

RADIO

IN AUSTRALIA
& NEW ZEALAND

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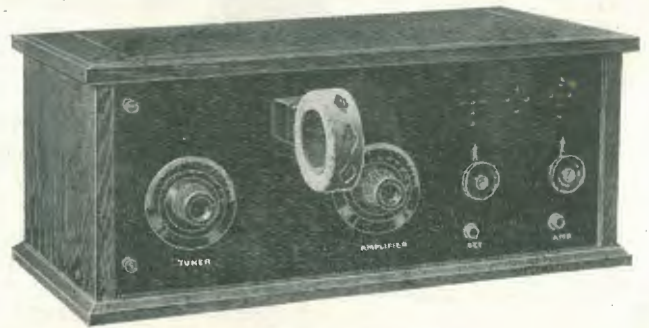


EDUCATION AS BROADCASTING WILL MAKE IT!

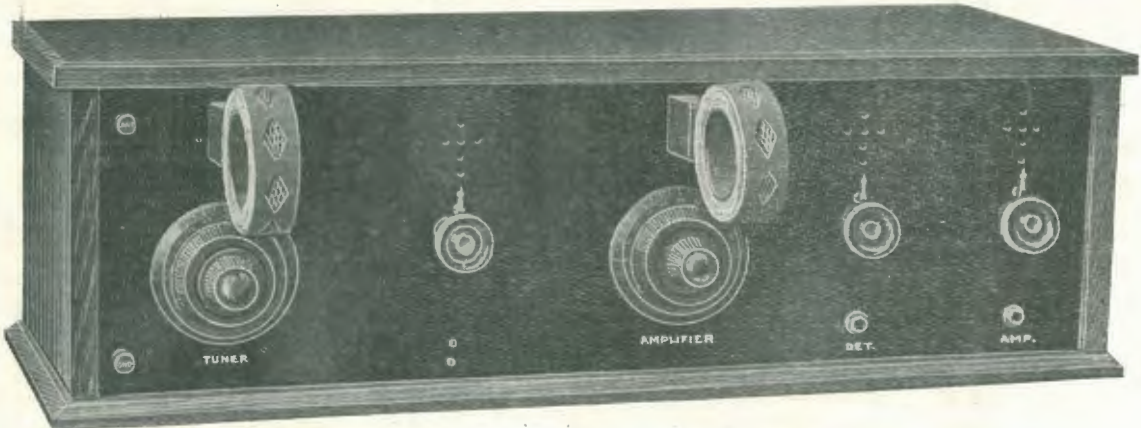
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A Story for Big and Little Children

entitled

"Not Quite According to the Brothers Grimm."



ONCE upon a time there was a little boy—or a little girl—it matters not which; if you are a little or a big boy read "soldiers" for "dolls," and if you are a little or a big girl read "dolls" for "soldiers." Whether you're big or little—a boy or a girl—you will always take more than a passing interest in the days when soldiers and dolls stood for Life's realities.

BUT to get back to that little boy.

THE day I am speaking about on which this story opens was a nasty, wet, miserable one. Although it was only a little after four in the afternoon, it was already twilight and mixed up with the rain and the half-darkness one could hear outside the mournful moaning of a cold, bleak wind.

IN the nursery, although a big fire crackled warmly, it seemed only a little less miserable there than in the street outside the house. Squatting on a foot-stool in front of the fire with his head buried in his two arms was a very cross and querulous little boy. He had, so he thought, very good reason to be so. He could not go out as it was raining. Everybody was too busy or tired to play with him and hardly any one of his toy soldiers would stand up of their own volition. And only those who have tried to play with toy soldiers which will NOT stand up know how annoying that is!

THAT little boy in fact, was in that dangerous state of mind that has often proved the undoing of much more superior and grown-up persons—he had nothing at all in the world to do!

PRESENTLY, Big Brother came in, grunted out a greeting, flung a small paper-covered book on the table and went out again, at the same time muttering something about "little bounders who sit sucking their thumbs over a fire all day."

PROOF through long practice to such unpleasanties, the little boy, as soon as the sound of the footsteps died away, tip-toed to the table and peeped into the book.

ONE hour later, in one of those uncomfortable positions which seem to remain the exclusive property of small boys but which always denote deep concentration, he was still "peeping."

THE silence continued for a little longer and then he suddenly closed the book and stole over to the corner

of the nursery where his money-box was kept. To rifle it of its contents—a few shillings—was the work of a moment and the result of highly specialised habit. Even less time was taken to snatch his cap, dash through the door out into the dark street and round the corner to a shop where were sold Mysterious Things.

AT half-past six that night our small friend was so excited that for once in his short life he was unable to eat his tea, and as he would give no reason for his disinclination, Authority decided that he was sick and, certain Preventative Measures being taken, he was put to bed. . . .

SOME hours later, Authority with a faint odour of "Chypre" about her looked in at the nursery to see "Whether the child really should have the doctor."

FROM what she saw Authority's first mind was to call in a brain specialist.

ROUND the room, about eight feet high, ran a glittering copper wire. (Our small friend knew better than to ever explain the risks he took to escape causing himself grievous bodily harm!) One end of this ran down and was connected to a—a—. . . .

"WHAT on earth are you doing, darling?" gasped Authority.

"MAKIN' a wadio set, Mummie," calmly replied Signor Marconi's latest and youngest disciple.

"BUT, my dear! *Do you know what the time is?*"

"MUMMIE!" No brush could paint, no pen could write all the emotion that rang through that still small voice as it pronounced the word—"LISTEN!!"

"MUMMIE" bent down and placed her pink ear to the old telephone receiver that her son held out.

IN a tiny, tinkly voice, the words smote her senses:—

"STATION 2ZZ here! We are broadcasting from —. The next item will be a piano solo by Mr. Vladimir Kotofsky entitled—"

"MY darling! Did you really make this all by yourself? I will get Daddie to buy you a better one so that we can all listen."

AND thus was Youth served.

(THERE is a Moral—quite a nice one—in this little story—see if you can find it.)

How Radio Relay Linked Six Stations

Great Feat Successfully Performed



ON Friday evening, March 7, 1924, the latest and greatest achievement of modern radio science was successfully demonstrated by an experiment of heretofore unheard-of proportions, when five powerful broadcasting stations in the United States and one in England, linked only by the ethereal medium of radio, simultaneously broadcast the speeches and music at the Annual Alumni Dinner of Massachusetts Institute of

Station WJZ of the Radio Corporation of America in New York City had its microphones installed upon the speakers' table and beside the musicians' rostrum in the main ballroom of the Waldorf-Astoria, and carried the programme from there to its control room at Broadcast Central by direct wire. Station WJZ broadcast the programme on its usual wave-length of 455 metres, while a tap-off wire from the amplifier panel in the control room carried the speeches and

of 326 metres for listener-in reception, the other sending on a 98-metre wave-length. This 98-metre wave served as carrier in similar fashion as did the 100-metre radio link between WGY and KDKA, but linked KDKA with stations KFKX in Hastings, Nebraska, and 2AC in Manchester, England. Station KFKX also served as a radio relay station, sending the speeches on a 104 metre wave to station KGO in Oakland, California, which latter station re-broadcast the received signals for local reception on the west coast.

The speed with which the radio waves travel is so terrific that 2AC was broadcasting the same sounds as KGO at practically the same instant, there being an inappreciable time loss in the jump from the Waldorf to Manchester or to Oakland.

Because of some difficulty in perfecting relay transmission at one link of the chain, no advance notification of the experiment was given the listener-in, although telephonic, telegraphic and radiogram communication was arranged between the Waldorf-Astoria and the various stations which were to re-broadcast the programme in order that early reports as to the success of the transmission could be secured. Consequently listeners-in from England to California were amazed to hear the announcement that "This programme is being broadcast by station WJZ, New York City, WGY in Schenectady, KDKA in Pittsburgh, KFKX, Hastings, Nebraska, and KGO, Oakland, California." Almost immediately upon the conclusion of Mr. Ralph Howes' opening address telegrams of congratulation commenced pouring in to the Waldorf-Astoria Hotel and continued to arrive from increasing distances until the conclusion of the programme at 12.15 Eastern Standard time. At 11.22 p.m. East. Standard time, the first report of reception by station 2AC in England was telephoned from the radiogram office. At 12.15 a.m. East. Standard time, a telegram from Mr. Sadenwater, engineer-in-charge of station KGO in Cali-



Miss Dorothy Brunton, the well-known musical comedy favourite, is an ardent radio "fan." Here she is seen listening-in in her dressing room at the theatre while waiting for the call-boy's urgent summons.

Technology given by the Technology Club of New York in the main ballroom of the Waldorf-Astoria Hotel in New York City. The test was effected through the close co-operation of the Radio Corporation of America, the Westinghouse Company and the General Electric Company.

The novel technical operations necessary for the success of the event embodied the use of the new short metre wave relay transmitter and receiver, and the proof of their efficiency opens new and boundless vistas to the radio public. In detail, the simultaneous broadcasting was accomplished in the following manner:—

music to station WGY of the General Electric Company in Schenectady. From that wire the programme was sent out from WGY by two different transmitters, one on the customary wave-length of 360 metres and by the other, a specially designed short wave transmitter, on a wave length of 100 metres. This 100 metre signal, inaudible to the ordinary listener-in, acted as a carrier wave, being received on a special receiving set at station KDKA of the Westinghouse Company in Pittsburg. From that receiving set the programme was again transmitted to two separate transmitters, one broadcasting on KDKA's usual wave

fornia, stated that the signals had been received and re-broadcast. These latter messages definitely placed the stamp of success upon the experiment, for two stations over seven thousand miles apart had inconvertibly received and been able to re-broadcast the same programme without the use of any material connection.

A few of the more detailed telegrams and letters read as follows:—

"Rochester, N.Y.

"Congratulations. Receiving you from New York, Shenectady, Pittsburgh, Hastings; all on loud speakers

wonders that engineers are providing. In my opinion, to-night's demonstration is another step forward towards a universal language international understanding and world peace."

The radiogram communications from station 2AC in Manchester, England, are given below:—

"Waldorf-Astoria Hotel,

"New York City.

"KDKA relay of M.I.T. dinner received here two valves.

