Small Portable Radio Set for Field Work

SINCE our entrance into the world conflict, American radio engineers have given considerable attention to the development and improvement of radio apparatus adaptable for various uses in the military service. The essential points to be considered in the making of such radio apparatus suitable for this kind of work are at once, simplicity, efficiency, and rugged construction.

Extremely Light Weight, Portable Wireless Transmitting Set, Intended for Military or Other Purposes. It Operates on Batteries and Utilizes a Special Spark Coil and Quenched Gap. A Hot Wire Radiation Meter is Provided as well as Volt and Ammeter for the Primary Circuit.

All of the above necessary features have been incorporated in a new radio set designed by a New York radio engineer, Mr. A. B. Cole. The apparatus which he has evolved and which has proven very successful is operated from a battery and for this reason his transmitter is adaptable to various important military maneuvers where other, more cumbersome, apparatus would not adapt itself. The transmitter is shown at Fig. 1. The high tension e.m.f. used for charging the condenser is derived from a specially built spark coil which is enclosed in the case. A new design of independent vibrator is utilized for interrupting the storage battery current necessary to operate the coil. This interrupter is seen in the lower left hand of the panel. An ammeter and volt-meter are interposed in the primary of the induction coil and are used for the purpose of indicating the current and voltage input into the low tension primary circuit. These meters are stationed at the lower right end of the panel. A key is connected in the primary circuit and is also mounted on the panel.

The high tension and oscillatory circuit apparatus consists of a high tension condenser placed within the case; this condenser being charged by the secondary of the spark coil. The condenser is allowed to discharge thru a specially built quenched spark gap and thru the primary of a compactly built oscillation transformer. The gap is enclosed within the cabinet, and a large insulated knob is connected to the movable electrode, which is seen to the right of the independent vibrator. A very small adjustment is necessary to bring the gap to proper operation, as will be evident from the small swing of the pointer. The inductance of the primary oscillation transformer is variable, and it is controlled by a multiple point switch which is located at the upper left-hand corner of the panel, while the multiple point switch to the right of the primary switch is used to control the inductance of the oscillation transformer secondary. A thermo-couple high frequency ammeter is interposed in the ground lead of the open oscillatory circuit, and this meter is located in the upper right hand corner of the panel. The two binding posts placed in the center of the panel are used to connect the ground and antenna. The telephone switch in the foreground is used to connect or disconnect the transmitting circuit from the antenna, and is also used to connect or disconnect the receiving set, if such is to be used in connection with this transmitting outfit. A plug for connecting a receiving set, so that it may utilize the same transmitting antenna, is placed in front of the quenched gap control handle. The plug to the left of this receiving plug is used to connect the source of power necessary to operate the spark coil, which is generally a six-volt storage battery.

The complete transmitting panel is mounted in a well insulated and ruggedly constructed case and is supplied with a leather carrying belt, the complete equipment being extremely light in weight.

The receiving set accompanying the above transmitting outfit is shown opposite. Altho it is not essential to use this particular receiving set, it was found, however, that most favorable results were obtainable from this particular type of portable receiving apparatus. This set is of the tightly coupled, capacity control type. It comprises a fixt inductance wound on a special tube and mounted within the case. Two condensers of the variable, air dielectric type are used entirely for tuning purposes, and these are seen on the upper part of the panel. A crystal detector rectifies the incoming, radio frequency oscillations. This detector is in the lower right hand corner of the panel. A test buzzer is also a part of the equipment, this being used to adjust the detector crystal to maximum sensitivity. The buzzer push button is located in front of the crystal detector stand, while the buzzer is placed at the central left hand portion of the panel. The plug in front of the buzzer is used to connect the telephone receivers, while the plug at the upper center of the panel serves to connect the antenna and ground wires to the receiving set. A partition is provided at the right hand part of the case to accommodate the telephone receivers when the set is not in use. The case of this receiving set is substantially made so as to stand heavy wear and rough use.

New Light Weight Radio Receiving Set, Well Adapted to All Military Requirements.

TEST WIRELESS CONTROL.

Announcement that satisfactory tests have been made of a military airplane controlled wholly by wireless was made at San Diego, Calif., recently by Flight Instructor N. B. Robbins of the Rockwell field signal corps aviation school. The tests, he said, were made a short time ago, the controls being 12 miles apart.

