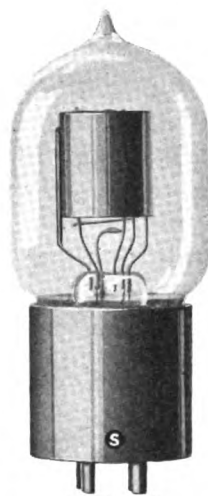


PACIFIC RADIO NEWS

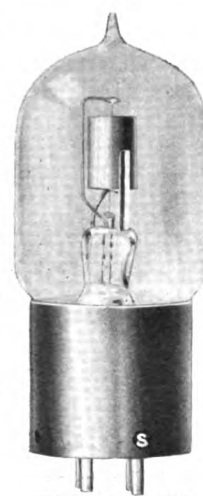
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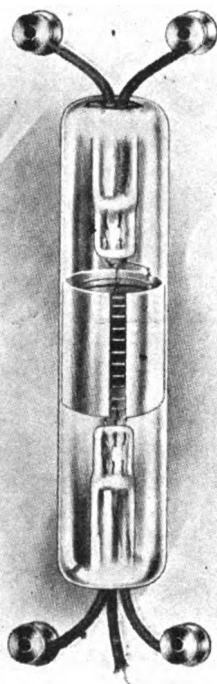
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PACIFIC RADIO NEWS

RADIOTORIAL
BY THE EDITOR

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“AS A MAN THINKETH, SO IS HE”

AND that is a truth that is being proved more and more every day.

There are a certain number of men, radio engineers, radio operators in commercial practice, and amateur operators, who **THINK** that the radio business is no place for them—that there is no money in it; or, in the case of the amateur radio man, that it takes too much of his time. These men knock the radio game hard, but we can forgive them, because they only speak as they **THINK**, and as they think, **SO ARE** they. But it is time for all the knockers to turn over a new leaf. This is the day of reconstruction; the days of destruction have shortly been left behind.

We need reconstruction within ourselves; we need to build our minds anew and fill them with clean, intelligent wisdom, just as we must build our muscles and bodies, physically, by exercise.

First of all—**BE SATISFIED**. If you are a radio engineer for the Blank Corporation at so much per month—**BE SATISFIED**. You may have fifty-seven varieties of things that you can grumble about **IF YOU WANT TO**—but why grumble? **YOU ARE THE MASTER OF YOUR FATE!** If you are in a position where you think you must grumble, **GET OUT!** That's all!! Put yourself where you are satisfied, happy and contented; life's too short to spend one-half of it in knocking, frowning, kicking and grumbling. If you are a radio operator at sea, and you don't like the ship you are on, **GET OFF** when you come ashore and make your report. If you are an amateur operator and your parents say you can't have a radio set any more because your reports are too bad, just sit down and figure out that it is your own fault. Weren't **YOU** the one to neglect your studies? You didn't **HAVE TO** do it.

After you are satisfied that you **ARE** satisfied with radio as a life work, then never be satisfied until you are master of your profession in every detail, for all improvement in life comes from those who are not satisfied with being a poor performer in any work. “Watch your step” and **GROW**

MEN and BOYS—GET OUT OF THE RUT! THINK RIGHT! Don't blame it on to the other fellow all the time because you are not satisfied. Take stock of yourself and see, first, whether you are not the one to blame for not being satisfied. And if you have done that carefully and realized that you were all right, but that your environment was wrong, why simply **GET OUT** of that environment. Place yourself where you **CAN** be happy.

But many of us are going to have a hard struggle to “police up” our minds. We are going to go to the bottom and pull out all the trash and rubbish, and begin anew.

Here is one of the first things to remember: **ALWAYS LOOK** on the **BEST SIDE** of life; always look on the bright side of the subject. If you are gloating, (for gloating it is), over some despondent problem, or over some disagreeable situation, just say to yourself, “What does it gain myself, or anyone else to worry, despair or grumble about this? I'm going to forget it and think of the pleasantest thing I know of.”

And another of the most important things to learn in this life is **CONCENTRATION**. If you have a stack of fifty **MSGS** to get thru. Don't worry about No. 50 while you are sending No. 6, or No. 1. Think of, and do, **ONE THING AT A TIME**.

And a word for the amateur men: **FINISH YOUR SETS**. Don't be com-

pletely changing your apparatus about every month. Sit down and design yourself something that you want,—get to work—and **FINISH YOUR JOB**, and have your set so that any time when you want to send a message you have only to sit down, put on your 'phones, and throw a couple of switches and send. Don't have a bunch of apparatus connected together with seven different kinds of wire, and scattered all over. If you do—you will never be satisfied. Amateurs! Have a complete radio set, and nothing else. You don't have, to have a \$1000.00 set, but you can have a complete one. Improve yourself! If you can't send; practice! Ask some man who knows, whether your sending is all right, and let him tell you why it is not right. Receiving will come to you easy enough. When a man is sending to you, on the air, and has something to say, don't let him send faster than you can receive. It doesn't pay to try to pose as a “speed eater” if you can't hold up your end of the game. You'll be found out sooner or later; besides, the operator sending to you might improve his sending an hundredfold if he did send slower.

But for the man who puts money before anything else; who judges men by the money they have; who accepts positions only because the salary is good, and, worst of all, the man who selects his profession because “there's money in it” we feel extremely sorry, because he gets pretty old before he realizes his mistake in life, **UNLESS** he is saved in time.

There is only one way to success, and that is to enter that vocation or profession where one can give more nearly 100 per cent efficiency and where one can give the best service. If every one

(Continued on page 30)

DOWN TO THE
MINUTE

Current Radio News

UP TO THE
STANDARD

THE following international conventional abbreviation has been published by the Berne International Bureau:

"Q. T. B.—I am not in accord with you in your statement of the number of words. I repeat the first letter of each word and the first figure of each number."

The operator, after sending Q. T. B., proceeds to transmit the first letter of each counted word. Q. T. B., followed by an interrogation point, means "Are you in accord with my check?"

THE British Government has placed a charge of six shillings on bearings received from radio compass stations in British waters.

MR. A. S. McKenzie, who is in charge of the Pacific Radio School in San Francisco, announces that a sending and receiving contest is being held at regular intervals. The contest usually takes place at the end of every month and radio apparatus is awarded as a prize to the winner. Mr. D. B. McGowan, assistant U. S. radio inspector at San Francisco, acts as judge and awards the prize to the best sender, regardless of his speed. A beginner, therefore, has the same chance of winning the prize as the more advanced student.

A contest was held on July 30th and a complete audion control panel with bulb and battery was awarded Mr. W. J. Martin, who has been at the school for only two weeks. The second prize, an Audiotron bulb, was awarded to Mr. C. W. Tinsley, instructor of electricity at the Polytechnic High School.

THE radio inspector at San Francisco states that A. R. Helms, an Oakland amateur radio operator and formerly of the naval radio service, is to be prosecuted for operating an amateur radio station without either operator or station licenses. The maximum penalty for such operation is \$2,500 fine and three years' imprisonment.

WILLIAM Wrigley, Jr., broke the record for wireless telephone conversation on July 16th, according to the San Pedro "Pilot." Wrigley called the Avalon radio station about 2:30 p. m. and was able to converse as rapidly as people in Los Angeles. Over the phone he was given a detailed report of the day's events at Catalina. Mr. Wrigley congratulated the operator on the achievement and added: "Now I suppose you will invent some kind of a wireless wave that will enable me to make week-end trips from Chicago to Catalina."

MR. O. M. Heacock, a jeweler in Enterprise, Ore., has reported hearing the radio telephone at Avalon, Catalina Island, on many occasions. This is indeed remarkable work, considering the fact that Oregon is over 600 miles from Avalon. The receiving equipment used in intercepting the radiophone signals is of the regenerative type. An aerial, 90 feet high and 125 feet long, was used by Mr. Heacock.

THE following extracts are from a letter received from Mr. W. H. Smith, of the Colorado Wireless Association, Denver, Colorado:

"The Avalon radio telephone has been heard in Denver. The voice of the Avalon operator comes in very loud and distinct—almost as loud as an ordinary city telephone system. My receiving instruments comprise a short wave loose coupler, single Audio Tron bulb and a sixty foot T aerial, 130 feet high."

Mr. W. H. Smith's station is located in the Y. M. C. A. building at Denver.

MR. A. E. Bessey (6BR) has just returned from a vacation trip through Southern California. Mr. Bessey had a complete sending and receiving equipment mounted on his automobile with which he was able to communicate with amateur stations along the route at all times. San Francisco amateur stations were heard as far south as San Diego, although the transmitting range was rather limited, owing to the small power available to operate the transmitter.

WITHIN the next few months installation of the combined wireless telephone and telegraph sets will commence in San Francisco, according to Mr. A. A. Isbell, Pacific Coast Manager of the Radio Corporation of America. The new equipments will be installed on vessels leaving this port; it is expected that the Admiral Line will be the first to adopt the new device.

CONSTRUCTION of a large aerial was recently started in San Diego by the Southern Electrical Company for the use of the Boy Scouts' Wireless Plant. Mr. Claude Seaman, manager of the radio department of the Southern Electrical Company, states that an efficient receiving set will be installed in order to enable the Scouts to copy P. O. Z. and other European stations.

STATIC has been eliminated at the Naval Radio Station on Goat Island (Yerba Buena) San Francisco, by the use of an underwater aerial system.

WHEN MELBA sang by wireless telephone to an audience 100 miles away, most folks who read about it were thrilled at the alluring idea.