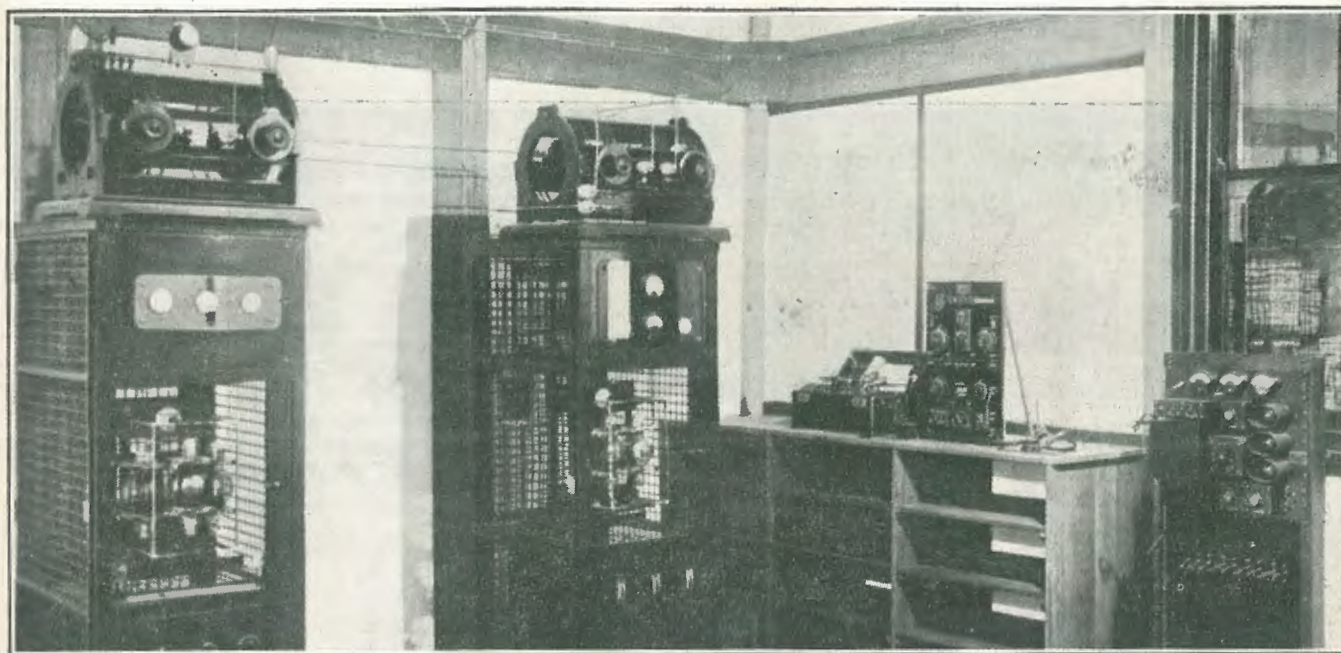
"(Signed) Fleming,

"Metro-Vickers, Co.,

"Manchester, Eng."

with his ten-tube set in the next room he brought in WGY, KDKA, KFKX and KGO in succession. "Each station," he said, "was absolutely synchronized in every note and every word with WJZ—there was no appreciable time difference."

Yet the full value of the experiment lies in the fact that the listener-in on a small set in Southern California or Northern Washington, who ordinarily receives little else but KGO—the families in the Southwest to whom KFKX is the clearest station—those in the Mississippi Valley whose sets



Perth (W.A.) now has its broadcast station. This is a view of a section of the apparatus installed. A photograph showing the studio itself and a description of the opening appears on page 188.

with three tubes each station separate."

"Kenilworth, Ill.

"Hello, have heard you through all stations except Oakland."

"Cleveland, Ohio.

"Receiving programme clearly from either of five stations at five dial settings. Congratulations."

"Brooklyn, N.Y.

"Voices coming through clearly from Hastings as well as New York, Pittsburgh and Shenectady, although atmospheric conditions do not seem as favourable as last evening. This is just a report from an ordinary broadcast listener quite overwhelmed at but exceedingly grateful for the

"Waldorf-Astoria,

"New York City.

"Have just received report your speeches received through KDKA, London.

"(Signed) Fleming,

"Metro-Vickers, Co.,

"Manchester, Eng."

The letters which poured in from the listeners were even more interesting giving in detail as they did the success of individual receivers all over the country. One letter in particular indicates the success of the relay, for the writer, a proud possessor of one eight-tube and one ten-tube super-heterodyne set, tuned his eight-tube set to WJZ and left it there while

will not receive east of KDKA, and those in Northern Maine and Canada to whom WGY is the "Distant Station"—could listen in to the programme at the Waldorf-Astoria Hotel with as much ease and clearness as did the New Yorkers and New Englanders to whom WJZ is a next door neighbour. To link up six broadcast stations, to blanket the country so that anybody, anywhere, with an ordinary receiving set could hear the one programme, all without the use of wire or other material connections, constitutes the most magnificent example of radio's advance and of its practicability that has yet been shown.

Highlights of Radio Broadcasting

Echoes of the Present

By Dr. ALFRED N. GOLDSMITH, B.S., Ph.D., Fellow I.R.E.,
Chief Broadcast Engineer, Radio Corporation of America

(Special to "Radio.")



WHEN echo answers a call of welcome in a mountain ravine, the effect is delightful. But when echo blurs the sharpness and clarity of a broadcast concert, a remedy must be found. Probably few persons realize the extent to which

as an armory), and whistle sharply, the sound is prolonged into a continuously fading note which may last five or ten seconds before it lapses into silence. If a succession of notes forming a melody are whistled, the echo blurs the melody badly; and if an orchestra plays in such a hall, the

original sound intensity. The fraction one-millionth has been chosen because it is found that the normal ear no longer hears the echo of a loud sound when the echo has diminished to one-millionth of the loudness of the sound which produced it.

The reverberation time of a concert hall is therefore of very great importance. If the reverberation time is too long, blurring echoes will ruin the orchestral renditions, particularly in the louder passages. Speech will not be understood, and the entire reproduction will be "smudged." If, on the other hand, the reverberation time is too short, while the music will be clearly defined and sharp, it will have a cold, unsympathetic quality and the hall will sound "dead" and without "resonance" or "response." Musicians find an excessively short reverberation time nearly as unpleasant as an inordinately long reverberation time. Hundreds of trials have now shown



An acoustically-corrected studio—WRC, Washington, D.C.

echo or reverberation damages the faithfulness of reproduction of broadcast music, and the scope of the measures which are necessary to overcome the consequent defects.

If one stands in a large empty hall (particularly one with covered wooden, plaster, or brick walls such

effect will be confused and disappointing. Acoustic experts, who have specialized in scientific measurements in the field of sound have coined a term: "reverberation time" which measures the time the echo lasts, or rather the time it takes the echo to drop to a loudness only one-millionth of the

musicians prefer halls having a reverberation time of one and two-tenths seconds. There is a rather astonishing unanimity of preference for this value among skilled musicians, and it is one of the few matters involving artistic judgment

where practically no difference of opinion exists.

In broadcasting concerts, the problem of avoiding excessive echo is even worse. There are two echoes to be considered. If the artist performs in the studio, the reverberation time of the studio must be taken into account, since it is the effect of his performance in the studio which is picked up by the transmitter in the studio. The music is then reproduced by a loud speaker, for example, in a residence. But the residential room also has echoes and its own reverberation time, and the blurring effect of the room in which the reproduction takes place is added to the studio reverberation. Clearly, then, if the studio has a reverberation time of two seconds and the living room in the home a reverberation time of one second, the echo effect on the music produced will correspond to that in a hall having a reverberation time of three seconds. This will be quite excessive, and the listener will be disappointed in the effects produced even though every other stage of the broadcast transmission and reception has been correctly carried out.

It therefore becomes necessary to reduce the studio echo to a low value so that the combined studio and home echoes will not be excessive. The method of acoustic correction of a studio is illustrated in the first photograph accompanying this article which is the studio of station WRC, of the Radio Corporation of America at Washington, D.C. The walls and ceiling of the studio are first covered with a thick layer of a special variety of felt, chosen because of the very slight reflection of sound

from it and the consequent deadening effect on echoes. Over the felt is left an air space, and then heavy, non-inflammable muslin is fastened in place with suitable moulding to give a panelled effect. The whole is thinly painted in appropriate colors. All doors and windows are similarly protected by heavy velvet or plush hangings, and the floor is covered by a thick, soft carpet. Heavily upholstered furniture is used. Under such conditions, the echo in the studio is greatly reduced and the reverberation time is kept quite low. The artists frequently object to studio effect as "dead," not realising that the reverberation in the home reproduction will add the necessary softness of

curtains properly placed in the studio, which curtains can be drawn back thus exposing hard reflecting surfaces and increasing the reverberation time. While the general requirements for studio design are now well understood, the whole subject is still under further investigation and improvements may be expected from time to time.

The nature of the installation in the home is far from indifferent so far as regards the effect produced. As a general rule, echo is worst in large rooms, in rooms having hard surfaced walls, in rooms having wooden furniture with little upholstery, and with few people in the room. Conversely, echo can be reduced in the



An example of an effective radio installation at broadcasting station WJY, New York City. The receiving set is a Radiola Super-VIII.

quality to their performance and that, if the effect satisfied them in the studio, it would certainly not satisfy them in the home.

Some experimental work has been done in the exact regulation of the studio reverberation time by roller

home by curtains or hangings, heavily upholstered furniture, by using a small room, and by having an audience of several people sitting not far from the loud speaker. It is because of these considerations that perfectly

(Continued on page 192.)

Radio Talks for the Layman

Inductance: What It Really Means

(By J. W. Robinson.)

THE third of a series of articles exclusive to "Radio." In them Mr. Robinson is furnishing a simple explanation of the various phenomena associated with wireless.



THE principle of inductance is perhaps the most important of all wireless phenomena. It is met with from the very first day a commencement is made with the amateur's studies and even when he has progressed to the "multi-valve" stage the effects of inductance are still considered a very important factor by him. Without an understanding of just what is meant by inductance, the principle of the tuning of either a transmitter or a receiver cannot possibly be grasped, nor can a thorough understanding of the manner in which the various types of tuning coils operate be obtained unless this is first of all understood.

Inductance may be best described as electrical inertia, and if a simple mechanical analogy is provided before we delve into any electro-magnetic laws, perhaps the student will be better able to understand just what is meant.

Most of us know that any body which is at rest displays a tendency to resist being set into a state of motion, and similarly, and body which is in motion inclines to resist being stopped. This tendency is termed the "inertia" of that body.

For instance, if a railway train is

moving at a considerable speed it can be brought to rest with safety only by the proper applying of the brakes which will slow it down until it finally stops. If some obstacle were placed across the line and an attempt were made to stop it instantaneously, serious trouble would result. Simi-

moving with the train or tram and tends to oppose any action taken with a view to stopping that movement suddenly. Consequently, a sort of spring must be made and two or three running steps taken when the man has reached the ground, these steps really amounting to a gradual slowing down.



Nurses, doctors and out-patients at the Royal Northern Hospital, London, listening-in to the King's speech which was broadcasted upon the occasion of the opening of the Wembley Exhibition.

larly, the same train when at rest can be started only by a gradual motion. It would not be possible to suddenly move it from a stationary position to a speed of 60 miles an hour, or even considerably less than this.

An even better illustration of mechanical inertia may be given if the case of a man jumping from a train or tram when the latter is in motion be quoted. The man who wishes to so alight must not merely jump to the ground and stand still. His body is

the starting of the flow. This tendency to oppose DOES NOT EXIST THE WHOLE TIME THE CURRENT IS FLOWING, but it merely makes itself felt when any fluctuation in the current flow occurs.