The new machine, it is announced, carries neither pilot nor observer. It is equipt at present to carry only heavy freight or explosive bombs. The pilot guiding the machine may be in another airplane, in a dirigible or anywhere on the ground. Robbins says that an aviator driving the control in the machine ahead of him may remain fully 15 miles behind. He also says that the machine may be built for one-fourth the cost of a standard military machine. An electrical device for releasing a cargo of bombs is attached to the airplane.

Flight Instructor Robbins is the designer of one of the fastest airplanes ever built in this country, of a very fast motor and of a stabilizer used by the Royal British Flying Corps.

A HOLDER FOR A TUBULAR AUDION.

Those who have tubular Audions know what it is to have to connect the four wires up and then take them loose again after the receiving is over to put the bulb away in a safe place, so that it will not get broken or tampered with.

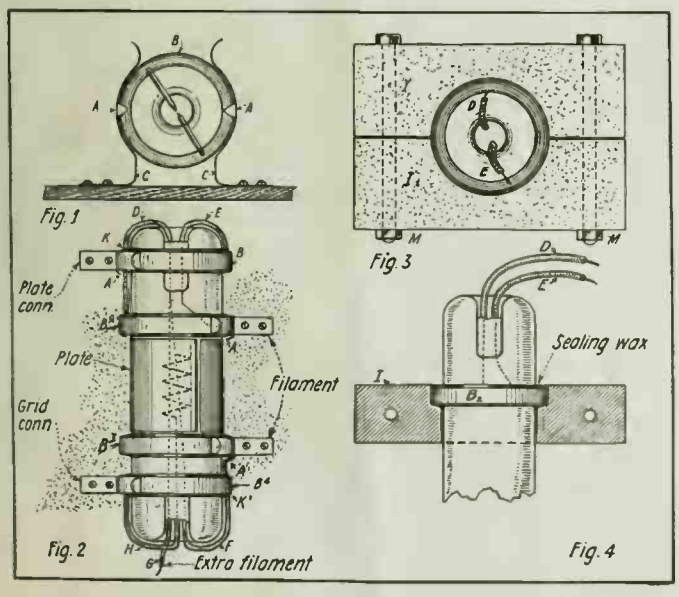
With this in mind I constructed a holder which has no wires to connect and at the same time makes good connections, and is not apt to fall out of place and break.

The construction of the holder can be seen from the drawings. The rings, B1, B2, B3 and B4 are made of nickel plated brass pipe which can be obtained from any plumber or hardware store. The rings are made about 3/16 or ¼ inch wide, and 1¼ inch in diameter. As can be seen the rings are held on the tube by sealing wax.

The best way to do this is to make a wooden mold as shown in figures 3 and 4. It will be necessary to get the wax good and hot in order to make it run in the mold. A hot knife blade will help a great deal in pressing the wax into place and smoothing it up afterward.

It is important to put the rings B2 and B3 on first, but connect the filament wires D and F before this. Then the other two rings may be put in place. A short piece of rubber tubing should be put over the wire at K and K1, where the filament wires go under the outside rings.

It will be seen from the drawing that the rings B and B2 are farther apart than B3 and B4. This arrangement makes it impossible to get the bulb connected up backwards as it will only fit one way. The clips are made as shown in figures 1 and 2. No dimensions are given as the builder will make them to suit himself anyway. In cutting out the strips for the clips, which are made of spring brass, do not forget the lugs A, figures 1 and 2. The purpose of these is to hold the bulb from falling or sliding downward. The wires should be soldered to the rings before the wax is put in as soldering would melt the wax. The extra filament wire G, can be left short and can be soldered on to lead F, when necessary. It can be seen that this method has many advantages over the regular way, as it is a very good idea to remove the bulb and lock it up when leaving the station, so that it can not be tampered with or broken.



The Audion Detector, Especially of the Tubular Form, Is Always a Difficult Instrument to Mount and Connect. The Present Design of Holder Solves the Problem Satisfactorily.

FRENCH BUILD RADIO TO AID AMERICA.

The French navy has just entered the international contest for the honor of building and possessing the most powerful wireless station in the world.

