Radio News of Canada

20 CENTS 20 CENTS

Vol. 2, No. 3 TORONTO September, 1923

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Brandes

New Price
Superior
$7.00

This man knows Radio!

He knows how to get the *best* out of his set. New hook-ups, new tubes, new parts—he tests them all and finds the best.

He was a wireless fan long before radio became the greatest indoor sport. Fifteen years ago he used Brandes. To-day he still sticks to his Brandes *Matched Tone* Headset.

He knows that its *Matched Tone* assures a clear and harmonious reception of the worldful of news which his set picksup. He gets it all—perfectly—with a Brandes.

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PERKINS ELECTRIC, LIMITED
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CANADIAN BRANDES, LIMITED
Toronto and London

Matched Tone
TRADE MARK REG U.S PAT OFF
Radio Headsets

AMATEURS ATTENTION

GET YOUR EQUIPMENT FREE

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MARCONI Radiotron

U V 201 A

PRICE $7.50

for 5 Subscriptions

Starr Detector Set

PRICE $18.00

for 12 Subscriptions

Workrite Headset

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PRICE $1.50

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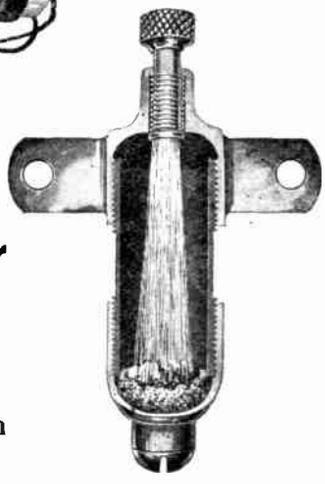

CONDENSITE CELORON RADIO PANELS AND TUBING

EXCELLENT FINISH **EASILY MACHINED** **IMMEDIATE DELIVERY**

Just pick out the size you want

CELORON Radio Panels, ready-cut in standard sizes, save you the trouble and delay of having your panel cut to order. Just go to a near-by radio dealer who sells Celoron panels and pick out the size you want. Then you are sure of getting a panel that is neatly trimmed and finished, and something more—you get the necessary insulation for successful receiving.

Condensite Celoron has high dielectric strength and great insulation resistance. Its moisture-repelling properties prevent warping.

Easy to work

You will like the "workability" of Celoron panels. They are easy to drill, tap, saw, and mill, and will engrave evenly without feathering. Each panel is wrapped in glassine paper to protect the surface. On every one are complete instructions for working and finishing. You can get Celoron panels in glossy black finish.

One of these standard sizes will fit the set you intend to build:

1—6 x 7 x 1/8	4—7 x 18 x 3/16
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3—7 x 12 x 1/8	6—7 x 21 x 3/16
7—12 x 14 x 3/16	

If your dealer cannot supply you, ask him to order for you, or write direct to us. Indicate by number the size you want. Celoron is also furnished in full-sized sheets, and

We Can Cut Panels in Any Sizes Desired

Write for this free booklet

You will find much that will interest you in our booklet, "Tuning in on a New World." It contains lists of the leading broadcasting stations in the United States and Canada, and explanation of symbols used in radio diagrams, and several efficient radio hook-ups. We will send this booklet to you free on request. A line on a card is sufficient. Write at once.

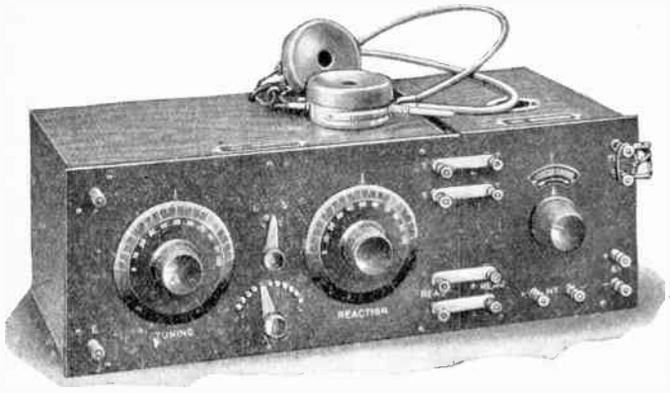
To radio dealers: Send for special dealer price list showing assortments

Diamond State Fibre Company
of Canada, Limited

TORONTO CANADA

Announcing—

New Prices and Schedules



Marconi Single Valve Receiver

Units and Accessories

Tuner and Detector Units only..... **$30.00**
Tuner, Detector, Radio Blue Headset and Radiotron U.V. 201A..... **$43.25**
Tuner, Detector, Radio Blue Headset, Radiotron U.V. 199 and Socket Adapter **$45.00**

Complete Single Valve Receivers

SCHEDULE 1 - - - - - - - ***Price $60.00***

Tuner	200 ft. Aerial Wire
Detector	30 ft. R. C. Flex
Radio Blue Headset	4 Aerial Insulators
Radiotron U.V. 199	Porcelain Tube
Socket Adapter	Earth Clamp
"A" Dry Battery	Lightning Arrester
"B" Dry Battery	Complete Instruction Booklet

SCHEDULE 1 A - - - - - - - ***Price $57.50***

Tuner	200 ft. Aerial Wire
Detector	30 ft. R. C. Flex
Radio Blue Headset	4 Aerial Insulators
Radiotron U. V. 201A	Porcelain Tube
"A" Dry Battery	Earth Clamp
"B" Dry Battery	Lightning Arrester

Complete Instruction Booklet

SCHEDULE 1 B - - - - - - - ***Price $55.00***

Tuner	"A" Dry Battery
Detector	"B" Dry Battery
Radio Blue Headset	"Ducan" Plug
Radiotron U. V. 199	20 ft. R. C. Flex
Socket Adapter	Earth Clamp

Complete Instruction Booklet

Complete Three Valve Receivers

SCHEDULE 2 - - - - - - - ***Price $105.00***

Tuner	"B" Dry Battery
Detector	200 ft. Aerial Wire
Two Stage Amplifier	30 ft. R. C. Flex
Radio Blue Headset	4 Aerial Insulators
3 Radiotrons, U. V. 199	Porcelain Tube
3 Socket Adapters	Earth Clamp
"A" Dry Battery	Lightning Arrester

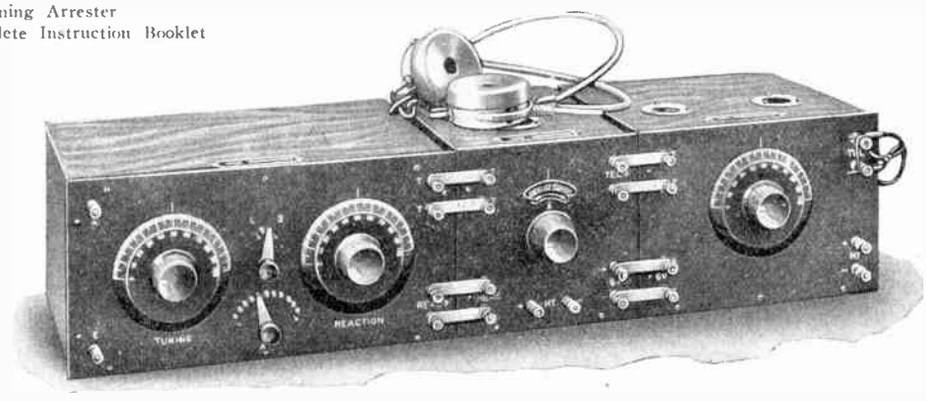
Complete Instruction Booklet

SCHEDULE 2 A - - - - - - - ***Price $100.00***

Tuner	200 ft. Aerial Wire
Detector	30 ft. R. C. Flex
Two Stage Amplifier	4 Aerial Insulators
Radio Blue Headset	Porcelain Tube
3 Radiotrons U. V. 201A	Earth Clamp
"A" Dry Battery	Lightning Arrester
"B" Dry Battery	Complete Instruction Booklet

Units and Accessories

Tuner, Detector and Amplifier Units only **$50.00**
Tuner, Detector, Amplifier, Radio Blue Headset and Three Radiotrons, U. V. 201A..... **$78.25**
Tuner, Detector, Amplifier, Radio Blue Headset, Three Radiotrons U. V. 199 and Three Socket Adaptefs **$83.50**
Marconi Two Stage Amplifier Unit (without valves) **$20.00**



Marconi Three Valve Receiver

The Marconi Wireless Telegraph Company of Canada Limited

VANCOUVER TORONTO MONTREAL HALIFAX ST. JOHN'S, Nfld.

Announcing—

The Amplitone Loud Speaker

No Battery Required

Price ***$35.00*** *Complete*

A Fine Musical Instrument!

Re-PRODUCES without *Blast*

The prime distinction between the Atlas Amplitone and other loud speakers is that the Amplitone is first of all a musical instrument. It reproduces, not a semblance, but the full, clear, natural tones of the music as actually sung or played. There is the same distinction as that between the old-fashioned wax cylinder, tin-horn, scratchy phonographs of a few years ago and the finest phonographs of to-day, whose reproductions deceive even the trained ear.

The rich mellowness of the violin, the brilliance of flutes and piccolos, and the various-toned notes of the voice are reproduced naturally on the Amplitone. Musical critics and radio devotees who have heard the Amplitone agree that, at last, the musical superiority of even the finest phonographs has been surpassed.

The Amplitone re-produces with truly amazing fidelity and naturalness the music and speech of broadcasted programmes. It **is non-distorting and will not blast.**

The Double Diaphragm

This astonishingly faithful re-production is largely due to a patented construction known as "the double composition diaphragm" **—an exclusive feature of the Atlas Amplitone Loud Speaker.** It compensates for the shortcomings of broadcasting and receiving conditions and renders the programmes clear, sweet and natural.

Adjustable to Any Receiver

A concealed adjustment in the base permits meeting any variation of the amplifier "B" battery from the 90 volts for which the Amplitone is set at the factory.

Other Advantages

The Atlas Amplitone is unbelievably sensitive, responding as readily to very weak as to the stronger impulses. It requires no storage battery to energize the magnets, and gives splendid results even with a single valve receiver.

The base is of black or mahogany-brown Bakelite. The resonant wood fibre horn (the best for loud amplification) has a lustrous black crystalline finish. The Amplitone is eighteen inches high and weighs only two pounds.

Amplitone Unit Without Base or Horn

If you already have a horn and base or if you desire to use your phonograph as a loud speaker, all that is required is the Amplitone Unit, Type "B," price $17.50. It fits on to any type phonograph (except the Brunswick), taking the place of the sound box and does not change the appearance of the phonograph in the least. It makes a loud speaker the equal of the Amplitone itself, for this unit is the "voice" of the Atlas Amplitone Loud Speaker.

Obtainable throughout Canada from all High-Grade Stores carrying Radio Equipment.

Sole Canadian Distributors

The Marconi Wireless Telegraph Company of Canada Limited

VANCOUVER TORONTO MONTREAL HALIFAX ST. JOHN'S, Nfld.

Radio News OF CANADA

Radio Press of Canada, Limited
Publishers
257-261 Adelaide Street West
Toronto, Canada

W. J. HEVEY
Business Manager
H. LEWIS,
Editor

VOL. 2. TORONTO, SEPTEMBER, 1923. No. 3.

SMUGGLING MUST CEASE

In the first number of this magazine we published the following in our editorial columns:

"Regarding our policy we want to say right at the start, that this journal will, first, last and all the time be published solely in the interest of the amateur. No corporation or manufacturer has any strings on the Radio News of Canada. It is an absolutely independent magazine and is out to please its only boss, its readers, from cover to cover it will always be 100 per cent. Radio.

"We intend also to keep our advertising pages clean, and advertisements will be accepted only from business houses of repute, and we want to impress upon the minds of our advertisers as well as our readers, that it is our intention to try and make our advertising section as interesting and profitable to the amateur as our reading matter."

We have endeavored to maintain this policy ever since then, and believe it to be in the best interests of radio, both from the viewpoint of the trade and the amateur.

And in pursuance of this policy, we are going to say a few words this month with regard to those who have been finding it more or less profitable to smuggle American radio apparatus into Canada.

A representative of this magazine was in Ottawa last week and it was brought to his attention that a great deal of smuggling was going on and that the authorities were taking steps to have this practice discontinued.

It is known that some dealers have been in the habit of making trips to nearby American cities and obtaining supplies at American prices and bringing them into the Dominion without paying duty on them.

This is, of course, against the law, and is something that is to be deplored.

Canada needs the money that should be derived from the payment of the customs duty, and our Canadian manufacturers, as well as the numerous branch factories of American firms who have located here, should have the protection that the import duties are supposed to give.

We know that our amateurs must of necessity purchase a very large proportion of their supplies from our enterprising cousins to the south, for the simple reason that much of the apparatus used in the radio art is not manufactured here, and, furthermore, the discriminating builder has a right to use his own judgment as to what equipment he wants to use, irrespective of where it originally comes from.

That is no reason, however, why the laws of Canada should be broken, and apart from that this practice gives the dealer who indulges in it an unfair advantage over the dealer who is conducting his business in accordance with the law.

We are confident that the Canadian amateur will agree with us when we say that they as experimenters have no desire to purchase goods that have been illegally brought into the Dominion.

The Government of Canada have dealt very fairly with the Canadian amateur, and it is up to us to see that we give them no cause to take any other course.

Apart from the few dealers who have been guilty of smuggling there are perhaps some individual cases where experimenters have themselves—when on a visit to the States—succumbed to the temptation of bringing over apparatus without giving the Government the benefit of the duty. We want to bring to the attention of those who have been tempted to follow this practice that the authorities are contemplating taking advantage of the clause in every amateur's license which says, in effect, that all amateur stations must be open for inspection by Government authorities at all times.

We have been informed that if on inspection the examiner finds any apparatus of foreign manufacture in the station he can then ask the owner the conditions of purchase, and if the owner is not in a position to show it was purchased in Canada or legitimately imported, that owner would, to say the least, be placed in a very uncomfortable position.

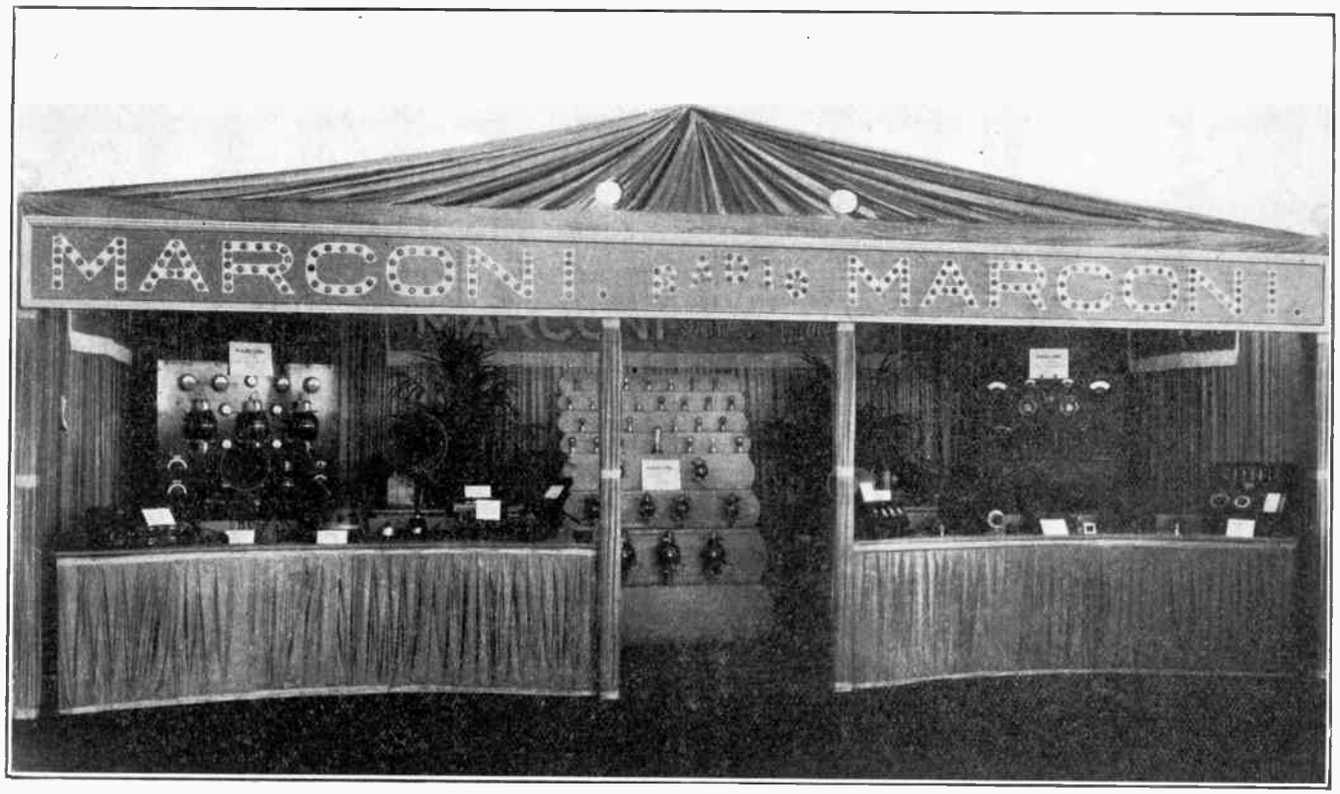
Our advice to the amateur is: Deal only with dealers whose reputation and standing are known to be O.K.

Our advice to the dealer is: Play the game on the level, and if profits are not so big in the immediate future, it always pays dividends in the long run to be true to the principles of Canadian commercial integrity.

Radio is an art that has for its devotees the finest type of young Canadian manhood—yes, and womanhood—of the present generation; it is destined to promote intercourse, and social understanding between hundreds of thousands of people in all walks of life. There are no class distinctions in the "air." The son of the millionaire relays messages to the son of the ditch digger, and they talk to each other through the limitless spaces of the ether. So let us keep our art clean, free from the shady practices of illegitimate trading, and then we shall all reap the benefits that accrue from honorable trading and just dealing with our fellows.

CANADIAN NATIONAL EXHIBITION

Marconi Exhibit—Sports Building



We have little doubt that one of the most interesting features of this year's exhibition—to our readers at any rate—is the excellent display made by the Marconi Co. We were fortunate in securing this illustration on the eve of going to press and to those who are unable to visit Toronto, it will give some idea of the care and fore thought with which it has been mapped out. The colour scheme is purple and silver, which proves an excellent background for the numerous interesting exhibits.

Here almost all types of radio apparatus are on display. The writer was particularly attracted by the 2 K.W. Broadcasting Model which, we understand, is similar to that operating in La Presse and other well-known stations throughout the country.

A big bank of Vacuum Tubes, ranging from the large transmitting type used in the Trans-Atlantic Station at Glace Bay to the new Radiotron UV-199, is probably the most interesting feature. As we passed by it was holding the attention of a large number of young amateurs whose gaze told only too plainly of their ambitions to possess.

The big marine installation standing out boldly on the right cannot but impress one with its appearance of strength and ruggedness—so necessary in a ship's radio outfit.

The Marine Direction Finder particularly attracted our attention and we were informed that all the principal Passenger Liners and many Cargo Vessels are now fitted with this latest addition to Marine Radio. We prevailed upon one of the demonstrators to show us some of the "innards" of this instrument and cannot help but state that for sheer beauty of design and clean-cut construction we have not yet seen its equal.

Probably what will interest our readers most is the large number of Broadcast receivers being displayed; even more interesting is the satisfying reduction in price due to organized production. Single Valve Receivers complete with all accessories are listed from $55.00, while three Valve Sets are marked as low as $100.00 complete. Headsets also show a gratifying reduction.

A notable exhibit is the Amplitone Loud Speaker for which we understand this company is the sole Canadian distributor. Its extreme sensitivity and wonderful reproducing qualities coupled with the fact that no additional batteries are required to energize the magnets should make it a very popular feature during the coming seasan.

The splendid array of accessories will delight the eyes of the real dyed-in-the-wool amateur who builds his own set. Here again a gratifying reduction in price and improvement in quality is observed.

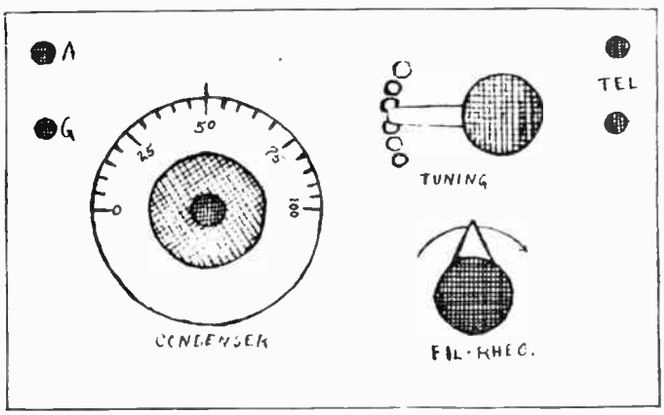
The Automatic Transmitting and Receiving Apparatus used in the Trans-Atlantic Wireless Service is a most interesting feature, for again it brings home to one that radio serves other purposes than the dissemination of news, music, etc.

The only regret that the writer had was that the different radio exhibits were scattered in the various buildings. One sees the Arts Building, Electrical Building, Mechanical Building, Sports Building, etc., but no Radio Building. Surely there are sufficient firms of repute interested in this latest art to warrant it having a home of its own. Let us hope that 1924 will witness a Radio Building.

A Colpitts Receiver and Transmitter

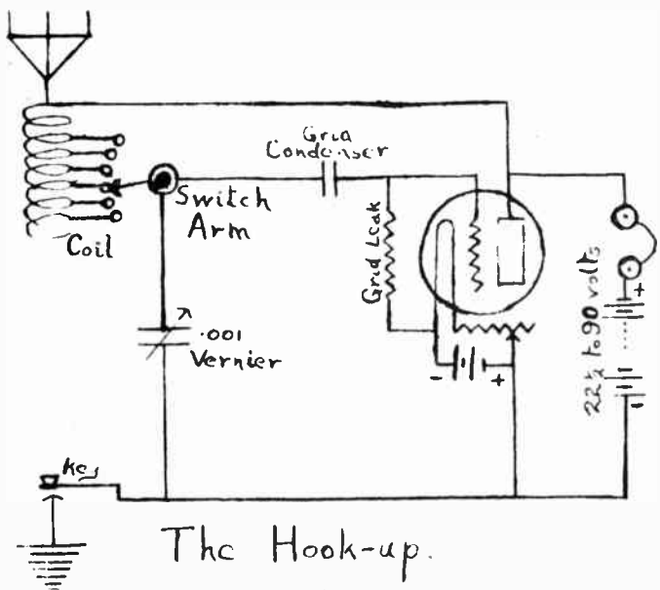
Keith H. Rapsey

For sharpness of tuning with few controls, a C.W. transmitter circuit easily equals the conventional double-circuit tuner. The one about to be described has fewer controls than a single circuit set. Then, too, by inserting a key in the ground lead, a portable miniature transmitter may be obtained, and a two-way conversation carried on over a distance of several miles. For this purpose an amplifying tube and an anode voltage of about ninety volts should be used. The key must be shorted while receiving.



As to range, CFCA, CKCE, WGR, WGY, KDKA, WAAM, 3BP and 3GS were some of the stations picked up with surprising audibility. While these may not look like records, they were all heard in three or four summer nights.

A list of the parts used by the author is: Eighty-five turns of N. 22 cotton covered wire on a 3½-in. Condensite tube three inches long, and tapped every tenth turn, beginning with the thirty-fifth, thus making six taps. A forty-three



The Hook-up.

plate vernier U. S. Tool Co. condenser, Standard Dubilier grid condenser and grid leak. (The writer used a Durham variable grid leak, but this is not necessary, although the set gives much stronger signals at some settings of the leak). Peanut tube and tube socket, Vimy rheostat, Eveready 22½-volt "B" battery, Western Electric phones, small 1½-volt cell for "A" battery, aerial and ground wire, key, panel 5¼ x 8½ x ⅛ in., cabinet 7-inch back. This makes the set easily portable. A vernier rheostat would be some advantage for DX. The coil is slipped over the condenser to save space. The "B" is back of the two, while the tube and "A" are behind the rheostat.