Why can't all the world listen in, at a future time, when a great diva pours forth her golden notes?

One man, meanwhile, is not waiting for such a development of radio wonders. He is the Rev. Clayton B. Wells, pastor of Fairmont Congregational church, Wichita, Kas. With the co-operation of one of his parishioners, C. A. Stanley, Dr. Wells preaches every Sunday to 1000 wireless operators, amateur and otherwise, who live in a radius of 500 miles from Wichita.

And the wireless "bugs" like it! Stanley cut in one Sunday night to ask how many operators on his wave-length had been to church. There were no ayes, but a babel of noes. A night watchman at a cement plant near Waterloo, Ia., said he had to sleep in the daytime, and thus never got to hear a good sermon.

That started the wireless "services." To the present the operators haven't been told to join in singing "Hymn No. 546," but there are plenty of ethereal Amens when the concluding benediction has been spoken.—"San Diego Sun."

PACIFIC COAST RADIO CONVENTION
PLANS WELL UNDER WAY

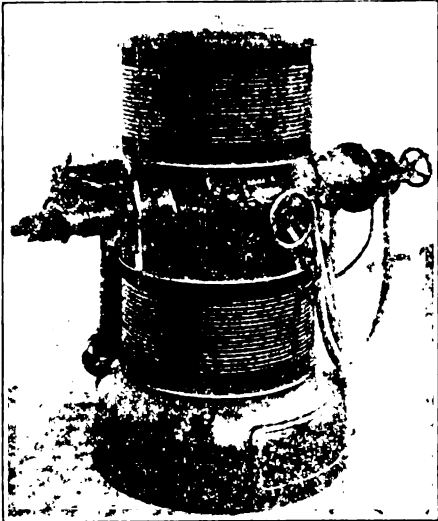
At the last meeting of the San Francisco Radio Club, Inc., it was decided to increase the number of candidates on the Convention Committee to ten instead of five, as was previously proposed. A committee of five leading radio manufacturers will be asked to serve on a special advisory committee in order to cooperate with the club's committee. It is respectfully requested that all radio clubs on the Pacific Coast communicate with the Convention Committee in order to make the coming affair a huge success. It is proposed to have the convention extend over a period of three days. A banquet and Radio Operators' Ball will conclude the affair. Mr. R. M. Klein, manager of the local DeForest office, will install a complete amplifying receiving equipment and loud speaker. Music for the ball will be furnished by radio. Radio clubs on the Pacific Coast, who desire to take an active part in the affair, should communicate with the Convention Committee, San Francisco Radio Club, Inc., 355 Presidio Ave., San Francisco.

If you cannot spare \$2.00 today for a yearly subscription to "Pacific Radio News," send us a dollar bill and we will enter your subscription for six months.

Arc Radio Apparatus

By Jennings B. Dow

Published by Permission of the Secretary of the Navy.



A 20 K. W. Federal Arc.
All parts of the chamber as well as the
Electrodes are water-cooled.

Arc Radio Apparatus, important as it is in the commercial field today, has never come into general use by experimenters. At the present time, it is a most reliable source of sustained oscillations, and, neglecting the recent designs of high-power vacuum tubes and high frequency alternators, it has been practically the only source of undamped oscillating current. At the close of the past year it was estimated that, considering the actual power radiated into space per day for radio purposes, the arc was responsible for twenty times as much as all other systems combined.

The very limited use of this apparatus by experimenters may be accounted for, in a measure at least, by the following facts:

1. Literature on the subject has been very limited because its development has been confined to research by very few engineers, and its commercialization has taken place thru more or less secret channels.

2. The general use of the vacuum tube by experimenters has taken place only within the past few years previous to which time the reception of undamped waves was possible only with such apparatus as choppers and arc heterodynes which, at their best, were very troublesome.

3. Until recently, it was impossible to use the arc successfully with circuits having wave-lengths shorter than 2400 meters.

4. Early designs of arc apparatus were very unsatisfactory in operation, and many pioneers in this field were loath to give them up in preference

to the less troublesome spark apparatus.

5. The invention of a successful high current microphone, the dream of most early investigators with which to control the arc output for radio telephone purposes, was not forthcoming and many gave up work with this apparatus to search for the more easily controlled generators of high-frequency currents found in the vacuum tube, and, thanks to Mr. E. F. W. Alexander-son, in the more powerful high-frequency alternator.

The Poulsen arc of today is practically as it was some fifteen years ago. It is true that refinements have been added and the sizes have been materially increased, but no great changes in fundamental principle have been made. Considerable effort has been put forth lately towards the development of the smaller sizes (under 5 K. W.), which have always been a source of much trouble, and toward the development of the arc for use with circuits having short periods of oscillation, that is, frequencies over 200,000 which correspond to wavelengths below 1500 meters. This effort has been awarded with some measure of success.

The phenomena taking place between the electrodes of the arc are not well understood; the exact theory of the magnetic field and the gas which is administered into the chamber are still puzzles; and the theories advanced on these are awaiting proof. With regard to the oscillating circuit, potentials of hundreds of thousands of volts are commonly found in certain parts of this circuit, even though but a few millihenries of inductance and a small capacity are used. Mathematics accounts for only a small portion of this potential.

The author has found recently that the constants of the supply circuit seriously affect the operation of the arc at the higher frequencies, and has also found that by applying certain laws founded upon an investigation of this characteristic, that pure undamped waves, rivaling those produced by the vacuum tube, could be obtained up to frequencies as high as 300,000, corresponding to a wavelength of 1000 meters.

In the development of the arc to its present status, great credit is due the engineers of the Federal Telegraph Company whose work resulted in the development of the high power arc apparatus with which it was possible to transmit

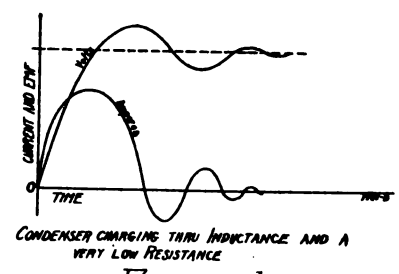
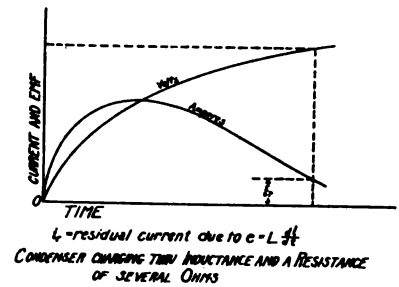


Figure 1

an almost uninterrupted flow of dispatches during the war from our shores to our forces at sea and abroad.

Theory of the Arc

The singing arc, the discovery of which is due to Duddell's work in 1900, was the forerunner of our present arc radio transmitter. If an ordinary electric arc between two had uncured carbons be shunted with a circuit consisting of an inductance of a fraction of a milli-henry in series with a capacity of a few microfarads (ordinary paper telephone condensers if the arc voltage is not greatly in excess of 110 volts), it will be found that under certain conditions of adjustment, the arc will emit a highly musical note which may be varied by changing the magnitude of either inductance or capacity. An inductance of a henry or more should be placed in each leg of the supply circuit. The phenomena briefly is this: owing to the potential difference across the arc, a current begins to flow into the condenser circuit; this current, however, is virtually robbed from the arc because the time constant of the inductance in the supply circuit is such that a sufficient momentary current is not available to supply both arc and condenser circuit, and the current consumed by the arc falls off. Owing to this falling characteristic of the arc, the potential across the electrodes rises as the current falls off and more current flows into the shunt circuit further charging the condenser. The current rises very rapidly at first (see curve in Fig. 1)

(Continued on page 24.)

ARCO RADIO APPARATUS

(Continued from page 23.)

owing to the low resistance and small value of inductance in the shunt circuit.

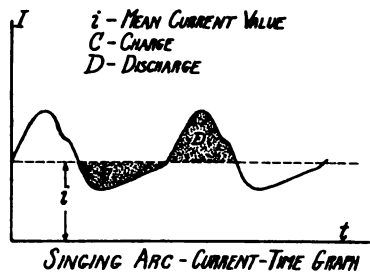


Figure 2

As the charging of the condenser continues the current reaches a maximum

and then begins to decay because the impressed electro-motive-force and the condenser electro-motive-force resulting from the charge approach the same value. When the condenser is fully charged, a current still continues to flow owing to the self-inductance of the circuit. This additional current tends to over-charge the condenser, the potential across it becomes greater than the impressed electro-motive force, and a current flows back into the arc discharging this stored electrical energy.

It will be observed by referring to Fig. 2, that the effect of the condenser circuit is to make the current in the arc pulsating and that the current never reaches zero in value, in other words, the

arc is never extinguished and this is the case usually found in singing arcs.

The ordinary singing arc has little place in the radio field as its efficiency is a matter of only a few percent, and the frequency of oscillation is entirely too low. It may be so modified, however, that its efficiency may be materially increased and the frequency of oscillation brought well within the range of radio frequencies. These modifications consist chiefly in changing the material of the positive electrode to copper, in enclosing the arc within an air-tight chamber into which a hydrocarbon gas may be administered, and in placing the arc within a powerful magnetic field.