The reason may at first sight appear very hard to find, but if the student will bear in mind some of the facts which were stated in a previous article when induction was dealt with, the cause of this opposition to a change in current flow becomes very apparent.

Let us now forget for a few moments these mechanical illustrations of inertia and discuss a few known facts in connection with electricity.

When any current flows along a conductor that current always tends to resist being stopped, and, if no current flow in a conductor when a circuit is first made with the object of causing a current to flow, there is a tendency, just as the current springs into being, to oppose

When we discussed induction it was pointed out that if a current moves along a wire, lines of magnetic force are created around that wire and that if these lines of force are varied (by a variation in current flow) they cut across any other conductor held near the first one and induce another current in it.

Now, if the student will think for a moment, he will realise that when such a current flows and such a magnetic field is created, some of the lines of force from it must cut across the original conductor itself. This being the case, they must induce in that conductor a slight current. Of course, this current will be induced in the conductor just when a variation in the original current flow takes place, and in the case of a direct current, this variation will be just at the instant the current is switched on or switched off.

In the case of a straight wire which carries a current, very little current will be self induced because very few of the lines of force will recross the conductor but it does not require much imagination to realise that if the wire is wound in the form of a loop or a spiral, quite a number of lines of force created by the original current will cross the conductor.

The currents which are thus created are termed "self-induced" currents, and it is a known fact that all self-induced currents tend to act in opposition to the original current which produces them.

This sounds complicated, but it is really very simple. It merely means

that if we force a current along a coil of wire the small self-induced currents in that coil act against the first current and tend to choke it back.

Perhaps the relation of the mechanical analogy to the actual phenomenon of inductance may now be seen. Inductance is simply electrical inertia. Mechanically, we

A little consideration will show that this choking effect of inductance may be put to some remarkable uses in wireless working. For instance, where alternating or oscillating currents are employed, and where the change in flow is occurring many times per second the inclusion of conductors in the circuit wound in such a manner as to produce a very great

choking effect, or in other words, wound with a high value of inductance, will have a serious stifling effect on the circuit and may even be used to slow down or choke back the frequency or time period of that circuit. In other words, if a current is oscillating or alternating a certain number of times per second and a coil is included which will have a choking effect on the current, then that current will be slowed down in movement and will not swing or oscillate so many times per second.

This is actually what is done to tune both transmitters and receivers. Certain values of inductances are merely included in the circuits and the time periods of certain currents used are slowed down or else speeded up.

In a future article the exact number in which tuning is effected will be explained.

A REGULAR radio broadcasting service has been commenced by the Shanghai *Shunpao*, which is the first Chinese newspaper to utilise wireless. It sends out four daily programmes comprising lectures and musical items.



This is Miss Marie Conkwright, a New York beauty, and her pet boa-constrictor. The lady says she spent many fruitless hours trying to train the reptile, until when about to give it up and send the snake back to South America, she happened to be listening to a Radio concert and noted the effect of the music on the reptile, which peacefully and immediately responded to the ether-borne music.

know that a train, when running tends to resist being stopped, or that when stopped, it tends to resist being started, and now we have seen that a current inclines to resist being started and when once flowing steadily tends to resist being stopped.

The forces which tend to resist any change in current flow therefore constitute the principle of inductance.

New Zealand to Buenos Aires

On 125 Metres and 2.5 Amps.

By IVAN O'MEARA,
2AC, New Zealand.

(Special to Radio.)



IN the early hours of the evening it is my usual practice to listen for American amateurs and on Tuesday, May 22, at 7.15 p.m., while doing so, I heard a station on about 115 metres, calling CQ UR CB8. I was not sure of his nationality, but as his signals were fairly strong I took a long shot and answered him on 125 metres, radiation 2.5 amps.

At 7.30 p.m. CB8 acknowledged my call with "GM (Good morning!) your sigs. QSA." He called again and continued, "From Buenos Aires—very pleased to have received your answer this being a good record—congratulations. My name Charles Braggio Calle Alsina Df 412 Buenos Aires."

I then gave him QSL for his number one and also offered him my congratulations. As he might be in touch with U.S.A. I gave him a short message to QSR to 6CGW and my name and address.

He replied: "R your nr one OK but missed your name and address. I want to send you cable pse rept name agen address" (Lost rest of his message through QRM.)

I then asked him to repeat words after "agen." "R," CB8 replied: "Your sigs vary now—pse rept agen yr name address." Repeated name and address as requested and received his reply. ". . . wrd before Gisboine ga want address now pse." Reception was difficult owing to QRN and his signals were weaker. Gave him repeat for several minutes, but he replied, "QRN bad here—will call you to-morrow seven GMT—am sorry but impossible to receive QRN."

Had another try with name and address but missed again, he replying, "QRN but will try last time receive your address—rept. address."

I then repeated both name and address and almost uttered a prayer to help it along. You can imagine my joy when he replied, "R OK R! Tks Mr. Ivan O'Meara, Gisboine—



Mr. Ivan O'Meara.

very glad—you have one friend more—time 5.45 a.m.—will call to-morrow—I call at seven GMT gm."

I asked him if he meant 7 p.m. my time, but he replied, "7 GMT gm (good morning)."

As it was 5.45 a.m. with him I asked him if it was daylight there and QRK? Received his reply, "R R It is dawning (hr?). Your sigs QSA—well gm till tmw." His signals were loudest this time and QRN was fairly quiet. Answered and bid him gm.

This closed our communication which lasted for just two hours and ten minutes. On Friday afternoon I received a cable from Mr. Braggio as

follows:—"Hearty congratulations your radio record." I replied by cable, offering him my congratulations on his record.

We experienced a bad storm for the next few days, during which, although I heard CB8 calling, I was unable to connect with him.

However, on Tuesday, May 27, I heard him call ARRL (American Radio Relay League, U.S.A.) and answered him at 7.58 p.m. He acknowledged me with "NG—weather very bad QRN difficult receive."

I then tried to tell him I would see him at 6 GMT, but he replied, "N G—weather bad QRN difficult receive QRS (transmit slower)." Then repeated my previous message. His reply was: "N G—QRN difficult receive—please call long—will try better receiver." Called him again and transmitted slow and steady—CB8 replied, "Your sigs vary. I receive you on tubes QRN. I use two hundred watts QRN impossible receive. Will call to-morrow 8 GMT. Congratulations again. Till to-morrow 8 GMT gn." I then acknowledged and closed down. I was on schedule the next evening but my radio shack was leaking and moisture had entered the HT condensers so that I could not work.

I heard him calling again on May 30 at 8.10 p.m. but was unable to raise him. The storm continued for some days during which the weather was very thick, and even the local (N.Z.) amateurs' sigs. were fading badly, so gave CB8 up till the weather cleared.

I have written Mr. Braggio and arranged a schedule with him for once a week. As he has to get up very early in the morning (about 3 a.m.) he won't be inclined to do it too often!

Although I have a two-step R.F. Amplifier and three steps of Audio,

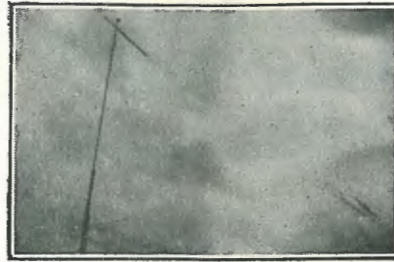
I only used two valves on him owing to QRN. The coils used were made of 14 gauge copper wire and are known as "Low Loss Coils." The primary has only four turns and is untuned, while the Secondary has 20 turns with a diameter of 4 1/4 inches. Reaction coil has 13 turns—3 1/2 inches diameter of 4/16 wire.

Transmitter is a series Hartley using a separate tuned Grid. Valve is a Cunningham 50 watter, taking 1,000 volts on the plate (input used was 900 volts at 165 MA). Generator is an Esco 1,000 volt, 300 watt machine driven by 1/2 H.P. Motor at 3,400 r.p.m.

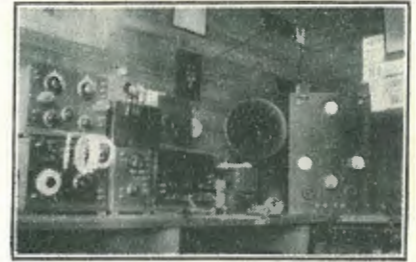
It might interest readers of *Radio* to know that several Australian stations have been heard here recently

on short waves, and their signals are about five times stronger than when on their usual waves! Also, on Sat-

several orchestral selections were heard and the operator announced a special programme (names of singers,



Portion of Mr. O'Meara's Aerial.



The transmitting and receiving Apparatus.

urday, May 24, between 5 and 5.30 p.m. I heard a programme from WGY broadcasted on 110 metres—

etc.) to be broadcasted at 7.45 p.m. standard time on the following Sunday.

Radio Does Big Business

THE tremendous turn-over of business of the United States radio industry during the last season confirms a statement broadcasted by Mr. C. A. Stephenson, of the Babson Statistical Organisation through the Detroit Free Press Radio Broadcasting station. Briefly, these facts were:—(a) A season's business of 50,000,000 dollars in radio tubes; (b) 250,000,000 dollars in sets and parts; (c) another

45,000,000 dollars in A and B batteries, and (d) 50,000,000 dollars more for loud speakers and accessories—which constitutes a sum total of 395,000,000 dollars. It is interesting to compare this business with several other industries. The sporting goods and camera trades turned over 185,000,000 dollars. The carpet and rug business totalled 215,000,000 dollars. For every dollar spent on

furniture, thirty-nine cents was spent on radio, while for every dollar on shoes the public expended twenty-five cents on radio. The musical trade's sales, including phonograph, pianos and organs, had only twenty-five per cent. greater value than the year's radio business. The entire jewellery industry with clocks and watches thrown in only equalled the radio sales for 1923-4.

EXPERIMENTERS! — COMPARE THESE PRICES.

3in. Dials, 2/6 to 4/-.
American V.T. Sockets, 2/3 to 4/-.
English V. T. Sockets, 2/- and 2/6.
Book Pattern .001 Condensers, 15/-.
Vernier Condensers, 3 p., 12/-.
Vernier Condensers, 5 p., 13/6.
Inherent Balance Condensers, 43/-.
Audio Frequency Transformers, 22/6.
R.C.A. Audio Transformers, 42/6.

Jefferson Star Transformers, 25/-.
Jefferson 41 Transformers, 32/6.
Switches, 3/6, 4/-. 4/6 and 5/-.
Aerial Earth Switches, 3/-.
8-point Inductance Switches, 10/-.
Mounted Crystal Detectors, 2/6.
Columbia 22 1/2 V. High Capacity "B" Battery, 14/-.
SEE SPECIAL DISPLAY IN OUR SHOWCASES.

Moulded 4in. Lead-in Insulator, 4/-.
Moulded 9in. Lead-in. Insulator, 5/6.
Variocouplers, 24/-.
Variometers, 45/-.
W.D. 11 Valves with Adaptors, 35/-.
Weco Valves fit standard English Socket, 37/6.
De Forest Duo Lateral Coils from 25 Turns, from 11/3, mounted.

