Angstrom units, therefore, the smallest radio wave of 12 inches, or three-hundredths of a meter, is 300,000,000 units long. From this it is easier to compare the size of the smaller brothers.

Thus, scientists have measured heat waves to range from 2,000,000 to 700 units. Light waves measure between this and 2500 units. Then come violet rays, down to 400 units. And so on down to the tiniest of all—the gamma rays, measuring one-twentieth of an Angstrom unit, or one ten-billionth of a meter.

Two brothers in this marvelous family of wireless waves are missing. Scientists are still searching for them. The only identification they can give is their sizes. One of these missing brothers is the cosmic ray, which is a radio wave and the largest heat wave. The other's place is between the smallest violet-ray wave and the gamma rays. What functions they might have in the general scheme of things, scientists have still to discover.

Radio Notes.

SHALL we be able to see radio? That is not impossible, according to Professor Dayton C. Miller of the Case School of Applied Sciences in Cleveland. In fact, says Miller, an instrument could easily be devised by which the angles and large waves may be caught and photographed as they flash by at the rate of 186,000 miles a second. Professor Miller's instrument is made to vibrate a needle of light whose oscillations are photographed as they form. In the same manner, it is believed, the radio waves may be converted into sound waves which in turn may be photographed by his oscillograph.

By means of a new radio receiving instrument, distress calls from ships at sea can be picked up automatically. The new signal takes the place of the famous CDQ and SOS calls. It consists of four dashes of one second each, repeated three times at regular intervals. When this code is received by a vessel equipped with an automatic instrument, the pulses pass through a tuning coil and then to four vacuum tube amplifiers where they are enormously magnified. After amplification the dashes pass through an electrically operated switch which is controlled by a lever arm. The latter terminates in dash pots for the purpose of giving the correct intervals between signals. The catches which comprise the "selector" and operate after the manner of the striking mechanism of clocks. An electric signal in the circuit rings when the distress signal is properly sent and received.

When the operator on a ship supplied with the device goes off duty for the night, he switches off his regular equipment and connects the automatic receiving set with the antenna. The famous long-distance radio station, Nauen, in Germany, is to be altered so as to increase its range and to meet the increasing traffic in the United States and Argentine Republic. Twenty-five million marks additional capital is being raised by the Trans-Radio company and a beginning has already been made with the constructive work. The plans include the erection of seven new masts, each 585 feet high, and the dismantling of four of the existing masts.

As the number of radio listeners increases so does the chance of interference from the use of patent devices to improve radio reception. By this time the radio public knows much more about static and its interfering effects than it did in April. And after having an interesting lecture or well-executed musical selection spoiled by the cracks and blisses of the atmosphere, the radio enthusiast is psychologically in the proper status for the operations of the vendor of a static eliminator. At the time of this writing such a thing does not exist nor is there any immediate promise of such a device, but has not yet been put forth anything of the kind which is worth the trouble of installation. The United States pat-

COMBINATION CIRCUIT NOVEL AND EFFICIENT IMPROVEMENT

One Stage of Radio Frequency Amplification and Crystal Rectifier Being Used in East With Excellent Results.

A British medical journal recently published an article that has caused much discussion, regarding the possible aid that may be afforded by radio to the deaf. It is generally known that persons who are unable to hear direct, ordinary conversational tones, can carry on telephonic conversations with ease. This is due to the fact that sound waves, recreated in the telephone receiver, and sent directly into the ear of the deaf person, are much stronger than the sound waves as originally created by vocal organs.

The possibility of giving mechanical aid to a deaf person depends upon the physical conditions responsible for the deafness of the afflicted person. When the auditory nerve is paralyzed, sound waves, no matter how strong, strike upon the ear drum without effect. The auditory nerve is the interpreter that translates waves into sound for the brain.

If the deafness is due to trouble of a lesser nature, a vacuum tube may be effective, and it has been found that in some cases, hitherto considered beyond help, radio waves have been helpful. A man of this type had been so deaf for years that he could only hear shouted sounds, by increasing the number of thermionic valves in the radio receiver, was able to hear conversations in Paris. By experimentation it was found that five thermionic valves produced the best results in his case.

The prospectus which has just been issued for the Coliseum show to be held at the Coliseum October 14 to 21, inclusive, indicates that the show will be one of the biggest and most important radio exhibitions yet held in the United States and, if the prospectus is a criterion, one of class as well as importance. The selection of the Coliseum, probably the biggest and best-known exposition center, gives the show an adequate setting and the prestige of the very many successful trade shows that have preceded it. It is planned as a "see-together" week for the manufacturer, offering him an opportunity of meeting the jobber, the dealer and the general public and plans to make it appealing to each section are being perfected.

The arrangements for the show are the product of the study of practically every other radio exposition that has been staged in this country during the past year and a half, as its projector, U. J. Herrmann, himself a showman of long experience, has visited practically all of them to learn what not to do. An outstanding feature of this show is that over 60 per cent of the floor space has been devoted to aisle space for the customer, and it is estimated that will come at a season when the buying public will show keen interest in the developments of radio during the summer months and at a time when they are looking for some diversion for the winter months. It has been announced by the management that several other countries have considerable exhibit space under option, which will assure an international interest.

