

# THE OREGONIAN BEGINS WORK ON HIGH-POWER RADIO STATION

Preparations Made for Installation of Equipment Which Is Due to Arrive October 30—Apparatus Expected to Be Completed by Election Day—Crew of 15 Men Now Busy.

**BY SAUL EMANUEL.**  
**W**ORK on the Oregonian's new high-power broadcasting station is already under way. Under the direction of Al Cochran, the building superintendent, a crew of 15 men is busy around the roof and clock tower of The Oregonian building from daylight until darkness preparing for the arrival of the Western Electric radio equipment.

Word has been received that the equipment is on its way to Portland by fast freight. Barring a railroad wreck or other accident the apparatus should be in Portland by October 30. On that date will arrive P. E. Wray, the Western Electric engineer, who will supervise the installation of the big set.

Tomorrow morning will find men fitting up the "studio" room with layers of what is known as "acoustical felt," a product of the Johns-Manville company, and through which, it is claimed, no sound can pierce. Over this felt base will be laid heavy fabric. The side walls of the "studio" will be covered, in addition, with portieres and draperies.

Work on the new steel towers which will carry the great spread of antenna wires will be stretched, will also begin this week. One will be raised high into the air from the top of the clock tower and the other will stand upon the roof of the Northwestern Bank building. The tower tops will be 231 feet apart and nearly 300 feet from the streets.

## RADIO QUERIES AND ANSWERS

**Editor Radio Waves and Rippler:**  
 1. I live 25 miles from Portland and would like to know if it is possible to hear satisfactory results with a set.  
 2. Is this thing large enough, made of one layer of No. 23 tin-plate cotton covered paper with a 4 1/2-inch tube and stamped every ten turns?  
 3. My aerial is about 130 feet long and 20 feet high on one end and 25 feet on the other end. If I use a fixed condenser, tuner and detector, should I be able to receive messages from Portland?  
 4. How can I find my own frequency?  
 5. When a variable condenser helps in tuning?  
 6. Would four sheets of tinfoil between five sheets of mica 2 by 2 inches make a good fixed condenser?  
 7. Does it reduce the power of receiving if the coils are connected together?  
 8. Would it be better to file the nickel plating off the coil points?  
 9. How can I find my own frequency?  
 10. How can I find my own frequency?

**1. OTHER conditions are satisfactory.** You ought to be able to hear the Portland stations.  
 2. Your tuner is by far too large for short-wave reception. Would suggest winding a coil of only 40 turns and using No. 20 copper wire.  
 3. Tap every five turns.  
 4. This will depend on other conditions outside of your apparatus and aerial. Under favorable conditions, crystal sets often pick up signals much further than 25 miles.  
 5. Add the length of the antenna to the length of the lead-in wire and multiply by 1.5. This will give you the approximate wave length of your antenna.  
 6. The Oregonian station will be closed down for several weeks until the new 500-watt set is placed in operation. The new schedule of programme hours will be announced later.  
 7. Yes. The addition of a variable condenser will sharpen the tuning.  
 8. Such condenser should prove an excellent one for bringing around the telephone receivers.  
 9. If you mean the antenna wires, one or more of them crossing each other and touching each other will cut down the strength of your signals.  
 10. No. If the plating is clean and not corroded, it is unnecessary to file the points.

**Editor Radio Waves and Rippler:**  
 1. Why is it necessary for me to place the switch lever in the "radio" position when I am using a variable condenser in the grid circuit of my receiving set, but not getting any results. Where can I get the condenser to get better results?  
 2. I am using a variable condenser in the grid circuit of my receiving set, but am not getting any results. Where can I get the condenser to get better results?  
 3. This is most likely due to poor construction of the antenna in the degree of tuning cannot be obtained. When you place the lever on two taps at one, you probably have an inductance value which is closer to the wave-length of the received signals. If you connect a variable condenser across the coil, you will be able to get a sharper degree of tuning when using only one tap at a time.  
 4. A variable condenser in the grid circuit increases the wave length of the circuit, throwing it out of resonance with the aerial circuit. For short waves, the small fixed condenser in the grid circuit is the best, and the variable should be placed across the phones and "B" battery.