The tube should be well protected when the set is carried about, and the batteries must be fastened down. A separate box was made to carry the aerial wire (100 feet of No. 18) and phones. If it is desired, the two cabinets may be fastened together and a lid placed over both.

The set is wired with No. 14 tinned bus wire, and this is covered with spaghetti tubing. All connections should be soldered, because loose connections have an annoying little habit of making your tube a roasted peanut.

THE CHURCH RADIO

A church in an outlying district is a great asset, as well as one of the great home-builders of to-day.

Many far-away homes never see a church, or hear a service; no, not even a hymn, even in this far-advanced period we are living in to-day.

Yet, there are very many who would be glad to be able to attend a service at church, or to be able to hear a sermon in some near-by farm-house or hall.

As we are all well aware, one of the most essential things to a farmer to-day is a radio receiving set.

There are a vast number of farmers operating sets, chiefly for the benefit they derive on the latest stock and market quotations.

Then, why not use it for church services, as well as for news, market reports, and concerts?

Now, would it not be beneficial for these tillers of the soil to invite their near-by neighbors over on a Sunday evening to listen to one of the many church services which are broadcasted regularly?

Summer time would be the most ideal time for these service gatherings, as the farmer and his family are in-between periods of seeding and harvesting.

We are well aware that during the summer many people in the cities go away for holidays, thus causing a slight decrease in radio sales. But what of the farmer? He is spending his holidays on the farm, and most likely utilizing radio supplies.

And here is where the farmers' church gatherings could commence. All through the summer, and winter, too, his radio congregation would come to his house every Sunday evening to hear the Word of God, and those good old hymns.

If his congregation were desirous of building a church, every Sunday evening a collection could be taken up, and in due time they would have sufficient funds to establish a real Christian church and community.

When once a church was built by such a congregation as this, there would be no trouble at all to obtain a clergyman to keep it on the right path.

And now let radio, which is leading the world in all news of social life, keep at least some homes in touch with Christianity.

T. A. BONES.

The Alladin's Lamp of the Twentieth Century

The vacuum tube is one of the scientific triumphs of the present day.

These tubes are used in connection with power machinery to control and rectify the electric current, by amplification they made telephone conversations possible over long distances and they are a fundamental part in radio outfits of which there are over two million in use on the American continent alone.

An important step has recently been taken in Canada. The Canadian General Electric Co., The Marconi Wireless Telegraph Co. of Canada, The Canadian Westinghouse Co., The Bell Telephone Co., The Northern Electric Co., and the International Western Electric Co., have now agreed to pool all their patents for the common good. Under the terms of the agreement each party agrees to license the other parties within their natural fields; that is, the Marconi Co. will have the use of all the patents derived under the agreement for the purpose of wireless telegraphy, the Telephone Company in the field of public telephone communication, and the manufacturing companies, which includes the Marconi Co., have the right to make and sell.

The importance of having the best and most efficient radio apparatus will appeal strongly to the ever-growing number of people who listen in on the daily programmes sent out by broadcasting stations throughout Canada and United States and who will welcome every improvement in the art.

Many patents have been issued covering the use of these tubes and apparatus and systems involving their use in connection with wire telephony, guided-wave telephony, power apparatus, wireless telegraphy, wireless telephony and broadcasting. Certain large companies hold a very substantial portion of these patents, but no one concern could manufacture or use apparatus combining all the features covered by such patents without inviting litigation. For this reason the art was being held back, as no one could manufacture the best and most complete apparatus.

At the suggestion of the Federal Government of the United States, certain companies in the United States threw their patents into a common pool in the public interest in order that the art might progress unhampered by delay and litigation.

The Canadian agreement just announced is for the life of all existing patents and also covers future patents or applications for patents.

The companies entered into the agreement in the broadest spirit. It was impossible to estimate the value of each individual contribution as this would have involved litigation to determine the validity and scope of the patents held by each party, nor was it possible to foretell which party might produce the most valuable discoveries or inventions in the future. While each party owns valuable patents, each party also has the benefit of the research work carried on by the respective allied companies in United States and England. The great research departments of the Telephone Co., the General Electric Co., the Westinghouse Co., and Marconi Co., may be expected to produce many important and far-reaching improvements and all these will, by reason of this agreement, be utilized to progress the art in Canada.

The agreement also provides for a traffic arrangement between the Bell Telephone Co. and the Marconi Co., for mutual interchange of part wire and part wireless messages. By this combination, a telephone subscriber—when arrangements are completed—will be able to speak by wire to the nearest land station of the Marconi Co., and then by wireless to a passenger on an Atlantic liner, lake boat, or even a moving train. In process of time, subscribers here may also be able to speak to telephone subscribers in England or on the continent. Technical difficulties must be overcome and the trans-Oceanic telephone business must be placed upon a commercial basis, but the decision of these companies to pool their interests should hasten advances in the art in regard to every purpose from which this wonderful Aladdin's lamp can be used.

CAPE BRETON AMATEUR RADIO ASSOCIATION BROADCASTS LORD BYNG'S SPEECH

Triumph for Amateur Radio

On the occasion of the visit of the Governor-General, Baron Sir Julien Byng and Lady Byng, to North Sydney, N.S., on July 24th, the Cape Breton Amateur Radio Association secured His Excellency's consent to broadcast the speeches made at the civic reception, which was to have taken place on the lawn of the Western Union Cable Station, about 200 feet from the residence of Mr. G. Arnold Edwards, the Association's president, whose transmitter is licensed for association broadcasting. The transmitter, which was undergoing reconstruction at the time, was temporarily assembled and tuned all in readiness, when the weather man decided to take a hand in the matter and turned on the tap for three hours before scheduled time. The local theatre was requisitioned for the reception and for a while it looked as though the broadcasting was "off." Not to be outdone, Mr. Edwards called in the help of Mr. C. A. Hastings, Exchange Manager of the Maritime Telegraph and Telephone Co., and by dint of hard work coupled with a good soaking, wires were run to cable junctions and a mile of cable brought into service, making over four miles of actual wire in use. This was completed and the opening announcement made three minutes before the Governor-General arrived, the whole proceedings being entirely successful.

In addition to saying farewell to those assembled, His Excellency picked up the microphone and bid his radio audience good-bye.

It is understood this is the first occasion in which Lord Byng spoke from an amateur broadcasting station, and it seems a fitting coincidence that this Association should have the honor, as their station was the first in the Dominion to receive an amateur broadcasting license.

Once again the value of amateur radio, coupled with an efficient telephone system, in being of service to outlying districts and those unable to attend in person, has been demonstrated. The Association's thanks are extended to Mr. Hastings and his assistants for their valuable aid in the cable work, and to Mr. Syd. Bateson, our Sydney Mines vice-president, who acted as operator on such short notice.

GARNET EDWARDS.

W. B. Cartmel, Radio Engineer, Northern Electric Company, Replies to Mr. C. J. Carter Regarding Peanut Tubes

Last month we published a letter from Mr. J. Carter, of Saskatoon, in which Mr. Carter outlined his rather unfortunate experience with some tubes which he referred to as "Peanuts."

Mr. Carter did not state in his letter what particular make of tube he was having trouble with, but knowing the wide experience of the engineers connected with the Northern Electric Company, we added a footnote in which we stated that we would refer the matter to them, knowing we should obtain from their engineers a correct explanation of the problem, which would satisfy our readers and place Mr. Carter in a position to overcome his difficulties.—Ed.

August 15th, 1923.

Editor Radio News of Canada.

Dear Sir,—I am writing you regarding the complaint in Mr. Carter's letter which appeared in your August issue of Radio News of Canada, which in an editorial footnote was referred for reply to the engineers of the Northern Electric Company.

We are doubtful whether your correspondent is referring to tubes of Northern Electric manufacture when he speaks of "Peanut" tubes, because what he refers to is so far removed from the behaviour of Northern Electric Peanut Tubes that we feel that he must be using the word "peanut" in a general way, meaning thereby the small type of tube operated from dry cells, although the name "Peanut" is registered and strictly applies to Northern Electric product only. In particular, Mr. Carter's statement that the support for the filament is stiff and does not allow for the rapid contraction of the filament, is certainly not true of the Northern Electric Company's R215-A peanut tube, although there are other tubes on the market of the small type in which it seems to me the filament is held too stiffly.

Examination of the R215-A peanut tube will show that within it are two stiff, upright, metal supports held together at the top and at the bottom by glass beads. Attached to one of these upright pieces of metal is the suspension spring to which one end of the filament is attached. This suspension spring, it will be noted, is bent in the form of the letter U and when the filament is heated and expands, the sides of the U spring away from one another and maintain the filament taut, and when the current is turned off, the filament contracts and pulls the sides of the U close together again. No one who examines this tiny U-shaped suspension spring will believe that this delicate spring can possibly break the filament by means of any forces which it is able to exert. This spring has been carefully designed to exert just the right amount of force to hold the filament taut, and no more.

The writer has had a huge correspondence during the past winter in connection with radio subjects generally and peanut tubes in particular and he has never known of any complaint of this kind having been made, although other tubes on the market may be subject to some such difficulties. However, if the tubes were actually of Northern Electric manufacture I would suggest that someone has turned on a very excessive current during your correspondent's absence from his set. I cannot think of any other explanation.

Mr. Carter, I notice, writes from Saskatoon, Sask., and if it is actually Northern Electric peanut tubes that are in question I would suggest that he write the Northern Electric Company's branch house at Regina, who will no doubt give him satisfaction if he feels that the tubes were defective.

Yours truly,

W. B. CARTMEL,
Radio Engineer.

GOVERNMENT WILL ISSUE NEW REGULATIONS FOR AMATEUR TRANSMITTERS

In the following letter which the Department of Marine and Fisheries have asked us to publish, it is pointed out by them that it is their intention to follow the lead of the authorities of the United States and stop the transmission of messages by amateurs between 7.30 p.m. and 10.30 p.m., in the Dominion.

They are anxious, however, to do all they can to prevent inflicting an injustice upon the amateur and want the amateurs to communicate with them so they can learn at first hand just what the amateur transmitter thinks about this new regulation.

We would suggest that those interested should write Mr. A. Hawken, Acting Deputy Minister, Dept. Marine and Fisheries, Ottawa, Ont.

Department of Marine and Fisheries, Ottawa.

Editor Radio News of Canada.

Sir,—The regulation recently established by the United States, forbidding transmission by amateur radio stations between the hours of 7.30 and 10.30 p.m., has caused urgent representations to be made to this Department for the establishment of a similar rule in Canada.

As you are aware, practically all the radio clubs and associations in the Dominion have already met this demand by voluntarily agreeing to cease operating their transmitters during the evenings.

There would appear to be, however, in most of our cities, one or two holders of transmitting licenses who are not prepared to abide by these local rules. Such parties have neither the sympathy of the Department nor the reputable amateur, and in order that steps may be taken to curtail their unwelcome activities, the Department is disposed to consider the above representations and to issue a regulation specifically forbidding the use of transmitters during certain specified hours. Any party then breaking this regulation will be subject to the penalty prescribed therefor, viz., a fine of $50.00 on summary conviction.

Before the Department commits itself to any definite policy in this matter, we would appreciate an expression of the views of your association in regard to the same. The Department is anxious to afford the amateur every possible latitude, and at the same time protect the broadcast listener. The latter now outnumber the amateurs by at least twenty to one, and it is not unreasonable that they should be afforded the protection they ask for.

I am, Sir,

Your obedient servant,

A. JOHNSTON,
Deputy Minister.

AMATEUR RADIO IN GERMANY

by Dr. Alfred Gradenwitz

While Germany, in the development of radio engineering, takes a most active part, amateur radio, for various reasons, has so far been practically non-existant in this country. Now, however, a decided change has been brought about by the recent foundation of a German Radio Club which, judging from the first steps asserting its existence, has a rather militant character, and will, with juvenile enthusiasm, defend the cause of the amateur. Inasmuch as the monopoly of the postal department still threatens with severe penalties the man or woman daring enough to venture on the installation and operation of a private receiving set, the club is virtually a society of legal offenders who, however, so far from shunning the light of day, are intent upon making their doings as widely known as possible.

An Interesting Lecture

At the first meeting of the club, Dr. E. Nesper delivered an address drawing attention to what is being done abroad in the way of broadcasting, and discussing the possibility of a German organization avoiding any prejudice to the official, state-controlled radio service. While the postal department at length seems to be willing to let out ready-made receiver sets on hire, what the amateur wants is a station fitted up and altered by himself to suit his personal wishes and ideas. Dr. S. Loewe, in a subsequent lecture, showed to what enormous and ever-increasing extent other countries were profiting by amateur radio, and what an important part some leading men were playing in this connection.

At the last meeting, to which the writer was invited, Mr. Platz gave an historical account of the development of radio, dwelling at some length on the merits of those experimenters whose work made the construction of small receiving stations possible. A diminutive loop antenna, presented by the speaker enabled the productions of the London Grand Opera to be listened to. The end to be attained in Germany was to make radio as popular as it is abroad, thus enabling its educational possibilities to be taken advantage of, especially with a view to the spreading of knowledge in science and engineering.

It is intended to issue a high-class magazine, "Der Radio-amateur," the first number of which will probably appear in July.

RADIO ON RAILS

The Canadian Forestry Association Exhibit Car, at present touring the Maritime Provinces, in charge of Mr. G. Gerald Blyth, Secretary of the Association, was equipped with Marconi radio early in the spring and reports some exceedingly interesting experiences.

During a trip through the Lake St. John District of Northern Quebec, concerts from such distant points as Davenport, Iowa; Omaha, Nebraska, and all the well-known stations, were heard by local audiences numbering a hundred or more, for the first time in their lives. The equipment at this time consisted of a Standard Marconi receiver, a loud speaker horn, and a two-wire aerial seventy-five feet long, supported by two poles, the average height above the car roof being about five feet six inches.

During a brief stay in Montreal before journeying eastward, it was decided that in view of the previous excellent results, further equipment would be added in order that even larger audiences might be entertained. Two stages of power amplification were accordingly installed and the car departed for Mount Joli and points beyond. During this trip Mr. Blyth experimented with an indoor aerial and succeeded in tuning in Schenectady strong enough to operate the loud speaker.

Mr. Blyth reports many amusing incidents during the course of his travels. An extract from a recent letter gives one some conception of how the Forestry Exhibit Car is welcomed wherever it goes:

> "We pulled into Port Daniel, on the Gaspe Coast, and a few minutes later two short white masts were raised, a ground wire fastened to the rails, and all was ready for the big show. Folks from near and far gathered about the car to see the forest fire prevention "movies" and to hear a radio concert for the first time in their lives. The night was cold and damp and eventually it poured with rain, but this in no way damped their enthusiasm. Reel after reel was shown to the delight of the four or five hundred people assembled on the station platform. Shortly after we placed our loud speaker out of the window and then the fun began. Our tuning at first was not perfect and the loud speaker gave a mighty roar; then came the sweet strains of a popular air and later the familiar announcement: "WGY, Schenectady, New York, ONE MINUTE, PLEASE."

RADIO PATENTS ISSUED DURING JULY, 1923

Compiled by Ridout and Maybee, Toronto.

232,372—Combined Talking Machine Sound Box and Radio Microphone—C. L. DeS. Murray, July 3rd, 1923.

232,373—Signalling Apparatus—D. C. McCaa, July 3rd, 1923.

232,477—Radio Apparatus—T. Appleby and L. M. Knoll, July 3rd, 1923.

232,492—Radio Transmission System—The International Western Electric Co., Inc., R. A. Heising, July 3rd, 1923.

232,493—Electron Discharge Device—The International Western Electric Co., Inc., W. G. Housekeeper, July, 3rd, 1923.

232,622—Radio Receiving System—The Radio Corp. of America, J. Weinberger, July 10th, 1923.

232,623—Radio Receiving System—The Radio Corporation of America, J. Weinberger, July 10th, 1923.

232,646—Multiplex Radio Signalling System—The Canadian Radio Corporation, Limited, L. de Forest, July 10th, 1923.

232,650—Means of Modulating High Frequency Oscillations—The International Western Electric Co., Inc., R. V. L. Hartley, July 10th, 1923.

232,906—Receiving Device for Electric Waves—F. Schneider, July 24th, 1923.

232,934—Production of High Frequency Currents—The Canadian General Electric Co., Limited., E. Weintraub, July 24th, 1923.

232,938—Electron Discharge Apparatus—The Canadian General Electric Co., Limited, W. C. White, July 24th, 1923.

232,945—Signalling System—The Canadian Westinghouse Co., Limited, F. Conrad, July 24th, 1923.

232,964—Electromagnetic Device—The International Western Electric Co., Inc., G. C. Cummings, July 24th, 1923.

232,966—Vacuum Tube—The International Western Electric Co., Inc., W. F. Hendry, July 24th, 1923.

232,973—Radiogoniometer—The Marconi Telegraph Co. of Canada, Limited, G. M. Wright, July 24th, 1923.

232,780—Frequency Trap for Radio Signalling Apparatus—The Radio Corp. of America, R. H. Ranger, July 24th, 1923.

233,142—Vacuum Tube Base—The International Western Electric Co., Limited, J. W. Radu, July 31st, 1923.

233,185—Transmission of Radio Energy—J. H. Hammond, Jr., E. L. Caffee, July 31st, 1923.

CRYSTAL SET IN CAPSULE HAS GREAT SENSITIVITY

D-X Crystals—This crystal has the unique distinction of passing the inactive portion of its existence prior to purchase within the transparent walls of a capsule. The idea is not at all impracticable, since the bit of rectifier mounted in its nickeled brass cup is tightly sealed and untouched by the fingers until the paper stamp is broken.

The D-X Crystal is claimed to be ideal for Reflex work, as a detector it is very efficient in its operation and, as is characteristic of this clinker-like type, abounds in sensitive spots. In addition to the crystal there is enclosed within the capsule a circuit diagram showing a method for making use of a crystal set's output in connection with a supplementary tube.

The D-X Crystal has been awarded the New York Evening Mail Certificate of Excellence. Manufactured by the Specialty Service Company, of Brooklyn, N.Y., and distributed in Canada by Radio Limited, Montreal.

FRENCH SECTION

UN APPAREIL DE RECEPTION RADIOTELEPHONIQUE TRES SIMPLE ET TRES ECONOMIQUE—DETAILS DES DIFFERENTES PARTIES QU'IL CONTIENT

Dessins de M. Hector McPherson

Le schéma ci-haut représente un poste de réception à lampe avec transformateur d'oscillation. Très simple et très économique, il est reconnu comme très efficace. Cet appareil récepteur comprend les parties suivantes:

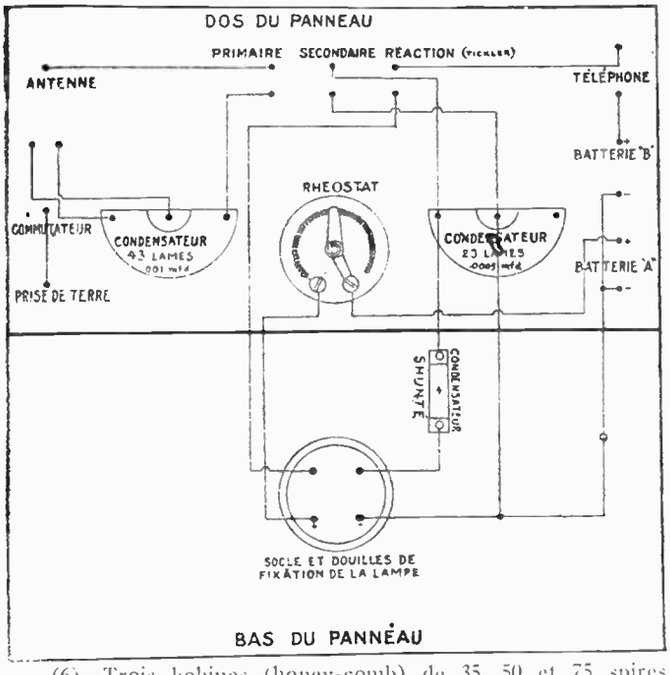
(1)—Un condensateur variable de 43 lames, dans le circuit primaire de l'antenne pour faciliter la syntonisation. Si ce condensateur n'est, parfois, pas requis, comme l'occasion s'en présente assez souvent un commutateur dans le circuit de l'antenne sert à s'en dispenser temporairement.

(2)—Un condensateur de 23 lames est dans le circuit secondaire pour donner une plus grande sélectivité aux transformateurs d'oscillation.

(3)—Un rhéostat de 5 ohms contrôle le courant du filament de la lampe.

(4)—Huit bornes nickelées servent aux connexions des téléphones, batteries, antenne et prise de terre, tel qu'indiqué sur le schéma.

(5)—Une monture pour les trois bobines (honey-comb) transformateurs d'oscillation.



(6)—Trois bobines (honey-comb) de 35, 50 et 75 spires respectivement; c'est-à-dire 35 spires pour la bobine primaire 50 spires pour la bobine secondaire et 75 pour la réaction (tickler).

(7)—Une manette à deux phases pour éliminer le condensateur de 43 lames ou le mettre en série avec l'antenne lorsque l'opérateur désire recevoir des ondes plus courtes que l'onde propre de son antenne.

(8)—Un condensateur shunté donnant un potentiel nègatif à celui de la lampe et permettant aux électrons, s'échappant du filament, de se diriger vers la plaque; ce condensateur facilite aussi le passage du courant de la plaque vers le côté négatif du filament.

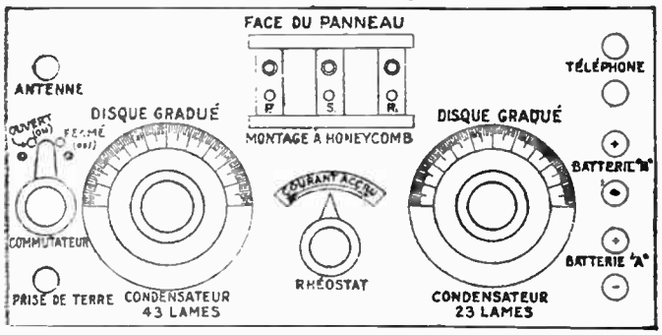
(9)—Une douille pour lampe.

(10)—Un tube à vide (lampe détectrice).

(11)—Un panneau, 6 x 12, en ébène, sur lequel se fait le montage de l'appareil.

(12)—Une batterie "A" (accumulateur ou pile sèche) et une batterie "B" de 22½ volts.

Avec set appareil, les concerts de postes divers ont été clairement entendus à une distance dépassant mille milles.



Le dessinateur de ce simple et économique appareil, M. Hector McPherson, possède une expérience en télégraphie et téléphonie sans fil d'au-delà de vingt ans. Pendant la guerre, et il dut entrainer des centaines d'opérateurs pour en faire des au département du trafic, ayant sous ses ordres 150 hommes, et il dut entrainer des centaines d'opérateurs pour en faire des télégraphistes compétents.

Ses études et son expérience approfondies ont été faites aux différents observatoires de New-York et avec plusieurs compagnies américaines. Habilement secondé par son frère, le lieutenant C. McPherson, qui servit au front avec le 22ième bataillon, M. Hector McPherson inaugura, le printemps dernier, (1922) la maison de commerce Main Radio & Audio Supplies.

THE FRESHMAN FIX-O

Is a combination of Grid Condenser, Leak Mounting and Resistance Leak. The manufacturer—the Chas. Freshman Co., Inc., 106 Seventh Avenue, New York City, has, by a clever stroke of manufacturing ingenuity, been able to produce this complete item to retail at the price grid leak mountings alone formerly sold for.

The distinctive feature of this device is that the mounting is constructed out of the actual plates of the fixed condenser. This is accomplished without any solder, making the device a true and perfect leak mounting and, at the same time, eliminating entirely the necessity of a separate mounting.

It is claimed by the manufacturer that Freshman Fixed Resistance Leaks are the only leaks on the market which contain no carbon, graphite or lamp black. They have attained a resistance which will permanently endure and will remain in their specified value under all and any climatic and atmospheric conditions, thus rendering a leak which is always absolutely constant. An added feature to the leak is the Safe-T Handle. The Freshman Company own and control the exclusive rights for the manufacture of the Safe-T Handle for all radio apparatus.