(To Be Continued)

Commercial Operators Ask Pay Increase

THE United Radio Telegraphers' Association, a nation-wide organization of marine radio operators, recently conferred with Admiral Benson, chairman of the Shipping Board, in order to present their demands for an increase in wages for radio men employed aboard ship. The demands included an eight hour day, with provisions for overtime pay, increases of pay amounting to \$75.00 monthly for senior radio operator and \$50.00 monthly for junior operator, assurance that operators would not be required to perform additional services on board ships and that they would be permitted to leave the vessels when they were in port. The chairman of the Shipping Board and various shipowners refused to grant the demands. By figuring the overtime clause on a rather liberal scale, the shipowners declared that a chief operator might draw as much sal-

ary as a first mate on a large freighter. The main purpose of presenting the aforesaid demands was to put the marine radio operator on the same basis of pay as the third mate on the average vessel.

Admiral Benson proposed a plan whereby the salaries of the operators will be increased with the performance of certain years of service. For instance, it is believed that the Commissioner of Navigation will recommend a certain percentage of increase every few years. It is suggested that a 10 per cent increase be put into force for the chief operator every three or five years. It is said that the governmental board feels that the radio service should be encouraged and that there ought to be some stimulus for an operator to remain in the service after he obtains a position as senior operator. At the present time he cannot make more than \$125.00 per

month if he confines himself to radio work.

The United Radio Telegraphers' Association is working out a plan whereby four distinct grades of licenses may be issued to commercial radio operators. This plan will be submitted to the Commissioner of Navigation. Applicants who successfully pass the examination for a commercial license, but who have had no experience aboard ship, will receive a fourth grade license, according to the provided plan. A first grade license will be issued only to commercial operators who have served as senior radio operator aboard ocean-going vessels for a number of years. In this manner an operator with years of experience will be rewarded with better pay. The leaders of the association have accepted a proposal made by Admiral Benson for the extension of the life of the present agreement for ninety days.

Standardization Department

We beg to offer to the science of radio communication and allied branches of the radio industry a new department as a clearing house for ideas on standardization, and as a means for establishing for radio engineers, designers, experimenters and other interested parties certain accepted standards in this field.

It is the intention of this department to be the mouthpiece for authorities on the subject of radio, and, in fact for all those who can submit intelligent ideas towards the standardization of radio terms.

Radio is a young branch of science and, although it has seen many years of commercial practice, it is in bad need of standardization. The advance of the science has been so extremely rapid that it has heretofore been practically impossible to determine on any common

and accepted basis, terms, methods, designs, dimensions, systems and so forth. It is felt that a department of this type in this publication will bring about a means of working up to a point of complete standardization of the elements of the radio industry. Radio engineers, radio experimenters in colleges, universities or private laboratories, physicists, and, in fact, all men interested in the commercial and practical phase of the radio science are invited to contribute their ideas towards the building up of terms, symbols, methods, dimensions, designs, systems, etc., and standardizing them throughout the United States.

Material for this department must be written on paper 8x11 inches (letter size) preferably typewritten double space, with writing on one side of the paper only. If original manuscript is desired to be returned, stamps must be enclosed.

AMATEUR WIRELESS MEN INTERRUPTING PLANE FIRE PATROL

Please get off the air wave.

This is the plea of Captain Walsh, in charge of the wireless at Mather Field, to two amateur wireless operators, believed to be operating in this city. They sign themselves "6 G R" and "6 G F."

Through the interposition of these two operators Mather Field is finding it very difficult to keep in touch with the planes in air patrol work.

"We can't get our messages through because of the air rumpus caused by these two mystery operators," Walsh declared yesterday.

Walsh doesn't care how much the amateurs cut up at night, but his plea to them is to keep out of the air between the hours of 8 a. m. and 5 p. m. —Sacramento Union.

An Efficient Radio Telephone

By Edwin S. Watkins

A simple, yet efficient, continuous wave transmitter for either telephone or telegraph signals is within the means of every radio amateur possessing a few vacuum tubes, some batteries and the usual line of miscellaneous material found around the experimenter's laboratory.

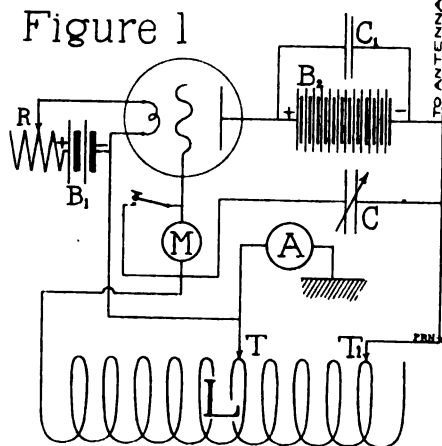
The main difficulty with most short wave bulb sets is their instability of oscillation. The importance of such a condition may be readily realized if one calls to mind that the difference in frequency between waves of 199 and 200 meters is over 7500 cycles and that if the difference in timing between the receiving and transmitting sets be more than 2 meters the resultant "beat" will run into inaudibility.

The set described below was, during actual daylight tests in the summer, between Souge and Coetquidan, France, a distance of about 90 miles, found to render quite efficient results on both continuous waves and telephone, using three French "Fotos" amplifier tubes whose constants were somewhat similar to the new Moorhead tube. The wavelength used was 192 meters and the plate voltage during most of the tests was 220 volts, altho it was found that readable telegraph signals could be obtained with as little as 90 volts on the plate.

Referring to the diagram; (Fig. 1) the inductance, L is made up of 60 turns of numbers 18, D. C. C. wire, so wound on a 2½ inch tube, that it may be tapped into with leads T and T1, on any turn between the 20th and the last. This is best accomplished by baring and twisting about ½ inch of wire at each turn, being careful not to short-circuit the turns. Feed-back and change of wave is secured by the above taps and condenser C, of .001 mfd. capacity. C, is a .5 mfd. fixed condenser shunted around the high voltage battery, thus reducing the high frequency resistance due to the battery. It should be insulated to withstand twice the voltage of the battery B2 on account of high frequency surges which are liable to puncture it. When using 220 volts on the plate, a standard .5 mfd., 550 volt telephone condenser functioned quite satisfactorily.

The microphone, M, operates best when in series with the grid, as shown. In our tests we had access only to high resistance types; consequently to obtain good results, had to utilize at least three in parallel.

Connecting the microphones across several turns of the inductance, L and putting it in the ground lead were both



tried, but in the former the audibility dropped fully fifty percent and in the latter a continuous buzz, due probably to arcing between the carbon granules, accompanied the signals. The only advantage gained by shunting the microphone across several turns of the inductance is that the potential drop across the former is comparatively low and if the speaker happens to accidentally touch it he will not receive the jolt he would get were it in the grid circuit.

An ordinary six volt accumulator, B1, lights the filaments of as many bulbs in parallel as you wish to operate. If more than three bulbs are used the wire on inductance L should be increased in size proportionally.

A radio frequency ammeter, A, in the ground circuit is necessary in tuning the set. Its size will depend on the number of tubes used.

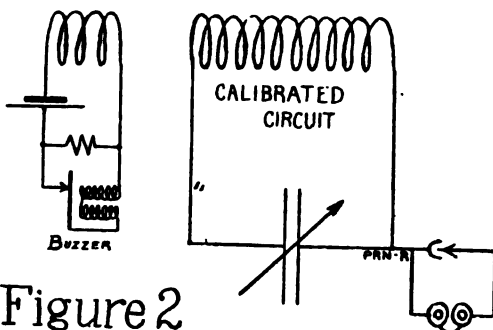


Figure 2

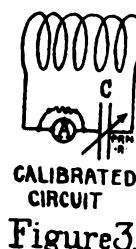


Figure 3

Connect the apparatus as indicated, using flexible leads with connecting clip terminals for T and T1. The tubes are then lighted to slightly above normal brilliancy and the telegraph key, K, around the microphone, closed. A buzzer jigger wave meter, (Fig. 2), is placed in inductive relation to L. Terminal T1 is connected to the end of inductance L, and T is connected approximately in the

center. The condenser is regulated to about one-half its capacity. A reading on the ammeter indicates when the set is in oscillation. The wave meter frequency is then varied until maximum response is received in the headphones. If the signals are very loud, remove the wavemeter until they are just audible. A wave length reading should be noted. Another reading is then taken with T1, at the fortieth turn and T at the twentieth turn. From these two readings you can estimate approximately how many turns to use for the desired wavelength. When the latter condition is obtained, the ratio of turns on either side of T is varied in conjunction with condenser C until maximum radiation is indicated.

If the constructor of this set possesses a sensitive hot wire meter, (a milli-ammeter reading 0 to 150 or 300 ma.), the wave meter circuit shown in Fig. 3 will be very precise in its working. It must, of course be ascertained whether the wave length radiated by the oscillator is long enough to affect the wave meter. This can only be found by computation or by experiment. With the circuit shown in Figure 3 and the oscillator in operation, the wave meter milli-ammeter will indicate current very quickly when the condenser C is on the correct wave. Sometimes, however, moving the condenser a sixteenth of an inch will throw it out of resonance.

It will be found that a very fine compensating adjustment for the changing of wave length for the different positions of T and T1 can be made with condenser C, thus keeping the radiation at a maximum thruout the wavelength range.

Using the three above mentioned "Fotos" bulbs it was possible to put out as much as one ampere, on 300 volts, in the plate circuit. At 220 volts the radiation was slightly less. The output dropped to .6 of an ampere when the microphone was in circuit.

Telephonic communication between airplanes and from airplane to ground


(Continued on page 38.)

RADIO station 7YS holds the distinction of being one of the most efficient stations in the state of Washington. The station is owned and operated by Rev. Sebastian Ruth, of St. Martin's College, Lacey, Washington. Amateurs in California report good signals from 7YS. The best distance covered is Phoenix, Ariz. Rev. Ruth has often heard 6GQ, 6CC, 6BQ, 6BR, 6AT, 6CO, 6CS, 6FE, 6OH and others. A total number of 216 relay messages have been handled by 7YS since January 1, 1920. Weather reports are broadcasted every evening at nine o'clock on 375 meters.