## Two Portlanders Invent Ever-Set Detector.

**Device Said to Eliminate Necessity of Finding the "Sensitive Spot."**  
**A**LITTLE device that its inventor says will add great impetus to radio telephony has just been produced by two Portlanders, Bert L. Bolinger and Sam G. Back, native-born citizens of this city.  
 The invention is called the "ever-set detector." Its chief advantages are the elimination of the necessity of finding a "sensitive spot" and of adjusting a "cat whisker." The new detector is not any larger than the ordinary penny tablet box and consists of very simple parts. Its inventors declare there is nothing about it that can get out of order no matter how rough treatment may be given it.  
 Patents have been applied for and until these are granted the inventors are withholding any information that might betray their secret. They say, however, that the governing principle of the detector is the manner in which it is connected up with a carbonium equipment. This material is not being used in any way in the ordinary small detector.

A factory for the production of ever-set detectors on a large scale is in contemplation, say the inventors. At present they are turning out a limited quantity at their laboratory, 308 First street. The claim is made that the ever-set detector rectifies signals better than any "crystal" detector on the market.

The first radio broadcasting station in Alaska was recently licensed by the department of commerce. It is operated by the Northern Commercial company and is located at Fairbanks. The new station will broadcast a programme of entertainment for the benefit of citizens within a radius of about 500 miles. The call letters are WLYA.

steel towers will be the steam-pipe system for melting ice during winter months. Five steel pipes will run through the towers, one in each corner, and the fifth in the center, running clear to the top. During heavy winter weather steam will be sent through these pipes, keeping the towers at such temperature that no ice will be able to form upon them.

Four heavy copper-stranded wires 150 feet long and stretched between 16-foot bridges will form the antenna spread of the new Oregonian station. These will be led into the apparatus room just below the clock tower roof, in the form of a cage. Both the antenna proper and the lead-in will be heavily insulated from the supports and the building.

About 100 feet below the antenna will be stretched another to act as the counterpoise or "ground" for the high frequency electric currents. This also will be heavily insulated from its supports.

An unusual piece of workmanship preliminary to the installation of the apparatus has just been completed. This was the 100-foot long copper pipe of one inch diameter which was run in a straight line from the topmost floor of the tower through every floor of the building and finally submerged in a base of charcoal 12 feet below the building basement. Each floor of the main building and the floors and stairs of the tower is connected electrically to this copper pipe. This pipe will be both the radio and lightning ground of the new station.

According to Mr. Cochran the new station ought to be ready for operation by November 7, election day.

## Radio Pockets Puzzle to Wireless Experts.

**Some Portions of Ocean Included in Dead Areas.**  
**R**ADIO shadows, or "pockets," as they are more commonly called, have long proved a profound mystery to scientists. These shadows are practically dead spots in the atmosphere through which the electro-magnetic waves are unable to penetrate. Parts of the eastern coast of the United States, a spot in southern California and certain sections of Oregon are included among these shadows.

These pockets are not confined to land only. They are also known to be in certain localities on the ocean as well as in the most remote islands. Radio operators of ocean-going vessels have often reported that at such and such longitude and latitude all signals being received by him faded out entirely, and for perhaps three or four hours all was silent as the grave save for an occasional splash of water.

According to the engineers who developed the tubes, two of them connected in parallel will undoubtedly carry the voice across the oceans. Tests made by the engineers indicate that even larger tubes with greater power can be made if necessary.

A feature of the new type of tube is that the "plate" forms the outer wall. Made of copper, the plate is a cylinder which is sealed to the glass in such a way that it will not crack under ordinary working conditions.

The high temperatures caused when enormous voltages are applied to the plate are taken care of by placing the tube in a tank of water which circulates through a radiator. One of these tubes stands 3 feet high and is 2 1/2 inches in diameter at the bottom. To heat the filament 6000 watts of electrical power is used.

The use of these tubes will make unnecessary the large and costly apparatus of the present-day high-power radio stations. Only two or three of these tubes will operate the largest station in service today.

many others applied for. Five men have received patents for basic conceptions and improvements: Marcel J. A. Fleming, who contributed to the vacuum tube; Lee DeForest, the audio inventor; Edwin Armstrong and Edwin H. Colpitts, whose repeater was patented in 1915.