While the Freshman Fix-O can be mounted almost anywhere, it is so constructed that it can conveniently be attached to the tube socket itself. This, of course, is a distinctive advantage as the shorter the lead from the tube to the leak the better the performance.

The foundation of the entire product is, of course, the Freshman Noiseless Tested Mica Condenser which is so designed that constant equal pressure is exerted on the condenser plates over the entire area.

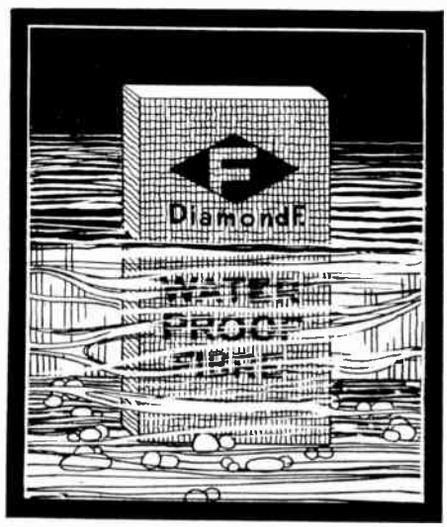
The Freshman Fix-O takes its place alongside of the Freshman Variable Resistance Leaks, for both base and panel mounting, giving Chas. Freshman Co. a most complete line of all types of resistance leaks, both fixed and variable.

GROWTH OF RADIO

by S. W. Place, Radio Engineer

Anyone who has closely followed the radio business for the last two years can readily see the trend of things since the sudden boom in the winter of 1921-22. Manufacturers were unprepared for the sudden boom, which virtually swept the whole country by storm. This resulted in frenzied efforts on their part, as well as thousands of newcomers, to meet this demand. Practically all of the established manufacturers were soon months behind in their production. Of the newcomers, some of them endeavored to produce quality products, others simply tried to see how much money they could make by turning out cheap imitations of the real thing. It is needless to say that not many of the latter remained in business.

When production caught up with the demand, and with the entry of many of the larger and older established electrical concerns into the radio field, the buyer became more discriminating and would not purchase anything offered without knowing something of the firm behind the product.



The sets of a year or more ago were, as a rule, clumsy and inefficient, and far from reliable. This last radio season has noticed a decided change. The trend is now for simplicity of design and operation, reliability and appearance. Instead of a dozen adjustments, there are now only two or three, making it easier for the inexperienced person to tune in a signal. Modern set design now tends toward compactness as well as simplicity.

Let us review briefly the trend of affairs since radio became popular. We find two years ago the two variometer set chiefly in use, with the Westinghouse and a few others marketing a single circuit set. It was soon found that the double circuit sets were entirely too difficult for the novice to tune, and thus the single circuit sets became more and more popular on account of their ease of tuning. Later, refinements in design rendered the single circuit set almost as selective as the double circuit set, resulting in the now almost universal use as the single circuit tuners.

Later in the season, the radio frequency sets became popular, but the transformers were, at first, not entirely satisfactory. The resistance coupled iron core transformer, and later an air core transformer was developed which would give a fairly good amplification over a band of several hundred meters wave length. The first radio frequency sets were built in massive cabinets, and connected to a large loop that stood in the room.

The multiplicity of controls on the earlier radio frequency sets rendered them unreliable and they soon became unpopular. The trade swung back again to the regenerative sets, with some manufacturers producing a set combining one stage of radio frequency with a detector and two stages of audio frequency.

In the latter part of 1922 new circuits appeared, among which were the Armstrong super-regenerative, and the reflex cricuits. The super-regenerative circuit became unpopular on account of the complicity of adjustments, while the reflex set gained popularity. The reflex circuit combines sharp tuning with long distance reception and volume of signal received on a loop using 3 tubes and a crystal detector. Some later developments were modifications of Armstrong's circuits in the "Reinartz tuner," Flewelling circuit, Cockaday circuit, etc.

A real advance in the radio industry was made with the invention of the "neutrodyne circuit" by Professor Hazeltine. Several very small condensers placed at the proper points in this circuit, eliminate all tendency of the circuit to oscillate, thereby allowing the signal to build up through two or three stages of tuned radio frequency amplification. This set works very satisfactorily on local as well as distant reception. The Grebe Company have also a new development in the way of a special form of tuned radio frequency set which operates on local as well as distant stations by use of a ground connection and a 20-foot length of wire.

This last radio season saw a great improvement in vacuum tubes, with the tendency towards the dry cell tube. The older type of tubes were heavy current eaters, which necessitated frequent recharging of storage batteries. The current consumption of some of these tubes was later cut in quarter and their efficiency increased.

The latest development is a dry cell tube operating on 3 to 4 volts and taking a filament current of only six-hundreths of an ampere. Several of these tubes can be operated for a hundred or more hours from 3 ordinary dry cells.

We have briefly outlined the development of radio since the inception of broadcasting; our next thought is, "what developments may we look for in the future?" If they come as fast within the next ten years as in the past ten years, who can prophesy what to expect?

KEEPING ENERGY WHERE IT BELONGS

A Radio Set That Loses Energy Through Imperfect Insulation Cannot Function Properly

There are properties which an insulating material for radio must have, for without these properties its efficient service will be short lived.

In some respects hard rubber and one or two other materials are splendid for insulating. They have the necessary dielectric strength. They are impervious to moisture.

But insulating material for radio must have no tendency to warp when exposed to heat or unusual cold. Neither should it be so brittle that it is likely to crack or split in the process of machining.

RADIO BRANCH, DEPARTMENT OF MARINE AND FISHERIES INSPECTORS (Part Time)

St. John, N.B., and District—A. L. Atkinson, C.P.R. Telegraphs, St. John, N.B.

Vancouver, B.C., and District—R. C. Bodie, 1290, 11th Ave. W., Vancouver, B.C.

Brandon, Man., and District—W. H. Carkener, 139 Frederick Street, Brandon, Man.

Windsor, Ont., and District—W. J. L. Carter, 512 Niagara Street, Windsor, Ont.

Kingston, Ont., and District—R. M. Davis, 210 Union St., Kingston, Ont.

Toronto, Ont., and District—W. C. C. Duncan, 196 Ellsworth Ave., Toronto, Ont.

North Sydney, N.S., and District—G. A. Edwards, Box 155, North Sydney, N.S.

Calgary, Alta., and District—A. V. Evans, 1507, 22nd Ave., Calgary, Alta.

Kitchener, Ont., and District—H. S. Gowan, 120 West King Street, Kitchener, Ont.

Three Rivers, Que., and District—G. A. Kemp, 20 Laviolette Ave., Three Rivers, Que.

London, Ont., and District—C. H. Langford, 258 Cheapside Street, London, Ont.

Sherbrooke, Que., and District—R. Lowney, Lennoxville, Que.

Saskatoon, Sask., and District—John Macklem, Helgerson Block, Saskatoon, Sask.

Brantford, Ont., and District—W. K. Mitchell, 104 Pearl St., Brantford, Ont.

Quebec City, Que., and District—D. R. W. McWilliams, 13 Fraser St., or 83 St. Peter St., Quebec, Que.

Moose Jaw, Sask., and District—W. R. Pottle, 1164 Willow St., Moose Jaw, Sask.

Montreal, Que., and District—A. Reid, 202 Birch Ave., St. Lambert, Que.

Province of P. E. I.—K. S. Rogers, Charlottetown, P.E.I.

Winnipeg, Man., and District—J. Shannan, 730 Victor St., Winnipeg, Man.

Peterboro, Ont., and District—H. F. N. Sherwood, 110 Lock Street, Peterboro, Ont.

Fort William and Port Arthur, Ont., and District—Wm. M. Sutton, 227 South Archibald St., Fort William, Ont.

Hamilton, Ont., and District—H. L. G. Westland, 58 Lorne Ave., Hamilton, Ont.

CORRESPONDENCE

165 King Street E.,
Bowmanville, Ont., Aug. 6, 1923.

Editor Radio News of Canada.

Sir,—I am writing to tell you that I am glad to help you and your Radio News of Canada along this way by taking another year's subscription for your magazine.

One thing I would like to say about radio and the work of new inventions toward it, is, that the patent law of Canada should come forward to help along this line as well as the radio inventor, by not charging too much for patent rights or giving the inventor a free patent right, which would help both the richer and poorer classes of inventors.

The way it is now, the poorer fellow has to spend his hard earnings by paying a high price for patents, which I think, and all other inventors ought to think, that a man has enough to do to work his brains and pay experimental costs without having to pay for patent rights, which is something that is not much good to him and he is money out of pocket by it.

Quite a number of men have had this same thing happen to them, and of course those people are not going to take an interest in the invention line. I think that the sooner the patent law is changed, in order to give all inventors a chance to be protected by being granted either a free patent or a cheaper rate, the better it will be for radio and all other inventors in Canada.

When we have this worked out the better it will be for Canada and all other countries.

Yours truly,
RADIO FAN FOR 23 YEARS.
Radio Station 3NL.

Toronto, July 15, 1923.

Editor Radio News of Canada.

Dear Sir,—Just a few lines on how radio has appealed to me during my long lingering illness of 19 months in bed. I found it to be the best gloom chaser that ever entered a sick room, also giving heaps of credit to C.F.C.A. for their fine broadcasting. I made my crystal set while I was in bed. I got hockey games, in fact everything that was broadcasted. I for one, can take more comfort out of listening in at any time than going to the theatre. The only thing with the crystal set is that you cannot reach any distance, but believe me, when I can see my way clear for money I will get a set that will reach as far as the other fellow can; then there is one thing more which in my mind is the education of the younger generation, keep them where the parents can keep an eye on them.

Where would Toronto have been for the Government election returns if it was not for the radio; we could not get returns by phone or telegraph for the storm broke the poles down and also the wires, then there are several things which help the public, the prices of food, stocks and bonds. There are lots of places where radio fills the summer vacation around 8 or 9 o'clock at night is when the mosquitoes start to bite real hard, what is the matter with going inside and tuning in to some broadcasting station. Hoping this will interest other fans as it has interested me and also help to push along a real live magazine such as the Radio News with its helpful hints and hookups on radio and also as a directory to other things and supplies.

Yours truly,
WM. FIEGEHEN,
384 Westmoreland Ave.

Miss Filament: "That horrid Mr. Hy. Tension threatened my life just now."

Constable Fuse: "Well, stand by me—I'll protect you with my life."

First Fly (on grid of valve): "Say, mate, come up on the slippery dip."

Second Fly (on accumulator): "Yes, and slip into the fire! Not on your life, these swimming baths will do me!"

Miss Anode: "Oh, dear, how stifling and hot it is in this glass-house when the fire is burning. Not a breath of fresh air, and those Milliampere girls and that Electron crowd hanging about when they're not wanted!"

"Hard pressed," said the wire when the terminal clamped it down.

RADIO AT HOME AND IN CAMP

M. A. RINGWALL,
Ferintosh, Alberta.

Last Christmas father gave us a Radio Receiving Set. How happy we were! From the very first we had no difficulty in receiving concerts from distant stations. Neighbors came in and our home became a social centre. Father said, "You'll soon get tired of it, when summer comes you'll forget all about listening in." However, we noticed he seemed as enthusiastic about radio as we.

As spring passed, and summer came on, my sister Nell, who had never been strong, seemed to be getting weaker and weaker. Our family doctor tried every means to improve her health. "She must have quiet and rest, a complete change," he said. We all felt the wisdom of his words. "Oh, to get away from the city," we said, "away from social functions." After my brother Leo, and I had fully discussed the topic between ourselves, we suggested to mother and father, our carefully made plans. They were, that we were to go camping during the month of June in some secluded spot, not a popular summer resort, but a place where we would be entirely by ourselves. At first dad objected, saying we would be shut off entirely from the world, and mother, of whom he was always so thoughtful and considerate, would be lonely. Leo and I, not to be defeated in our plans, argued that a complete change was what we needed, and why not get a complete camping radio set to take with us on our outing. Sister Nell, too, seemed interested in this, and finally, as dad could get away from business in June, we were busy preparing for our holiday.

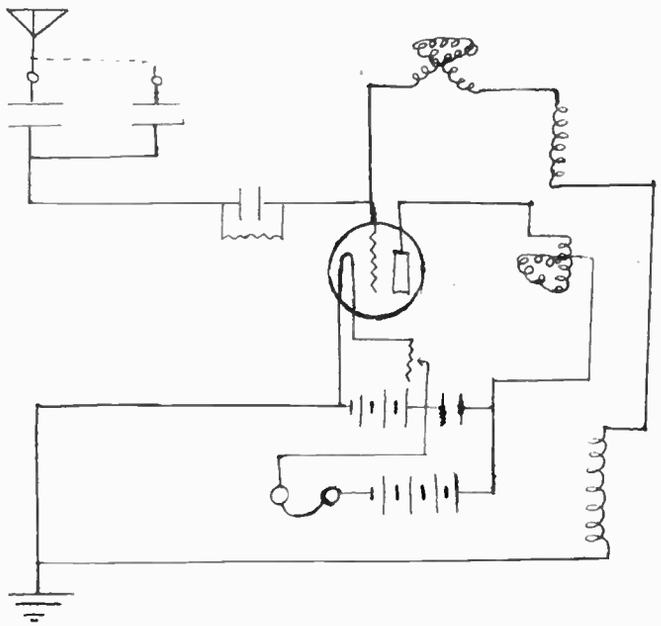
The place chosen for our camp was a most ideal spot—an island of about five acres, at least ten miles from neighbors. There, we felt would be quiet and peace, just what we wanted.

Our father was expecting an important business message sometime during June, he left word at his office for the message to be broadcasted, so he would know when to return to the city. Having made these and further arrangements we were off, leaving the rest of the world behind. Did we? Well, in a way, the world we didn't want, but the best we could have when we wished. We had a portable radio set, which we used on our way to camp, when we stopped to rest. How delightful it was to rest and listen to music. We were two days reaching our "haven of rest," and the last nine miles we went by motor boat. Here, too, we could listen to radio music. When we arrived at our new home, and had pitched our tents, we would often go boating for hours, drift along the current and listen to first class music from various stations. It was a grand and glorious life. We felt then, what a wonderful invention radio is, and how much more we enjoyed our life because of it. Sunday nights we could listen to regular church services, sermons and choir singing. We'd hear news and get other interesting information. The evening came when dad received his message o'er the air, and next day he was off. Within a couple of days he was back, having successfully done the business he could no longer put off. Sister Nell's health improved. How she would laugh at the jokes she heard, how content and peaceful she would look when reclining in a hammock listening to real music.

When the month of June was ended, home we went, feeling it was the most perfect month we had ever spent. Radio had made it so.

Should there be a slump in radio during the summer? Most decidedly not. Then, even more than in winter, we can appreciate and enjoy it. It is during the heat of summer we feel languid and listless, not able to exercise and tramp about as during the colder weather. Then—radio music soothes the weary senses, and it is the one thing that completes a holiday.

CORRECTION



This hook-up should have been placed with the article by A. A. Denton, appearing on Pages 38 and 39 of this issue.

BRANDES PURCHASE NEW FACTORY

The new factory containing upwards of 46,000 square feet of space in one building of mill type construction, having two stories on one end and three stories on the other, has just been purchased by C. Brandes, Inc., makers of Brandes Matched Tone Headsets.

The executive office and main plant of the corporation is located at 237 Lafayette Street, New York City, branch factories operating in Toronto, Canada, and London, England.

The plot which Brandes Corporation acquired in their purchase is located at Newark, N.J., having a frontage of 239 feet on Mount Pleasant Avenue, taking the entire block along Gouvenor Street to Ogden Street and runs along Ogden Street for a distance of 225 feet.

The plant has a frontage along Mount Pleasant Street of 100 feet, and runs to Ogden Street, where it has a frontage of 225 feet.

The new plant will be operated as a feeder plant for the rest of the corporation's factories. They will take possession of the lower portion of the building immediately and as soon as the assembly of machinery is completed they will begin the manufacture of parts for their headsets.

The New York plant will, as formerly, do assembling exclusively. Later, the New York plant will likewise move to Newark, bringing under one roof the entire American production of Brandes headsets. This will mean the employment of approximately 1000 hands.

The corporation with all its branch factories now occupy in the neighborhood of 70,000 square feet of space, probably the largest factory in the United States devoted to the production of one item of radio.

With their present facilities, prior to the purchase of the new factory, they had a production capacity of one headset every ten seconds of the working day. With the added facilities, they will be in a position to greatly increase production and at the same time maintain the high quality of product which they have been manufacturing for years.

"Very stuck up," said the earth wire when it surveyed the aerial.

"Hard hit," said the phones when they got across the H. T. Battery.

ELECTRONS, ATOMS AND THE ETHER

W. B. Cartmel, M.E.I.C., Fellow of The American Society.
Transmission Engineer, Northern Electric Company, Limited.
Paper read before the Montreal Branch, The Engineering Institute of Canada, March 30th, 1923.

In discussing electrons and atoms one is able to make a number of positive statements in regard to what we know at present on the subject, but it would probably take a course of at least five lectures in order to cover, in a satisfactory way, the amount of convincing evidence which modern science has brought to light. Therefore, in a lecture given in one evening, the evidence that can be brought forward will, of necessity, be less convincing, though it should be borne in mind that our present knowledge rests on the basis of a very much greater weight of evidence; in fact, the amount of evidence that has been collected by scientific workers is stupendous.

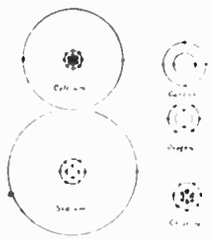


Fig. No. 1

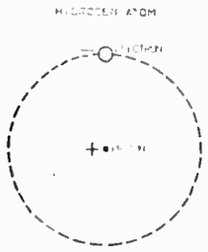


Fig. No. 2

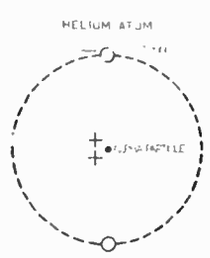


Fig. No. 3

To begin with, it is now well established that all matter consists of particles which we call atoms. Every kind of matter consists of atoms whether it be wood, iron, stone, water or what not; each atom has in its centre a positively charged nucleus surrounded by particles of negative electricity called electrons. Figure No. 1 shows one writer's conception of the arrangement of electrons in the atoms of various substances. You can see that each of these atoms consists of a number of particles of negative electricity, a different number in each and differently arranged. There is also within the atom a minute positively charged nucleus (not shown in the figure), the positive charge on the nucleus being equal to the sum of the charges of all the electrons, so that the atom is electrically neutral. Figure No. 2 shows the simplest atom of all, the hydrogen atom, which consists of a central nucleus having a single positive charge around which revolves one electron. The singly, positively, charged nucleus of the hydrogen atom we call the proton, so the hydrogen atom consists of one proton around which one electron revolves.

Figure No. 3 shows the helium atom which has a nucleus consisting of four protons and two electrons; the net positive charge of the nucleus of the helium atom is therefore two units, and there are two electrons revolving around this nucleus, their negative charges making the atom electrically neutral. The nucleus of the helium atom is called the alpha particle for reasons which will be brought out later. It is fairly well established now that the nucleus of the atoms of all other substances are composed of protons and alpha particles.

To give an idea of the size of atoms and electrons, if we were to take a cricket ball and magnify it to the size of the earth then the atoms within it would be about the size of the cricket ball. However, a clearer and more accurate conception of all these magnitudes may be formed by giving their dimensions in terms of a very small unit. The unit we shall use is called the Angstrom unit which is generally used to-day in tables of wave-lengths of light. The Angstrom unit is one ten thousand millionth (1/10,000,000,000) of a metre which is almost exactly one two hundred and fifty four millionth (1/254,000,000) of an inch. The wave-length of yellow light is about one fifty thousandth (1/50,000) of an inch or more (nearly six thousand Angstrom units), while the diameter of an atom of hydrogen is about equal to two Angstrom units. Engineers are fairly familiar with a thousandth (1/1,000) of an inch. If we were to take the one thousandth part of one thousandth of an inch, this would still be 254 times larger than the Angstrom unit. You will see from the minute dimensions of the atom how difficult it is to disabuse our minds of the fact that certain substances, such as for instance a piece of smooth polished metal is not continuous but consists of atoms. As a matter of fact it has been suspected for ages that matter was made up of minute particles and although modern science was sceptical about this until recent years, there is now no question about it, it is beyond dispute.

Figure No. 4 shows a wave-length of light in comparison with the molecules of a body. It will be seen how difficult it would be for light having a wave-length relatively so much larger than the particles, to produce any image of these particles in our eye. Compared with a wave-length of light, atoms are relatively much smaller than shown in the figure. An atom of hydrogen is approximately equal to two Angstrom units in diameter, the electron is about thirty-seven millionths (37/1,000,000) of an Angstrom unit in diameter and the proton is about one two-thousandth (1/2,000) the diameter of an electron.

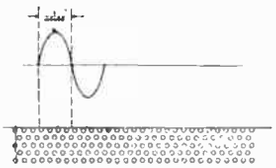


Fig. No. 4

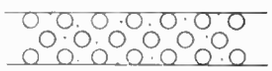


Fig. No. 5

What is Electricity?

In the past, theories as to the nature of electricity have been so vague that we will find it clears the matter up quite a good deal if we consider electricity as being made up of particles, and the flow of electricity in metals to be the passage of these particles between the atoms of the metal. Metals, as you know, conduct heat and electricity much better than do other substances. This is because there are a certain number of electrons which become detached from the atoms and can move more freely through the metal. Figure No. 5, shows what we may imagine as the cross-section of a sheet of metal with its atoms and free electrons, atoms being represented by circles and the free electrons by dots. When a difference of potential is applied between the ends of a sheet of metal or a wire, the electrons move through the metal under the action of this difference of potential. Conduction of heat through the metal takes place somewhat differently, the agitation of the electrons being passed on from one electron to its neighbor until all of the electrons in the metal have similar agitations; in other words, the temperature is the same throughout the metal. It is because of the greater number of free electrons in metals than in insulating substances, that metals are good conductors of both heat and electricity. It is not thought that the atoms of the metal are in violent motion due to the heat energy as are the molecules of a gas, but that the atoms of a metal of any solid substance remain more or less fixed and the heat energy consists chiefly of the vibration of the free electrons.

You will note that in passing along between the atoms of a sheet of metal the paths are much more restricted if the sheet is very thin because the electrons do not leave the surface of the metal (except at very high temperatures) and therefore can only pass on one side of the surface atoms. Experiments made on sheets of metal a few molecules thick, show that diminishing the thickness causes more than a proportional increase of resistance, that is to say for very thin sheets a few molecules thick, halving the thickness more than doubles the resistance. It has also been found that at liquid air temperatures where the vibration of the molecules has practically ceased, the resistance of a metal decreases enormously. This is no doubt due to the absence of vibration of the electrons, in which case no electromotive force is lost by encounters between the free electrons and the atoms. Now if we heat the metal very hot, the agitation of the electrons becomes so violent that they escape through the surface, and "boil" out

of the metal. This fact was first noticed by Edison in his incandescent lamps where the electrons were "boiled" out of the carbon filament. He placed a metal plate within the bulb of a carbon lamp and found that he was able to draw several milliamperes of current from it. That was in 1883. The arrangement is shown in Figure No. 6, which shows a lamp with a metal plate inside, the carbon filament of the lamp being heated by a battery. Now as we know the free electrons in any hot body are vibrating very violently and the carbon filament being heated to incandescence, the agitation of the electrons is so violent that they fly out in all directions. However, as there is a metallic connection between the plate and the filament, there will be a difference of potential between the plate and the middle portion of the filament, equal to half the battery voltage. The plate being therefore positive with respect to the filament, the emitted electrons are drawn to the plate and flow through the connecting wire back to the battery. It will be noted that the actual flow of electrons along the wire, is opposite to the direction ordinarily taken as the direction of flow of electric current. As a matter of fact the direction of flow of electric current in a wire is opposite to what it was formedly supposed to be. The Edison effect was never understood until the discovery of the electron in 1897 by Sir J. J. Thomson. This discovery disclosed the direction of flow of the electric current, showing it to be in the opposite direction from what had previously been assumed.