The receiving equipment consists of a short and long wave regenerative receiver, equipped with honey-comb coils. A Murdock one kilowatt transformer is used for transmitting as well as a special type rotary gap, oil immersed condenser

7 Y S

The well known
amateur radio
station of
Rev. S. Ruth,
St. Martins College
Lacey,
Washington



and a large oscillation transformer. The aerial is of the "T" type, 100 feet high and 300 feet long. Stranded phosphor bronze wire is used throughout.

For long wave reception a single wire aerial, one-half mile long, is used. The radiation of the transmitter is six amperes on 375 meters.

How to Get a Patent

By T. A. CUTTING

ANY person who has invented something useful and new may apply for a United States patent. It is not necessary to pay an attorney a large fee to make out the papers; any inventor is privileged to prosecute his own case. This is not a difficult matter if one knows how to go about it.

The total cost of a patent, if an inventor makes his own drawings, writes his specifications and the description of his device, is thirty-five dollars. It is payable to the patent office in two installments, fifteen dollars upon submitting the application and twenty dollars when the final papers are made out.

If a person hits upon something new in his radio experiments, the cost of a decision upon its patentability is merely the cost of the application—fifteen dollars. If there is any uncertainty concerning the commercial value of an invention, it is a good plan to draw up the papers and sketches in the manner that will be explained and mail them, either flat or in a substantial mailing roll, to the Commissioner of Patents, Washington, D. C. Even the initial fifteen dollars may be omitted. The informal application will then be placed on file in the government office, and the idea is safe.

Now ask others about your idea; try to sell the prospective patent, or get someone interested in its promotion. As soon as you are convinced of its commercial possibilities, send the fee and continue the prosecution of the case.

All this must be done within one year, however, or the application will lapse.

There are five necessary requirements in applying for a patent:

1. A petition
2. An oath, requiring a notary's signature.
3. A carefully executed drawing of the device.
4. A specification describing the invention.
5. An initial government fee of \$15.

The United States Patent Office, Washington, D. C. will furnish a free booklet upon request, entitled "Rules of Practice in the U. S. Patent Office", which contains the proper forms for the petition and oath. These forms must be copied and filled in, and the oath sworn to before a notary.

The drawing must be made on bristol board, ten by fifteen inches in size. There must be an inch margin left all around, and inside the margin at the top, a space of one and a quarter inches must be left for the printer's title. The drawing must be done in India ink with draughtsman's instruments, and the parts of the device neatly numbered.

The specification must begin in the formal manner indicated in the specimen patent, printed in the "Rules of Practice." It must then tell to what the patent relates, enumerate the objects of the device, and describe in detail the manner of its construction and operation, detailed reference being made to the drawings.

The claim concludes the specification. This is the most important part of the patent, and must be carefully written so as to fully protect the invention. Claim everything about your device that you believe to be new. If you claim something that has been invented before, the examiners will reject the claim and refer you to previous patents showing the same device. But rejected claims are no need for discouragement. Send for copies of the patents cited, study them carefully, see if the idea is really the same as yours; if not, revise your claims, wording them more clearly or specifically, and point out to the examiner wherein your device essentially differs from that which he has cited.

The correct form for amending specifications or claims will be found in the aforementioned "Rules". Many times a slight change in the wording of claims will result in their final acceptance. A carbon copy of the entire specification should be kept so that the examiner's references to page and line may be traced.

The examiner will give notification as soon as the case has been allowed, and when the final fee of twenty dollars is to be paid. It takes three or four months, as a rule, to get the examiner's preliminary report. Every application must await its turn, as the amount of accumulated business is extensive. The whole process of getting a patent will often take more than a year, but development may safely begin as soon as the patent has been applied for.

MANUEL Spagnuolo of 721 Kirkham street, Oakland, Cal., (6LL) has been penalized by the local radio inspector for causing willful interference with

other amateur stations. His license has been suspended for a period of thirty days.

You pay \$2.40 a year for "Pacific Radio News" if you buy it from your news dealer every month. You save 40 cents by subscribing. Why not do it?

Radio Club News

NEW RADIO CLUB IN MILWAUKEE

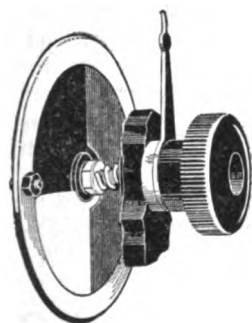
The Wisconsin Radio League, 373 Broadway, Milwaukee, Wisconsin, was recently organized to further the interests of radio communication. Mr. R. F. Laidlow is president of the club, Mr. Merwin Grogan is vice-president and Mr. Erving Strassman is secretary.

AUDION RAFFLE AT RADIO CLUB

On August 17th, the San Francisco Radio Club, Inc., will hold an audion raffle for the purpose of raising sufficient funds to complete the installation of the club's radio equipment. Audion apparatus of every description will be raffled and refreshments will be served. Several prominent speakers will address the audience. The initiation fee has been reduced to one dollar, extending over a period of thirty days. All prospective applicants should communicate with the secretary at once in order to receive the benefit of the low initiation fee.

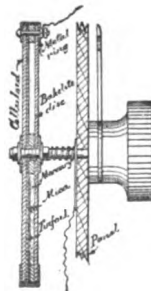
A NEW VARIABLE CONDENSER OF RADICAL DESIGN

Mr. John Parkin, Manager of the Parkin Mfg. Company, has applied for a patent on a variable condenser of unique construction and low minimum capacity. The condenser is constructed of three discs; one of fibre, one of mica and one of celluloid, the mica disc being in the center. Between the celluloid and mica disc is placed a semi-circular plate of tinfoil which forms one of the plates of the condenser. The fibre disc is separated by a distance of about 1/16 inch from the mica disc at the periphery by an insulating washer and at the center by a metal washer which serves to make contact with a quantity of mercury, with which the lower half of the space is filled. The accompanying views show the constructional details of the new condenser.



From the working sketch it will be noted that the discs are held together by a metal ring at the periphery and contact is thereby made with the foil plate. The ring is clamped securely in place under a pressure of five tons, making the escape of the mercury an impossibility. Connection for one side of the circuit is made by soldering a lug to the shaft, and from the other side, by a flexible wire attached to the ring provided for this purpose. This contact can also be made by a strip

of brass, mounted on the back of the panel and bearing against the ring. From the above it will be seen that the tinfoil constitutes one side of the condenser and the mercury constitutes the other. The mercury, by its own weight, is caused to remain in the lower half of the chamber at all times while the tinfoil plate will rotate with the condenser. Therefore, by rotating the tinfoil plate it is easily seen that the capacity of the condenser may be varied. The unit is only three inches in diameter and has a capacity of .001 mf. The full capacity is obtained when the tinfoil plate fully covers the layer of mercury. The



high capacity obtained in such a small space is due to the separation between the mercury and foil by means of the thin ruby-mica insulating disc. A lower minimum capacity that is possible to obtain with an air condensed is claimed by the manufacturer. A transparent celluloid cover allows the operation of the condenser to be visible at all times and facilitates the original setting in a zero position.

We need more amateur station photos and descriptions for publication in "Pacific Radio News." Every amateur who sends us a photo of his apparatus will receive the copper half-tone free of charge. Get busy!

We pay one cent per word for accepted "How-to-make-it" material. Get you pen and ink on the job.

Radio Club Directory

Published every month. It keeps you posted on important meetings.

United Radio Telegraphers' Association, Pacific Coast Division—Rooms 418-420, 24 California St., San Francisco Cal. Phone Douglas 706. All commercial operators eligible for membership. Address communications to above address.

San Francisco Radio Club, Inc., 355 Presidio Ave., San Francisco, Calif. Meetings every Tuesday evening at 8:30 P. M. Visitors welcome at any meeting except first meeting of the month. Initiation fee \$2.50. Monthly dues 50c. For experimental and commercial radio operators, address communications to the secretary, 355 Presidio Avenue.

The Bay Counties Radio Club. Meetings held every Friday evening at 354 Perry St., Oakland. Special Notice: Meetings suspended for summer months. Next meeting to be held on August 27th. Monthly dues 50c. Age limit 16 years. Visitors welcome. Address communications to the secretary, 354 Perry street, Oakland. —adv.

SIXTH DISTRICT AMATEUR STATIONS—Continued.