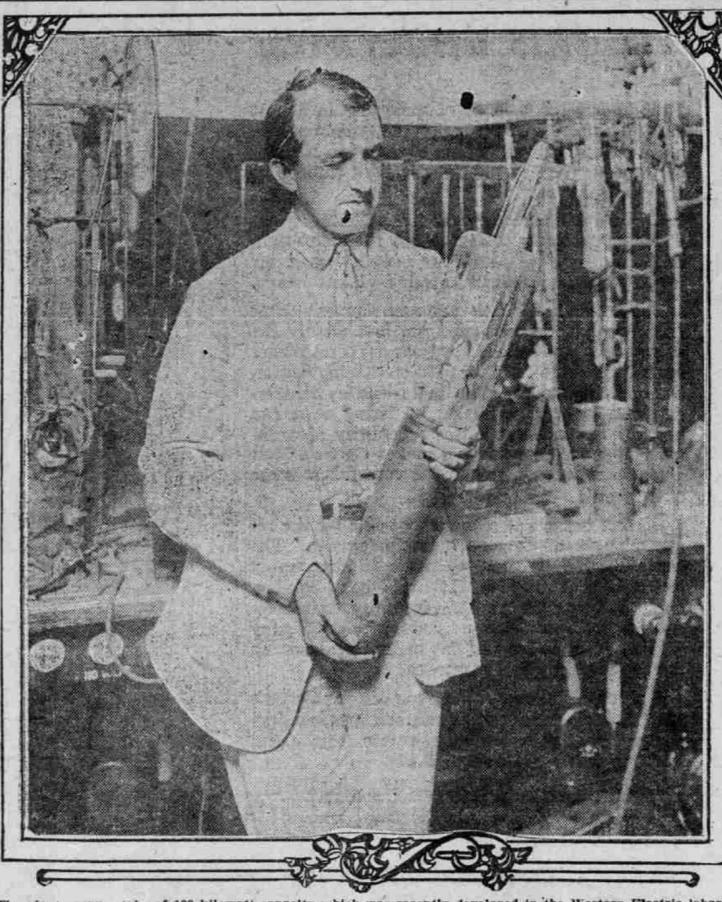
Secretary of Labor Davis started broadcasting on October 2 for the department of labor through the naval air station at Anacostia, N. O. P. The service will be for three 15-minute periods each week from 7:15 to 7:30 every Monday, Tuesday and Thursday. The secretary in his first broadcast presented a short exposition of what the department of labor can do and is doing for American wage-earners. A definite programme will be announced later.

Plates Not Only Factor in Condenser's Capacity.  
**Erroneous Idea Declared Held by Many Radio Fans.**  
**M**ANY people have become so accustomed to buying apparatus of a certain make or specification that when they want a condenser of one kind or another they think of one that has 48 plates. Or if they want one of 6000 microfarads, the 23-plate type comes to their mind.

This is an erroneous idea, for there are several other factors besides the number of plates that determine the capacity of a condenser. The essentials of a condenser are two metal plates separated by an insulating medium or dielectric, which in this case is air. Now the capacity of such a condenser depends on three factors—the area of the dielectric, the nature of the dielectric and the thickness of the dielectric.

## RADIO ENGINEERS DEVELOP VACUUM TUBES OF 100-KILOWATT CAPACITY

With Such Giants, It Is Believed That Long-distance Wireless Telephony Will Soon Be an Assured Fact. Carrying of Voices Across Oceans Is Anticipated.



The giant vacuum tube of 100-kilowatt capacity which was recently developed in the Western Electric laboratories and which is expected to revolutionize radio telephony.

**A**FTER several years of experimenting the radio engineers of the Western Electric laboratories have developed vacuum tubes of 100-kilowatt capacity. With such giant tubes it is believed that long-distance radio telephony will soon be an assured fact.

## NEED OF IMPROVING RADIO APPARATUS IS EMPHASIZED

Lack of Public Interest is Blamed to Dealers Foisting Too Much Poor-quality Goods on Buyers.

**T**HE necessity of improvements in radio apparatus is strongly emphasized by H. Gernebeck, editor of the Radio News, in an editorial appearing in the October issue of his magazine.

"Too much poor apparatus is being foisted upon an unsuspecting public because of the cause of the tremendous falling off of interest in radio during the summer months, according to Mr. Gernebeck.

"To revive the interest, the radio industry must clean house, and make a clean sweep," he declares. "Every instrument, every piece of apparatus that leaves the factory without giving 100 per cent satisfaction to the user will prove a boomerang six months hence, when the public will refuse to buy. There has been too much poor equipment and flooding of the market with inferior goods, and we cannot expect a thin, tin horn to give anything but a tiny sound, which, in fact, it does. We have seen horns who horn with phones that started to vibrate at their fundamental stage, giving off a note of their own, and you can imagine the noise that issued forth from such a horn, instead of music. The materials are usually entirely too thin, and if metal is used it should never be less than 1-32 inch in thickness."