BURGIN ELECTRIC COY.

WIRELESS ENGINEERS AND SUPPLIERS,

1st FLOOR, CALLAGHAN HOUSE, 391 GEORGE STREET, SYDNEY.

(Opposite Hordern Brothers).

MAKERS OF THE FAMOUS "BURGINPHONE" RECEIVERS.



KEEPING stride with the rapid advancement of Radio in West Australia, Messrs. Boans, Ltd. have secured large and varied stocks of components from overseas. The Radio department of this firm is under the direction of Mr. Caird, a local wireless enthusiast. Messrs. Foy and Gibson, Ltd. have also imported large stocks of radio apparatus. Their department is under the supervision of Mr. Colebourne, also a local amateur.

"THE old lady sat in the train corridor listening to the music while I held the wireless set on my knee.

"And where is the music coming from?" she asked.

"It is coming from Melbourne, madam," I answered.

"She looked at me and said nothing, but with her eyes she said, 'What a liar!'"

This story was told by Mr. Morris, a well-known Melbourne optometrist, when detailing how he had picked up broadcast music on the Adelaide express, using a valve set and no outside aerial, while the train was travelling at 45 miles an hour. Mr. Morris said the music from three broadcasting stations was heard quite distinctly for an hour and a half.

MR. W. A. HOPKINS, of Newtown, Sydney, listening-in on a short wave-length recently heard speech from 5BQ (L. C. Jones, Westbourne Park, S.A.), calling 2AP (New Zealand). Mr. Hopkins wrote to 5BQ and sent a copy of the speech heard. 5BQ later confirmed this. 5BQ uses a 10-watt transmitter, while Mr. Hopkins received using S.T. 76 circuit slightly modified.

2FC

—

BROADCASTING TIMES.

Sydney Mean Time.

P.M.

12.55: Tune in to the Music of the Chimes.

1: "Sydney Morning Herald" News and Cable Service.

1.25: Coastal Farmers' Market Reports.

1.30: Stock Exchange Intelligence.

1.32: Weather Report.

1.35: Midday "Evening News" News and Cable Service.

1.45: Close down.

3: Chimes.

3.5 to 3.45: Musical Programme.

3.47: Afternoon Weather News.

3.50: "Evening News" News and Cable Service.

4: Close down.

6.30: Chimes.

6.33: Children's Time — Lamplighter Stories.

7: Dalgety's Market Reports.

7.5: Fruit and Vegetable Market Reports.

7.7: Closing Stock Exchange Intelligence.

7.10: Late "Evening News" News and Cable Service.

7.15: Close down.

7.55: Tune in to the Music of the Chimes.

8.00 } Entertainment.

to } See List hereunder.

10.00 }

EVENING ENTERTAINMENT.

Mondays: Popular Concert.

Tuesday: Theatrical items.

Wednesday: Dance Programme by Farmer's Novelty Jazz Orchestra.

Thursday: Music Lovers' Night.

Friday: Popular Concert and Amateur Theatricals.

Saturday: Choral and Popular numbers.

it could be used by vessels at sea to pick up the warnings of foghorns or other sounds beyond the scope of the human ear. Also it had shown to be of great use in studying the sound vibrations of the organs of the body, such as the brain and heart, and even to picking up the sounds made by tiny insects. "The ultra-audible microphone will do for the ear what the microscope does for the eye," Mr. Kintner concluded.

* * *

GRADUALLY the isles of the Pacific are being linked up by wireless and the chain will soon be complete. Work is proceeding apace throughout the Cook group and the Chathams, and a complete wireless plant is being shipped for installation in the Island of Niue. The latter has been long delayed, seeing that a wireless site was selected nearly four years ago. The weather reports received in Auckland daily from the various centres in the Pacific are a great boom to shipping.

* * *

THE broadcasting of Church services is likely to become general throughout the Dominion. It has been successfully carried out in Christchurch for some time and has now been introduced into the Auckland Baptist Tabernacle and Beresford Street Congregational Church in the Northern City. The broadcasting from the Tabernacle is performed at a private station 1YB, in Karangahape Road. Immediately the first sermon was sent out appreciation messages were received from many parts of the district, and the next morning a telegram was received from the Thames stating that the sermon was received clearly and distinctly.

THE Westinghouse Electric and Manufacturing Company of New York announce that the perfection of an electric ultra-audible microphone has been achieved by Dr. Phillips Thomas. This apparatus will allow scientists to record sound vibrations which are at present too faint or rapid for the human ear to catch. While the invention was only in its experimental stage, Mr. S. M. Kintner, Director of Research for the Westinghouse Company, stated that the microphone was successfully used to transmit by wireless the human voice's highest notes and those of musical instruments. Now, however,

Bananaland Amateur Hears KGO

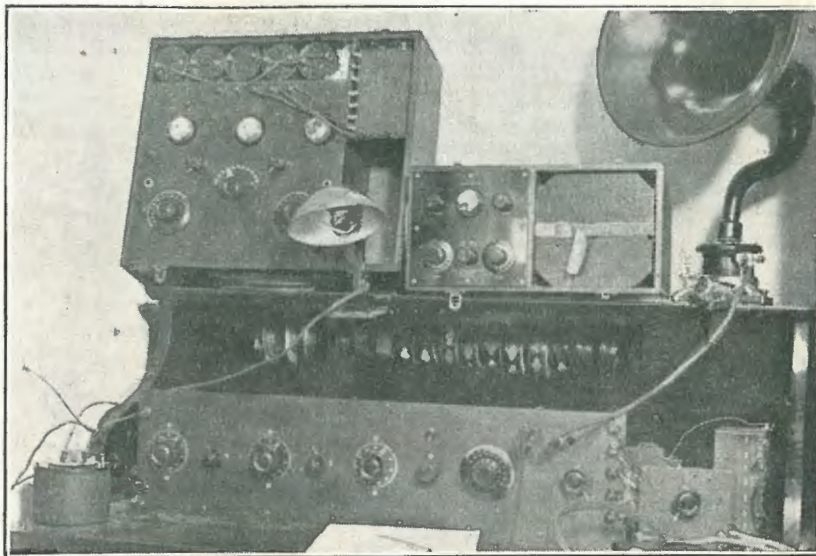
"KGO, Oakland, California, speaking. There will be an intermission of ten minutes." Mr. A. McLeod, of Red Hill, Brisbane, was perhaps the most pleased man in Queensland when, on Sunday, June 1, he picked that sentence up from out the ether on his five-valve Neutrodyne receiving set, for it represented the attainment of at least one of his ambitions. A month or two previously Mr. McLeod had set his mind on receiving the Californian station, and with this object in view wrote to them for particulars as to their wave-length and programmes. On the Friday previous to the reception he had received

a reply to his inquiry, and success was his almost immediately.

"About 5.45 p.m. on Sunday," said Mr. McLeod, "I was listening in when I picked up what I took to be a howling valve. Its persistency was so marked, however, that I tuned in carefully. Presently I could distinguish music—real jazz music!—and

Sunday (June 8), I picked him up again, but static interference militated against a successful reception."

Mr. McLeod has now embarked on an even more ambitious programme, as he contemplates the erection of a Super Heterodyne circuit. He has secured full details as to the method of construction, and is optimistic



Mr. McLeod's three sets, which consist of (lower) five-valve Neutrodyne circuit, (upper left) three-valve portable, and (upper right) one-valve portable.

then, punctually at 6 o'clock I heard: 'KGO, Oakland, California, speaking. There will now be an intermission of ten minutes.' About quarter past six the music came on again, and I held him until 7 o'clock, when I heard: 'KGO, etc., we are now signing off. Good morning.' On last

with regard to its ultimate success.

In the accompanying photograph is seen Mr. McLeod's sets, three in all, comprising the five-valve Neutrodyne set on which he received KGO; and a three-valve and a one-valve portable set with which he has secured excellent results.

*The Greatest Event ever
launched by David Jones'*

Now for
DAVID JONES'

SALE

SENSATIONAL
REDUCTIONS

in

RADIO DEPARTMENT.

Less 2/- in the £ for Cash
(except on a few proprietary lines).

DAVID JONES',
OPP. G.P.O., SYDNEY.

VALVE TRANSMITTERS FOR N.Z. STATIONS.

AT a meeting of the Wellington Radio Service League, the assistant telegraph engineer, Mr. Gibbs, announced that valve transmitting attachments will be installed shortly at the New Zealand commercial radio stations. Interrupted continuous waves will be used in preference to straight CW to facilitate the calling up of ships, and for the sake of those vessels equipped with crystal receivers or non-regenerating valve sets.

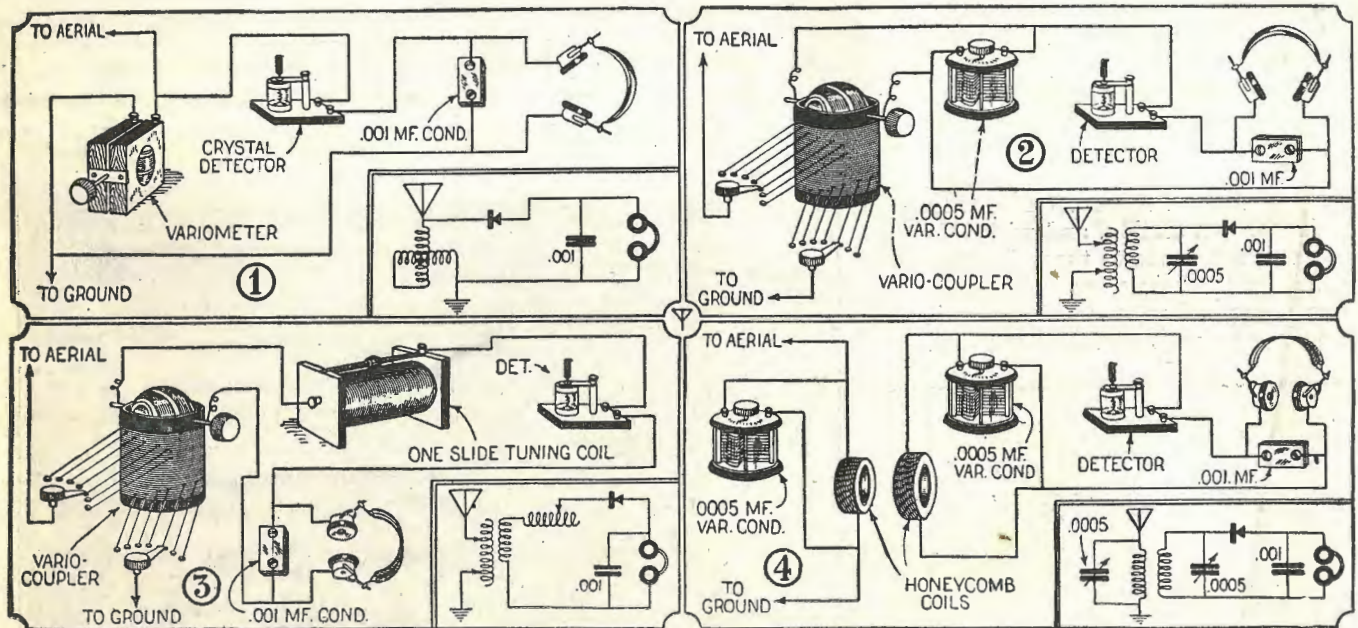
"B" BATTERY POLARITY.