The above, however, is not the only way in which electrons have been brought out of the atoms of substances. You would naturally suppose that if the atoms of all substances are made up of these particles of electricity we must be continually noticing electrical effects from ordinary substances in everyday life, and this is as a matter of fact true. We are all perfectly familiar with the phenomena of frictional electricity. We know that if we rub sulphur on hard rubber, the sulphur or the hard rubber takes a negative charge. In other words, atoms and electrons are rubbed loose in the process and detach themselves from the hard rubber or the sulphur, of if we rub a glass rod with silk, we rub electrons as well as neutral atoms off the glass rod, leaving it with a slight deficiency of electrons, or in other words positively charged.

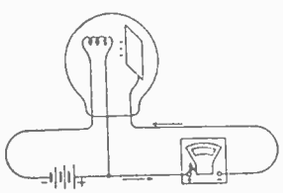


Fig. No. 6

Now in order to clarify our ideas in regard to the nature of electricity, it will be necessary to speak briefly of the ether and of the effect of electrons upon the ether. Moving electrons drag the ether with them. The simplest illustration of this is an ordinary wireless transmitting and receiving station. Consider two aerials arranged for radio telegraphy. The intervening space between the aerials is, as we all know, filled with a mysterious substance which we call the ether. When a message is sent out from the transmitting aerial, electrons rush up and down through the metal of the aerial dragging the ether with them and setting it into violent motion, thereby causing waves to go out through the ether in all directions. These waves on reaching the receiving aerial drag the electrons therein up and down in accordance with the vibration of the waves and thus a message is received. It is not possible to-day to speak much about the ether; we know it is there and is probably a gas, but if it is a gas many of its properties are very different from those of any other gas. Probably because its particles are so extremely minute, we have not so far been able to find out much about it. However, we do know that this important inter-action between electrons and the ether takes place. It has been found that light waves are set up in the ether by vibration of the electrons just as waves in wireless telegraphy are set up. The difference between the two amounts only to a difference in wave-length. Light consists of waves having a wave-length of one thirty-five thousandth (1/35,000) of an inch to one seventy thousandth 1/70,000) of an inch, while electric waves vary in wave length usually from fifty metres up to several thousand metres, although electric waves have been produced having a wave length of only a small fraction of an inch.

Vibrating Electrons Cause the Ether Vibrations That We Know as Light

One of the means which led to the discovery of the electron was the role it played in the production of light. It was known that light was not produced by the vibration of atoms because they are much too large. In this connection it might be well to say a word about the so-called Zeemann effect, which is an optical effect that led up to the discovery of the electron. When light falls on a grating, that is to say, on a piece of glass ruled with very fine distinct, parallel lines, the fine ruling causes the light to be bent through an angle. The angle through which it is bent depends on the wave-length of the light and the fineness of the ruling. On interposing this grating in a beam of white light you will notice that the light is bent, the violet light being bent least and the red the most. If we know the number of lines per inch in the grating we can tell from the angle through which the light is bent what the wave length is. Now, in Zeemann's experiments, a sodium flame was placed between the poles of a strong electro-magnet and the yellow light from this flame was allowed to fall on a grating and the deviation of the light was noticed. An electric current was passed through the windings of the electro-magnet and then turned off again, and it was found that the deviation (hence the wave length) was slightly different in the two cases. The spectral line was really doubled or tripled. This was due to the action of the magnetic field on the rotating electrons in the flame. These rotating electrons set up electro-magnetic waves in the ether just as the electrons oscillating up and down in an aerial do. We all know what a powerful effect the magnetic field of a dynamo produces on the electrons in the conductors of its rotating armature and can therefore well imagine the effect of a strong magnetic field upon these rotating electrons. From measurements made of the change in wave-length it was possible to determine the ratio of the charge of the electron to its mass or weight; in fact, this proved to be one of the most accurate methods of measuring this ratio. This has been mentioned because of the important effect produced by electrons on the ether. If we had two such sodium flames it could be shown that we would have virtually a transmitting and a receiving aerial. If white light is sent through a sodium flame it is found that the constituent vibrations in the white light which agree with the free period of the rotating electrons in the sodium flame are taken up by these electrons. This is quite similar to a wireless receiving aerial, where the aerial has to be in tune in order to take up the vibrations from the ether. If it is tuned to 200 metres, it will catch only 200-metre messages separating them out from other wave lengths that may be present.

Conversely, Light Sets Electrons into Violent Vibration

We may use an allied method for obtaining electrons from a piece of metal. Allowing ultra-violet light to play upon a sheet of zinc, it may be proved that electrons are emitted by it. If the sheet of zinc is first given a negative charge and connected to an electroscope, and the ultra-violet light from the spark of this industrion coil allowed to fall upon the zinc, you will note that the emission of electrons causes it to lose its charge. In this case we have again a similarity to a wireless receiving aerial; the short electro-magnetic waves which we know as light falling on the metal plate set the electrons into vibration just as ordinary electro-magnetic waves do in the case of the aerial and if the vibration is sufficiently violent they fly out. Ultra-violet light which is light of very short wave length, falling on the electrons in the zinc, agitates them so violently that they shoot out of the zinc. We can cause electrons to shoot out of almost any substance by using light of the proper wave length. Even light of the visible spectrum falling on certain substances, such as alkali metals will cause electrons to fly out from them. However, the shorter wave lengths will cause the electrons to shoot out of more substances than longer ones will. We shall see later that X-rays are merely light of very short wave length, about one ten thousandth the wave length of ordinary light. By means of X-rays, electrons can be brought out of almost all substances. This fact is easily illustrated and furnishes one of the most striking lecture experiments. The author gave a practical demonstration of this experiment explaining: "I have here an electroscope, mounted in a projecting lantern. On charging the electroscope you will note the little leaf of aluminum foil stand out at right angles to the supporting wire. At the other end of the platform is an X-ray apparatus. On causing this to emit X-rays you will notice that the electroscope loses its charge, as indicated by the gradual fall of the aluminum leaf." This experiment may be explained as follows: Electrons being sensitive to the very short wave ether vibrations which we call X-rays, they fly out of surrounding matter when the X-ray machine is in action. They thus cause the

charge on the electroscope to leak away. In particular, the air surrounding the highly insulated aluminum strip gives out electrons, and in place of neutral atoms of air we have positively charged atoms of air or positive ions, and electrons or negative ions. The electric charge on the aluminum leaf is conducted away by the joint action of the positive and negative ions moving in opposite directions. This so called ionization of air, or ejection of electrons from air by means of X-rays, was shown directly on a photographic plate by C. T. R. Wilson. It was known that if a sudden expansion was produced in moisture laden air, drops of moisture would condense on dust particles in the air. Wilson found out that positive and negative ions, that is to say positively charged atoms and electrons would serve as nuclei for the formation of drops of water. Photographs made by Wilson (see Fig. 7) show the ejection of electrons by X-rays from moisture laden air. The moisture in the air condenses around the ejected electrons, and around those atoms which having lost an electron are positively electrified, and thus these electrons and positively charged atoms are made visible as shown in the figure.

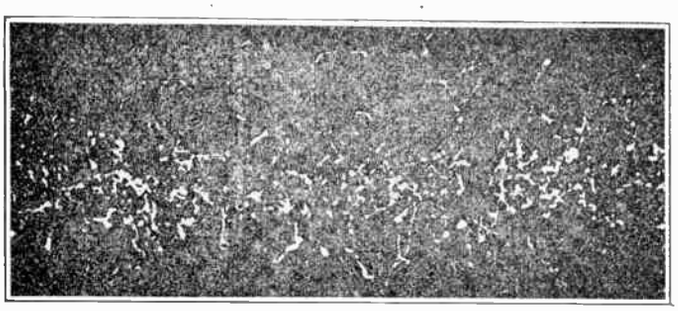


Fig. 7

Early Work on the Electric Discharge Through Gases

So far an endeavor has been made to give a conception of electrons as they exist in the atoms of matter and something has been said about optical experiments which pointed to the existence of electrons. However, their existence was actually proved by experiments in which they were entriely separated from matter. This was done by passing an electric current through tubes from which practically all the air had been pumped out. A great deal of investigation work has been done in connection with the electric discharge through tubes containing rarified air and other gases. We will however only take up two conditions of gaseous discharge.

First consider the case of a glass tube having electrical terminals or electrodes sealed into the ends, and exhausted by means of an air pump so that only about one ten thousandth of the original air remains. Very beautiful effects are obtained when electricity passes through tubes pumped out to this degree of exhaustion. Tubes of this sort, known as Geissler tubes, are often made into fantastic shapes as shown in Fig. 8. A demonstration was given by the author with five such tubes connected by wires with the terminals of an induction coil, during which he said: "You will note that the air in these tubes has become conducting to such a degree that the current passes through the five tubes in series, giving an air path of approximately forty inches, rather than jump between the sparking terminals of the induction coil, through half an inch of air at atmospheric pressure." The other case we shall take up is where the air is pumped out to a very much higher degree of exhaustion. Pumping out more of the air from the tubes causes the electric current to pass through them with more difficulty, because the further removal of air makes a shortage of molecules for ionization. On exhausting a tube to a very high degree, a voltage sufficient to produce a spark of several inches in air is necessary to cause current to pass through the tube. Sixty years ago experiments were made by Sir William Crookes, with tubes evacuated to a millionth of an atmosphere, which was about as high a degree of exhaustion as it was possible to produce at that time. In these tubes known as Crookes tubes (see Fig. 9) it was found that there was no glow with beautiful colors as in the Geissler tube, but instead there was a beam of bluish light proceeding normally from the cathode or negative terminal of the tube. The bluish light known as cathode-rays impinging on the walls of the glass tube caused it to glow with a yellowish-green glow. In 1876 Crookes announced the view that the cathode-rays consisted of particles of matter, which he called radiant matter. He assumed that in addition to the three known states of matter, solid, liquid, and gaseous, there is a fourth state, which bears a relation to gaseous matter similar to that which gases bear to liquids.

Investigations of the electric discharge through gases as illustrated in the tubes just referred to, were carried out for a long period of years by Sir J. J. Thomson and his pupils. It was finally demonstrated that the stream of cathode-ray particles in the Crookes tubes were particles of negative electricity. This was very puzzling at first because it gave a clear understanding of negative electricity, but not of positive electricity. However, it was in accordance with Benjamin Franklin's old single fluid theory of electricity which assumed that

Fig. 8

there was only one electricity, that positively charged bodies had an excess of this fluid, and negatively charged bodies a deficiency. We now know that it is the sulphur rubber with wool that has an excess of electrons, and glass rubbed with silk has a deficiency, so that in assigning the terms positive and negative we should have chosen the sulphur rubber with wool as the positively charged body because it does actually have an excess of electrons, while a piece of glass after rubbing with silk has a deficiency. If this had been done our conventional direction of flow of electricity would be in accordance with what we know to be the actual flow of electrons in a substance. Thus the electrical charge on the zinc plate of a battery is of the same sign as the charge on a piece of sulphur rubbed with wool, hence on connecting a wire between it and the carbon plate, there is a flow of electrons through the wire from the zinc to the carbon. We see therefore that the experiments of Sir J. J. Thomson established the single fluid theory of electricity but they still left open the question of the nature of positive electricity. To-day we know that the atoms of all substances consist of a minute, central, positively charged nucleus surrounded by a certain definite number of

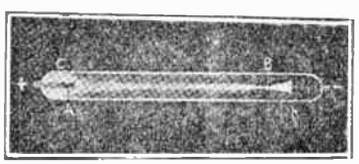


Fig. 9

electrons, but at the time of the discovery of the electron or particle of negative electricity, the nature of positive electricity was very mysterious. Many discoveries however, (such as the discovery of X-rays and radium) came along in rapid succession, the meaning of which was not immediately apparent. Ultimately these discoveries enabled physicists to piece together various odds and ends of knowledge so that not only was a knowledge of the structure of the atom attained but even of its minute nucleus. The rest of this paper will be devoted to an explanation of these discoveries and of their bearing on the structure of the atom.

(To be continued next month)

RADIO BROADCASTING NEWS

BROADCAST BILL'S RADIOLAYS

By William E. Douglass

Sakes alive! You should a seen me last week on a trip down East. Lots of folks don't like to travel. I don't mind it in the least. Saw New York an' Coney Island, 'Lantic City an' the rest, but uf all the places vis'ted I liked 'Lantic City best. Mebbe some of you have been there. Like as not I'll go again. If I do I'll bet a dollar I don't tell nobody when. Lots uf funny things will happen when a feller starts to roam, things I never would ut thought uf in my peaceful quiet home. Why one day when I went swimmin' where the waves come rollin in an' the sunshine, fer you know it, burns some blisters on yer skin. I attracted more attention as I sat there on the beach an' it wasn't fifteen seconds till I'd spotted one fair peach. In the first place after swimmin' I thought I would rest awhile in the sand an' watch the bathers fer it seemed to be the style. 'Course I had my loop antenna an' my good ol' wireless set. I may leave my wife an' family but I haven't left it yet. Riggin' up the set as usual 'twazzn't long till I "tuned in" on the local sending station so I turned an' with a grin sez to this here babe I'd spotted. "Want to listen in with me?" "Sure," she sez (the smile she give me wuz as pretty as could be). Since I only had one head set we were sittin side by side, to myself I kept repeatin' "Let your conscience be your guide." 'Twuzn't long till there were others waitin' 'round so they could hear, an' my sentiments are always "Try to please the ladies dear." While I didn't mind their lis'nin', it wuz quite a pleasant duty, wuz it Radio attractin' them er just my style of beauty? Anyway I had a waitin' list of twenty-five or thirty. There were Genevieves an' Helens, Eleanors an' dainty Gertie. Things were gettin' mighty interestin' when crack up on my dome came the blow of an umbrella. 'Twas a message straight frum home. Next time I start out to travel, sometime I may go again to the seashore, I'll just betcha I don't tell my family when.—Copyright, 1923.

A PRIVACY RADIO SYSTEM LINKS CATALINA ISLAND

The radio telephone link between Los Angeles and Catalina Island, 30 miles off the coast of California, has set a new record in the history of communication. It is the scene of the first trial on a commercial basis of a radio telephone system insuring privacy to its users. The radio telephone apparatus which has heretofore established connection with the mainland is now replaced by a new radio development of the Bell System engineers which may be called a privacy system for the radio telephone. The new apparatus prevents any of the receiving sets commonly in use picking up the messages transmitted by this system and converting them into understandable speech.

The wireless "talk bridge" which has given telephone service across the 30 mile gap of water separating Catalina from the California coast is unique in many respects. It was designed and installed in 1920 to give two-way talk between the mainland and an island 30 miles at sea, and has proved

in on a commercial basis, giving satisfactory transmission day and night throughout the year.

At the time the radio apparatus was installed a submarine cable could have been laid joining the Island and mainland which would have supplied a better grade of service at less expense, but the conditions which existed at that time and which grew out of the war were such that the manufacture of cable would have involved a long delay in supplying service. However, suitable submarine cable will be available in the near future and will be laid to the Island as soon as available, but not before the new private radio system has received a thorough trial. The radio system, even with privacy assured, can only be considered somewhat in the nature of a temporary affair, for it is known that a cable could handle the traffic more economically as well as more satisfactorily in all other respects. The installation of the cable will make the ether wave lengths now used by the radio system available for broadcasting or other essential radio services.

The wireless link connects Catalina Island not only with Los Angeles but also, through the trunk lines of the Bell System, it connects the island residents with every commercial centre in the United States. After the laying of the telephone cable between Key West and Havana, the longest telephone circuit on record was set up between Catalina Island in the Pacific and the Island of Cuba in the Atlantic. This circuit was remarkable for its character as well as for its length. Starting from Catalina Island the first 30 miles of this circuit was wireless; from Los Angeles to Key West, a distance of 5,000 miles, the transmission was over the long distance wires of the Bell System, and from Key West to Havana there was 110 miles of deep sea submarine telephone cable. Although the transmission was by wireless, by overland wire and undersea wire, the listeners at Catalina Island could easily understand and recognize the voices of the speakers at the Cuba end, and vice versa.

Now again the Catalina Island radio link is distinguished as the first to be equipped with the wireless telephone privacy system recently developed by the engineers of the Bell System.

Heretofore talks over the Catalina Island link while clear and understandable to those using the service, have also been picked up by amateur radio receiving stations in the neighborhood, so that the privacy of the usual telephone conversation was lacking. Any radio receiving station in that part of the country, if it happened to be tuned to the right wave length, might get fragments of the talk with Catalina Island, which would be of no interest to the radio listener. Of course, the talker could not tell how far afield his words might accidentally go.

The privacy system was designed by the American Telephone and Telegraph Company to largely remedy this situation. It is not claimed that the new system is absolutely secret, but at least privacy has been obtained, so that no one will inadvertently overhear the conversations which are transmitted by this system.

The new radio equipment which has been installed both on the Island and the mainland will handle telephone messages in such a way that they will be unintelligible to all ordinary radio receivers. In a word, the new sets, before putting the messages "on the air" will distort or scramble them, and no receiving set which is not specially designed or manipulated to unscramble them can obtain anything intelligible.

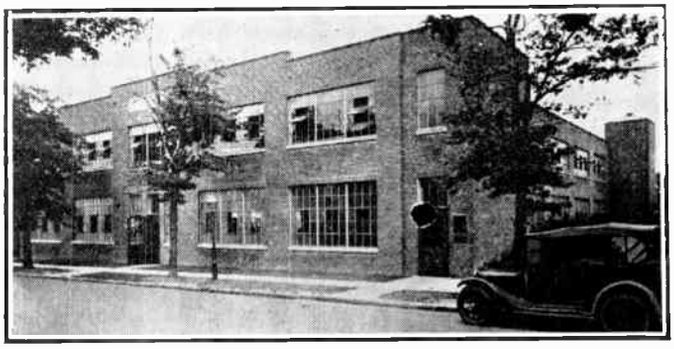
While anyone familiar with this system, and possibly an ingenious person not familiar with it, might devise a set which could listen to the system, such a set would be much more complicated than the ordinary set, and the added complication would be of no value except for picking up transmission over this system. It is, therefore, not likely that many people will undertake the work.

Such a privacy system may be compared to a lock and key. A person relies upon a lock to secure his house and other property and is not much troubled by the possibility of a thief breaking in to steal. However, there is always a possibility. The privacy system presents an analogous case. For all practical cases it insures the requisite privacy to a radio telephone conversation, but it does not make impossible the designing of a special set, near enough like the receiving sets used in the system itself, to transform the messages into more or less intelligible form.

THE HOTEL WINDSOR DANCE ORCHESTRA, MONTREAL

The most popular Dance Orchestra, from La Presse Station, CKAC

NEW BRANDES FACTORY

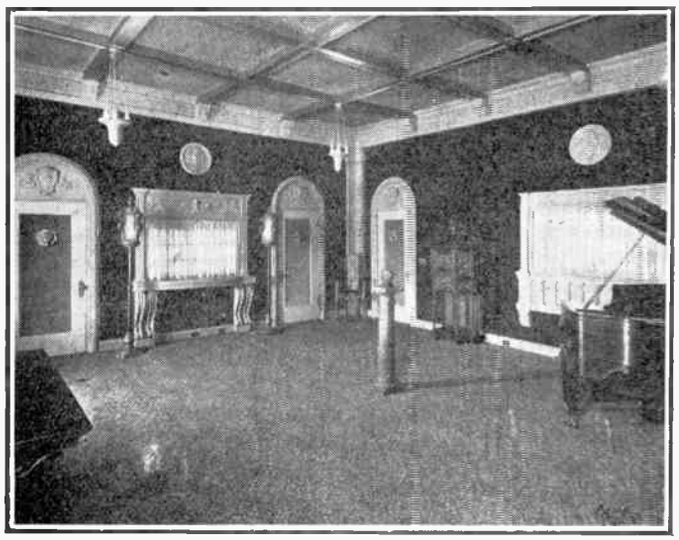


The big demand for Brandes Matched-Tone Headsets was the determining factor which caused that well-known firm to purchase this modern building at Newark, N.J.

SOME VIEWS OF STATION WHB

RECEPTION ROOM OF RADIO STATION WHB

The Reception Room of Radio Station WHB is located on the tenth floor of the Sweeney Building. The decorative effect is that of a Japanese Garden with Japanese lanterns and wicker furniture. The receiving sets, shown at the end of the room, will enable those visiting the station to listen to the concert without entering the studio. The window at the right is for the purpose of obtaining a view of the artists performing in the studio. The door at the end of the room will enable visitors to watch the operation of the transmitting set.

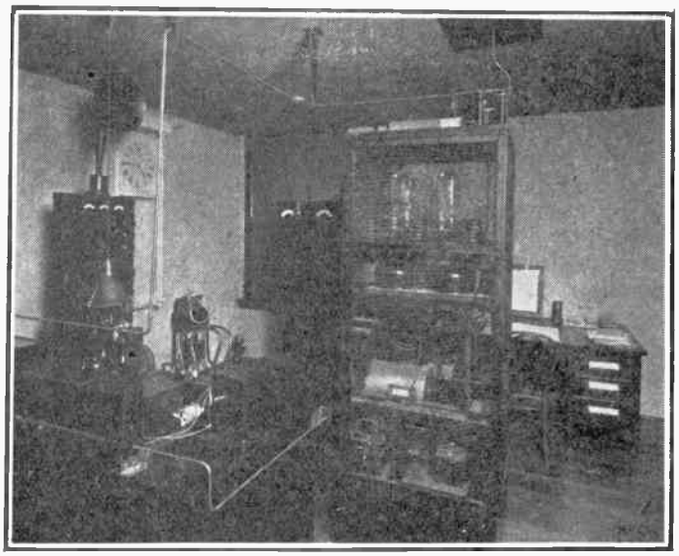


VIEW OF STUDIO OF STATION WHB

The room is 20 x 25 feet with a 14-foot ceiling. The walls are lined with three layers of cotton flannel with a quarter of an inch air space between each layer, and covered with red velvet. The color of the velvet of the ceiling is gray and that of the walls is a dark warm red.

OPERATING ROOM OF STATION WHB,

Showing the Western Electric Type 1-A Radiophone Transmitter. The speech import panel, Type D-76527, is located at the left, the power panel in the background of the picture, and the main transmitting panel at the right.



NEW WAVE LENGTH ASSIGNMENTS

New York, June 7, 1923.

Editor, Radio News of Canada.

Gentlemen,—The new wave length assignments have caused some confusion in the reception of programmes from the various stations. The general result, however, has been very gratifying and we are certain that WEAF's programmes are being received with less difficulty and interference than in the past. Our broadcasting programmes are giving entertainment and education to an ever-increasing number.

We would be very much pleased to learn how our programmes are being received on our new wave length of 492 metres by the radio audience in your locality. We encourage communications from your readers and will be glad to hear from them directly or through you. If you care to publish an announcement to this effect in your radio columns, we will appreciate it.

Very truly yours,

W. E. HARKNESS,
Manager of Radio Broadcasting.

RADIO FOR THE BEGINNER

by Edward Lindley Bowles

There are certain bare essentials which enter into the construction of a radio set, and with these as a nucleus about which to build, various refinements are added which are developed for either electrical reasons or purely aesthetic reasons, or both. First, however, we are interested in the electrical aspects of the set. Unfortunately, a few manufacturers have started from the other direction. In order to receive a disturbance sent out by the transmitting station, an aerial is necessary. The aerial is, in a sense, an electrical feeler capable of collecting a certain very small portion of the energy contained in a passing radio wave. This wave is traveling with a velocity of light, which, so far as we know, is 186,000 miles a second, or 300,000,000 meters a second. This velocity impresses the average person as being practically instantaneous, yet in radio work it is dealt with in such a way that it becomes a very important item. If it were not for this high velocity, radio communication would be impossible, at least by the present means.