The patent office is feeling results of the widespread interest in radio. According to an article in the Dearborn Independent, more than 1000 patents have been granted, with the patent office is feeling results of the widespread interest in radio.

**YOU ARE MISSING**  
 The wonderfully improved radio concerts and other broadcasted programs. The local stations are all installing larger and better broadcasting equipment, and getting away from phonograph music to programs furnished by talented local and visiting artists.

**DO YOU KNOW THAT WE WILL SELL YOU A LOUD-SPEAKING RADIO SET ON MONTHLY PAYMENT TERMS?**  
 Write or phone for our new catalogue.

**Radio Service Bureau**  
 310 Oak Street Phone 4538  
**WE ARE NOW OPERATING KYG THE FAMOUS HAWLEY STATION**

Dielectrics have what is known as an inductively value or dielectric constant, and this value is calculated by the relationship of the capacity values of the different dielectrics to that of air at ordinary pressure, which is considered as having a value of 1. On this basis a dielectric of paraffined paper would make a condenser having a capacity 5.65 times that of air; mica would make a capacity from 4 to 8 times that of air; hard rubber about 2.5 times, etc. You can now readily see how such very small condensers can be made having a comparatively high capacity by using a mica dielectric.

Condensers for tuning purposes with resistivity of its plates invariably have a dielectric of air, as this substance incurs the least losses, so that factor we need not further consider. But there are two other factors that are of equal importance—the area of the dielectric and the spacing of the plates. The greater the area of the dielectric, the greater the capacity, and also the closer the plates are together, the greater the capacity.

When buying condensers keep these thoughts in mind and choose by the capacity rating instead of by the quantity of plates. Some variable condensers of .0005 mfd. capacity have 23 plates, while others of the same capacity have but 15, and the condensers with the lesser number of plates will serve every purpose as well as the one with the greater, constructional details being equal.

**Nearly All Tubes Require Filament Voltage Under 6.**  
**Westinghouse Aeriole Sets Need But 1.5 Volts on Filament.**

**WHAT** is the capacity of a grid condenser? How many ohms resistance should the receivers be for best results? Will eight volts be all right for the tube filament? Such questions constitute a large part of those sent in by anxious experimenters.

Practically all of the receiving tubes now on the market require a filament voltage of not more than six. The tubes made for use with Westinghouse Aeriole sets require but 1.5 volts on the filament. The majority of the standard tubes require a plate voltage of 22 1/2. Some of the other tubes may require a critical voltage adjustment that may rise up to 60. The plate voltage of amplifier tubes should be between 45 and 60.

Rheostats for use with receiving tubes should have a resistance of about six ohms and should be so made that they will withstand a continuous current of at least one ampere without heating.

Receivers or phones are usually rated according to their resistance, but this rating should not be taken as an absolute indication of quality or sensitiveness. The constructional details of the phones must also be taken into consideration. Well-constructed and properly designed phones for radio use will generally be most sensitive if wound with enough wire to indicate a resistance of from 2000 to 3000 ohms.

A condenser to be shunted across the phones to afford a by-pass for radio frequency currents should have a capacity of from .002 to .003 mfd., while the grid leak should have a resistance of about one megohm. These last two figures will vary with different tubes.

Variable condensers for general tuning purposes can well have a capacity of .001 mfd. If a lower range desired you can use one .005 mfd. condenser, and if a greater range is needed you can use one of .0015 mfd.

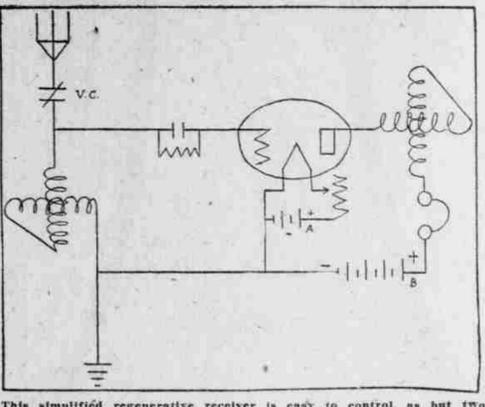
Ordinary dry cells give a voltage of 1.4, so if you wish to use such cells to light your tube filament you will have to connect four of them in series.

Storage battery cells normally give a voltage of two. Three such cells in series are necessary to give six volts.

Until the advent of the modern regenerative receiver, the term "shielding" as applied to radio apparatus was quite unknown. In a regenerative receiver, however, being super-sensitive to all electrical influences, has been found to require protection from all such electrical disturbances. Shielding accomplishes this. It is the process of surrounding the entire receiver and sometimes even the individual

## NEW, SIMPLE REGENERATIVE RECEIVER EASILY HANDLED

Two Variometers and One Variable Condenser Properly Installed Produce Satisfactory Results in Amplification of Signals.