In support of its claims that its newly constructed station exceeds all others now in operation, the French navy has just demonstrated its ability to send messages as far as Australia. The stations there, which registered the messages from the new French naval station, were not powerful enough to acknowledge by wireless their receipt, but had the courtesy to reply by ordinary cable that the French wireless communications had been received.

The new French naval wireless station is in reality an acknowledgment of gratitude of the French navy to the United States for its entrance into the war.

The moment America made its formal declaration of war against the enemies of France, the French navy decided to erect immediately a powerful wireless station that would put France into constant and sure touch with America. It was planned also as a very effective safeguard against the submarines for the stream of troop ships and munition convoys which it was realized would soon be headed for France.

A site was accordingly chosen on the French coast, where it was most likely that one of the American naval bases would be establisht, and from where it would be able to pick up with the greatest degree of certainty distress messages from any American boat that might encounter a submarine.

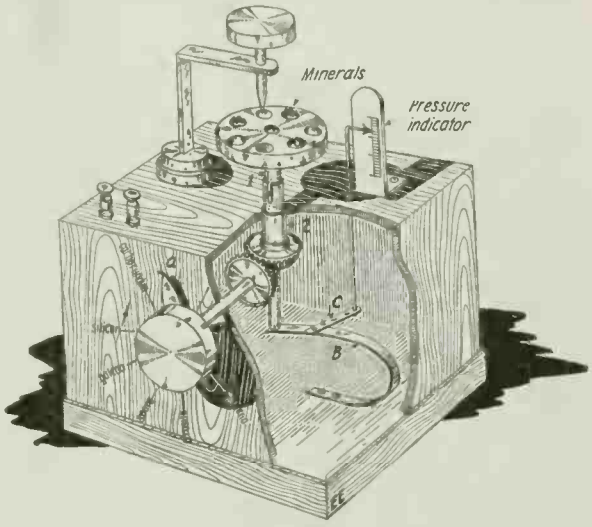
The metallic pylons of the French station are over 600 feet high. Perfected electrical equipment makes it possible to send out waves that will be received at any distance at which they can be picked up in the form of musical sounds instead of the ordinary crack-crack of the wireless. As a result of these musical intonations the receiver is always able to pick out the waves of the French wireless plant from all the other storm or wireless waves with which the air may be filled.

Waves can be sent out with a length of from 3,000 to 13,000 yards (approximately 2,700 to 11,890 meters) and which, as has already been demonstrated, carry as far as Australia.

The electrical apparatus furnishing the current for these waves is capable of producing 600 horsepower.

A RESEARCH TYPE OF DETECTOR.

Herewith I present drawings and specifications of a detector comprising two distinct merits. First—that it can be determined what pressure each mineral requires, pressure being recorded on the upright scale. Second—That the detector cup is made movable by means of gear-wheel attachments, and a graduated scale on the front of cabinet shows which mineral is under point of detector; other minerals may be brought under the point by turning the handle which revolves cup. It will be an easy matter to compile a set of *pressure* readings for each mineral contained in the cup, and from this a fair idea as to just what pressure each mineral requires, will be had.



This Form of "Research" Radio Detector Will Prove Extremely Valuable in Conducting Qualitative Tests on Various Crystals, as the Relative Pressure Applied on Each Crystal Is Indicated on the Scale.

As will be noted, no measurements are given; first, because the detector parts may be of different construction and material; secondly, because different size cogs may be used, as a whole any material on hand may be used if the original idea is carried out.

Contributed by E. T. J.

DR. FERDINAND BRAUN DIES.

Dr Ferdinand Braun, who shared the Nobel Peace Prize with Marconi in 1909, died April 20th in Kings County Hospital, in Brooklyn, in the sixty-eighth year of his age. He had been living with his son, Conrad, having come to the United States in 1915 as a witness in the litigation between the Marconi Company and the German company which then operated the wireless plants at Sayville, L. I., and Tuckerton, N. J. He had made a study of wireless since 1898, and it was claimed by his adherents that his discoveries had made the Marconi system possible.

His system of wireless transmission was used in Germany. He was born in Fulda, Germany, June 6, 1850, and graduated from the University of Berlin in 1872, with a work on the vibration of chords. He was for some years a professor of physics in Strassburg and Karlsruhe, and for ten years in the Tübingen University.