The polarity of the B battery connection is most important. Always make sure that the positive terminal connects with the plate of the vacuum tube. A variometer, or telephone tickler coil may be connected in between, if the circuit needs it, but the polarity should remain the same, that is, the positive terminals should be on the plate side and not on the filament.

Efficient Crystal Receiving Sets

By A. P. PECK, A.M.I.R.E.

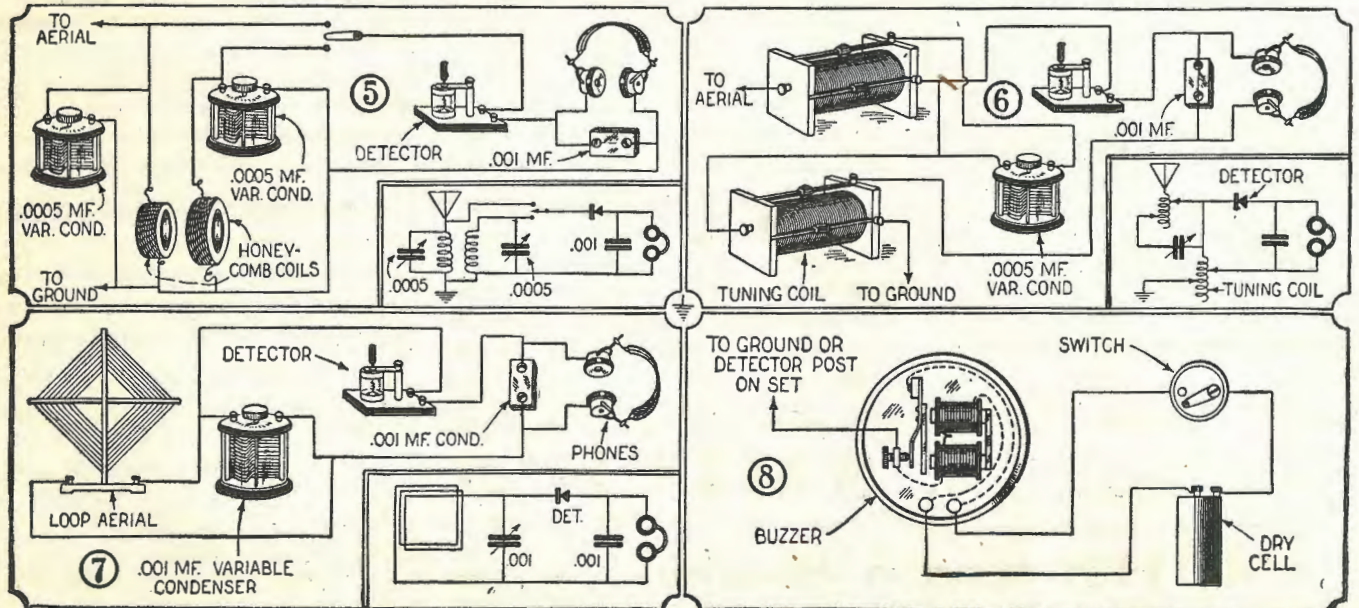
(Reprinted from "Science and Invention.")



VERY often we hear of crystal detectors receiving radio broadcast programmes over distances of 1,000 miles or more. This is usually accomplished under extraordinary conditions and cannot be depended upon. However, the crystal detector, when operated properly and used with a selective tuner, will very often give astonishing results. The writer has personally received from stations 300 miles away using a crystal detector and a circuit similar to that shown in Figure 2. This work was done very consistently during the autumn. The crystal used was a piece of very sensitive galena selected from a pound of the commercial variety. The same work was also done with one of the many synthetic or manufactured crystals now offered for sale.

The diagrams given herewith have been carefully selected to give the best results with a minimum of apparatus. The circuit in Figure 1 is the simplest of them all and with a standard variometer will give excellent results for local reception. It is not, however, very selective. The circuits in Figures 2 and 3 are very similar, the secondary tuning being done in Figure 2 with a variable condenser and with a one-slide tuner in Figure 3. Many amateurs are firm exponents of the use of the honeycomb coils and, therefore, we show the circuit diagram in Figure 4 employing these highly efficient coils. Note that small variable condensers are used, being shunted across the two coils. This gives sharp tuning. The sizes of the coils used must be determined by experiment. A variation of the circuit given in Figure 4 is shown in Figure 5.

The two point switch is added so that for local reception and to obtain slightly louder signals, a single tuned circuit may be used. For selectivity and distance work the switch blade should be placed on the lower point. In radio operator's parlance this is known as a "stand-by and tune" circuit. A combination wave-trap and tuning circuit making use of two standard two-slide tuners is illustrated in Figure 6. For reception from stations located not more than two or three miles away, a loop aerial may be used, being connected as illustrated in Figure 7. The loop should be as large as possible so as to pick up the greatest amount of energy. A buzzer test is a great help in crystal reception both for adjusting and bringing signals that seem to fade. The circuit of a buzzer test is shown in Figure 8.



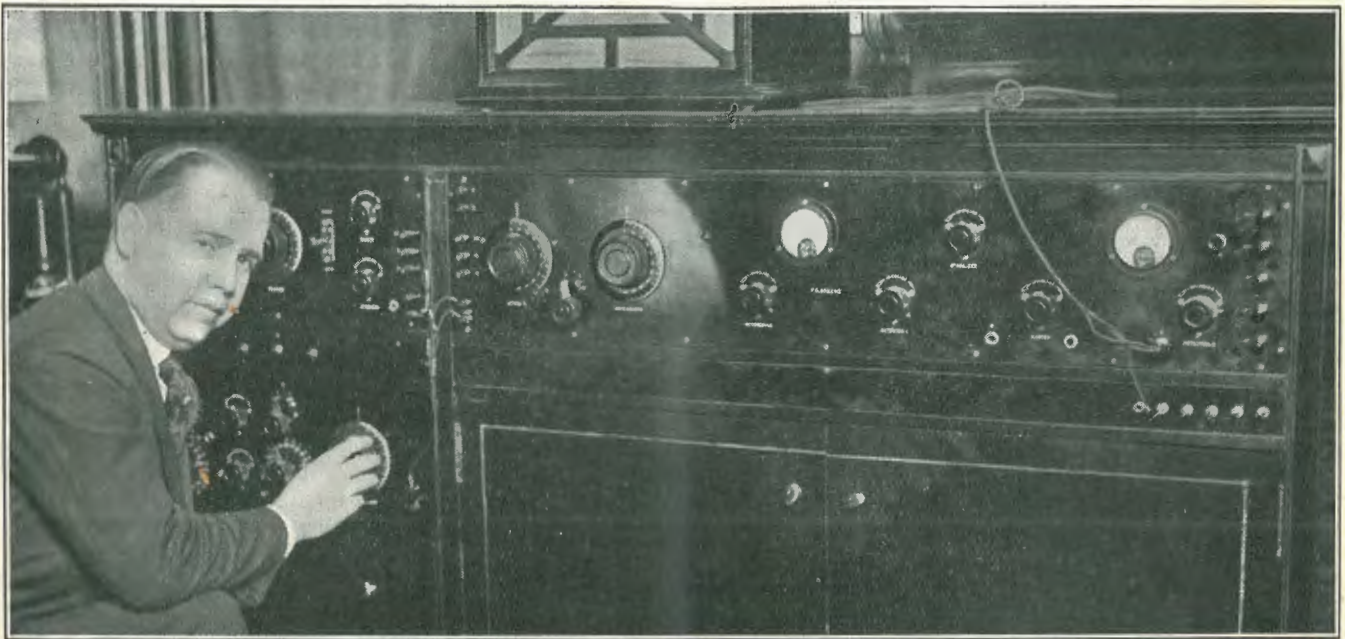
Sydney Experimenter Hears KGO on Full Power

THIS evening's entertainment from KGO, writes Mr. G. C. Finch, of Bankstown, Sydney, on June 29, was the occasion of their first transmission on high power, and instead of the usual jazz dance programme, it was a very fine concert. Up to 6 o'clock it was the familiar jazz numbers on their usual strength, after which a short speech was made, and then a

From 6.40 to 6.50 a speech was made, in which was mentioned that a world's record had been made by KGO and that they were now on their limit of power, etc.

Old-time and well-known songs were sung, a baritone singing "Mona" with such strength and clearness that every word was distinct.

It was noticeable that 4YA, Dunedin, N.Z., made some mention about to-night's transmission from KGO, this station also being wonderfully clear and strong. A feature of their broadcasting being that, at about 7.33 p.m. one can hear the Dunedin Town Hall clock chime the quarters and then boom out 9 o'clock on a big deep-toned bell, which on two valves



This super-heterodyne radio receiving set works on either eight, nine, eleven or fourteen tubes and is arranged as follows:— Eight tubes in super-heterodyne, two tubes in audio-frequency amplifier, one tube amplifying adapter and three tubes of amplification. It requires 276 volts on the "B" battery, two "A" batteries, one 150 amperes and another 100 amperes. The cabinet is 41 inches high, 5 feet 6 inches long and 16 inches deep and has in all 19 dials. No ground or aerial is necessary to its operation. The set was designed by F. R. Greene, of New York City.

band selection, which came in on two valves, detector and audio loud enough to be easily heard all round the room from the 'phones.

Their modulation was perfect, being wonderfully clear.

At 6.35 a lady sang, "When My Ships Come Sailing Home," and a piano, which was the only accompaniment, was remarkable for its beautiful tone.

Unfortunately, static was very bad, and prevented much of the speech being heard, the other items of speech and music, however, could be easily followed as fading was not noticeable at all.

KGO can now be heard with about the same steady strength and as easy to tune as our local broadcasting stations.

sounds just as though one were standing right under the clock in Dunedin.

In thanking you for your last letter, I must also thank you for the kindness you have shown me; the same which is extended to all amateurs great and small and it makes one feel that in *Radio Magazine* experimenters have a real friend.

To Celebrate
the Opening of

SMITH'S

New
Radio Store

2/- will be refunded for every £1 spent. This remarkable offer is for one week only, and applies to purchases from 1/- up.