The Effect on the Antenna

The effect on the aerial is proportional to the velocity of the wave. After the aerial has collected a part of the wave's energy, the wave goes on almost as if nothing had happened, especially if the aerial is small. If we could see the wave it would probably have a small portion of itself cut out by the aerial in much the same way that a water wave passing a rod held vertically in the water would have a part of itself cut away. In other words, a shadow would be cast immediately behind the rod in the water or the antenna in the air. After the water wave had passed some distance beyond the rod it would have patched itself up again so as to hardly show any evidence of the rod's effect. The same thing holds true with the aerial. The collected energy is the same no matter what sort of device we may connect to the aerial, but since this collected energy is extremely small, in order to use it to advantage we just connect special apparatus in the antenna circuit.

Resonance

When a particular note on a piano is struck, it sends out sound waves. These sound waves strike the strings of every other note on the piano so that the various strings each absorb a certain amount of energy sent out in this sound wave. The amount they absorb, however, is small. If there were another note in the piano, made up of strings tuned exactly as the note struck, these strings would vibrate sympathetically through large distances, so that if one set of similarly tuned strings is struck and then silenced immediately by touching it with the finger, the other groups of strings would continue to vibrate, owing to the energy absorbed from the strings struck. It is just such a thing as this that happens in the radio receiving circuit, only we can not hear the vibrations even though we might be able to reproduce them mechanically. At the same time, we are not able to produce them mechanically because no mechanical device which we might make would be small enough to vibrate at the rate of 1,000,000 cycles a second. In addition to the antenna, then, we must have a tunning device so as to obtain a large electrical vibration when a particular electrical note is struck by a transmitting station. Further, we must in some way transform this high frequency into some sort of a frequency which is audible.

The Tuner

We have said that the purpose of the aerial is to pick up a certain amount of energy from the electrical waves sent out by a transmitting station. If this energy is received it must in some way actuate a device in such a way that we will be able to hear the disturbance. The aerial must therefore have associated with it additional apparatus. This apparatus must possess three properties. It must be of such a nature that it can be tuned to correspond to incoming waves of only certain frequencies. Further, it must be so constructed that it is selective; that is, it should be capable of eliminating undesirable stations of the same frequency. It must also in some way convert the high frequency vibrations into audible vibrations. The part of the apparatus which performs the operation of tuning, as we say, to a particular frequency of wave, and

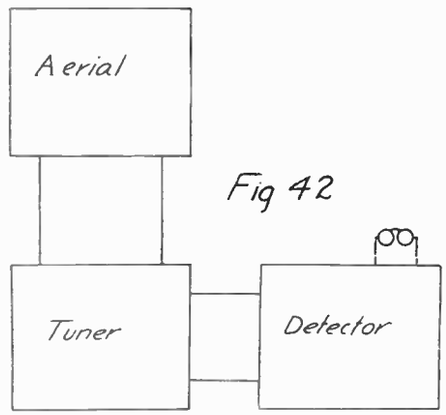


Fig 42

which combines selectivity with this tuning, in some cases, is called the "tuner." The apparatus which causes the high frequencies, or what we might call the super-audible frequencies to produce audible effects, is called the "detector." We might say, then, that in the simplest radio receiving set there are three units, as shown in Fig. 42, namely, the antenna, the aerial and the detector.

The Aerial

The aerial may consist of what is called an antenna, or it may consist of a coil of wire. The antenna form of aerial is that which is used by the large transmitting stations and by almost all receiving stations. It may consist of a single vertical wire, or a bent wire as shown, or of several wires, as shown in a previous issue of the Radio News of Canada. For receiving purposes a single wire suffices, but for transmitting purposes several wires are used. Any of these devices will serve to collect the energy of the radio waves coming from a transmitting station. All these systems are called antennae, and they are characterized by having one end "open"; that is, in each case there is one free end—the other end is connected to ground.

The coil aerial consists of a device such as is shown in Fig. 43. Both the antenna and the coil type of aerial are capable of transmitting and receiving. Transmission can be accomplished with much greater effectiveness by means of the antenna, and likewise receiving may be accomplished with much greater effectiveness by means of the antenna. The coil

aerial, although extremely convenient and compact, intercepts only a small part of the radio wave and therefore gathers only a very small amount of energy. With it, amplifying devices are necessary to make the received signals audible. In other words, for the same effectiveness, a coil aerial requires a great deal more apparatus, which we will discuss later on. So far as space is concerned, this form of aerial has much to endorse it. It is compact (being perhaps but three feet square), and further, it has what is called a directional characteristic in that it is capable of receiving waves from a particular direction more perfectly than from any other direction.

Direction Finding

The U. S. navy has installed radio sets using the coil aerial, at strategic points along the coast, for the purpose of giving ships their location. For example, if a ship calls for its "bearing," two or three of these short stations will listen to the signals, and by rotating their coil aerials about a vertical axis until the signals are loudest, the plane of the vertical coil aerial

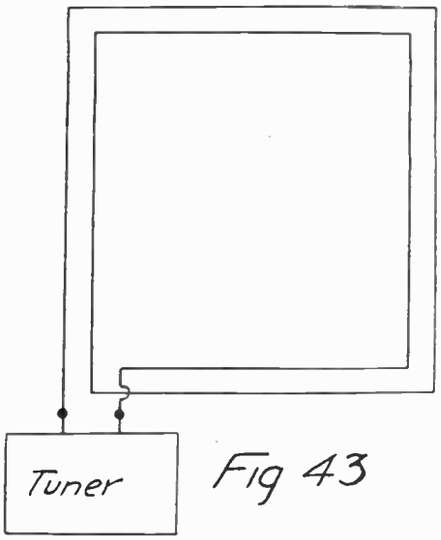


Fig 43

or "loop" as it is sometimes called will point to the ship. If two or three of these receiving stations (located at different points) find that their loops point in particular directions, they can communicate this information to each other and by drawing lines on a map radiating from the location of the receiving station and in the direction of the signals, they are able, by the intersection of these lines, to locate the position of the ship. For ordinary radio installations for broadcast reception, the loop is only satisfactory where the possessor is willing to meet the expense of devices which magnify the incoming signals. The added devices increase the difficulties involved, although the signals received by means of a loop are in many cases clearer than the same signals would be when received over an antenna, if there are electrical disturbances in the air, to which we give the general term "static" or "atmospheric."

Antenna Single Wire

For ordinary broadcast reception, the antenna may consist of a single copper clad, steel, copper, or phosphor-bronze wire (single or strand) of about 160 feet in length. This length should include the wire connecting the receiving set with the earth, for that is also a part of the antenna.

If the antenna is made longer it will pick up more energy, but at the same time other difficulties will come in, one of which will be a great annoyance from stations whose frequencies, or, as we shall see later, whose wavelengths are widely different from those in which we are interested at a particular time. The length of this antenna wire, in the case of the vertical antenna, will be the distance from the tip of the antenna to the ground, and in the case of an inverted "L" antenna, as shown in previous articles, the length is measured in the same way. That is, it is the difference as measured from the tip of the antenna, along the antenna to the point where it drops down and thence to the ground. There is an advantage in making the antenna high, so that a safe rule to follow is to take the 160 feet of wire, run it as high as possible, and then bend over at right angles what is left. The antenna is insulated from nearby objects by means of what are called insulators. The idea here is to cause the electricity to flow from the antenna through the tuner, and not from the antenna over the insulators to the ground. The tuner gathers a greater part of the energy collected by the antenna. Further than this, it causes the antenna to be more susceptible to the receiving of the power from a wave of one frequency than from a wave of another frequency.

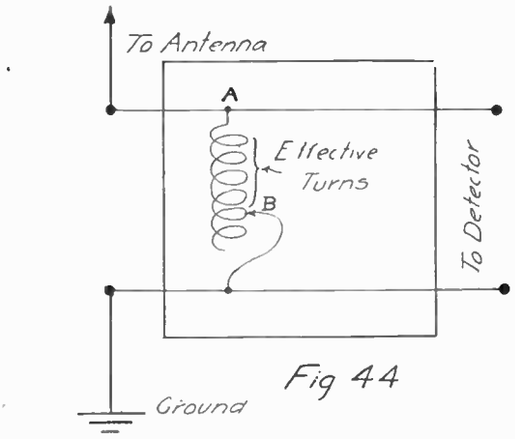


Fig 44

The tuner consists, in its simplest form, of a coil of wire such as is shown in Fig. 44, where a number of effective turns can be varied.

Forgetting about the detector, which is to be connected to this tuner, and which we have briefly discussed, we may consider the electric circuit consisting of the antenna wire, the turns of the coil, and the ground, as possessing the electrical characteristics of vibrations very similar to the mechanical characteristic of vibration of a musical string. If the musical string is plucked, it will vibrate at a certain frequency. Likewise, if the antenna-tuner-ground is electrically plucked, it will vibrate at its own frequency. The frequency at which it naturally desires to vibrate depends upon the length of the antenna wire, which includes the length of the ground wire, and also the number of effective turns included in the tuning coil.

The effect of moving the slider up and down so as to include more turns in the antenna circuit (that is, in between the antenna and the ground), is to tune the antenna in much the same way that the string of a musical instrument is tuned. By tightening or loosening a string, various notes will be produced if the string is struck. It is also true that if a string is tuned so as to produce a particular note, that is, if it is tuned so as to vibrate at a particular frequency, it will also respond to sound waves at that particular frequency if the waves strike it. It is a well-known fact, for instance, that in playing a piano certain articles of bric-a-brac will sometimes vibrate when a certain note on the piano is struck. It happens that these particular objects are so constructed that, if struck, they would vibrate at the same frequency at which they responded when the sound waves strike them. In other words, the important conclusion here is that if a particular string or object is tuned so as to emit a particular vibration, it will likewise be excited, or caused to vibrate, if the vibration comes from some other source. This is what is technically called a resonance effect.

(Continued on Page 27)

Some Points on the Honeycomb Tuner

By B. S. Bickelhaupt, M.D., 2CBA

In this Article the good doctor makes it plain that he prefers honeycomb tuners to any other type. He tells, however, the reason.

In a previous article I outlined the making of a honeycomb tuner employing single layer (solenoid) coils for short wave reception. Since that time I have had occasion to see in operation and to "get working" many sets such as I wrote about. This paper deals with my observations and conclusions drawn from that work, and also from my own stunts at home. I found a peculiarly common error, that whereas the B. C. L. or budding amateur were well versed in the Flewelling or some of the other hook-ups, they fell down flat concerning a regenerative one, as typified in a three-coil honeycomb set which I had occasion to examine. Now, every amateur has at some time actually made a honeycomb tuner, and perhaps some of them have also made errors, hence their denunciation of honeycomb coils. The contrast is clear. Without a working and theoretical knowledge of the regenerative set or the functions of it, hundreds of folks are nevertheless fooling around with more or less complicated "phoney" circuits, even tackling the notoriously ubiquitous R. F. amplifications.

In radio, as in most things, success is derived from doing the common thing well. And it behooves a lot of radio fans to admit their lack of knowledge and experience. With a sincere desire to achieve, to start right in and learn all they can about one regenerative circuit, believe me, they will have plenty to keep them busy.

Dealing with the honeycomb three-coil set, as I have done for three years past, many have brought their sets to me with the usual cry: "It won't work." And I found many reasons therefor, the commonest being errors in connections.

In connecting up an H. C. tuner, care should be taken that the aerial, grid and plate are connected as it were to opposite terminals, i.e., the aerial goes to the top of the primary mounting, the grid to the bottom of the grid mounting, the plate to the top of the ticker mounting. Many may disagree on this, but past performances speak for themselves, and a H. C. set hooked up this way will give the best results. Often the series-parallel switch is wrongly connected. Instead of the ground being placed in series, it is often placed where it will actually short and I therefore get the story that the switch is out of order. Examining the hook-up of a series-parallel switch it is easy to see how an error can do this. Yet the mistake is often made. The correct wiring is shown in Fig. 1.

If one remembers that the ground goes to the lowest tap on the right, the aerial to the highest tap on the left, no error is possible. Poor soldered connections and unnecessary long leads tell their pitiful tale when the set "don't work."

After the wiring and general construction details are correct, the set sometimes fails to oscillate according to some, and that brings me to the big point that I cannot emphasize too strongly. That is, that a very large percentage do not know how to tune a honeycomb receiver, and I hope in this article to aid many on that very point. The same remarks apply to H. C. or single layout in short wave work, only that the larger inductance value of H. C. and the sharper tuning must be considered as qualifying any statement made.

For amateur wave—150 to 200 metres—and for waves up to 250, the best results are obtained with the primary condenser in series. Using a 15-turn primary—25 turn secondary and a 35 tickler—with close coupling between secondary and tickler and about 4 inches coupling between primary and secondary, adjust filament to point of oscillation. If excessive brilliancy is found necessary, increase capacity of bridging condenser and lower filament to just below hissing point, by adjusting primary and secondary variables. A point will be found where oscillation stops. Further on, the oscillation will begin again. Now, just where your set again oscillates is the point where your set is tuned best for any given signal desired. It is the "Zero beat," and Spark, CW or ICW will be clear and distinct. A vernier secondary condenser is a very great aid in obtaining this point. Using one on my own set of .000035 mfd. (about two degress of a .0008 variable) I have frequently tuned in as many as a dozen DX stations.

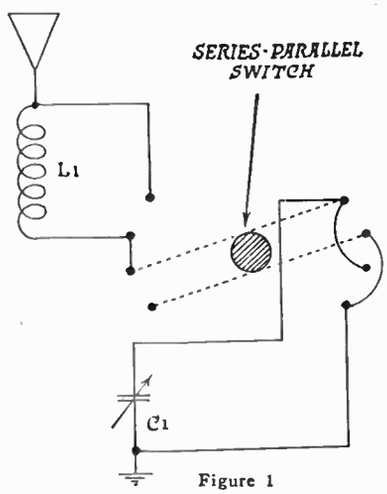


Figure 1

Often after a little practice with this tuning method, you will find that all your amateur wave work may be done with but two controls only—the primary and the secondary variables. This set also will eliminate QRM by using lesser coupling between the primary and secondary. In fact, the set I have will tune in KDKA with the primary coil at right angles to the secondary, a degree of loose coupling that is extreme indeed. Amateurs may be copied easily this way through the jam. The main feature to be mastered is the knack of using the primary variable in series with ground. Once you get this, your DX record will be all that you would desire.

A peculiar feature of the tuning is the ability to utilize the bridging condenser to bring out signal strength. A glance at the circuit (Fig. 2) will show that it is really a variable phone condenser which also bridges the "B" battery. It serves a very useful purpose in that, when a signal is tuned in, it may be brought out by increasing the capacity of the bridging variable. Reversing the action, you can control excessive oscillation by reducing the bridging condenser. Various tubes will operate differently but the principle is always the same.

For broadcast waves, the same tuning processes are followed except for the closer coupling necessary, because of the higher wave, and the use of larger single layer coils to accommodate the wave desired. Primary 20, secondary 35 and tickler 45 will be sufficiently large and, if QRM is bad on the broadcast wave, even smaller coils may be used, employing more

condenser capacity in tuning. My results were excellent enough to surprise many who heard the set work, and noticed the ease with which the various stations were picked up. It is surprising that folks will fool around with inefficient single circuit affairs, "phoney" hookups and what not. Apparently the more complex the better, although in this set you have the most reliable outfit, sensitive and selective, no frills and all the results you could wish for. In many cases, the expense is smaller and the time used up to make the set is certainly less. And from the numerous queries in the newspapers and the magazines catering to the BCLS I gather that fully 50 per cent.—possibly more—are in radio for results, the best that may be obtained.

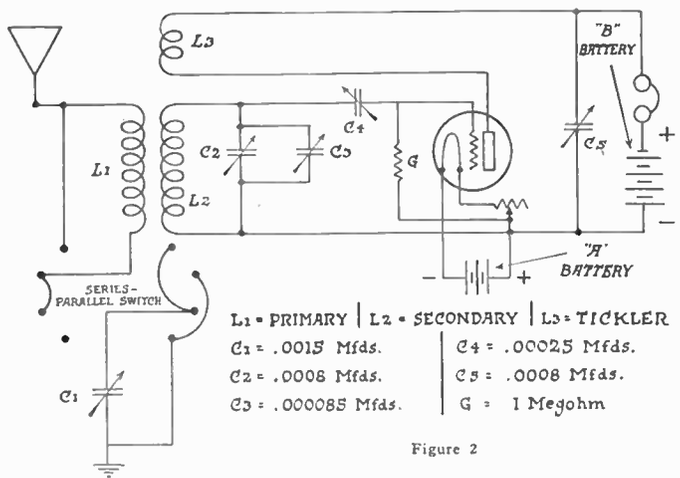


Figure 2

Finally, the proof is "set performance." I have heard every district but the sixth and seventh consistently. And the sixth and seventh has been heard during favorable conditions, and all this, using a 55-foot antenna in a congested section of the Bronx. As for broadcasting, the list is long. I have heard everything in a 1,500 miles radius that is powerful enough to reach me. The weak stations are never consistent anywhere but the stronger ones are received every time they are on. As for locals, they are too loud. I always have to detune slightly to reduce their intensity. In reference to selectivity, any evening, beginning with the lower and traveling upward to the higher waves, I am able, through local stations to tune the following and get no QRM anywhere; the result is something like this: KDKA, WJZ, WNAC, WDAP, WHAS, WGI, WGY, WBZ, KYW. Some of these stations are one-half a degree apart on the secondary condenser, yet are easily tuned in our out. I am sure this represents selectivity indeed .

In conclusion, let me say that it will be a long time before my honeycomb set is thrown into discard. It covers any wave you choose and is without question the most dependable, reliable and most selective set that I have ever experimented with.—(Courtesy, The Modulator).

POUNDIN' BRASS AT THE NORTH POLE

Dr. Donald B. MacMillan, Dr. Sc., F.R.G.S., who was formerly a professor at Bowdoin College, and was first induced to go to the Arctic by Peary, accompanying him on the expedition on which Peary reached the Pole, has been back to the Arctic seven times and is going on another expedition. This one will be different from all previous ones in that a complete radio receiver and transmitter will be part of the equipment taken along with the party on its trip to the North Pole.

MacMillan takes with him, installed in the forepart of the ship, a standard broadcast receiving set with a wave length range of from 150 to 900 meters, and equipped with three-stage amplifier and loud speaking apparatus, as well as a long wave receiving set with a maximum wave length of 20,000 metres. With these two sets reception will be possible of not only amateur telegraph and 'phone stations and radiophone broadcasting stations, but also naval and commercial trans-oceanic stations from which press reports, time signals and weather forecasts can be secured.

The transmitting equipment consists of a 500 cycle interrupted-continuous-wave set, using two 250-watt transmitter tubes and the Armstrong regenerative circuit. This apparatus is mounted very compactly in semi-panel form with all necessary metres, and is supplied with current by two gas engine driven generator units entirely separate from the regular power plant of the ship.

The ship's antenna is of peculiar construction, due to the fact that the Bowdoin depends for part of its motive power on sails and is of comparatively short length. A stem to stern antenna is used, passing over the main mast and foremast, the lead-in dropping through the foredeck to the radio quarters. In order to ensure good ground, steel and copper plates have been rivetted to the hull and in addition, connections have been made to the propeller shaft through the engine and to the supply of coal which is carried partly as ballast and for emergency use.

Dr. MacMillan will take with him as wireless operator, Donald H. Mix, of Bristol, Connecticut. Mix was selected by Captain MacMillan from five men who were chosen by Mr. Hiram Percy Maxim, President of the American Radio Relay League.

Realizing the tremendous interest which the use of radio on an expedition of this character would arouse in the public mind, Maxim sent out a request for volunteers to all the members of the American Radio Relay League. Hundreds responded. Not only technical ability as an operator and the ability to withstand hardships were requisites, but in particular the faculty for making oneself congenial among a small crew of men on an ice-bound ship. Dr. MacMillan's crew consists of only seven men. Mix represents Captain MacMillan's choice from among some of the best wireless operators in the country.

Once a week Mix will transmit from the Bowdoin a 500-word story of Arctic adventure and will transmit also diagrams of all new lands and harbors and lands found and charted.

At such times as it has been prearranged for Mix to attempt to get his wireless message through, Hiram Percy Maxim will issue a request for all amateurs who are members of the League to stand by and tune in for Station WNP. The sending station of the Bowdoin has been assigned by the Government the call letters WNP, "Wireless North Pole." The Government has assigned wave lengths of 200, 300 and 400 metres and has also given permission for Station WNP to use whatever wave length it may find necessary for experimental purposes.

Mr. Dynamo: "I am feeling so 'run down'."

Mr. Coupler: "You should see Dr. Storage. It looks like magnetic poisoning."

Mr. Dynamo: "I don't think I can afford to see him. What is his charge?"

Mr. Coupler: "Oh, about half an amp. for ten hours."

Traffic Cop "Grid" (disgustedly): "They expect me to control this reckless traffic on Filament Avenue; and me suffering from curvature of the spine and electronic spiralysis."

"Mrs. Audiotron told me her filaments were twins."

"That's nothing, Mrs. Coupler told me her honeycombs were triplets."

RADIO FOR THE BEGINNER

(Continued from Page 24)

Tuning

Suppose, for example, that a particular musical string of a musical instrument is loose. Suppose, further, that a certain note on a piano is struck continuously, and that at the same time the loose string is drawn gradually tighter and tighter. When the string has been drawn to a certain degree of tightness, it will vibrate most violently when a given note on the piano is struck. This condition exists only at one degree of tightness of the string, and this particular point is characterized by its violent reaction at only one particular vibration. When the string is in such a condition it is said to be in resonance with the incoming vibration, which, in this case, is that coming from the piano. Thus we might say that we have tuned this loose string until it is in resonance for that particular frequency that we wish. Changing the effective turns on such a tuner as is shown in Fig. 44, corresponds to changing the tensoin in the string of a musical instrument. Thus the antenna can be set in resonance for the particular electrical vibration that we wish to receive. In this way, if we are receiving electrical vibrations coming from a broadcast station at the rate of 833,000 a second, we will need a certain number of effective turns in the antenna circuit in order that the antenna will most readily respond to this particular vibration. In the electric circuit, the electric vibration is evidenced by the electric current. Current in the electric circuit is analagous to velocity in the mechanical circuit, so that where the string of the musical instrument moves, the current in the antenna circuit flows. When this current flows through the effective turns, it has the peculiar effect of causing an electric difference in electrical pressure between one end of the group of effective turns and the other end. In this case it is the difference in pressure between the dot "A" of Fig. 44, where the tuning coil is connected to the antenna, and the arrowhead "B," which touches the tuning coil. It is this difference in electrical pressure which is conveyed to the detector. The detector is so constructed that it is sensitive to a change in electrical pressure.

(To be Continued)

CORRESPONDENCE

Canadian Pacific Hotels,
St. Andrew's, N. B., Aug. 6, 1923.

Radio News of Canada,
257 Adelaide St. W., Toronto.

Dear Mr. Lewis:

Since receiving your August issue and reading Mr. Myers' letter, so fairly published by you, I am more than ever an enthusiastic backer of your magazine. So also should Mr. Myers be. It is a very fine thing for the Canadian amateur to have a home publication which will so fearlessly back the small amateur as well as the big manufacturer, and it should be a great incentive to all good Canadian amateurs to buy and back up the Radio News of Canada in work like this, of clearing up misunderstandings and promoting the good feeling between the user and the buyer and thus assisting and upholding the high standing of radio science.

I would also like to express my very deep appreciation to you personally and to all your associates for the trouble and interest you have taken in this matter. It has made the Radio News of Canada mean something more to me than an ordinary radio periodical, and I really feel that you have a personal interest in every one of your subscribers.

With all good wishes for the continued success you so richly deserve.

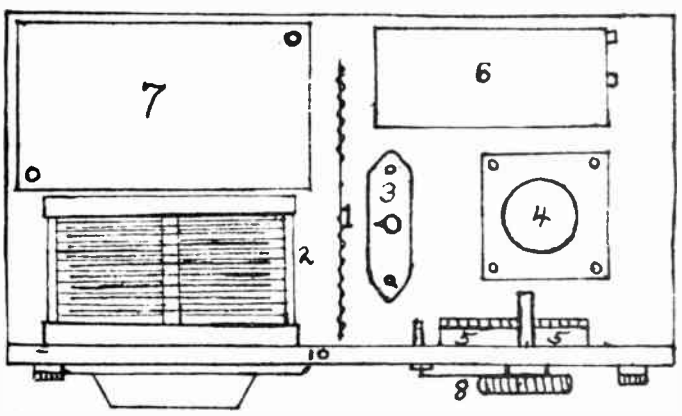
Sincerely yours,
A. W. MASON, Chief Engineer.