6WW	N. Lewis, Jr.	2666 Orchard st.	Oakland, Cal.
6WX	W. Korf	816 N. Main st.	Napa, Cal.
6WY	E. Kensky	689 62nd st.	Oakland, Cal.
6WZ	Al Munzig	1017 Tribune st.	Redlands, Cal.
6AAB	F. Thompson	348 W. Milford st.	Los Angeles, Cal.
6AAC	E. Hockenbeamer	721 Arlington ave.	Berkeley, Cal.
6AAD	H. J. Balden		Fillmore, Cal.
6AAE	L. T. Hall	691 Post st.	San Francisco, Cal.
6AAF	L. B. Hinckley		Fillmore, Cal.
6AAG	C. A. Coffman	R. F. D. Box 140	Anaheim, Cal.
6AAH	C. Baldwin & M. Gardner	R. No. 6 N Center	Phoenix, Arizona.
6AAI	H. Ambler	1070 10th st.	San Diego, Cal.
6AAJ	N. C. DeWolfe	1540 Palou ave.	San Mateo, Cal.
6AAK	A. B. Lopez	206 Ellsworth	Santa Barbara, Cal.
6AAL	H. Fleur	720 Santa Barbara st.	San Francisco, Cal.
6AAM	C. H. Wiles	R. F. D. No. 1, Box 57A	Stockton, Cal.
6AAN	Jack Dent	3rd and Elm st.	San Diego, Cal.
6AAO	R. S. Hewitt	3039 Royal st.	Los Angeles, Cal.
6AAP	C. E. Peterson	529 Santa Inez Drive	San Mateo Cal.
6AAQ	C. Bane	262 Castro st.	San Francisco, Cal.
6AAR	C. Zeigler	6355 Dana st.	Oakland, Cal.
6AAS	F. F. Moffett	843 Lake st.	Reno, Nevada.
6AAT	I. H. Brush	545 B st.	Santa Rosa, Cal.
6AAU	J. Byrne	28 Union st.	Santa Cruz, Cal.
6AAV	V. Elliott	840 Magnolia st.	Pasadena, Cal.
6AAW	A. Woolf	1904 Shattuck ave.	Berkeley, Cal.
6AAX	K. Burzell	2705 Mobile ave.	Sawtelle, Cal.
6AAY	P. H. Gilbert		Big Creek, Cal.
6AAZ	E. A. Banks	1648 Neal st.	San Diego, Cal.
6ABA	P. F. Johnson	2940 Maiden Lane	Altadena, Cal.
6ABB	Edw. Prosek	1085 Church st.	San Francisco, Cal.
6ABC	A. K. Aster	910 Chestnut st.	Alameda, Cal.
6ABD	R. C. Thom	2625 53d st.	Los Angeles, Cal.
6ABE	W. R. Dodson	924 A ave.	National City, Cal.
6ABF	C. S. Smith	3512 Park Blvd.	Oakland, Cal.

Whistling Posts and Wireless Wizards

By M. Preston

OLD J. P. Warford, an ex-railroad operator of the old school, looked up suddenly from his cramped little desk to behold his small son standing outside with his nose flattened against the window pane, looking at him with an automobile salesman's expression on his face.

"Humph," said the old man, "must be Saturday again."

Mr. Warford drew a leather purse from his pocket and extracted a small coin which he laid on the railing that shut off his small desk space from the public. He jerked his thumb towards the coin and turned to his cluttered desk.

Jimmy entered the office gingerly and snapped up the coin with his usual alacrity, but instead of hastily retreating, as was his regular custom, he lingered at the railing, standing uneasily first upon one foot and then upon the other, gazing at the maps and ads upon the dingy walls as if he had never seen them before.

"Well," said Mr. Warford, looking up again, "didn't you get it?"

"Yes, but—"

"'Yes but', nothing, your Dads busy go on outside now and blow your money."

"But Pop, listen—"

"Get out," roared the old man, "I've got work to do. I'll talk to you tonight when I come home."

Jimmy vacated the office with reluctance.

A few moments later Mr. Warford became aware of a peculiar scraping sound beneath his feet. Occasionally there was a thump and a grunt and then more scraping. Old J. P. was very busy that morning. As a rule he was a tolerant father but today his already frayed nerves wouldn't stand for Jimmy fidgeting around the office. He took a paper weight from the desk and hammered lustily upon the office floor.

"For the love of Milke cut it out down there," he bellowed. "Keep out from underneath there, you'll ruin your clothes."

"I want this pipe and wire," came Jimmy's muffled voice through the floor.

This was too much for J. P. He would have to see what that young hyena wanted. He went outside and stood by the little square door that served as the entrance to the dark interior under the office.

"Come on out of there," he said sternly.

A grimy face and a pair of dusty slippers protruded through the door.

"Pop, can't I please have this old wire and water pipe that's under here?"

"What in the devil do you want with that junk?"

"I want to put up a wireless station."

"Wireless station? Then you don't need any wire. What you need is a face wash and a hair cut. Come out of there."

Jimmy came out and dusted off his clothes and did some thinking. It was quite evident that he had an irate parent to deal with and therefore the situation should be handled with care.

"Pop, no foolin'. I want to put up a wireless station. Lots of the boys have them and they can hear messages from all over. I know how to put it up if you will let me, and you can listen on it too."

This last remark was one of strategy. It hit the bullseye. Mr. Warford had been a telegraph operator for the major part of his life and "once a telegraph operator always one," in heart at least. Many times here of late he had felt lonesome for the click of the sounder. He felt that something had gone out of his life that belonged there. The thought that he might sit in his own home and listen to "traffic" going through was a pleasant one.

"But, Jimmie," he answered, "wireless is a new thing. It's a complicated and expensive pastime for grown-ups just now. I'm sure I don't understand it and I'm darned sure you don't. It would take a lot of money and I haven't any to throw away on something that probably wouldn't work. Wait until you get a little older and go to school and learn something about electricity before you try to put up a station. Anyway I don't own that stuff underneath the office. It belongs to the man that owns the building. I'm just renting this office. Go on down town and take in a movie and forget it."

"It don't take much money, either, just for a receiving station," said Jimmy. "All you need is a coherer, telephone receiver and a tuning coil. I can make the tuning coil and if I could have this pipe for a pole and the wire for an aerial I could put the whole thing up for just a couple of dollars."

If Jimmy had talked about the theory of a vacuum tube, his Dad wouldn't have known any more about it.

"I'll take your word for it, Jimmy, but forget about it for today and I'll talk it over with you tonight after supper."

With that Mr. Warford went back to the office, lit a fresh cigar and said to his partner across the room. "This wireless is getting to be quite a thing. I'm putting one up out at my place. Don't know how it will pan out, of course,

I'm just experimenting with it. I ought to be able to get messages and press for a hundred miles around."

"Is that so?" answered Frank. "Don't know anything about it, myself, but I should judge it would be very interesting as well as expensive, from what I've heard."

"Oh no, not expensive," said Mr. Warford. "Just a few dollars outlay for a receiving station. Why, all you need is a coherer and a -er-r-r tuning coil, I believe it's called, and a telephone receiver. Of course you have to have an aerial."

In the meantime Jimmy had gone around to see a certain Mr. Osgood who owned the real estate office occupied by his Dad. Mr. Osgood said that the old wire and water pipe beneath the office were no good to him and that Jimmy could have them. Jimmy requested and received a note to this effect addressed to his father.

Jimmy was more pleased with the note than he would have been with a check for a million dollars. He rushed breathlessly into his father's office with it and waited for the verdict.

"You're one of these quick and silent workers, eh?" said the old man. "How in thunder do you figure you will get it up to the house?"

"Drag it up."

"Drag it? Good Lord, that's about a mile and a half. You must think you are a truck horse."

"Well then, if you want to know, Bud is going to help me drag it up as far as the switch where the street car stops and most of the passengers get off. Then we are going to wait for Mr. Riley's car. He is that fat, grey-haired conductor. He said he would let me hitch it behind the car if I didn't tell anybody about it."

"Alright, if you can work it that way, go ahead. But don't try to put the pole up until I get home and help you. It's liable to fall on you."

"Can I have a couple of dollars to buy that stuff so we can have her working tonight?"

Old J. P. with many inward misgivings, but still hopeful, gave his son a five dollar bill. The bill and boy both vanished.

That day was, perhaps, the busiest of Jimmy's young life. Like all boys, what he wanted, he wanted bad, and didn't want to wait a minute for it. He hopped on a street car and went down town to a wireless shop and purchased a coherer, watchcase seventy-five ohm receiver, some cotton covered wire and a short length of 'phone cord. Then he

With the - - - Manufacturers

NEW RADIO COMPANY IN SEATTLE

The Northwest Radio Service Company, of Seattle, Washington, has been organized with headquarters at 609 Fourth Avenue, where a retail supply store will be conducted. The company has secured the Washington and Oregon agency for the Radisco apparatus as well as the Amrad product and others. A deForest radio telephone has been installed at the store for broadcasting music and speech daily. The Northwest Radio Service Company has the exclusive deForest agency for the city of Seattle. Commercial and amateur radio apparatus is carried in stock.

Static's enemy is here. "NOSTAT" has been placed on the market by Mr. Arthur Lynch, of Brooklyn, N. Y. The new device enables the operator to tune out static with perfect ease; it discriminates between the tones of the incoming signals as produced in the telephone receiver, just as the radio set discriminates between the electrical wavelengths. The "NOSTAT" pamphlet, that has just been issued, is a valuable bit of information that should not be overlooked by any radio man.

The American Radio and Research Corporation has distributed a complete trade catalog to the many radio dealers in this country. The catalog comprises five bulletins that deal with Quenched Gaps, Spark Coils, Oscillation Transformers, Transmitting Keys, Resistances, Wavemeters, Detectors and Lightning Switches. The catalog is of a very artistic design.

Mr. H. Berringer, who is in charge of the radio department of the California Electric Supply Company, has duplicated the transformer and rotary gap that he is using at his amateur station (6BJ) and has placed it on the radio market.

The Klaus Radio Company of Eureka, Illinois, is establishing agencies in various parts of the country to distribute a new line of apparatus. Besides manufacturing its own apparatus, the company distributes Grebe, DeForest, Murdock and other prominent makes of radio equipment.

Mr. C. A. Peregrine has succeeded Mr. G. G. Greene as instructor in charge of the Marconi Institute in San Francisco. One of the new one-half kilowatt Radio Corporation lamp transmitters will shortly be installed at the school.