SMITH'S Radio Stores

3 VICTORIA ARCADE,
Opp. HOTEL AUSTRALIA, SYDNEY.

Hotel Sydney's Enterprise

Guests Listen-in to Wireless Concerts

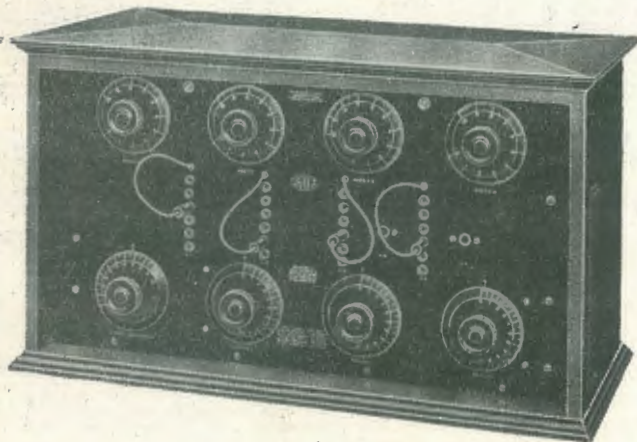
BY the inauguration of a broadcasting reception service the other evening the Hotel Sydney, Sydney, has the distinction of being the first big residential hotel in Australasia in which wireless concerts transmitted from a big broadcasting station may be heard. A programme of musical items was distributed from a total of

room respectively enabled the feat to be performed.

Among those present at the function were Sir Arthur Cocks, Sir David Storey, Sir R. M. Anderson, Sir William Vickers, Mr. F. A. Chaffey, Mr. F. Whysall, Mr. Fitzgerald, M.L.A.; Mr. Davies, M.L.A., and Mr. Keegan, M.L.A.

making adjustments of the biasing battery four rows of Jacks (six in each) with four plugs attached were used. With the set are two Telephone Jacks for operating the instrument on four or five valves. When utilizing the former the fourth row of biasing Jacks is cut out of the circuit. Four lower dials attached to the condensers are for aerial tuning, for the secondary vernier, a vernier on primary of radio frequency transformer and the last a vernier on the secondary of the radio frequency transformer. Connections for the aerial low tension battery and "earth" are made on the left-hand side of the instrument by inserting the corresponding plugs. A pleasing feature of this is that no mistakes can be made as the plugs are not interchangeable.

Connections for the biasing and high tension batteries are made on the opposite side of the set, the former's plug having six sockets and fitting into the top recess while the other has four and connects in the lower. The tension battery is an eight-volt unit, the reason for this being that the "L.S. 1" valves working on eight volts are made to operate on their correct characteristic. The biasing batteries are supplied as separate units, the tapping leads being run to the cabinet and connected as described above. Batteries arranged in blocks, each of which represents sixty volts, supply the high tension.



The Five-valve Radiola Set which was used at the demonstration.

seven different points throughout the building.

A five-valve Radiola, made by Amalgamated Wireless (A/sia.) Ltd at their Radio-electric works and several Amplion loud speakers installed in the dining-hall, grill-room, lounge, roof-garden, reading-room and ball-

The instrument used for the demonstration was a five-valve set using a specially designed circuit with resistance capacity coupled power valves for the last amplification stages. Valve types used were, first and second: "Marconi R," third, "L.S. 3," and fourth and fifth, "L.S. 1." For the best facilities for

New Zealander Logs KGO, KPO, KHJ, and KFI

WRITING from Waitakaruru, Hau-raki Plains, Thames (N.Z.), Mr. Henry Anderson states that he does not like to see N.Z. experimenters left out of the triumph of receiving American broadcasting stations, so he forwards a list of stations logged to date on one valve. KGO and the music broadcasted from the St. Francis Hotel he hears with great volume and he has been hearing this station nightly up till about 8.30 p.m., local time, for the last two months or more.

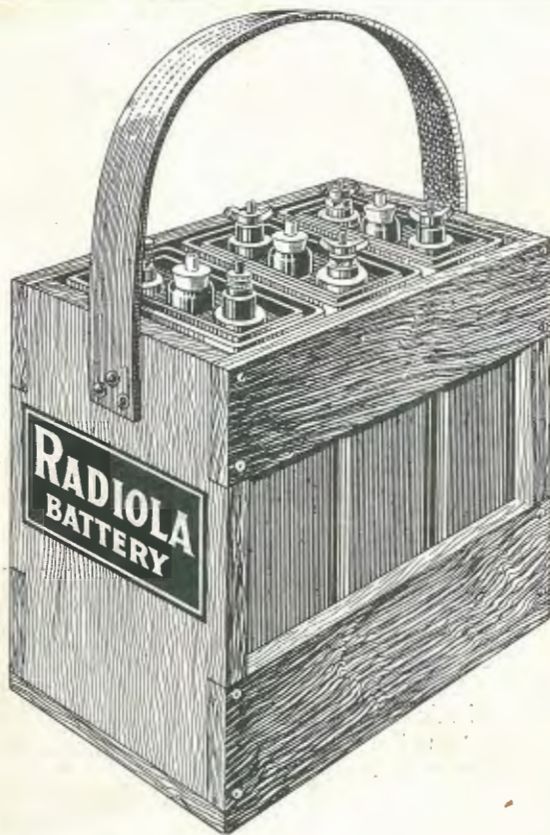
He also receives KPO, Hale Bros. station, San Francisco; KHJ, Time and Mirror Co.'s station, Los Angeles, and KFI, Earle C. Anthony's station in the same city. He expects to get more American stations when the static season passes. Mr. Anderson uses a three-coil receiver with an old-type audiotron as detector. Other experimenters in Auckland who, he states, are receiving American stations are Messrs. Jack Worthington and Allen Collins of Takapuna.

We are very pleased to receive the above letter and hope that it will induce more of our readers throughout N.Z. and Australia to send in more particulars of their reception than they do at present. It should be understood that all particulars are published in Radio and we are always pleased to receive as much information about the work experimenters are doing as they will send in.—Ed. R.

Radiola Headphones for Natural Reproduction

Radiola Headphones, as illustrated below, meet the demand for high-grade Receivers at a moderate price. They are of robust British manufacture, are comfortable in use, and give that perfect reproduction of speech, instrumental and vocal music, and code signals, which is so essential in wireless Headphones. Each set of Headphones is fitted with an adjustable leather-covered band which fits comfortably on the head.

Standard Resistance, 2000 ohms. Price, 37/6.



The Radiola Accumulator

The Radiola Accumulator is an English-made Secondary Battery, made up of separate 2-volt units. Each unit is in an ebonite case, and is of the most solid construction throughout. Severe tests show that this battery is one of the best on the market and can be relied upon to give good service for a long period.

Capacity, 22 a.h. continuous, 44 a.h. ignition.
Supplied as 4 or 6 volt Battery, complete in polished wood crate with leather carrying strap.

Prices: 4-volt, £2/10/-; 6-volt, £3/10/-;
Fully Charged.

Separate 2-volt Units, £1/1/-

OBTAINABLE FROM ALL PROGRESSIVE RADIO DEALERS.

IF ANY DIFFICULTY IN PROCURING, WRITE US DIRECT,
GIVING NAME OF YOUR NEAREST RADIO DEALER.

Amalgamated  Wireless
(Australasia) Ltd.

"Wireless House," 97 Clarence Street, Sydney.
"Collins House," Collins Street, Melbourne.

The 1/4 Kw. Telephone Transmitter for Use On Board Ships, Homesteads, and Cattle Stations



THIS set has been specially designed to permit of operation by persons without technical training.

By reference to the engraving it will be seen that the transmitting part of the set comprises a heavy bakelite panel mounted in front of a highly polished mahogany box. On the face of this panel are mounted the various controlling handles and the valve.

The left-hand instrument indicates the current flowing in the aerial, the centre one, the current flowing to the plate circuit of the valve, whilst the remaining one indicates the voltage across the filament of the valve. The uppermost dial on the left-hand side of the valve is the Variometer for varying the wave-length of the set above and below a fixed amount, which in this case is about 600 metres. The lower dial operates the re-action coil which controls the oscillations of the set, while the instrument between these two handles is the tone-buzzer and is used for communicating telegraphically by interrupted C.W.

The uppermost dial on the right-hand side of the valve controls the voltage across the filament. The lower dial is connected to a small variometer and takes the place of the usual Anode tap which is used for obtaining the best working position of the valve.

The handle below this dial is connected to the "send and receive" switch. In the illustration, this

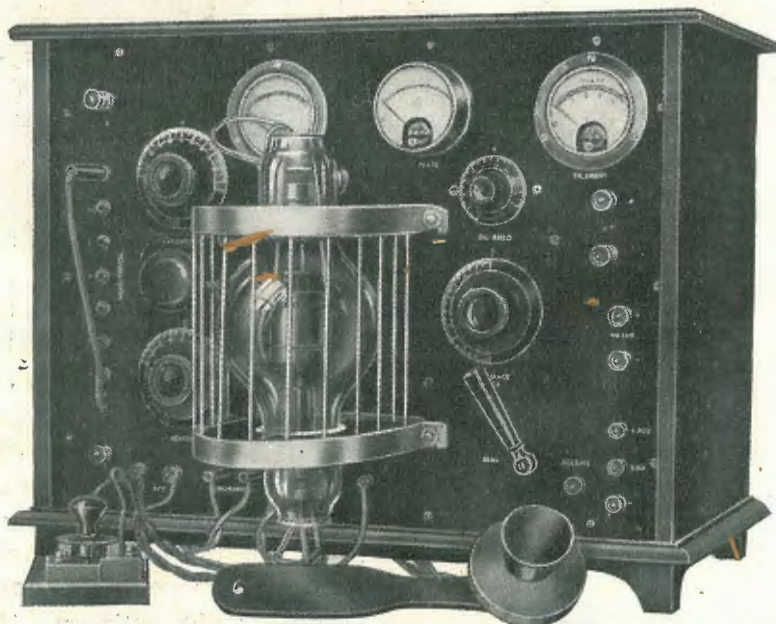
handle is shown in the "send" position.

The valve supplied with the set is of the type technically known as "T250" and requires 12 volts on its filament and up to 2,000 volts on its plate, and is suitably guarded by a metal grille.

The Plug and Cord shown on the extreme left-hand of the panel is associated with the aerial loading coil, and by its means the wave-length of the aerial can be adjusted to set values.

The operating key is shown in the foreground on the left-hand side, whilst the microphone is shown immediately in front of the "Send and Receive" switch.

The power supply is provided by a specially designed double current generator, the low tension side of which supplies energy for the heating of the filament of the valve, and the high tension set, energy at voltages up to 2,000 for supply to the plate circuit on which it is to operate, or, it may be driven either directly or by belt from a suitable engine.



This set is one of the most recent productions of the Radio Electric Works of Amalgamated Wireless (Australasia) Limited and incorporates the very latest ideas in Radio transmission and design.

More "DX!"

FOLLOWING the splendid record put up by Mr. Ivan O'Meara, of Gisborne, in successfully sustaining communication with the Argentine, reference to which appeared in last issue, comes another instance of long-distance communication received by Mr. F. R. Speckman, of Herne Bay, Ponsonby, Auckland, who has made several noteworthy

communications with California through a wireless set installed in the laboratory of Mr. A. J. Parker, analyst and consulting chemist. Some time ago, Mr. Speckman picked up the call of an amateur working with a small instrument, a toy set, at Santa Ana, in California. The sender audaciously announced that his call represented a world-message test for

amateurs with receiving sets! The message was heard distinctly by Mr. Speckman, who sought confirmation by post. On Monday he received a post-card from Mr. R. Heffner, Santa Ana, California, stating that the wireless test, message was letter-perfect and congratulating the receiver on its receipt over a distance of some 7,000 miles.