RADIO IN THE SUMMER TIME

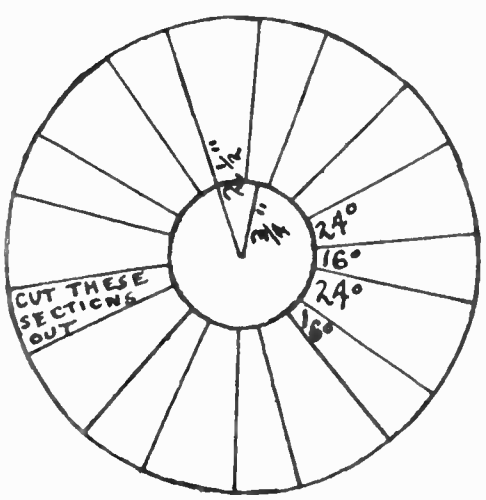
This month we are publishing the balance of the entries in this competition. The prizes will be awarded, in order of merit, from amongst the competitors whose entries were published last month and this. We had expected to announce the winners this month, but are unable to do so, as some of the judges are, or have been, away on vacations. The judges are: Mr. Geo. F. Eaton, Superintendent Great Lakes Division, Marconi Wireless and Telegraph Co.; Mr. Askham, Vimy Supply Co.; Mr. Ainsworth, Salisbury Electric Co., and the Editor of Radio News of Canada. Prize winners will be announced next month, and the winners will receive their prizes about September 1st.

A PORTABLE SET FOR CAMP

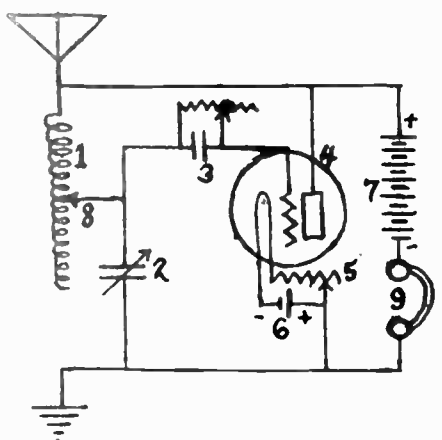
Although the "single circuit" set seems to be better adapted than any other to use in a portable set, the writer has had disagreeable experiences with this circuit, and resolved to find another. The old ultra-audion was finally decided upon. Since it is very simple, and has fallen into disuse, good results were not expected from the set, but, when completed, it proved far superior to the "single-circuit" in selectivity, and equal in sensitivity.



Below is a list of the parts required: (1) a spiderweb coil, as shown in the diagram, wound with seventy turns of 24 S.C.C. wire, tapped at the thirty-fifth, fifty-fifth, and seventieth turns; (2) .0005 M.F. variable condenser; (3), Freshman grid condenser and variable leak; (4), Northern Electric "peanut tube" and socket; (5), Howard vernier rheostat; (6), small dry cell (Woolworth's); (7), small size Burgess 22.5 volt "B" battery; (8), switch arm and 3 taps; (9), Brown's phones; (10), 5 in. by 8 in. by ⅛ in. panel; (11), cabinet, aerial equipment, etc.



The parts are arranged on the panel as shown. On the left are the condenser and "B"; in the centre the coil; on the right the "A," socket, grid condenser, and switch arm, with the rheostat directly below it.



General Hints—Because of the set's sharp tuning, a vernier condenser would be a great help. If it is desired to tune up to six hundred metres, a few more turns should be added to the coil. While carrying the set around, the tube, for protection, should be wrapped in felt. All control of regeneration is by the rheostat, so a vernier rheostat is necessary for distance. An empty cigar box was varnished and stained, and the phones and aerial equipment were placed in it.

The set is very simple and compact, but it is to be preferred to more expensive and complicated circuits. During the short time of operation, CFCA could easily be heard ten feet from the phones, and WJAX, WGY, KDKA, WGR, WMAK, WOR, 3TR, 3BP, were also Q.S.A.

F. H. TUCKER,
75 Roxborough Street W., Toronto.

TELL EVERYBODY THAT RADIO IS FOR EVERYBODY

That there is a falling off in popular interest in radio this summer cannot be denied, but the slump this year is more apparent in the number of new recruits signing on the great army of fans than in the indifference of those who have been on the strength for some time. A great change has taken place in prevalent sentiment toward radio since the summer of last year. Then the general opinion was that satisfactory reception could not be expected during the warm weather. It was commonly believed that one was fortunate to hear a good concert only now and then—that with static jazzing up the ether every day or so and Old Sol lagging down the waves from the broadcasting stations most of the time, it was a poor

(Continued on Page 30)

USE THE PEANUT TUBE IN YOUR SET FOR BEST RESULTS

R 215A
PEANUT TUBE

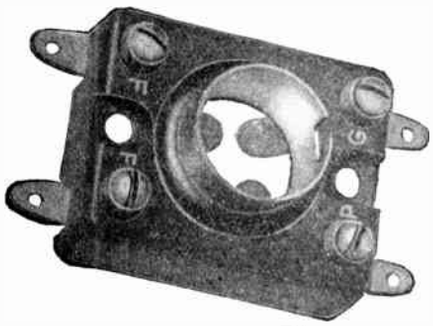
A Radio Essential

Just the thing for Summer Radio.

No Charging of Batteries.

Operates on a Dry Cell.

Ideal for Summer Cottage or Camp Sets.



R 40 SOCKET

Obtain your Tube and Socket Now

If not obtainable from your Dealer, write our nearest Branch house and we will tell you where to get them

Manufactured in Canada by

Northern Electric Company
LIMITED

Montreal Halifax	Quebec Ottawa	Toronto Hamilton	London	Windsor Winnipeg	Regina Calgary	Edmonton Vancouver

(Continued from Page 28)

game and hardly worth while. Popular opinion was pretty near right—last year.

This year things are vastly different—for several plain reasons. One is the wonderful improvement in broadcasting—both in the excellence of the programmes and the strength and quality of the energy; another is the progressive education of broadcast listeners in the operation of their receiving sets; another is that people have learned that high grade receiving apparatus is necessary for the real enjoyment of radio. Fans have been taught to know just how much to expect from crystal sets, and to fight shy of the cheap sets turned out by irresponsible makers, and the wierd contraptions enthusiastically peddled by juvenile De Forests and Marconis.

The campaign of education carried on by the large manufacturers and supply companies, dealing in radio equipment, through newspaper and magazine advertising, has been the means of bringing about the better understanding of things radio on the part of the public. These advertisers deserve to reap big rewards for their enterprise. That they are already getting results would appear from the increasing number of loud speakers, for instance, to be seen in cottages and on pleasure boats at summer resorts.

The writer is of the opinion, however, that there is still much to be done by way of quickening the public interest in radio. He believes that it would be well worth while for manufacturers, jobbers and dealers in radio supplies to form an association for advertising the benefits of radio in a broad way. If it is good business for makers of laundry machinery, for instance, to pool part of their advertising appropriations to tell the public that laundries should be patronized, surely it would be as good—if not better—business to tell the world what radio has to offer. Why not use the agricultural papers to explain to the farmer just what radio can do for him? Why not employ the trade journals to tell the business men of market reports and news bulletins; the church periodicals to appeal to the bed-ridden, the house-bound and the aged? Certainly there is a wide field and plenty of room for the intensive cultivation of the idea before the realization of the ideal, "Radio for Everybody."

W. R. REYNOLDS,
Marmora, Ont.

RADIO IN THE SUMMERTIME

By J. R. Berwick, P.O. Box 111, Shelburne, Ont.

Hundreds of Canadians who bought or built radio receivers last fall and winter and want to follow their pastime during the summer, are being dissuaded from so doing by the fear of lightning and the consequent fire hazard, and the interference caused by static.

Taking the first of these objections. Some time ago a writer in Popular Mechanics said that a properly installed outdoor aerial was no more of a fire hazard to any building than a bathtub was. By "properly installed" is meant an outdoor aerial that has a connection to the ground through one of the lightning arresters authorized by the Fire Underwriters' Association. If the arrester and ground wire have been connected in accordance with the directions given with each, the dwelling is really safer from lightning with the aerial than without it; for it acts as a lightning rod does by dissipating the atmospheric electricity and thus preventing a heavy electrical charge from gathering in its vicinity. Of course it is not advisable to try and listen in when a thunder storm is going on near by. The static interference is enormously increased over the summer normal and is practically continuous while the storm lasts.

This static interference is harder to overcome, but Dr. Steinmetz, of the General Electric Co., gives it as his opinion that apparatus can be made that will lessen the disturbance. It is up to the confirmed radio fans to direct their experimental activities along this line.

It has been found by some experimenters that by using a single wire aerial and making it shorter, the static is lessened. Also that the new allocation of wave lengths seems to help some. The static interference does not seem to be so much in the way when the listener is tuned into the shorter wave lengths. The use of an indoor aerial in the form of a "loop" will help a lot. This requires radio frequency amplification to bring in satisfactory signals from distant stations, and radio frequency amplification will itself shut out a lot of static interference.

In Radio News of Canada for February, 1923, there was an article on underground aerials, which says in part that "total elimination of static can be accomplished by burying two coils of insulated wire in moist earth or dropping them on the bottom of a river or lake, each coil having a diameter of two feet and containing from 200 to 1,000 turns of wire. One end of one of the coils is connected to the aerial terminal of the receiver, and one end of the other coil is connected to the ground terminal. The two remaining ends of the coils are left free. By shielding the receiver and leads it is claimed that total elimination of static is possible."

These are some of the ways along which the problem is being tackled. No doubt during the summer other experimenters will make still further advances. It is to be hoped that they will give the readers of Radio News of Canada the benefit of their experience.

However, even with thunder storms and static interference, there will be many evenings this summer when radio may be fully enjoyed. The receiving sets are very much better than they formerly were, and owing to the new allocation of wave lengths there are not so many stations on the air at one time that interfere with one another. Then, as has been stated before, static is not so bad on the shorter wave lengths.

It would appear, therefore, that the owner of an up-to-date receiving set should get a lot of satisfaction out of it this summer, and while amusing himself can do a little missionary work among his friends and neighbors. If he has a loud speaker he can do a little local "broadcasting" from his verandah or porch. Put the loud speaker on the porch and connect it with two wires to his receiver. It will work perfectly on a cool, clear evening, and the neighbors will be delighted and edified as the different programmes are tuned in and out.

The radio fan who owns a portable set should take it with him on his vacation. If he goes back to the farm for his holiday he will find many people who have heard about radio, but not very many who have actually listened in to a concert from the air. He will be told by some (as I have been), "Humph, you've got a wire connected somewhere." There was a wire connected all right but not the way he thought. Perhaps some of those who listen in with him will take the notion to get sets of their own. This town started with one homemade set. Now there are six in town and two in the country. There would be more in the country, but the farmers cannot see any $6 value in a "Peanut" at first. A variocoupler with two switches and a lot of wire, or a 43-plate vernier condenser looks more "worth the money" to them. However, just give the radio bug a good chance to bite deeply and the victim is a goner. He'll have a set some time, if he has to sell the tires off Lizzie to get one.

If the radio fan is one of those superlucky ones who intend to spend their vacation up in Canada's Northlands, his

(Continued on Page 32)

The Symphony

The ability to select your entertainment from the various programs that are being broadcast, and the clarity with which long distance stations can be heard depend entirely on the quality of the receiving set.

The Symphony is an unusually good receiver. By turning a single knob under proper conditions, it is possible to tune in stations, one by one, to the total exclusion of all others.

This improved circuit, in the vernacular of the technical expert, is an improvement over the single circuit by means of a variometer, and affords unusually selective reception.

So efficient is the Symphony that its volume, at any stage, surpasses many sets, and is equal to many other receivers using additional stages of amplification.

Every piece of apparatus that goes into the Symphony is the best that can be produced, and each unit is correctly mounted in proper relation to each other part, factors that play an important part in your satisfaction of radio.

The placing of a Symphony in your home is a permanent investment that will win your instant approval, and occupy a prominent place among your most cherished possessions.

The Symphony Receivers are made in two types—detector, and two or three stages of audio frequency amplification.

If your dealer cannot furnish information on the Symphony, wire, or write for illustrated catalog, giving us his name.

JONES RADIO COMPANY

1066 W. Adams St., Chicago

The Symphony is manufactured under the U. S. Patent No. 1113149, Armstrong Regenerative Circuit

All parts used in the Symphony are built and guaranteed by the Kellogg Switchboard & Supply Company, manufacturers for twenty-five years of complete telephone equipment

RADIO IN SUMMERTIME

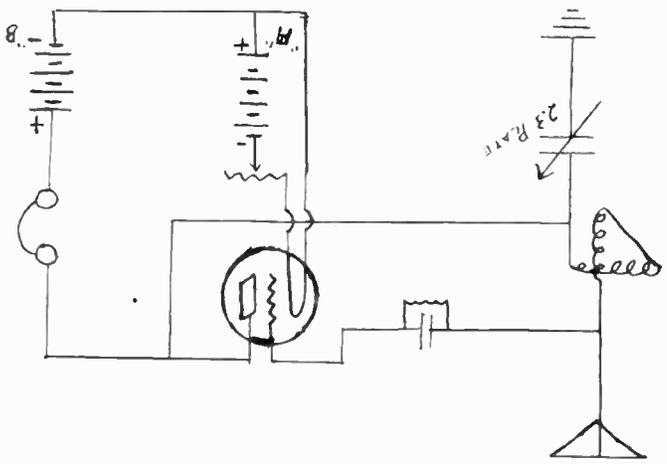
(Continued from Page 30)

set should go with him. He will want to keep in touch with the lacrosse and baseball scores; and what is more conducive to good digestion than to listen in after supper to CFCA's daily evening concert? And then, later, can you imagine him being lulled to sleep on his bed of pine branches by the strains of WDAP's jazz orchestra?

Oh, Boy!! Ain't it a G-R-A-N-D A-N-D G-L-O-R-I-O-U-S F-E-E-L-I-N-G? !!!!

UNCLE TOM.

Only one year ago most people or those having expensive sets did not consider it worth while to pursue radio telephoning during the summer on account of the prevailing atmospheric conditions of static and accentuated wave absorption, resulting in fadeaway, either conditions rendering the operation most unprofitable. In one year only such great improvements have been made that no one should be without some form of radio, from the humble crystal set to the super sets, for the great amount of pleasure to be derived from them. Broadcasting stations have sprung up in such large numbers and such improvements have been made in transmitting, etc., that one can pick up something nearly all day and night and at almost any place one happens to be. The use of the loop aerial makes a portable set compact and aids in eliminating static. A single tube detector set with either a loop aerial or the antenna to a variometer as in the instructions furnishes an inexpensive and effective hook up. The plate and grid connections are worthy of notice in this set, which is very effective for D.X. work. The set can be built for $20.00, using U.V. 199 and for slightly increased cost U.V. 201A, which is advised. It is simple, small and easily set up and its operation is the most potent argument and proof that everyone should have radio in the house, automobile, canoe or camp. There is no changing of needles or winding up and then look at the variety we get. Is any further inducement necessary when a set like the accompanying sketch can be built so cheap?



1 varometer.
1 grid condenser and leak.
1 durable condenser.
1 22½ B. battery.
1 6 volt A. or dry cell for U.V. 199A.
1 tube 201A.
1 socket.
1 rheostat.
1 head set.

WM. C. DERRY,
48 Lappin Ave., Toronto.

FREQUENCY VERSUS WAVE LENGTH

Authorities on matters pertaining to radio are agreed that the most logical and useful way of specifying the wave length of a radio station or transmitter is in cycles or kilocycles. This will be evident from careful study of a theory underlying the method of computing either the frequency or wave length.

A radio wave travels with the speed of light, which we know to be approximately 30,000,000 metres per second. If the wave length of a transmitter were one metre this would mean that there would be 300,000,000 vibrations or oscillations per second, or, in other words, that the frequency would be 300,000,000. If the wave length, however, were 300,000,000 metres then it would take one second for one oscillation to take place, which would be a frequency of one for that wave length.

From the above it will be seen that by dividing the speed of electricity by the number of oscillations per second, or the frequency as it is usually called, we obtain the wave length in metres. This is the distance between two successive oscillations. If there is but one oscillation per second then the wave length would be the distance travelled in one second, which would be 300,000,000 metres. However, if there should be a million cycles per second then the distance travelled by the wave in one second divided by the number of cycles in that second would give you the wave length of one complete cycle.

New Glasgow, N.S., July 12, 1923.

Editor Radio News of Canada.

Dear Sir,—I am enclosing a few notes on a combination tuner.

I have operated a receiver as described and have heard, in winter, stations over 3,000 miles away (KHS, Los Angeles), with a single peanut tube. Using ground alone and two step audio amplifier, stations over 1,500 miles away were heard clearly. Summer reception is not quite as good, but is superior to other types of receivers.

The tuner is ideal as it can be auto-coupled for use in cities and by changing two switches, transformed into a near super. (Above receptions were heard when the coil was acting as a single circuit tuner). As a portable set is used in isolated places, this circuit should be O.K.

Yours very truly,

NORMAN OLDING.

P.O. Box 532.

A Practical Hook-up for Portable Receivers

With the summer season upon us, there is an unusual demand for hook-ups of sets, which will operate satisfactorily as portable receivers.

While experimenting with the Reinartz circuit, the writer developed a combination tuner which gives excellent results.

This tuner is very easy to operate and will enable one to hear distant stations clearly.

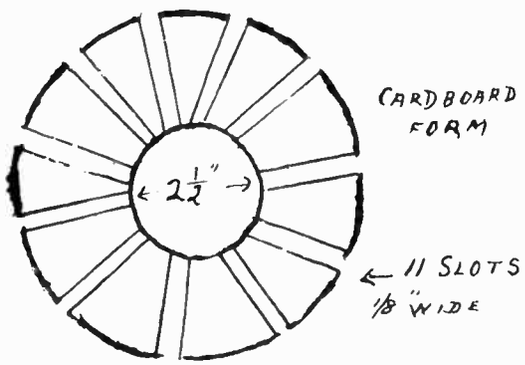


Diagram No. 1

Cardboard Form
11 Slots, ⅛ in. wide.

The coil is wound on an eleven-spoked cardboard form, as shown in diagram No. 1.

The coil may be wound with No. 26, 28, 30 or 32 D.C.C. or S.C.C. wire. The smaller sizes will make the most compact coil, but there will be a slight loss in efficiency.

The plate or feed back coil is wound first, and consists of 50 turns, tapped at the 15th and 30th turns.

In winding this coil, the first turn passes behind the first spoke, in front of the second, behind the third, etc., and as there are an unequal number of spokes the second turn will pass in front of the first spoke, behind the second, in front of the third, and so on. Note—Both coils are wound in the same direction.

After the first fifty turns are wound on, the wire is cut and two layers of twine are wound on in the same manner.

The string is then cut and the remaining fifty turns of wire are wound on, taps are taken off at the 2nd, 4th, 6th, 10th, 18th, 25th and 30th turns. This will make a coil from 4 in. to 6 in. in diameter, depending on the wire used.

When used with an audio F. amplifier, connect a 400-turn honeycomb coil at "X."

The set is connected up as shown in Diagram No. 2.

When switch Z is placed on any of the contacts, 2, 4, 6, 10, and switch Y on contact No. 2, the set will operate as a Reinartz receiver.

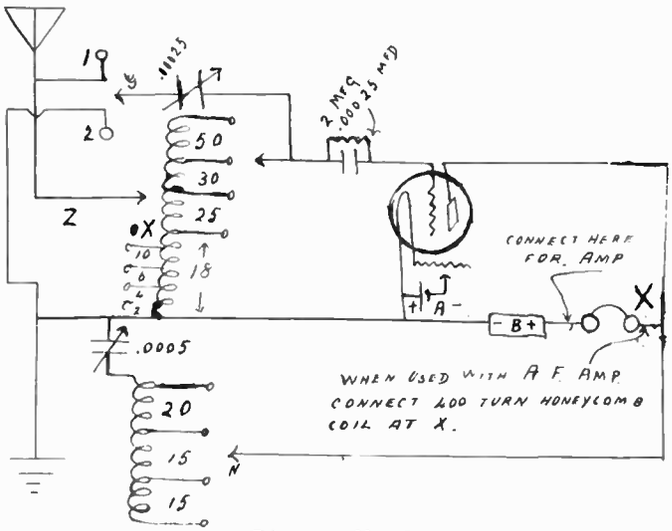


Diagram No. 2

In this case, switch Z tunes the primary, switch M is used as a rough adjustment for the secondary, and switch N gives a rough adjustment of regeneration.

Fine tuning and regeneration are secured by rotating the .00025 (11-plate), and the .0005 (23-plate) condensers.

The Reinartz receiver will tune sharply and will operate over long distances with a minimum of interference.

When using a short aerial or either aerial or ground alone, place switch Z on the blank, or unconnected contact X, and place switch Y on contact No. 1.

This connection, which the writer believes to be original, causes the tuning coil to act as a single circuit tuner, with Reinartz regeneration.

This single circuit tuner will tune sharp and transforms the set into the super class.

If ground is used alone, connect it in place of the aerial and use no ground on the filament.

Note—Use great care in tuning, when using ground alone, otherwise you will miss stations, due to the sharp tuning.

Single circuit operators will find this circuit easy to use. The .00025 condenser is use for tuning, the .0005 condenser acts in place of a tickler to control regeneration.

---

4 Meagher Ave.,
Toronto, July 13, 1923.

Contest Editor, Radio News of Canada.

There was a time, not long past, when radio reception was "tabooed" during the summer months. Although weather conditions pervail to-day as then, new circuits, better designing, and a more definite knowledge of the "whys" and "wherefors" of these disturbances, have been developed.

Circuits employing a loop and radio frequency, probably leads the way in clarity of reception during the sultry days. A circuit of this type employing 5 bulbs, 2 radio detectors and 2 audio in conjunction with a loud talker, will give almost equal results, to within 20% efficiency of wintertime reception, although some disturbances do get through, they are practically nil. The discrepancy in "DX" is due to: First, absorption, due to increased foliage of trees, and this permits less energy to reach the actual antenna. In other words, each

tree acts, in a manner, as an ordinary antenna, and therefore the district becomes too crowded for good radio work.

Second: Bright sunlight, in summer causes "dampening" of radio energy, due to ionizing of atmosphere.

Third: Static and its accompanying troubles is much more prevalent in summer than in winter.

Aside from using radio frequency, the mere fact of cutting down the aerial length to 75 feet and not more than 100 feet of single wire. This timely "gag" in itself, using even a simple single circuit, will very often give startling results.

For results, especially on smaller sets, using one to three bulbs, a loose coupler is the best—the more loosely coupled, the better, resulting in greater elimination of interference, ease of tuning and truthful reproduction. This is especially true in the employment of loud talkers where even the slightest foreign sound is reproduced threefold.

In conclusion, these few simple pointers might be well borne in mind. Indoor aerials stand first as interference eliminators—but this means greater expense and elaborate apparatus, more than the average listener cares to go in for, and therefore falls to the next best using short outdoor aerial and a very loose coupled tuner.

H. C. ANNIS.

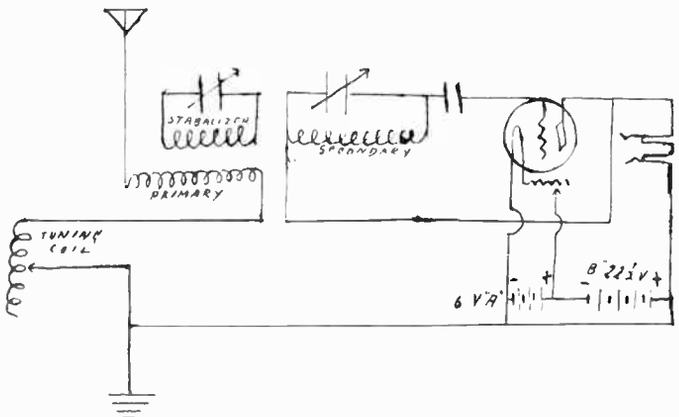
1057 St. Clarens Ave., Toronto.