ONE of the most distinct features of the Avalon radio telephone installation is the bell ringing arrangement. Confusion of messages from promiscuous wireless phones is eliminated and it is unaffected by messages from stations using the same wavelength. It will cut out all impulses except those on the Catalina service.

CORPORAL C. Morrison, formerly a signal corps radio operator on the U. S. A. T. "Sherman," is serving a four-year term in the local military prison. Morrison was found guilty of embezzling four hundred dollars of government funds collected on the vessel for radio tolls.

ANNOUNCEMENT

Mr. T. Lambert's article, "A Short Wave Regenerative Receiver," will appear in our next issue.

You should use the Classified Advertising section of "Pacific Radio News" if you desire to dispose of your apparatus. The rate is only three cents per word.

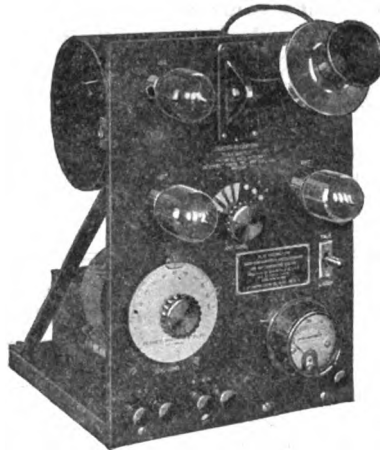
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TYPE OT-5



DeForest Portable "Radiophone" Transmitter
Buzzer Type OT-5

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Price

Without Storage Batteries
Including Vacuum Tubes
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Western Distributors

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WHISTLING POSTS AND WIRELESS WIZARDS

(Continued from page 28.)

talked a garage man out of a half-dozen cast-off dry cells.

He hurried home again and set about the construction of his tuning coil. An old rolling pin was pressed into service. Its handles were sawed off and the wire wound around the roller. A heavy piece of wire with a bit of sheet brass wrapped around it served as a slider. He mounted this astonishing outlay of apparatus on an old table close to his upstairs bed room window and then, with the aid of Bud and Mr. Riley's street car, the pole and coils of old lighting wire were brought to the house.

The heavy insulated wire that was to be used for his aerial gave him lots of trouble. It stood to reason, he thought, that no wireless message could penetrate the insulation, so therefore it must be burned, pounded, or scraped off. When this tedious task was completed he enlisted the services of several of his friends and the pole and aerial were hoisted into position, every bit of thirty feet above the ground. By supper time he had his station in commission, and the United Wireless station at the University, ten miles away, was coming in loud enough to read quite plainly.

When old J. P. came up the walk that evening he looked with distinct disfavor on Jimmy's bent mast and scraggly aerial. By the time he had reached the front porch he decided that it was an eye-sore to the community and when he got inside the house he swore that something would have to be done to keep that young one from tearing the house down regularly every Saturday. But as soon as he opened the door to Jimmy's bedroom he forgot all about these troubles.

"Gosh, Pop, just listen to 'em. Some station I've got, eh, Pop?"

The old man's eyes sparkled as he held the little receiver to his ear and listened to the snappy, clean cut Morse. "Some station, was right," he thought as he reached for a piece of paper and started to copy with the steady flow of the practised telegrapher's hand.

"Supper's ready," called Mrs. Watford.

Not a sound from above.

Fifteen minutes later Mrs. Watford made the announcement that if he didn't come to supper she was going to throw it out.

J. P. said "Damn the supper." Nevertheless he reluctantly went down and raced through the meal.

As soon as he had finished he called up his partner on the phone. "Come on over, Frank, and see my new wireless station."

"You don't say! It works alright then, eh?"

"She sure does. I'm getting messages from all over the country, right upstairs. Come right over and hear them."

Jimmy was already upstairs trying his best to grab a word with more than three letters in it when his Dad came in.

"Let me sit down there and copy. You are not a good enough operator to copy that man at the University."

"Well, I guess I know the code, don't I?"

"If you didn't I'd give you a lickin', but you just need a little more practice, that's all."

"Well I am practicing."

"You can do your practicing when I'm away, Jimmy. And listen, when Frank comes in and I start telling him about this wireless station I don't want you to butt in. Do you hear me? Don't tell your mother but here's twenty dollars. Tomorrow you go down to the lumber yard and get six two-by-fours. I want to put up a better mast. Spend the rest for a better outfit."

A moment later Frank came in.

"Hello Frank," said Mr. Warford, "just wanted to show you what I've been doing with my spare time. Been experimenting a bit with wireless telegraphy. Of course, this is just a makeshift outfit I've got, but it works. Now that I see it's going to pan out alright I'm going into the thing a little heavier. I'm going to have a sending set, too, so I can sit right here and talk to the other stations within fifty miles or so. It's a wonderful thing. Hear that little buzzing noise? That's it. Great stuff, eh?"

"But Dad, you didn't—" said Jimmy.

Mr. Warford gave his son a very penetrating look.

"You see Frank," he continued, "it comes in dots and dashes like this." He wrote a string of dots and dashes on a sheet of paper. "Here Jimmy, see if you can read what I've written down."

Jimmy read:

"YOUR MOTHER WANTS YOU. BEAT IT."

WIRELESS GOSSIP BY IDLE OPERATORS WILL NO LONGER CLUTTER UP THE ETHER

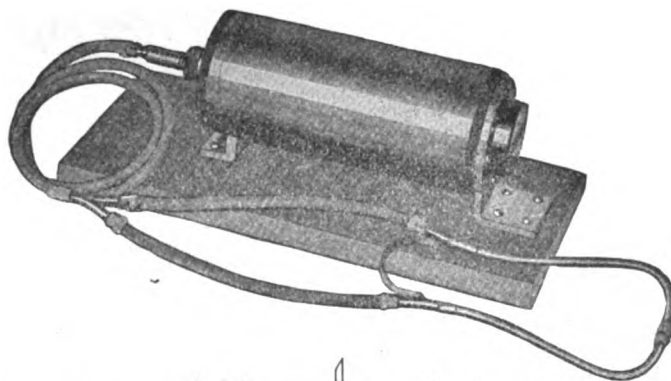
Swapping the gossip of the seven seas, comparing breakfast menus on shipboard and peddling the latest scandal from shoreside may no longer be carried on by commercial wireless operators. This edict has gone forth from the office of Col. J. F. Dillon, radio inspector of the department of commerce, that idle conversation by wireless operators must cease.

A drowsy afternoon on the Pacific may no longer be enlivened by the radio operator's getting into communication with the operator of a liner or tramp and passing an hour or two in exchange of pleasantries or shipboard gossip. Henceforth if any radio operator picks up something delectable ashore at a port to which another operator is bound, said news of said delectable dish will have to be conveyed by other means than wireless.

Delay in the transmission of commercial messages through idle gossip via the ether is said to be responsible for Colonel Dillon's edict.—San Diego Union.

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"Conqueror of Static"



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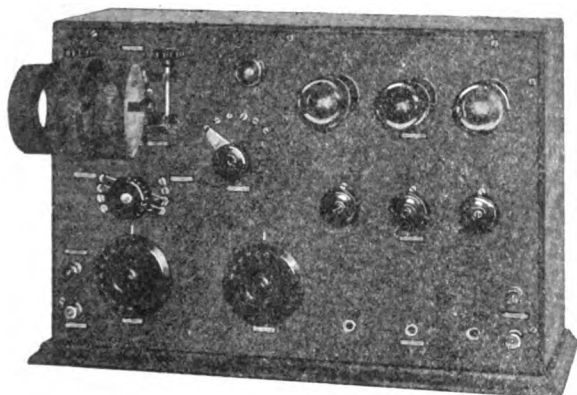


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equipment you can not
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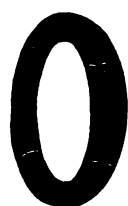
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50c per 100 Feet



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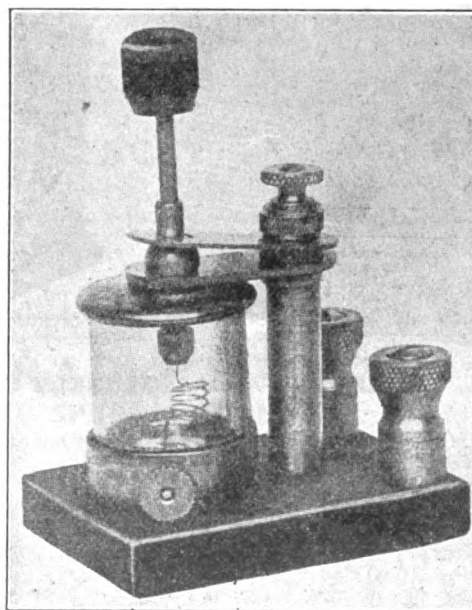
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Cash in registered letter, check or money-order must accompany all orders. If shipment by parcel post is desired include postage, otherwise material will be shipped by express collect.

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Electrical Specialty Company
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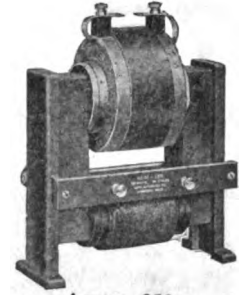


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The type of the detector illustrated is being sold at prices ranging as high as \$4.50. Our price is \$2.80. This instrument is absolutely dust and moisture proof. The crystal, which is one of galena mounted in a block of Woods metal, is encased within a glass cylinder rendering it impervious to atmospheric conditions. Has ball and socket joint. Shipping weight 1 lb. Price \$2.80.