This simplified regenerative receiver is easy to control, as but two variometers and one variable condenser are used to adjust the circuits.

**A** SIMPLIFIED regenerative receiver can be easily made with two variometers. One of the variometers is used as a tuning inductance for both the primary and the grid circuit, while the other is placed in the plate circuit.

The advantage of this type of receiver is in the simplified control. Only three controls are used—the condenser and the two variometers. Even though the possibility for critical adjustment of primary and secondary circuits and the coupling of these two circuits is eliminated, this set will be found to be quite selective and to produce satisfactory results in the amplification of signals.

The use of a variable condenser in series with the aerial circuit will permit independent tuning of the aerial circuit apart from the secondary circuit.

A bonus of the simplified regenerative receiver accompanies this article. The variometers are the standard short wave type, while the variable condenser is of .001 microfarad capacity. If another variable condenser of .0005 mfd. capacity is placed around the primary variometer, a still greater sharpness of tuning will be had.

circuits therein, by a metallic surface. This usually takes the form of a copper lining in the receiver cabinet and on the top of the panel. This shielding absorbs any electrical influence which would normally find its way to the windings of the receiver and induces in them an electric current, in the same manner that radio waves induce electric currents in a receiving antenna.

**Radio Notes.**  
**UNCLE SAM'S** "sell it by air" plan of broadcasting to business, is developing rapidly, department of commerce officials announced today. Following the broadcasting from Boston of the department's trade opportunities throughout New England, many chambers of commerce in the country have asked for similar services for their broadcasting stations. Several of the high-power radio stations have offered their services to the bureau of foreign and domestic commerce for this new and unique method of making public the trade opportunities in foreign lands.

The Ridgewood (L. I.) Times broadcasting station is anxious to serve the territory around New York. Another station, W. F. O. at Dayton, O., desires to receive information on the world's markets that it may be broadcasted to the exporters in the Miami valley. A station at St. Louis has already begun to broadcast foreign trade notes to 10,000,000 fans, and the chamber of commerce at Buffalo wants the data for use in two of its local stations.

It is understood that the bureau of foreign and domestic commerce at Washington is considering sending weekly data to other localities, where it will be distributed by radio to interested manufacturers and exporters.

For a home-made storage battery, mix a solution of 2 per cent sulphuric acid and 98 per cent water. Do not make the mistake of pouring the water into the acid. That would be disastrous. Pour the acid into the water. Water, when poured into sulphuric acid, develops a high temperature.

**Aeriole Jr. Radio Set**  
 A Westinghouse Product  
 Fills the popular demand for an inexpensive long-range set. The filament of the vacuum tube operates from a single dry cell; no storage battery needed. Easily operated, extra sensitive Regenerative. Not subject to irregularities sometimes found in fragile receivers.

**Price \$65**  
 Antenna & Batteries \$6.20

**STUBBS ELECTRIC CO.**  
 Operating KQY  
 75 Sixth St., Portland, Ore.

**What You've Waited For**  
 "Northwestern's" greatest achievement.  
**2-RADIO-DETECTOR-2-AUDIO!**  
 Simple control, wonderful selectivity. Single Cabinet.

**REAL DISTANCE RESULTS ON AERIAL OR LOOP!**  
**HALLOCK & WATSON RADIO SERVICE**  
 192 Park Street Portland, Oregon  
 Broadcasting Station KGG Experimental Station 7XI

**2000 OHM Kilburn & Clark Double Head Sets \$4.00**  
 Special Quantity Price to Dealers

**CRYSTAL RADIO COMPANY**  
 320 ABINGTON BLDG.

**Build Your Set**  
 at a saving from our complete stock of parts. EVERYTHING IN RADIO Just received: Meyers' Audio Amplifying Coils.

**M. J. WALSH ELECTRIC CO.**  
 106 Fourth Street BET. WASHINGTON AND STARK

**E. L. KNIGHT & CO.**  
 440 Washington St., Near 12th  
**RADIO CONCERT EVERY SAT. NIGHT**  
 "KNIGHT MAKES DAY-THE ELECTRIC WAY"

**RADIO SETS**  
 of all kinds, made to your order. Complete sets in stock. Large supply of parts.

**SMITH-McGOY ELECTRIC CO.**  
 264 Alder St. Main 3011