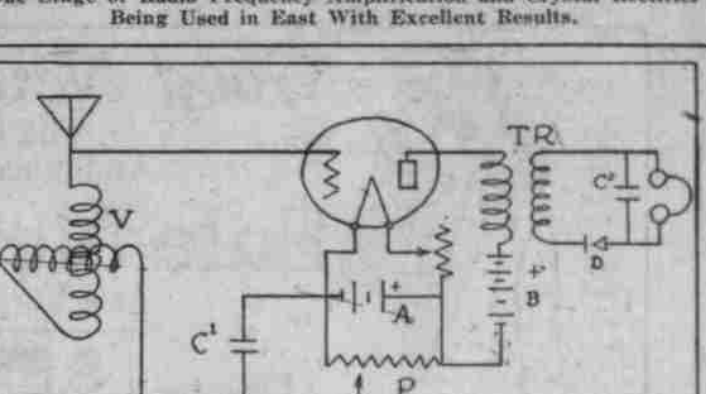
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COMBINATION CIRCUIT NOVEL AND EFFICIENT IMPROVEMENT

One Stage of Radio Frequency Amplification and Crystal Rectifier Being Used in East With Excellent Results.



A COMBINATION of one stage of radio frequency amplification and a crystal detector is being used by many eastern experimenters with very good results. Such a circuit is quite simple and easy to operate. It has been long known that as a rectifier the crystal detector is quite on a par with the vacuum tube. It has advantages not enjoyed by the vacuum tube, in that it is practically noiseless in action. Mutual reproduction, in the telephone receiver with a crystal detector is usually sweet and clear.

In a radio frequency combination with a crystal detector, the crystal should be of a more rugged type than galena. Silicon or iron pyrites are recommended as these reduce the necessity of frequent adjustments. Units necessary for such a set are as follows: One standard short-wave variometer, one vacuum tube of the amplifier type, a tube socket, filament rheostat, one 200-ohm potentiometer, a fixed condenser of 100 microfarads capacity, one 4-volt storage battery, a "B" battery of 45 volts, a radio-frequency transformer, a crystal detector and telephone receivers. Connect up the units as in the diagram.

A little attention must be given to get the correct setting of the potentiometer. After this is done, a slight adjustment of the variometer will tune the aerial circuit to the different stations. The tube will operate best when lighted at a little more brilliancy than is usual with the ordinary tube set. The best results are obtained with the potentiometer pointer almost completely over to the negative side. The crystal detector is operated in the usual manner. It will be found that not so much attention is needed to find the most sensitive spots.

Experimenters who have used such a set declare that it tunes quite sharply. Interference from the spark stations is cut down almost to a minimum with a small variation of the variometer. The most powerful broadcasting station in the United States will soon be installed in Washington, D. C., according to an announcement made recently by the Radio Corporation of America. The station will be located in a new building now being erected in the highest section of the city. The finest "concert station" ever built for radio broadcasting is being planned. A practically all-day service will be arranged by the company. Leading entertainers, speakers and educators of the country will feature the program of this station, which are expected to be heard in almost every section of the United States.

Radioize Your Phonograph We will gladly convert your phonograph into a Combination Outfit so you can enjoy concerts Either Way Hear the radio when it is being broadcasted or hear your own records whenever you choose.

Radio Service Bureau Gasco Bldg. Main 4538 NOTICE TO EASTERN OREGON! We installed the "FORD CARAVAN" WATCH FOR IT! HALLOCK & WATSON RADIO SERVICE 192 PARK STREET, Portland, Oregon. Broadcasting Station KGG Experimental Station 7XL

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The New General Electric Tuner Detector—Amplifier A Complete Radio Receiving Station. This compact and highly efficient receiver is of the single circuit type with a continuously variable air condenser for tuning. Provided with a regenerative coil for amplification and oscillation. Suitable for reception of voice and all signals. Come in—Let Us Demonstrate. Broadway 1696 STUBBS Operating K. Q. Y. 75 6th St. ELECTRIC CO. SPECIAL—WE WILL BROADCAST MONDAY ROSE'S FAMOUS ORCHESTRA BET. 6 AND 7 P. M.

Going Out of Business? I Should Say Not! Merely overstocked in certain articles and must "clean house" of odds and ends. Our sale advertised in last Sunday's Oregonian will be continued for another week with additions, a few of which are listed below: Price—Original Sales. Elite 43-plate Condensers \$4.75 \$1.75 Triple Sockets, Elite \$3.20 \$1.00 Fada Rheostats \$1.00 .75 Arkay Phonograph Attachment \$1.50 .80 Paragon Crystal Detectors \$1.75 .90 Arkay Vernier Adjusters \$2.00 .50 Fircro Bulldog Grip Plugs \$1.50 \$1.00 Tuska Variocouplers \$8.00 \$4.40 Fada Detector and Two-Step Amplifier with filament control jacks in oak cabinet \$65.00 \$35.75 SORSINC Store J. B. WEED, Mgr. (The Oldest Exclusive Radio Store in Portland) Mail Order Service—Write for Catalog 310 OAK STREET (Installers KGW) Portland, Oregon