ACME TESTIMONIAL

ACME 250



Acme 250

St. Louis, Mo., July 24, 1920.

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"He reported the signals QSA through heavy static and QRM and I can corroborate this statement by his letter which I will receive in several days. The transformer was tested at my home and connected with a BENWOOD GAP the radiation being exactly two amperes.

"I think this is excellent work due to the fact that it is mid-summer and hardly possible to work stations 25 miles distant using a one (1) KW installation.

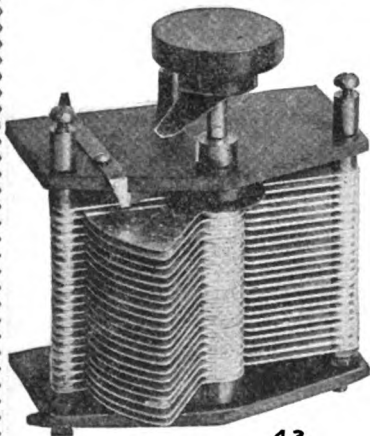
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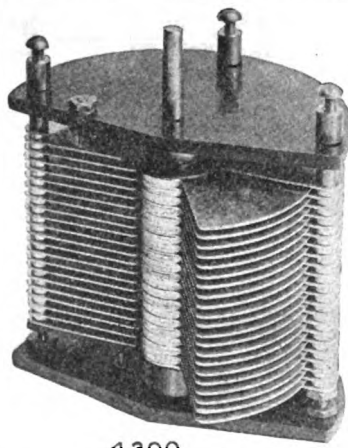
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TRANSFORMER AND RADIO ENGINEERS AND MANUFACTURERS



43



4300

Announcing a New Variable Condenser

Built along the same general lines as our SERIES "S" condenser, but heavier construction throughout. The plates are die-stamped from 1/32" hard rolled aluminum, and are separated by heavier spacers. Extreme rigidity, best of materials, accurate machine work and careful assembly are the outstanding features of construction. At the present time we are unable to fill orders for the SERIES "S" condenser, as we are unable to obtain materials for its construction, but we can ship the NEW SERIES "T" and the SERIES "L" VARIABLE CONDENSER from stock.

REMEMBER—WE ABSOLUTELY GUARANTEE SATISFACTION OR YOUR MONEY BACK.

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No. 20	2 plate VERNIER	\$2.00	No. 2300	23 plate, .00075	\$ 6.00
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No. 230	23 " .0005 m.f.	3.60				
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Include postage for one pound

Either style of condenser fitted with indicating dial at additional cost of 75c.

Include postage for two pounds

The Wireless Shop

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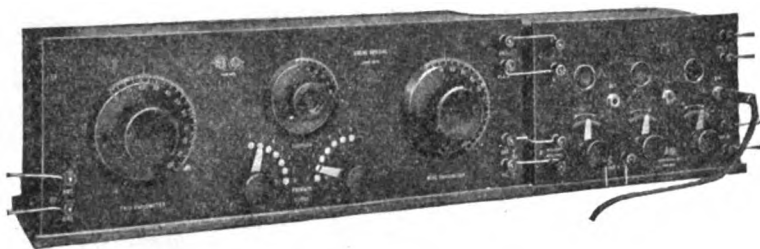
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This is the Outfit which made a reputation for itself in the recent QSS tests.

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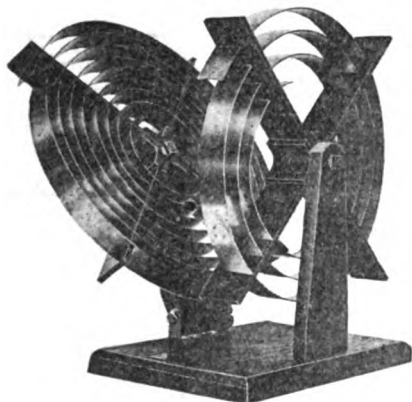
Inspect this Outfit at your Dealer's. If he doesn't carry our line as yet, drop us a postal for catalogue, mentioning his name.

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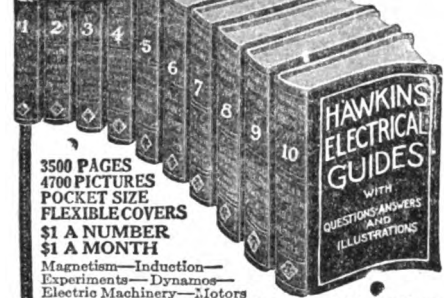
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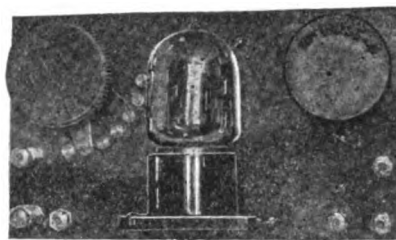
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CONSTRUCTED OF GENUINE BAKELITE

This panel is equipped with a filament control rheostat, latest model V. T. tube socket, "B" battery switch with large knob, two brackets for securing panel to table, nickel plated binding posts and carefully wired connections.

You cannot buy a better Audion Control Panel. Every panel is fully guaranteed against mechanical or electrical defects. We can supply an adapter for Audiotrons at \$1.50 additional to above price. These panels are specially priced for a limited time.

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It's addressed to Doctor Ace.
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He will give you all the data
So you may get in the "race."
THEN YOU'LL GET THE SIGNALS, TOO.

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CHELSEA Variable Condensers (Die-Cast Type)

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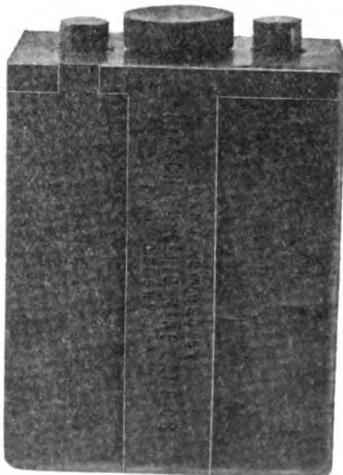


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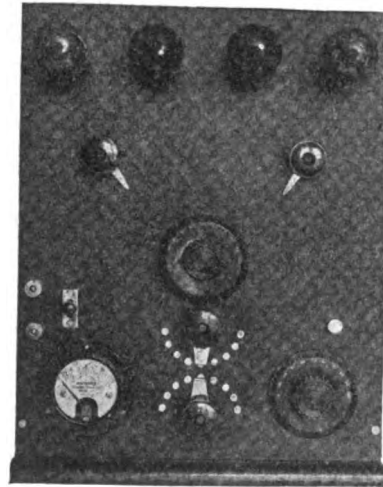
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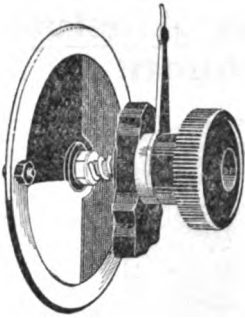
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Dept. R.1.

Omaha, U. S. A.



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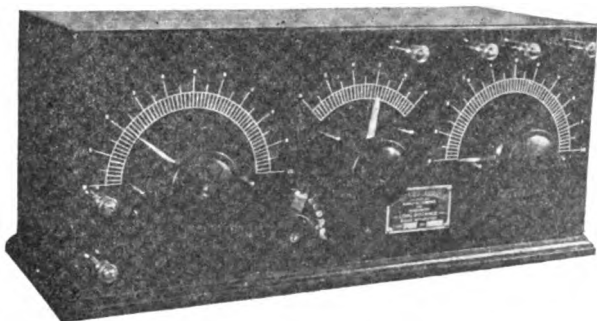
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Name

Address City..... State.....

Pacific Radio News.

Radiophone Music from Alaska With the C. R. L. Paragon!



C. R. L. Paragon Short-Wave Regenerative Receiver

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Think of what the C. R. L. Paragon can do for **your** relay work this winter!

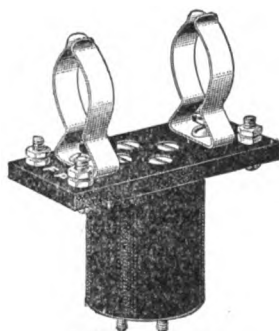
The C. R. L. Paragon can now be used to receive **long wave time signals**. Watch for our announcement of the Paragon Time Adapter next month.

C. R. L. Paragon Short Wave Regenerative Receiver, F.O.B. Chicago, **\$55.00**.

Licensed under original Armstrong U. S. Patent No. 1,113,149 and U. S. Application Serial No. 807,388.

CHICAGO RADIO LABORATORY

1316 CARMEN AVENUE
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RADIO CORPORATION OF AMERICA

Phone Douglas 3030

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RADIOTORIAL

(Continued from page 21.)

of us would do that, there would be less "square pegs in round holes." Forget the money side of it, and you will find that it takes care of itself very nicely.

Therefore, if you like the radio game, **STICK TO IT**, and **BOOST** all the time. Look for the best things in the radio game, become satisfied and contented. Make those around you as happy as you are with always a good word instead of a knock,—otherwise **GET OUT** of the radio game!—it is only a place for **GOOD MEN**.

AN EFFICIENT RADIO TELEPHONE

(Continued from page 25.)

and vice versa was established over a distance of ten miles on 400 meters using trailing wire antenna. The receiver was a standard short wave regenerative set in conjunction with a three stage, audio frequency amplifier.