Western Suburbs Amateur Wireless Association

By *GEORGE R. CHALLENGER, Hon Sec.*

OUR association claims third place in the field of wireless clubs in N.S.W. At the time this body was formed there was only the Wireless Institute and the Waverley Radio Club, in existence. The first meeting of the association took place in the School of Arts, Parramatta, on Tuesday, July 26, 1921. At that time, clubs were so scattered and few, that members came from far and near.

For some months the club held its meeting at Parramatta till Mr. G. Challenger, Sr., built a room at the rear of his residence, and the club has held its meetings rent free there ever since December, 1921. After this, the association started to make its name. By July of 1922, the club's annual function was looked forward to, and so a few of the members got to work and, between them, built a four-valve set for a demonstration.

This, it is claimed by the Association, was the first of its kind held in N.S.W., since it was the first amateur body to build an amateur set and receive music from an experimental station, so that the public could hear it. The function took place at the Masonic Hall, Auburn, on September 25, 1922. The receiving apparatus was in the hands of Messrs. H. A. Brown and Geo. R. Challenger, assisted by Messrs. Burman, St. Hill, and others. Mr. C. Maclurcan, 2CM, was the kind lender of the Magnavox and also the operator of the station from which we received the music.

The next event of interest occurred in April, 1923, when the Association gave a demonstration at a flower show in Auburn. The music on this occasion was received from Burwood Radio Club.

Another successful function was held on October 25, 1923, when a radio concert was given in the Auburn Town Hall. The feature of particular interest was that the man who sang on the stage at 8.30 p.m. was, in a mysterious manner to many, heard at 9 p.m. from the Magnavox. Mr. A. E. Haigh, shortly after singing at Auburn, was motored to Strathfield, and at 9 p.m. sang into the microphone at 2CM. The reproduction on three valves was excellent. The receiving set was in charge of Messrs.

Burman and Challenger and, during the song, Mr. Burman left the set and stood on the footpath in front of the Town Hall, where he was still able to hear the singing. Once again, the Association claims to be the first to put up such a performance.

The most distant members of the club are Messrs. Calver and Chap-

man. Mr. Calver, of Blaxland (N.S.W.), has heard Farmer's broadcasting station at that distance.

Some of the recent activities among the members include the nearing to completion of a transmitter, while Mr. Green has secured some gratifying results on a Cockaday four circuit tuner.



ISN'T he the picture of merriment "listening in" to all the fun that Radio in the home

means? Radio brings enjoyment for boys and girls as well as the rest of

the family. It provides excellent entertainment for young and old as well as educational and news features.

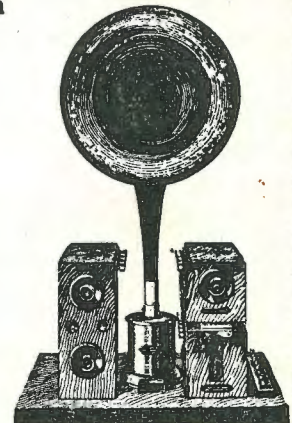
To get the best that Radio can achieve you will choose

Western Electric RADIOPHONES

for they are simple to operate, pure and correct in reproduction, and you can choose according to your purse—always sure of the best. The Western Electric Co's experts are at your service to assist and advise on all Radio matters.

Western Electric Company
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192-194 Caslereagh Street, Sydney.
Phones: City 336 and 356



Perth Broadcasting Station Opens

Westralian Farmers Ltd. Now on the Air



AM greatly privileged this evening in being asked to open the first broadcasting system of wireless telephony and telegraphy in Western Australia. This has been installed by the Westralian Farmers Ltd., and at the present moment has a broadcasting capacity of 600 miles. The company deserves great credit for their enterprise, for not only will they cater for their own 6,000 clients, but

because of our great distances and comparatively few people, for in no other States do the conditions apply to the same extent. It will be of immeasurably greater benefit to the people of the remotest areas of our own State than to city dwellers. From Esperance and Eucla, in the south, to Wyndham, in the far north, owners of small receiving sets will be able to listen-in and enjoy all that can be offered by the great cities in music, singing, or lectures, or any other form

factured in Australia, and being one of the most powerful in our continent, reflects great credit upon those responsible for the undertaking and those who have arranged the installation.

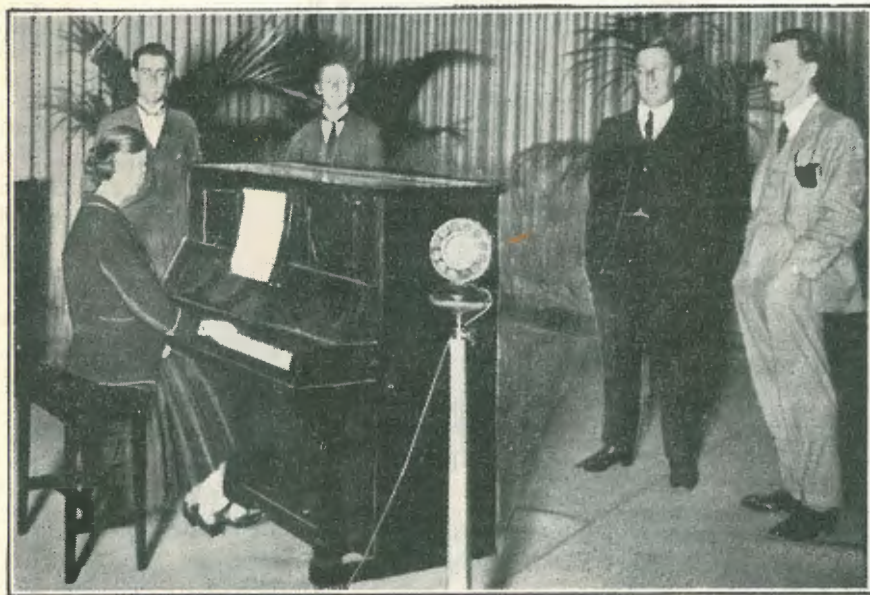
"In conclusion, I would like to mention one feature that strongly appeals to me, and that is this, that while you are compelled to listen to me, you cannot talk back or interject, for if you should do so I would be blissfully unconscious." In such manner and vein did the Premier of W.A. (Mr. P. Collier) recently declare open the new broadcasting station of Westralian Farmers, Ltd. installed at their buildings in Murray Street, Perth.

Mr. Basil Murray, managing director of Westralian Farmers, Ltd., welcomed the Premier, and as Mr. Collier spoke in the studio, a loud-speaker installed in the social hall, delivered his message, which could be heard distinctly by the large gathering.

The station was installed by Amalgamated Wireless (Australasia) Ltd., and consists of a half k.w. transmitter, which was manufactured in the company's works at Sydney. At an early date, a large six k.w. transmitting set will be installed. The wireless masts are erected on top of the Westralian Farmers, Ltd., building, and are 110ft. above the roof. It is interesting to note that each mast weighs some 3½ tons.

Two studios are provided in the building, one being used for concerts and orchestral music, while a smaller one is for the dissemination of news, bedtime stories, and market reports. The studios are entirely sound-proof.

The station is being operated by Mr. S. Trim, of Amalgamated Wireless (Australasia), Ltd., and Mr. W. E. Coxon, technical officer to the Westralian Farmers, Ltd.



A section of the studio of Western Australia's first broadcasting station.

also for the edification and entertainment of numerous other owners of receiving sets throughout the State. An installation of this nature must serve to overcome the isolation which is one of the disabilities of present-day life in the country. It will annihilate distances, and bring the people of the outback in touch with every-day life and enjoyment of the city and of other countries.

"A station of this kind has very special significance to our own State,

of entertainment. This is a wonderful science, and has made enormous progress during the past decade. A cable message in to-night's newspaper informs us of a successful experiment in wireless telephony between Great Britain and Australia. Truly it may be said that this day marks an epoch in the history of Western Australia, and of world-wide communication through the empyrean blue. It is very gratifying to know that this station has been designed and manu-

EDWARD WATERS & SONS

(Established 1859.)
PATENT and TRADE MARK ATTORNEYS,
 Cathcart House,
 11-13 Castlereagh Street, Sydney.
 Tel.: B 5937. (And at Melbourne.)

STERLING PLATING & MFG. CO

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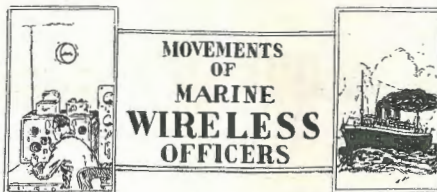
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MAY.

Messrs. C. M. Allison and F. J. Patrick
 signed off s.s. *Boonah* at Sydney, 27th.

Mr. T. O. Sexton signed on s.s. *Ceduna*
 at Newcastle, 30th.

Mr. C. Drew relieved Mr. A. C. Jackson
 on s.s. *Junee* at Sydney, 30th.

Mr. T. M. Alexander relieved Mr. E. S.
 Bailes on s.s. *Loongana* at Melbourne,
 30th.

Mr. A. S. Figtree signed off s.s. *Boonah*
 at Sydney, 27th.

JUNE.

Mr. E. T. Prentice signed off s.s. *Dilkera*
 at Sydney, 3rd.

Mr. G. Pow relieved Mr. H. E. Young on
 s.s. *Esperance Bay* at Sydney, 4th.

Mr. H. M. Watson signed off s.s. *Eugowra*
 at Sydney, 5th.

Mr. H. S. Chown relieved Mr. L. Cole-
 man on s.s. *Waikouaiti* at Sydney, 5th.

READERS, PLEASE NOTE!

At the moment of going to press we
 are advised that the price of Radiola
 Telephone, illustrated on page 185, should
 be 39/6, not 37/6.

Mr. C. R. Waite signed on s.s. *Saros* at
 Port Pirie, 6th.

Mr. A. S. Figtree signed on s.s. *Merriva*
 at Sydney, 12th.

Mr. C. C. Ullman signed off s.s. *Tinten-
 bar* at Sydney, 11th, and signed on s.s.
Eugowra at Sydney, 13th.

Mr. R. P. Ginders signed off s.s. *Watte-
 mata* at Sydney, 13th, and signed on s.s.
Boonah as senior operator at Sydney,
 same date.

Mr. J. J. Edwards signed on s.s. *Boonah*
 as 3rd operator at Sydney, 13th.

Mr. F. Exon relieved Mr. H. J. Bryne on
 s.s. *Burwah* at Sydney, 13th.

Mr. T. A. Jones signed on s.s. *Katoomba*
 at Sydney, 12th.

Mr. A. W. Hodge relieved Mr. A. R.
 Catford on s.s. *Moir* at Sydney, 12th.

Messrs. A. W. Hodge, J. Thompson and
 H. J. Edwards signed off s.s. *Parattah* at
 Sydney, 11th.