July 10, 1923.

Atmospheric disturbances, interfering with broadcast reception during the summer months, has, until recently, been a bug bear to the average radio fan. Heretofore eliminating this trouble meant elaborate apparatus requiring technical knowledge to manipulate satisfactorily and, needless to say, an outlay of money far in excess than the average listener feels like spending, particularly on something having such a diversity of opinions as "Radio."

Portable sets, of course, are in a class by themselves, serving their purpose in their respective fields, camping, motoring or at the summer resorts.

The great requisite is compactness coupled with a fair receiving range. Since the advent of the so-called "peanut tube," this problem of good, portable receivers, has, in a



measure, been greatly reduced. Although in a great many instances, receivers of this type cannot operate loud talkers and retain their compactness, have a great many of the fine qualities of permanent sets. A single stage of radio amplification with a detector, in both cases using the W.S. 11 tube, in conjunction with a stranded aerial, one readily wound up on a reel, or a spiral aerial, give exceptional DX results. This type particularly, should appeal to the canoeist or owner of

(Continued on Page 38)

AMATEUR STATIONS

This department is open to all amateurs. We want pictures and write-ups of amateur stations, either receiving or transmitting or both. We shall give prizes every month to the amateurs sending in pictures which we consider worthy of reproduction. We will present a prize to the value of $3 for each picture used.

Not less than a 100-word write-up must accompany each picture.

Points taken into consideration in awarding prizes will be general arrangement, neat workmanship and connections, and efficiency of apparatus.

Pictures should be 5 x 7. We cannot reproduce photos smaller than 3½ x 3½. Write your name and address plainly on the back of photograph. We prefer pictures that include a photograph of the operator.

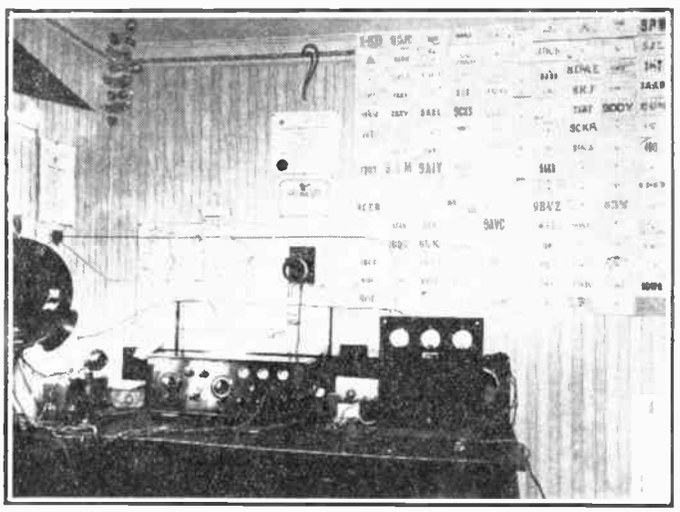
258 Cheapside Street,
London, Ont., July 7, 1923.

Editor, Radio News of Canada.

Sir,—The photo enclosed is sent to Radio News of Canada for entrance in its prize contest. It is the receiving and transmitting station 3XN and 9CF, owned and operated by myself.

The receiving set is a modified Reinartz with up to three stages of audio amplification. This instrument, as well as all other instruments of the station, were built by myself. With this, broadcasting has been heard from California, as well as practically all eastern stations. 300 metre signals have been heard from Porto Rico and California, as well as a greater part of the United States.

The transmitter consists of two 50-watt tubes supplied with chemically rectified 2,000 volts on plates. A Hartley circuit is used. Five thermo-couple amperes is the normal radiation. The plate current is 200 mills., filament voltage 10,



alternating current. The key is in the 2,000-volt plate circuit. Jewell metres with Radio Corporation parts complete the transmitter. The complete instrument, as well as the high and low voltage transformers, were built by myself. Signals from this station 3XN, have been heard in France, Hawaii, Porto Rica, California, and on one occasion by the S.S. China, while 1,100 miles west of San Francisco.

The aerial is 60 feet high and 60 feet long, composed of two 4 in. cages on 14 ft. spreaders.

I am in very close touch with the amateurs, being Government radio inspector and city manager for A.R.R.L.

Yours sincerely,
C. H. LANGFORD.

"So near and yet so far," said the High Tension current when it tried to jump the shunt condenser.

RADIO IN SUMMER TIME

(Continued from Page 35)

other small craft. Obviously it is more practical to use a stranded aerial on land and the loop or spiral for marine use.

For a more permanent set of exceptional qualities, easily built at an approximate outlay of from $40.00 to $50.00 embodying all these fine points; ease of tuning and remaining so, eliminating, equal if not slightly better than any other type, all intereference and giving great clarity and truthful reproduction, is the more recently developed, four circuit turner. This tuner, not originated but successfully built by the writer, is of exceptional merit. A short explanation is herewith given with an accompanying diagram.

Extremely loose coupling is used—the slip up voltage of the receiving transformer is approximately 65 to 1. The regenerative method of amplification is employed but differing from the usual method of not requiring variometers, couplers, feed-back coils or tuned plate circuits. Instead, it consists of an inductively-coupled stabilizer circuit functioning to vary the A.C. resistance of the grid circuit—this circuit is isolated but placed directly within the magnetic field surrounding the grid coil of low resistance, shunted by a variable condensor. Change of coupling is unnecessary; regeneration can be set and will stay "put." This set is not sensitive to body capacity and does not have to be externally shielded.

Detector stage only—2 stages of radio added.

From the writer's viewpoint, after having tried several types of tuners, this is the best yet. The range is remarkable, and with the two stages of audio and a loud talker, is the "ideal" tuner.

WM. LUNDY.

Montreal, July 9, 1923.

The first thing we must consider is that the weather in summer time is not as good as that the winter. Although there is plenty static and enough electricity in the air we can receive 90% as good in the summer time as in the winter time. People are frightened of lightning, the majority of this is remedied by standard lightning arresters.

The next problem is, would a man sit up on a summer night with a heavy pair of earphones on his head. The average man sweats and it is the most uncomfortable feeling experienced, because the earphones stick to the head. Some people use sponge pads between the ear and the earphones but still the earphones are heavy. Manufacturers should make lighter and more comfortable earphones. I have tried them all and I find the same trouble with all of them.

The next reason is that the average radio fan is not in the experimenting mood in the summer time. If he is the concerts are not so attracting as those in the summer time or the case is that all the artists are sick and gramophone records are played during the whole concert. In winter time the radio fan has nowhere to go so he sits down and listens in. One case I know of is right here in Montreal. La Presse does not broadcast on Saturday night and I hear crystal fans grumbling. A man who I know decided to take a bath on Saturday night, but before the bath he decided to hear a concert on his crystal set. There was of course no concert and the man did not listen in again for a week because he had no chance to. Again he listened in on Saturday and of course no concert because La Presse has suspended sending out concerts on Saturday nights in the summer time.

The average radio fan gives up the first reason is (a) the earphones, (b) time, (c) unattracting radio concerts, (d) a misunderstanding that there is too much statis in the air to receive distant stations.

I find that a coupled cricuit with a condenser on the aerial and one on the feedback I get distant stations good and clear. The other things I use is a varicoupler and a variometer, at present I have my set up in the country and I get good results.

Finis

Sirs:—This is my theory of radio in the summer time.

Yours truly,

J. FREEDMAN.

1255 St. Clair Ave.,

Toronto, July 12, 1923.

The Contest Editor, Radio News of Canada.

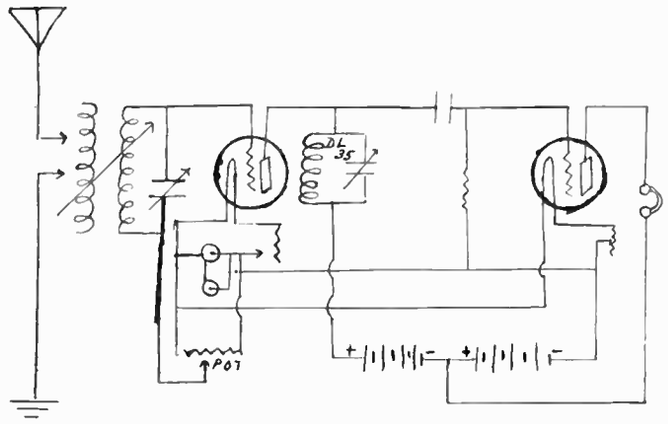
Summer is usually thought of as a holidaying time and for those interested in "radio," this sometimes spells disaster for the "set;" but does it?

The permanent outfit, embodying storage batteries, large tubes and the complications connected with it, is entirely too cumbersome for camping purposes.

Camping, motoring or canoeing present problems for the radio fan and though results are limited, more or less, they are, by no means, of such unsurmountable difficulties as to warrant the discontinuing of "listening in" for this period.

A good portable set, using the popular "peanut tube" and either the feed back type or one employing a radio frequency amplifier, are the two most commendable types.

A brief outline of these two might be in keeping (although neither are original by any means) give exceptional results and are worth while emphasizing.



On a single tube six inches long by three and one-quarter inches in diameter consisting of three windings constitute the static of the tuning variometers and the plate varometier.

The two rotors are wound on tubing two and three-quarter inches in diameter consisting of forty turns. Both rotors are wound alike.

The circuit employed is given herewith.

The other of tuned radio frequency will appeal to the car owner or canoeist, using either a loop or better still a spiral antenna.

This set is a little more expensive, but has exceptional portable qualities. It employs vario-coupler, two twenty-three plate condensors, two W.D. 11 tubes, D.L.—35 coil, rheostats, condensors and a potentiometer of 200 to 400 Ohms resistance. The circuit is given below.

Yet another field presents itself... Owners of large sets do not very often feel like spending more money on something less pretentious than their permanent sets. Crystal sets can be purchased for very little and readily converted into a fairly good receiver using W.D. 11 tubes.

Many of these crystal sets are stagnant on the market and could be profitably transformed into a "peanut tube" set and rented for a small fee less the tube, by some enterprising firm similar to the renting of phonographs and pianos for the summer months, by musical firms.

This plan would, without a doubt, meet with instant approval and support of all classes of "fans" and prove an exceptionally good business venture for the pioneer.

A. A. DENTON.

"Buzz," said the B Battery when it go amongst the Honeycombs.

* * *

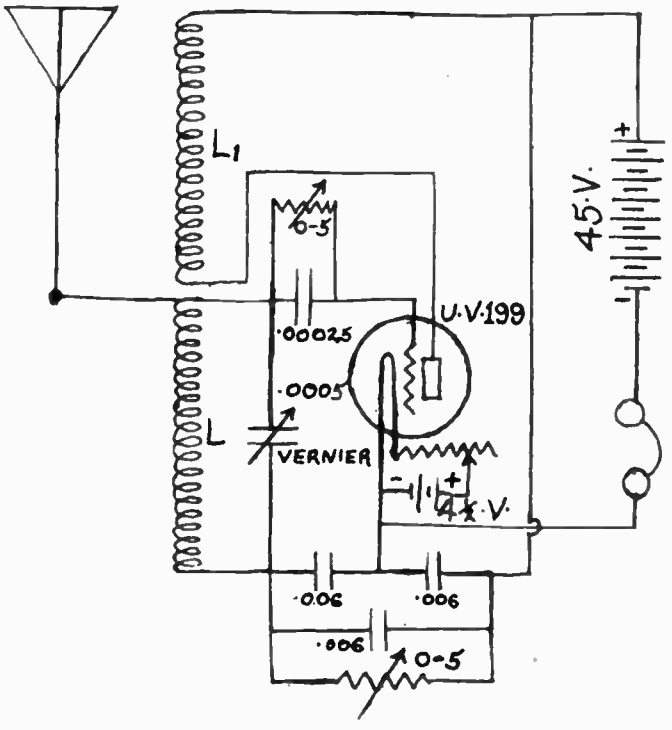
"Nothing to speak of." said the Plate when it looked at the Vacuum.

A PORTABLE FLEWELLING SET

70 Belsize Drive, Toronto.

Practically the only difficulty to prevent the wider use of portable sets is the inconvenience of a suitable aerial and ground. The set about to be described uses only five or six feet of lamp cord as an aerial, and is thus adapted to the needs of the vacationist.

The parts of the set are as follows:—L. is a fifty turn honeycomb coil, while L1 has seventy-five turns. The variable tuning condensor is a twenty-three plate with attached vernier. The grid leak and condenser are a Freshman unit. Freshman .006 mfd. or Dubilier .005 mfd. fixed condensers make up the condenser bank. A Freshman variable grid leak is placed across the condenser back as shown. The tube used is the new U.V. 199, because of the low current consumption. A Howard rheostat, a socket, three 1½ volt batteries, a 45 volt B. battery, and a good pair of phones complete the set. The hook-up is illustrated. Since everyone has hsi own ideas, the arrangement of the parts on the panel is left to the builder.



A vario-coupler may be used in place of the honeycomb coils, but more space will be taken up. Also, some authorities claim that the high resistance across the condenser bank need not be variable. One megohm is suggested.

The grid leak and the high resistance just mentioned are somewhat critical in their adjustment; but once adjusted, results are obtained easily equal to those given by a one-tube set using aerial and ground. The set wil work a loud-speaker in addition to getting good distance.

An amplifying tube and a large plate voltage are recommended in this receiver, and, where weight and size are not factors, it would be advisable to use about one hundred volts on the plate.

For daylight reception, either an aerial or a ground, but not both, may be used. At night neither seems to be necessary.

In closing, the writer wishes to advice all readers building this set to use only the best quality apparatus, and thus to be sure of good results.

ALEX. JACQUES,

THE CONTINENTAL BROADCASTING STATIONS.

Transmitting Station.	Call Sign	Hours of Transmission.	Items Transmitted	Wave-length in Metres.	Remarks.
BELGIUM					
Brussels (1)	Brussels	12 noon	Weather report	1100	Working days.
		4.50 p.m.	Aeroplane traffic	1100	When necessary.
		6.00 p.m.	Concert	1300	Sun., Tues., Thurs.
HOLLAND					
The Hague	PCGG	3-5 p.m.	Concert	1050	Sunday.
		8.40-9.40 p.m.	Concert	1050	Mon. & Thurs.
The Hague (Laboratorium Heussen)	PCUU	7.45-10.00 p.m.	Concert	1050	Tuesday.
		9.40-10.40 a.m.		1050	Sunday.
The Hague (Velthuyzen)	PCKK	8.40-11.40 p.m.	Various	1050	Friday.
Ymuiden (Middelraad)	PCMM	8.40-11.40 p.m.	Concert	1050	Saturday.
Amsterdam	PA5	8.10-11.10 p.m.	Concert and News	1050	Wednesday.
FRANCE					
Levallois-Perret (Radiola)	SFR	2-3 p.m.	Music	1780	Sunday.
		5 p.m.	Stock Exchange News	1780	Every day.
		5.15-6.15 p.m.	Instrumental music	1780	Every day.
		8.45 p.m.	General News	1780	Every day.
		9-10.30 p.m.	Vocal & instrumental concert	1780	Every day.
Paris (2) (Eiffel Tower)	FL	6.40 a.m.	Weather Forecast	2600	Every day.
Radio-Riviera (Nice)		11.15 a.m.	Weather Forecast	2600	Every day.
		3.30 p.m.	Stock Exchange News	2600	Every day.
		6.20 p.m.	Weather Forecast, Concert	2600	Every day.
		10.10 p.m.	Weather Forecast	2600	Every day.
Ecole Superieure des P.TT.		7.45-10 p.m.	Radio Concerts	450	Tuesday, Thurs.
		2.30-7.30 p.m.	Radio Conferences	450	Saturday.
		11 a.m.	News, Concert, tzigane	460	Every day.
		5-6 p.m.	News, Instrumental Concert	460	Every day.
		9-10 p.m.	Latest News, Concert	460	Every day.
GERMANY, CZECHO-SLOVAKIA, AND SWITZERLAND					
Berlin (Konigswusterhausen)	LP	6-7	Financial News, etc	2800	Every day.
		11-12.30			
		4-5.30 p.m.	Financial News, etc	2800	Every day.
Prague	PRG	7-11 a.m. and 3 p.m.	Weather News, General News	1800	Every day.
		9-2 p.m. and 9 p.m.	Concert	4500	
Geneva	HB	6-7 p.m.	Concert	1200	Every day.

(1) If, at the indicated times, a station has to receive or transmit service communications, the weather transmission will take place after these communications. Tuesday: Operatic selection on the gramophone. Thursday: Various on gramophone. Sundays: Various by artistes.

(2) Special concerts given during the evening are announced in the course of the preceding transmissions.

(3) All times are G.M.T., not B.S.T.

MR. MASON NOW COMPLETELY SATISFIED WITH TREATMENT RECEIVED FROM MR. MYERS

St. Andrews, N.B., August 9th, 1923.

Editor Radio News of Canada.

Dear Sir,—Further to the correspondence published in Radio News of Canada in connection with the Myers tube situation.

After receiving the last copy of Radio News of Canada with Mr. Myers' letter in it, I at once wrote him at Montreal, and have to-day received a reply from him that clears up all this past misunderstanding.

I have replied to Mr. Myers, expressing regret that the situation ever had to occur, and have explained to him that nothing of this matter was printed until your magazine had looked into the matter with the endeavor to locate him, and thus get his side of the matter.

I feel it is only right and fair to Mr. Myers to ask you to publish this matter fully, expressing to our radio friends generally that everything has been cleared up to everyone's satisfaction, and I know that we all shall wish him every success in his Canadian undertaking. Mr. Myers is now located in Montreal permanently, from his letter to me, and it will doubtless not be long before we hear of his newest lamp.

Mr. Myers, in a very nice letter to me, expressed that no ill-feeling exists at all on his part, for which I thank him extremely. I am glad indeed that everything has been well cleared up, and I must thank Radio News of Canada, and I know Mr. Myers does also, in getting after this misunderstanding and putting everybody straight.

Yours sincerely,

A. W. MASON.

DEVELOPMENT OF BIG TUBE PROMISES TO REVOLUTIONIZE RADIO

Scientists Who Dream of Communicating With Other Planets Are Elated by Discovery

Development of a giant vacuum tube, having 400 times the power of tubes now used in transmission, promises to revolutionize radio and make possible the sending of broadcast and code messages over distances heretofore deemed impossible.

The new tube, which is no larger than an ordinary desk drawer, has a power of 1,000,000 watts, as compared with the 250-watt power of vacuum tubes which are now used in the so-called "high power" radio stations. Since four of the 250-watt tubes used in a single transmitting set are capable of carrying messages from America to Europe, it is believed by radio engineers that the new tube will be sufficient to hurl wireless signals to every spot on the globe.

Existing trans-Atlantic stations have been rendered obsolete by the development of the new tube, radio engineers say. Whereas many acres of floor space are now required to house the machinery used in wireless communication across the ocean from the big stations, it is predicted that power plants requiring not more than ten square feet of floor space will take their place in the near future.

The vacuum tube being the very heart of modern radio, engineers see vast possibilities opened for extension of the services it can render humanity now that a tube of such power is available. Not only is the vacuum tube necessary for the sending and receiving of the human voice and code signals over great distances, but it plays a vital part in every use to which radio has been put.

Transmission of photographs and the control of ships and air craft are impossible without the tube, and it is also an important part in pieces of scientific apparatus for studying sounds and taking minute measurements. Many other uses, many of them startling in their nature, are forecast by experimental work which is now being conducted in various laboratories.

Scientists who have long dreamed of establishing communication with other planets are elated by the advent of the new tube. In it they see the possibility of signals from the earth bridging the vast space to Mars and being picked up there.

WOULD YOU?

If the opportunity were offered you to learn the art of Wireless Telegraphy and Wireless Telephony,

Would you accept it?

If you had the opportunity to learn everything about line Telegraphy,

Would you accept it?

If you had the opportunity presented to you, would you take advantage of it in order to learn the technical construction of receiving and sending sets, both voice and code.

The Government is willing and anxious that you should accept this offer from them.

Free of All Cost to Yourself

An opportunity is given to grown boys and young men, eighteen years of age or over, to learn all about wireless and line transmission and reception, free of charge, during the coming winter.

Spend Your Evenings Profitably

If you wish to know more about this opportunity for Radio Fans—or others who are interested—call at the Armouries on University Ave., Toronto, on Sept. 14th, at 8 p.m., and ask for Major MacPherson, Canadian Corp of Signals, or if you live in Hamilton, Ont., call at the Hamilton Armouries and ask for Major Hunt, Canadian Corp of Signals.

One or two evenings a week at these classes will make you an efficient Radio Operator in every branch of the art.

The Radio News of Canada heartily endorses the above and we advise every amateur who desires to know more about Radio to join the above Battalion.

RADIO TUBES LIMITED

New Company Will Make Tubes in Toronto

We have learned just before going to press, that a large new radio tube manufacturing company, with $500,000 capital, to be known as Radio Tubes Limited, has been organized. This company is to have as directors, F. C. Clark, S. B. Trainer, C. V. Logwood and two others not yet chosen. The company has acquired the Canadian rights and patents owned by F. S. McCullough, recently retired from Westinghouse Electric and Manufacturing Co., Pittsburgh, Penn. The McCullough fused filament and patented radio tubes, acquired by Radio Tubes Limited, immediately put this new company in the first ranks of tube manufacturers, with no patent or other interferences to stand in the way of immediate success.

We shall be able to announce further details in our next issue. This company has in hand an extensive advertising campaign for the coming season. From information we have, the trade will do well to hear from this company in making arrangements for a supply of tubes for the fall trade. All the officials of the company are men well known to us and with such capable management the company will be heard from in a big way. The company has the strongest financial backing. The head office and factory will be in Toronto.

WELL KNOWN BRITISH RADIO MANUFACTURER IN TORONTO

Mr. W. H. Lynas, of London, England, General Manager, Radio Dept. Graham and Company, is in Toronto for the purpose of inaugurating a sales campaign throughout Canada and the United States.

The Graham products enjoy a wide degree of popularity in the old land, and there is no doubt that if steps are taken to show the Canadian and American amateur the fine workmanship on the Graham product, and the splendid results that can be obtained by their use, they will soon be as popular on this side as they are in Great Britain.

"VOICE OF THE PEOPLE" CHANGES TIME SCHEDULE

Station WSB, the Atlanta Journal, has advanced its 7 p.m. broadcasting session to 8 o'clock, central standard time. This schedule was Dixie's first radio entertainment hour. Founded sixteen months ago, when "The Voice of the People" took the air as the second newspaper station in the world, the period has been moved forward an hour to meet the summertime conditions. The change will facilitate reception especially in the east, where daylight saving means that WSB's carrier wave will now begin to arrive at 10 o'clock instead of 9. The Journal's nightly Radiowl broadcast at 10.45 p.m., the nation's first regular belated session, will be maintained as before.

LIGHTNING BOLT PROVES SAFETY OF RADIO

If any further evidence were necessary to prove the safety of radio, there was plenty of it furnished during the severe electrical storm a few days ago.

Lightning entered the Amrad Broadcasting Station at Medford Hillside, Mass., during the worst of the storm, which was very severe locally. Investigation showed that it was attracted by the electric light wires which it completely demolished. The electric light service was paralyzed. However, the 320-ft. steel antenna tower used in connection with the broadcasting was not touched, nor the powerful broadcasting apparatus, thereby proving that a radio antenna and a receiving or transmitting set does not attract lightning in any way.

Time was when uninformed persons thought the installation of radio provided an extra fire hazard. This belief has been somewhat dispelled by the experts who call the lightning hazard or radio a "childish bugaboo." No less authority than Dr. Steinmetz, the electrical wizard, the man who recently produced an electrical storm all his own, has said that the radio installation properly made was a protection rather than a source of danger from lightning. The truth of his statement was verified by the practical test last Saturday.

WSB USES PORTABLE TRANSMITTER IN SUMMER

Atanta, Ga.—A portable transmitter, ready to hurry to any point where something of interest may happen, is a highly popular feature of WSB's summertime radio service.