It is important, when using this type of radio telephone where the microphone is inserted directly in one of the circuits, (instead in inductive relation to it), to note that the source of the sound waves with respect to the microphone, has much to do with its successful operation. The change in radiation is almost unnoticeable for various positions of the speaker, but by testing with a receiving station you can readily determine the correct position and volume of sound to use for highest efficiency.

In a series of tests it was found best to talk into the transmitter microphone on a straight line with it, with normal speaking voice and about five inches away from the microphone. A distance of two inches away from the microphone at an angle of forty-five degrees was also found to produce excellent results at the receiving end. However, the experimenter must ascertain for himself which are the best positions for his particular set and which fit the peculiarities of this microphone. It is important to use a low resistance microphone to obtain good results. Two high resistance microphones in parallel do not work nearly as well as a single efficient one.

Figure 4 shows a circuit utilizing an ordinary telephone induction coil and battery. This has been found quite efficient in modulating the continuous oscillations in the telephone transmitter. It has the advantage that a high resistance microphone may be used, provided that the induction coil and battery are of the proper proportions.

When properly set up, insulated well, and tuned precisely to a good antenna, this set will function over really worth while distances; depending on the size or the number of vacuum tubes used.

Binding Post and Switch Points

Commercial—Standard

SPECIAL—

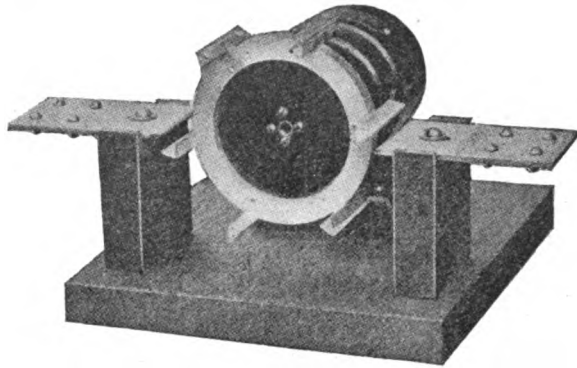
Binding post made of brass, nickel-plated and polished

- No. 1—size 1/4 in. diam., 5/8 in. high, per doz\$.75
- No. 2—size, 3/8 in. diam., 7/8 in. high, per doz 1.05
- No. 3—size, 7/16 in. diam. 15/16 in. high, per doz 1.10
- No. 4—size, 1/2 in. diam., 3/4 in. high, Bunnell Pattern, per doz. 1.75
- No. 5—Double Post, 1 1/8 in. high three for60
- No. 6—Triple Post, 1 1/8 in. high, three for65
- No. 7—Contact Points, 7/32x7/32 in. head, with 4-36 screw, Brass, 3 dozen for60
- No. 8—Contact Points, nickel-plated, with threaded shank and nut, same size head as above, 3 dozen for 1.05

Our new price list of raw materials and parts now ready, sent to any address on receipt of 5 cents in stamps, which will be refunded on first order to the amount of \$1 or over.

KEYSTONE RADIO COMPANY
Drawer 307. Greenville, Penn.

GIVE YOUR SPARK A CHANCE



Our New Rotary allows all of the energy in the closed circuit a free discharge surface. Electrodes are 2 1/2 inches wide and 1-16th inch thick, accurately shaped on a milling machine. Made with 6 or 12 points for high or low note. You can't beat the combination of an Acme transformer and our 12 point rotary. Absolutely highest efficient gap ever offered, fully guaranteed.

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HOOK 'ER TO YER BULB



THE MOST WONDERFUL TUNER IN THE WORLD FOR \$15

It weighs but two pounds—size about 4 1/4 x 4 1/2 x 3 inches. It has a primary and secondary coil only and receives all arc signals from 5,000 M to 20,000 M. It will not work with a crystal detector. The wiring diagram is on the bottom of each tuner. Do not remove top of tuner or you will destroy it—the coils are waxed in and leads are short. Tests all over the world show this tuner will receive efficiently arc signals on the smallest aerial. We recommend a single wire 25 inches high by 40 inches long. Three variable condensers and an audion are needed for the circuit.

Don't take our word for it—write us for name of nearest Amateur using one; add Parcel Post.

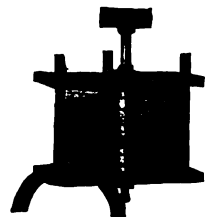
N A A—ARLINGTON TUNER—5,000 M.

This tuner is same size as above tuner only it has a tickler coil and uses the straight audion hook-up with tickler in series with phones. It is the only spark tuner that gets NAA on a small aerial without any variable manual coupling. This tuner also gets the arc signals at 5,000 meters and records easily wireless phone talk from 600 to 5,000 meters. Priced at \$15.00 plus parcel post.

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The only fool proof, complete assembled condenser in the world that will fit any cabinet, and take the place of any and all the condensers that you may be using. IT HAS A CONTINUOUSLY VARIABLE CAPACITY FROM .00025 MF TO .001 MF. Studs are so mounted as to prevent any leakage and to fit any holes you may have already drilled in your panels. Size 3x3x1 inches and shipping weight one pound. Priced at \$2.50 and add Parcel Post.

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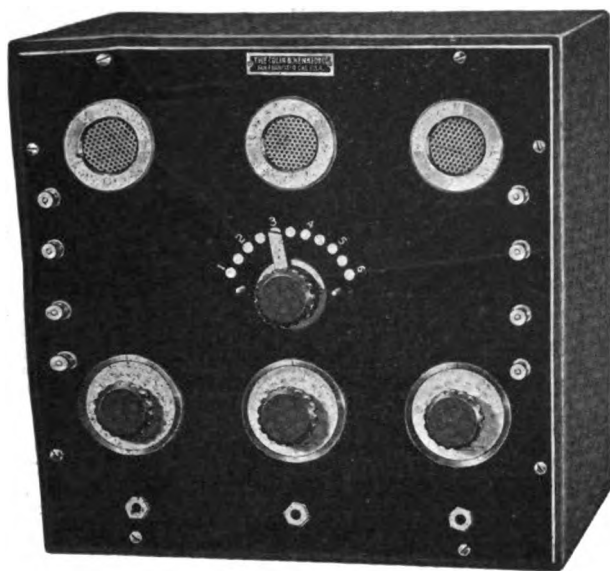
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Two Stage Amplifier \$70.00
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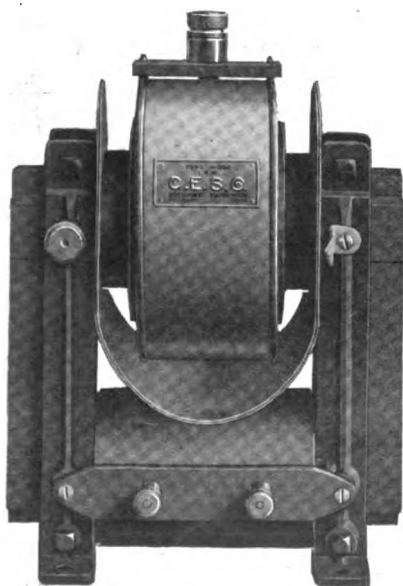
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Radio Transformer
Price \$52.50

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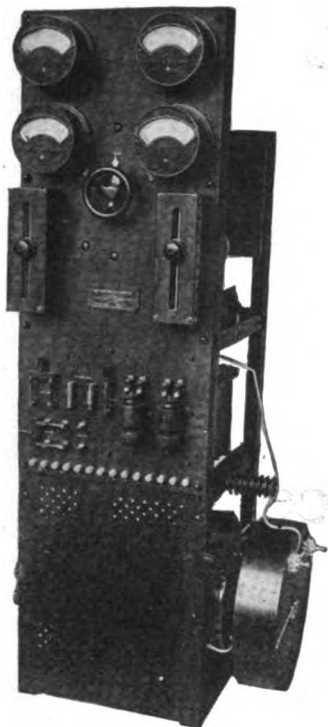
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“D X” Relay Men Know Baldwin 'Phones are Best

We have just received a letter from an Ex-Sergeant of the 117th Field Signal Battalion, Rainbow Division, which shows the worth of Baldwins.

John Firth & Co.
New York

Kansas City, Mo.
4022 Wayne Ave.,

Gentlemen:

Reading your advertisement of Baldwin phones in the January QST and having used several different pairs of these phones in the Signal Corps, I desire very greatly to obtain a pair.

I have tested Baldwin phones against almost every phone made, including several French, British, and even German-made receivers, and have found nothing to equal them. I used “a pair of Baldies” while on the U. S. Mexican border, in conjunction with a Signal Corps mule-carried pack set, and can say they stood up under the severest jars and jolts a stubborn mule could give them. I also had a pair with me at the Aisne-Marne defensive, the Chateau Thierry offensive, St. Mihiel, The Argonne, and on our hike to Germany. The type phone I had I don't know and cared less—all I knew was that they had the others beat in a walk.

Awaiting your circular, I remain,

Respectfully,
B. F. Riggins.

This is only one of the many letters we receive daily praising the qualities of the Baldwin Phones.

Any A.R.R.L. long-distance relayman will tell you there are no other phones as sensitive as Baldwins. The enormous increase in sensitivity over ordinary receivers is secured by the famous Baldwin construction—a mica diaphragm, removed from the constant pull of a permanent magnet, and a separate light iron armature. Write for interesting illustrated bulletin explaining the construction of these phones, and why they are BETTER.

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How you swelled with pride when you traced the red blood in your veins, the blood of these wonderfully aristocratic men and women.

Just as you take pride in your pedigree, we take pride in ours, going back to the very beginning of the business world, we find that our pedigree runs to the most royal of all royalty

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