Messrs. V. P. Nevins, F. J. Patrick and
 C. M. Allison signed on s.s. *Cartna* as sen-
 ior and 3rd operators respectively at Syd-
 ney, 3rd.

PERSONALITIES

MR. B. O. JONES, Manager of
 Messrs. Farmer and Company
 Ltd.'s broadcasting studio, is at pre-
 sent enjoying a well-earned holiday
 in Central Queensland. During his
 absence Mr. J. W. Robinson will oc-
 cupy the managerial chair.

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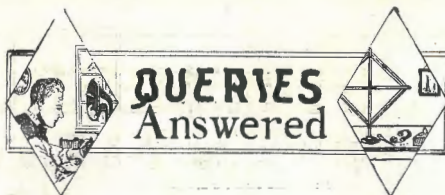
Phone: B 3368



M. J. F. (Barcaldine). Q.: Which is the powerful spark station interfering with 2FC? **A.:** Probably one of the Dutch stations which you would pick up very strongly. **Q.:** Who should I apply to for a license? **A.:** The Radio Inspector, Brisbane, who will give you all particulars.

"Catwhiskers" (Tamworth). Q.: Would a WD12 valve be efficient as an amplifier? **A.:** Yes, these can be used either as detectors or amplifiers. The results you have obtained on your crystal receiver are excellent. We would like to hear further from you.

T. F. (Warracknabeal, Vic.). Q.: To whom do I apply for a license? **A.:** Apply in writing to the Chief Manager, Telegraphs and Wireless, Melbourne. **Q.:** Would one Marconi "R" valve H.F., one Peanut Valve Det., and one Marconi "R" Valve L.F. work satisfactorily together? **A.:** Yes, but why not use three UV199 or WD12 valves? The former operates on three dry cells and the latter on one dry cell. For UV199 either a 30 ohm rheostat should be employed or a 4 ohm rheostat with 26 ohms resistance in series. **Q.:** What are the plate voltages for the above-mentioned valves? **A.:** Marconi "R," 70; UV199, 20-80; WD12, 20-100. **Q.:** My aerial is on top of a roof 40 feet from ground three wires 40 feet long, T with two insulators on each wire at each end, is this O.K.? **A.:** Yes, but without a personal inspection it is impossible for us to give you further advice.



W. M. H. (Anglesea, Vic.). Q.: Why is it my receiver does not oscillate on long wave-lengths, although it will oscillate and receive well from 100 to 380 metres? (Diagram and particulars of receiver submitted.) **A.:** This effect is due to the capacity of the valve which becomes inappreciable on longer wave-lengths, when it is necessary to join the correct potential end of the coil to the grid.

A. G. (Macksville). Q.: On Sunday, June 8, picked up music on crystal receiver. Will you check and ascertain if items received correspond with transmission from 2BL for that night? (Distance from Sydney, 240 miles.) **A.:** We have checked the items stated to have been received by you and find they correspond with 2BL's programme on that night. This is very good work. **Q.:** Is my calculation of wave-length correct? (Particulars of coils submitted.) **A.:** Yes. **Q.:** Should variometer shown in sketch make any difference in tuning? **A.:** No, not in tuning circuit.

W. A. W. (Parkes). Q.: Would concrete tank 5ft. under surface built on natural rock fountain be a good earth connection? **A.:** No. Try a petrol tin buried four feet

under the ground. **Q.:** Is 40 feet too long for connection between receiver and earth? **A.:** No, but make shorter if possible. **Q.:** Has earth wire and aerial to be of same capacity? **A.:** No. **Q.:** Would trees 50 yards in front of aerial cause any interference with incoming signals? **A.:** Not to any great extent.

E. P. D. (Avondale). Q.: How many hours should 4 DER or WD12 valves work off one dry cell? **A.:** This depends on the size of the cell. Use "Commonwealth" Diamond cells 40 hours. **Q.:** How many hours should 50 hour Exide Battery work UV200 and three V24's? **A.:** 10 to 12 hours. **Q.:** What plate voltage will V24 valves take as amplifiers? **A.:** 60 to 80 for best results. **Q.:** Would reception be improved by a counterpoise, if so, need it be directly under the aerial? **A.:** Only slightly, yes. Your other questions will be answered as soon as information is available.

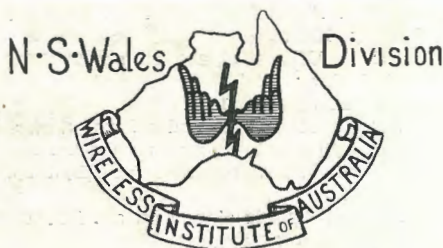
V. W. (Brisbane). Q.: Why is it when a current is connected to a coil of wire, such as that surrounding a core of a magnet or transformer, a short circuit does not occur, although if the + and - leads are connected with a short length of the same conductor a short circuit is caused? **A.:** Current = Voltage-Resistance. The resistance of the transformer winding is such that the current is restricted. **Q.:** What are the following stations: HVV, HVW and UGK? **A.:** HVV, Noumea; HVW, Vila (New Hebrides), UGK, s.s. *Pacifique*.

MONTHLY GENERAL MEETING.



MEMBERS of the N.S.W. Division who were present at the monthly general meeting held at the Royal Society's Hall on Tuesday, June 17, spent a very enjoyable and profitable evening. The occasion was a series of papers by members on low-power transmitters, but before these papers were read, Mr. Renshaw gave a brief account of the recent Federal Council meeting in Melbourne.

Mr. Renshaw, accompanied by Mr. Stowe, represented the Division at the Council meeting, and while they were in Melbourne did some very good work interviewing both Mr. Malone and Mr. H. P. Brown, Secretary to the Postmaster-General. Both these gentlemen received the representatives very courteously and thoroughly discussed the present position with regard to broadcasting and experi-



mental interests. They showed a great deal of sympathy for the genuine experimenter and there is no doubt that experimental interests will be carefully safeguarded in the new regulations. In this connection, both Mr. Renshaw and Mr. Stowe spoke very strongly against any alteration in the licence fee to be charged to experimenters and their action has since been confirmed by the Executive Council of the Institute and the Delegates' Council of Affiliated Societies.

A letter has been received from Mr. Malone, in reply to the telegram recently forwarded, stating that every consideration will be given to the wishes of experimenters.

It was also announced that the Australian Radio Relay League had accepted the offer of the Delegates' Council to take over the activities of the League in toto and establish same on a sound working basis.

Mr. Cook then spoke with reference to certain aspects of low-power transmission, emphasising the necessity of carefully designing the aerial and counterpoise systems showing that they must be absolutely balanced for the most efficient working. He then dealt with the general principles of direction finding and described a portable transmitter which could be used for this class of work. He urged members to make themselves proficient in this branch of the science.

KGO Heard at Corrimal (N.S.W.)

TRANSMISSION from KGO was received at Corrimal (N.S.W.) by Mr. J. S. G. Worland on the evening of June 15. The transmission was as clear as the proverbial bell, and good

audibility was secured on a three-valve set—one radio frequency, one detector and one audio frequency—carrying eight high-resistance telephones. Even upon listening with the first two valves, Mr. Worland

writes, the station was easily audible. "It was certainly no whisper as some experimenters have reported their reception to be." No aerial reactance was used, but this was secured by coupling the tuned anode inductance.



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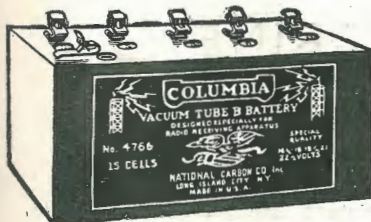
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Highlights of Radio Broadcasting

(Continued from page 175.)

identical receiving sets and loud speakers, properly used on the same reliable transmitting station will give different effect in different homes. This fact has been very generally ignored in the past, but it is of importance to persons of musical taste who wish to get the utmost out of broadcast reception.

Another effect which has been noticed by careful listeners is that the positions of the loud speaker and of the listener in the room have a considerable influence on the apparent quality of the music. If the loud speaker is placed at certain points in the average room, the quality will apparently be effected and the music will become less agreeable. The exact

location of these undesirable points, which should, of course, be avoided, can be found only by experiment, and it is well worth while spending the necessary time with a long cord attached to the loud speaker to determine the proper location of the set before permanently placing it.

A typical ornamental installation of a radio receiver of the cabinet type is shown in the second photograph. Very handsome appearance of the receiver and proper blending with its surroundings can be secured at the same time that the acoustic requirements are met.

The position of the listener relative to the horn is also of importance. If the listener gets too close to the horn, aside from the excessive loudness of the music, there is a harsh effect. If, on the other hand, the listener gets very much to one side of the horn or behind it, the music

will not be loud and will also seem blurred since much of the sound then gets to the listener's ears by reflection from the walls rather than directly from the loud speaker. The placing of the listeners at a broadcast concert is not a matter of indifference.

Another effect having indirectly to do with echoes will be discovered if the listener tries the same set in a large room and then in an entirely similar but smaller room. The larger room reinforces and strengthens the deeper notes of lower frequencies, while the small room does not. As a result, it is more difficult to get deep full effects in small rooms unless the loud speaker is designed to take care of this.

Broadcast listeners will see from the above discussion why scientific investigation in the entire field of sound has been greatly stimulated by the growth of broadcasting.

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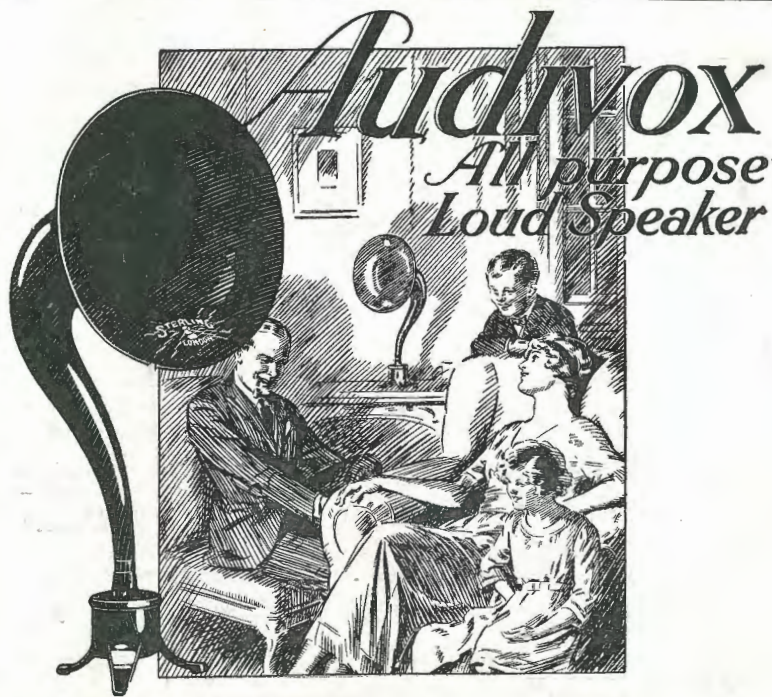
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