The transmitter is mounted on a motor truck and may be put into action in a matter of seconds. Co-operation by the local telephone company, coupled with a relay system brought to an astonishing degree of simplicity and perfection by A. Walter Tison, the Journal's chief operator, are giving WSB's circle of listeners many innovations.

A recent twenty-four hour motor cycle race, the Elk's parade, eye-witness broadcast of Atlanta baseball games, indoor and outdoor athletic events, meetings, celebrations and a multitude of other events have found the portable transmitter on hand to link the proceedings with the world at large.

The average human life is thirty-one years.

Coaches were first used in England in 1569.

Modern needles first came into use in 1545.

Kerosene was first used for lighting purposes in 1826.

The first newspaper advertisement appeared in 1652.

List of Broadcasting Stations of the United States

360 and 400 metres—Music and Entertainment

Location of Station	Call signal	Wave lengths
East Pittsburg, Pa.	KDKA	360
San Francisco, Calif., Fairmount Hotel	KDN	360, 485
Cleveland, Ohio	KDPM	360
San Diego, Calif., Third and E. Streets	KDPT	360
Salt Lake City, Utah	KDYL	360, 485
San Diego, Calif., 236 C Street	KDYM	360
San Diego, Calif., Union and C Streets	KDYO	360
Portland, Ore.	KDYQ	360, 485
Great Falls, Mont.	KDYS	360, 485
Salt Lake City, Utah, 1138 Michigan Ave.	KDYV	360
Phoenix Ariz., 3rd Ave. and Jefferson St.	KDYW	360
Honolulu, Hawaii	KDYX	360
Denver, Colo., 1512 Broadway	KDYY	360
Tucson, Ariz.	KDZA	360
Bakersfield, Calif., 1402 Twentieth St.	KDZB	360
Seattle, Wash., 1321 Second Ave.	KDZE	360
Los Angeles, Calif., 260 Figueroa	KDZF	360
San Francisco, Calif., 433 California St.	KDZG	360
Fresno, Calif.	KDZH	360, 485
Wenatchee, Wash.	KDZI	360
Reno, Nev.	KDZK	360
Ogden, Utah., 2311 Washington Ave.	KDZL	360
Centralia, Wash., 203 North Tower Ave.	KDZM	360
Los Angeles, Calif., 724 South Olive St.	KDZP	360
Denver Colo., 429 South Sherman St.	KDZQ	360
Bellingham, Wash.	KDZR	360
Seattle, Wash.	KDZT	360
San Francisco, Calif., 2198 O'Farrell St.	KDZW	360
San Francisco, Calif., 1536 Ellis St.	KDZX	360
Everett, Wash., 1705 Hewitt Ave.	KDZZ	360
Glendale, Calif., 222 S. Brand Boulevard	KEAC	360
Phoenix, Ariz., 134 S. Central St.	KEAD	360
Pullman, Wash	KEAE	360
Denver, Colo., 737 Lincoln St.	KEAF	360
Boulder, Colo.	KEAI	360
Moscow, Idaho	KEAN	360
Butte, Mont.	KEAP	360
San Jose, Calif.	KEAQ	360
Hollywood, Calif., 1645 Hudson Ave.	KEAR	360
Reno, Nev.	KEAS	360
Eugene, Oreg., 681 Wilamette St.	KEAT	360
Boise, Idaho	KEAU	360, 485
Venice, Calif.	KEAV	360
Santa Ana, Calif.	KEAW	360
Medford, Oreg.	KEAY	360, 485
Reedley, Calif., 1348 Z St.	KEAZ	360
Havre, Mont.	KFBB	360
San Diego, Calif., 5038 Cliff Place	KFBC	360
Hanford, Calif., 315 North Douty St.	KFBD	360
San Louis Obispo, Calif.	KFBE	360
Tacoma, Wash.	KFBG	360
Marshfield, Oreg.	KFBH	360
Sacramento, Calif.	KFBK	360, 485
Everett, Wash.	KFBL	360
Astoria, Oreg.	KFBM	360
California (portable)	KFBN	360
Prescott, Ariz.	KFBQ	360
Trinidad, Colo.	KFBS	360
Laramie, Wyo.	KFBU	360
Colorado Springs, Col., 523 S. Hancock St.	KFBV	360
Seattle, Wash., 418 Union St.	KFC	360, 485
Phoenix, Ariz.	KFCB	360
Wallace, Idaho	KFCC	360
Salem, Oreg.	KFCD	360
Walla Walla, Wash., 707 Baker Bldg.	KFCF	360
Billings, Mont., 12 North Thirtieth St.	KFCH	360
Colorado Springs, Colo.	KFCK	360
San Antonio, Calif.	KFCL	485
Richmond, Calif.	KFCM	360
Casper, Wyo.	KFCQ	360
Baker, Oreg.	KFDA	360
San Francisco, Calif., 464 California St.	KFDB	400, 485
Spokane, Wash.	KFDC	360
Boise, Idaho	KFDD	360
Casper, Wyo.	KFDF	360
Tucson, Ariz.	KFDH	360
Corvallis, Oreg.	KFDJ	360
Denver, Colo.	KFDL	360
Taft, Calif.	KFEB	360
Portland, Oreg.	KFEC	360
Polytechnic, Mont.	KFED	360
Tacoma, Wash.	KFEJ	360
Denver, Colo.	KFEP	360
San Diego, Calif.	KFFA	360
Pendelton, Oreg., Pensland Bldg.	KFFE	360
Astoria, Oreg.	KFGG	360
Stanford University, Calif.	KFGH	360
Los Angeles, Calif., Tenth and Hope Sts.	KFI	360
Yakima, Washington, Herald Block	KFV	360
Spokane, Wash., 118-120 Lincoln St.	KFZ	360
Tacoma, Wash, 1130 Broadway	KGB	360
Portland, Oreg., 192 Park St.	KGG	360
Portland, Oreg., 1556 East Taylor St.	KGN	360
Altadena, Calif., 2940 Maiden Lane	KGO	360
Honolulu, Hawaii, Waikiki Beach	KGU	400
Portland, Oreg., Sixth and Alder Sts.	KGW	360
Lacey, Wash.	KGY	360
Colorado Springs, Colo., P.O. Box 285	KHD	360, 485
Los Angeles, Calif., 757 S. Los Angeles St.	KHJ	400, 485
Seattle, Wash., 419 Thirteenth Ave.	KHQ	360
Los Angeles, Calif., 1048 S. Olive St.	KJC	360
Sunnyvale, Calif., 229 Sunnyvale, Ave.	KJJ	360

485 metres—Market and Weather Reports

Location of Station	Call signal	Wave lengths
Stockton, Calif., 615 East Main St.	KJO	360
Seattle, Wash., 6838 Nineteenth Ave. N.E.	KJR	360
Los Angeles, Calif., 536 South Hope St.	KJS	360
Passadena, Calif., 1295 East Villa St.	KLB	360
Del Monte, Calif.	KLN	360
Los Altos, Calif., O'Keefe Ave.	KLP	360
Oakland, Calif., 2201 Telegraph Ave.	KLS	360
Oakland, Calif., Thirteenth and Franklin Sts.	KLX	360
Denver, Colo., 1534 Glenarm Place	KLZ	360, 485
Reedley, Calif., 1516 F. Street	KMC	360
Fresno, Calif., H. and Tulare Sts.	KMJ	360, 485
Tacoma, Wash., 732 Pacific Avenue	KMO	360
Eureka, Calif., Humbolt National Bank Bldg.	KNI	360
Roswell, N. Mex., 112 West Third St.	KNJ	360, 485
Los Angeles, Calif., Seventh and Broadway	KNN	360
Aberdeen, Wash., 913 West Hume St.	KNT	360
Los Angeles, Calif., 815 South Main St.	KNV	360
Los Angeles, Calif., 216 West Third St.	KNX	360
Denver, Colo., Lincoln St. and 16th Ave.	KOA	485
State College, N. Mexico	KOB	360, 485
Los Angeles, Calif., Seventh and Grand Sts.	KOG	360
San Diego, Calif., Fifth and Broadway	KON	360
Detroit, Mich.	KOP	360
San Francisco, Calif., Fifth and Market Sts.	KPO	360
Berkeley, Calif.	KQI	360
Hood River, Oreg., 308 Cascade Ave.	KQP	360
Pittsburg, Pa. 719 Liberty Ave.	KQV	360
San Jose, Calif., 467 First St.	KQW	360
Portland, Oreg., 75 Sixth St.	KQY	360
Berkeley, Calif., 3100 Adeline St.	KRE	360
St. Louis, Mo.	KSD	400, 485
San Francisco, Calif.	KSL	360
Long Beach, Calif., 18 Elm Ave.	KSS	360
Seattle, Wash., Seventh Ave. & Spring St.	KTW	360
San Francisco, Calif.	KUO	360, 485
Los Angeles, Calif., 3000 Central Ave.	KUS	360
El Monte, Calif.	KUY	360
Sacremento, Calif., 915 Seventh St.	KVQ	360
Stockton, Calif., 530 East Market St.	KWG	360
Los Angeles, Calif.	KWH	360, 485
Modesto, Calif., City Hall	KXD	360
Los Angeles, Calif., 363 New High St.	KXS	360
Bakersfield, Calif., 1925 I Street	KYI	360
Los Angeles, Calif., Eighth St. & Broadway	KYJ	360, 485
Honolulu, Hawaii	KYO	360
Chicago, Ill., 72 West Adams St.	KYW	400, 485
San Francisco, Calif., 175 Steuart St.	KYY	360
Seattle, Wash., 1429 First Ave.	KZC	360
Oakland, Calif., Thirteenth & Harrison Sts.	KZM	360
Salt Lake City, Utah	KZN	360, 485
Wenatchee, Wash.	KZV	360
San Francisco, Calif., 646 Mission St.	KZY	360
New Orleans, La., 137 S. St. Patrick St.	WAAB	360
New Orleans, La.	WAAC	360
Cincinnati, Ohio	WAAD	360
Chicago, Ill.	WAAF	360, 485
St. Paul, Minn., 182 East Sixth St.	WAAH	360
Boston, Mass., 899 Boylston St.	WAAI	360
Milwaukee, Wis.	WAAK	360, 485
Minneapolis, Minn., 54 South Fourth St.	WAAL	360
Newark, N.J., Bond Street	WAAM	360
Columbia, Mo.	WAAN	360, 485
Wichita, Kans., 441 N. Roosevelt Ave.	WAAP	360, 485
Greenwich, Conn., 22 West Putnam Ave.	WAAQ	360
Decatur, Ga., 38 Peachtree St.	WAAS	360
Omaha, Nebr.	WAAW	360, 485
Crafton, Pa., 35 Haldane St.	WAAX	360
Youngstown, Ohio., 254 West Federal St.	WAAY	360
Emporia, Kans., 14 East Sixth Ave.	WAAZ	360
El Dorado, Kans., 300 South Main St.	WAH	360, 485
West Lafayette, Ind.	WBAA	360
Syracuse, N.Y., 213 Westminster St.	WBAB	360
Minneapolis, Minn., 31 South Fifth St.	WBAD	360
Moorestown, N.J., 337 Chester Ave.	WBAF	360
Bridgeport, Pa., Ford Street	WBAG	360, 485
Minneapolis, Minn., 7th St. and Nicolet Ave.	WBAH	360
Toledo, Ohio, 27 Ontario St.	WBAJ	360, 485
Paterson, N.J., 193 Ellison St.	WBAN	360
Decatur, Ill.	WBAO	360
Fort Worth, Tex., 400 W. Seventh St.	WBAP	400, 485
Hamilton, Ohio., Third and Market Sts.	WBAU	360
Columbus, Ohio, 146 North Third Sts.	WBAV	360, 485
Marietta, Ohio	WBAW	360
Wilkes-Barre, Pa., 66 Gildersleeve St.	WBAX	360
New York, N.Y., 24 Walker St.	WBAY	400
Anthony, Kans., 401 South Anthony St.	WBL	360
Newark, N.J., 178 Central Ave.	WBS	360
Charlotte, N.C., 905 Realty Bldg.	WBT	360, 485
Chicago, Ill.	WBU	360
Springfield, Mass.	WBZ	400
Newburgh, N.Y., 40 Grand St.	WCAB	360
Fort Smith, Ark., 701 Garrison Ave.	WCAC	360
Canton, N.Y.	WCAD	360
Pittsburgh, Pa., Sixth and Smithfield Sts.	WCAE	400
New Orleans, La., 606 Canal St.	WCAG	360
Columbus, Ohio	WCAH	360
University Place, Nebr.	WCAJ	360, 485
Houston, Tex., 2504 Bagby St.	WCAK	360
Northfield, Minn.	WCAL	360
Baltimore, Md., 319 North Charles St.	WCAO	360
Decatur, Ill., 211 Main Street	WCAP	360, 485
Defiance, Ohio 309 Clinton St.	WCAQ	360

(Continued on Page 48)

FIRST RADARIO WRITTEN ESPECIALLY FOR CHILDREN

T. C. O'Donnell has written several plays and stories for children and spoken to a world-wide audience from WLW, of Crossley Manufacturing Company, "The Station With a Soul." His plays appear every month in "Child Life" Magazine. He has made a study of the radarios written and produced at WLW, and has written the first original radario for children. This is called "The Magic Journey," and will be given in September from the broadcasting station.

There may be some new radio-set owners who do not know that radario plays were originated by Fred Smith, studio director of the WLW studio, but most of the radio audience during the past year know about this and their enthusiastic letters have encouraged the production of these plays on even a larger scale than heretofore. Mr. O'Donnell, who is also editor of Writer's Digest, which is conducting a $100 prize contest for the three best radarios submitted, has this to say about them:

"The word radario can best be defined by giving a brief history of the broadcasting of one-act plays, as written for and produced upon the stage. In this, station WLW was the pioneer. It was found that with the aid of occasional interpolations by the studio director, describing the entrance and exit of characters, and with each part given by a reader with a distinctive voice, it was possible to render the play so clearly that the listener could readily follow the play.

"But—direction by the radio director did interrupt the dialogue and the action of the play, and to that degree the play failed to be perfectly adapted to radio broadcasting. Mr. Fred Smith, studio director at WLW, hit upon a means of obviating this difficulty. His idea was to so construct the play that the dialogue would convey to the listener the entire action.

"For example, in a scene with two young women conversing about the young man whom they are expecting, upon his appearance the studio director in the regular play would have said, 'At this point Reginald Fairfield enters and greets the young women.' The radioized version would be something in this manner:

"Phyllis: Oh, here comes Reggie now!.....Hello, Reggie!"

"Reginald: Why, here you are! Hello, Phyllis! Hello, Dorothy!" and the dialogue would go on smoothly and the entire action be as clear to the listener as though the studio director, or 'descriptionist,' as he is now called, had described the action.

"To this new form Mr. Smith gave the name 'radario,' a word which has quickly become fixed in the language, so that the publishers of the Standard Dictionary have announced that the next edition of this work would contain the word and its definition.

"Mr. Smith also wrote the first radario, 'When Love Wakens,' the title initials being the letter which denote the station WLW. This was broadcast early in the year and was followed by other radarios, one of these being a clever radioization, if we may use the term, of Moliere's 'Trader Turned Gentleman.'

"An essential of the radario is that it tell a complete story; in other words, that it have a plot. Also it must be brief, not occupying more than twenty minutes on the programme. And if variety is introduced in the form of a song by one of the performers, or a bit of orchestra music, or a novelty like a whistling solo, so much the better."

CANDIDATES SUCCESSFUL IN EXAMINATIONS FOR RADIO CERTIFICATE

The Department of Marine and Fisheries announce that five (5) candidates were examined during the month of July, 1923, of which the following were successful and obtained Certificate of Proficiency in Radiotelegraphy:

Commerciay—2nd Class—J. A. Doig, Montreal, P.Q.

Amateur—S. Bateson, Sydney Mines, N.S.; J. L. Brumpton, Port Stanley, Ont.; L. DeCelles, Montreal, P.Q.; C. E. Trott, Chilliwack, B.C.

MR. SLACK, OF WENTWORTH RADIO COMPANY, UNDERGOES SERIOUS OPERATION

Mr. Slack, the popular radio engineer of the Wentworth Radio Company, is now in hospital and will be operated upon for appendicitis. The trade wishes Mr. Slack a speedy recovery, and hopes he will be around in time to take charge this season.

(Continued from Page 45)

Location of Station	Call signal	Wave lengths
San Antonio, Tex., 608 West Evergreen St...	WCAR	360
Minneapolis, Minn., 818 Superior Blvd.....	WCAS	360
Rapid City, S. Dak.....	WCAT	485
Philadelphia, Pa., 1936 Market St.....	WCAU	360, 485
Little Rock, Ark., 113 West Capital Ave.....	WCAY	360
Quincy, Ill.	WCAW	360, 485
Burlington, Vt.	WCAX	360
Milwaukee, Wis., 517 Grand Ave.....	WCAY	360
Carthage, Ill.	WCAZ	360
Minneapolis, Minn., 212 South Fifth St.....	WCE	360
St. Louis, Mo., Washington St.....	WCK	360
Austin, Texas	WCM	360, 485
Worcester, Mass.	WCN	360, 485
Detroit, Mich.	WCX	400, 485
Springfield, Ill., Ninth and Grand Ave.....	WDAC	485
Tampa, Fla.	WDAE	360, 485
Kansas City, Mo.	WDAF	400, 485
Amarillo, Tex., 605 East Fourth St.....	WDAG	360
El Paso, Tex., 412 San Francisco St.....	WDAH	360, 485
Syracuse, N.Y., 411 South Clinton St.....	WDAI	360, 485
College Park, Ga.	WDAJ	360, 485
Hartford, Conn.	WDAK	360
Jacksonville, Fla.	WDAL	360, 485
Dallas, Tex., Ervay & Corsicana St.....	WDAO	360
Chicago, Ill., Wrigley Bldg.....	WDAP	360
Brownsville, Pa., 312 Market St.....	WDAQ	360
Philadelphia, Pa.	WDAR	360
Worcester, Mass., 49 Benefit St.....	WDAS	360
New Bedford, Mass., 23 North Water St.....	WDAU	360
Muskogee, Okla.	WDAV	360
Centreville, Iowa	WDAX	360
Fargo, N. Dak., 117 Broadway.....	WDAY	360, 485
Washington, D.C., 18th and N. Sts., N.W....	WDM	360
New York, N.Y., 80 Washington St.....	WDT	360
Omaha, Nebr., 5022 Cass St.....	WDV	360
Roselle Park, N.J.....	WDY	360
Tuscola, Ill., Star Store Bldg.....	WDZ	360
Flint, Mich., 104 Walsh Bldg.....	WEAA	360
Fort Dodge, Iowa, 619 Carver Bldg.....	WEAB	360, 485
Terre Haute, Ind., 24 South Eighth St.....	WEAC	360, 485
Atwood, Kans.	WEAD	360
Blacksburg, Va.	WEAE	360
New York, N.Y., 463 West Street.....	WEAF	400
Edgewood, R.I., 94 Armington St.	WEAG	360
Wichita, Kans.	WEAH	360, 485
Ithaca, N.Y.	WEAI	360
Vermilion, S. Dak.	WEAJ	360
St. Joseph, Mo., 819 N. Twenty-third St.....	WEAK	360
North Plainfield, N.J.....	WEAM	360
Providence, R.I.	WEAN	360, 485
Columbus, Ohio	WEAO	360, 485
Mobile, Ala., O'Gwinn Bldg.....	WEAP	360, 485

Location of Station	Call signal	Wave lengths
Baltimore, Md., Munsey Bldg.....	WEAR	360
Washington, D.C., 7th and F. Sts. N.W.....	WEAS	360
Tampa, Fla., 707 Azeele St.....	WEAT	360
Sioux City, Iowa.....	WEAU	360
Rushville, Nebr.	WEAV	360
Anderson, Ind., Box 140	WEAW	360
Little Rock, Ark., P.O. Box 614.....	WEAX	360, 485
Houston, Tex., 612 Travis St.....	WEAY	360
St. Louis, Mo., 1110 Olive Street.....	WEB	360
Tulsa, Okla. (300 S. Main St., Eldorado, Kan.)	WEH	360, 485
Houston, Tex., McKinney Ave. and San Jacinto Street	WEV	360, 485
St. Louis, Mo.	WEW	360, 485
Wichita, Kans., 1725 Fairmount Ave.....	WEY	360, 485
Dallas, Tex.	WFAA	400, 485
Syracuse, N.Y., 802 McBride St.....	WFAB	360
Superior, Wis., 2326 John Ave.....	WFAC	360
Salina, Kans., 217 North Santa Fe St.....	WFAD	360
Poughkeepsie, N.Y., 357 Main St.....	WFAF	360
Waterford, N.Y., Sixth and Broad Sts.....	WFAG	360
Port Arthur, Tex., 637 Proctor St.....	WFAH	360
Ashville, N.C., 47 Zillicoa St.....	WFAJ	360
St. Cloud, Minn.....	WFAM	360
Hutchinson, Minn.	WFAN	360, 485
Cameron, Mo.	WFAQ	360
Fort Wayne, Ind., 107 E. Main St.....	WFAS	360
Sioux Falls, S. Dak., 109 North Main Ave...	WFAT	360, 485
Boston, Mass., 121 Federal St.....	WFAU	360
Lincoln, Nebr.	WFAV	360, 485
Miami, Fla.	WFAW	360
Independence, Kans.	WFAY	360
Charleston, S. C.	WFAZ	360, 485
Philadelphia, Pa., Eighth & Market Sts.....	WFI	400, 485
Houston, Tex., 1213 Prairie Ave.....	WGAB	360
Ensenada, P. R.	WGAD	360
New Haven, Conn., 296 Elm St.....	WGAH	360
Shenandoah, Iowa., 413 Seventh Ave.....	WGAJ	360
Macon, Ga.	WGAK	360
Lancaster, Pa., 23 East Orange St.....	WGAL	360
Orangeburg, S. C.	WGAM	360
Penascola, Fla., 216 West Romana St.....	WGAN	360
Shreveport, La.	WGAQ	360
Fort Smith, Ark., 507 Rogers Ave.....	WGAR	360, 485
Chicago, Ill., 1547 North Wells St.....	WGAS	360
Lincoln, Neb., 314 Richards Block.....	WGAT	360
Wooster, Ohio, 235 East Liberty St.....	WGAU	360
Altoona, Pa., 1918 West Chestnut St.....	WGAW	360
Washington Court House.....	WGAX	360
Madison, Wis., 250 State St.....	WGAY	360
South Bend, Ind.....	WGAZ	360
Des Moines, Iowa	WGF	360, 485
Medford Hillside, Mass.....	WGI	360, 485

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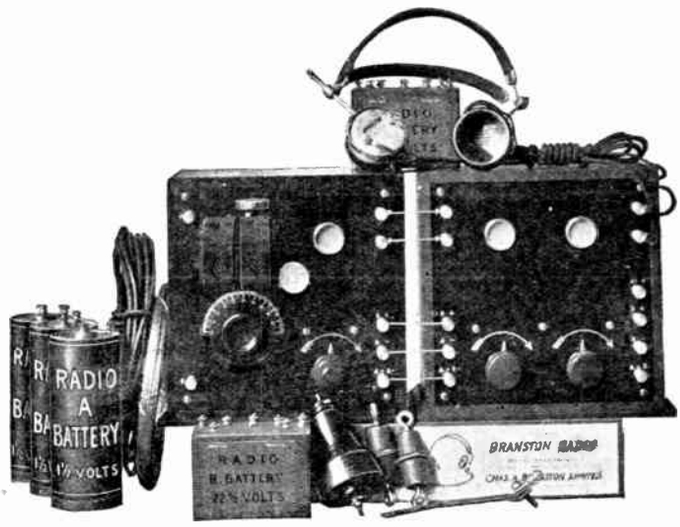

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35	.50	1.40	400	1.30	1.95
50	.55	1.50	500	1.45	2.20
75	.65	1.50	600	1.60	2.35
100	.75	1.70	750	1.80	2.60
150	.85	1.75	1000	2.00	2.85
200	.95	1.80	1250	2.45	3.30
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