

WIRELESS WEEKLY

Registered at the G.P.O., Sydney, for

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VOL. 5. No. 10

FRIDAY, JANUARY 2, 1925.



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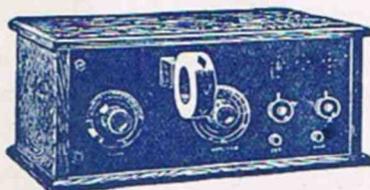
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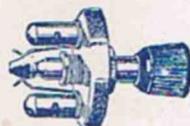


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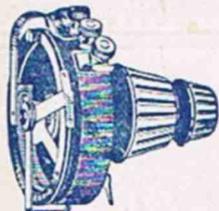


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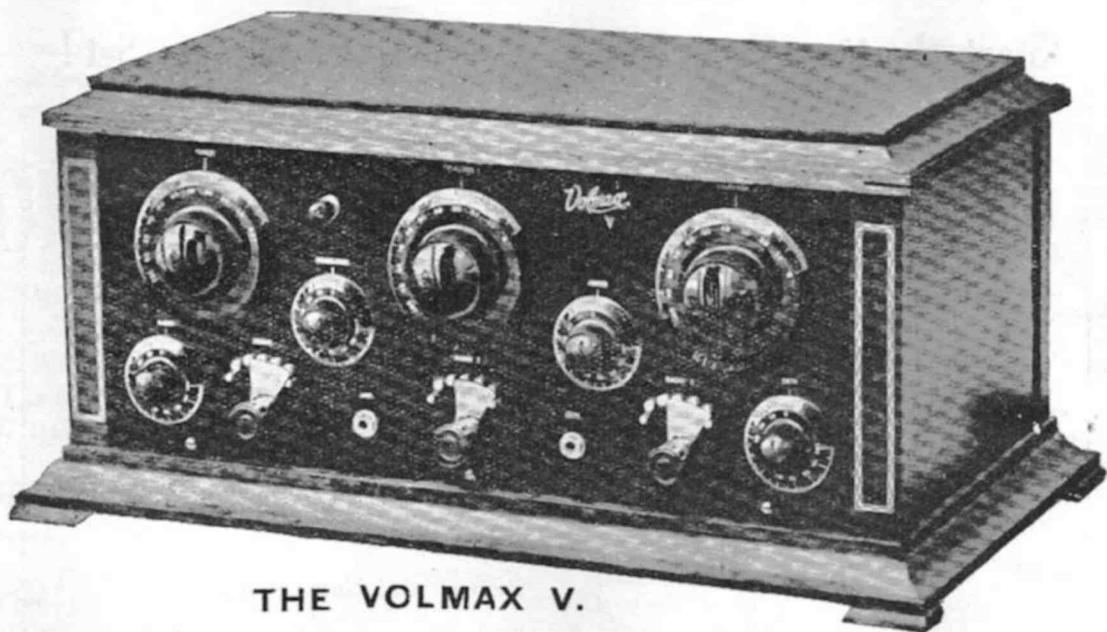
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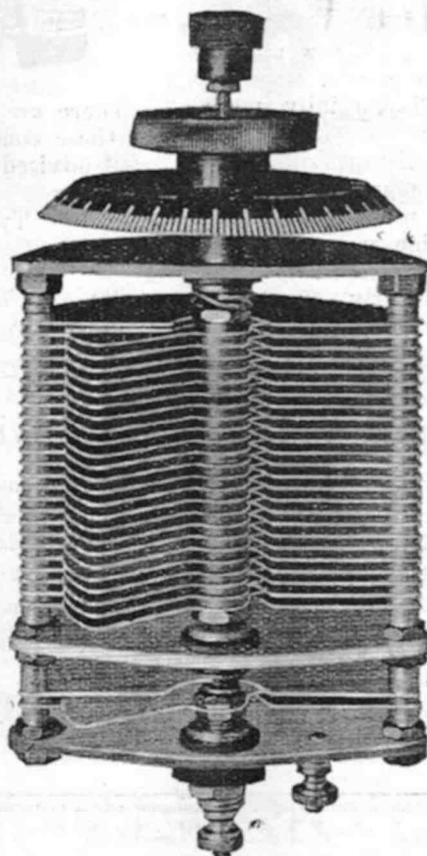
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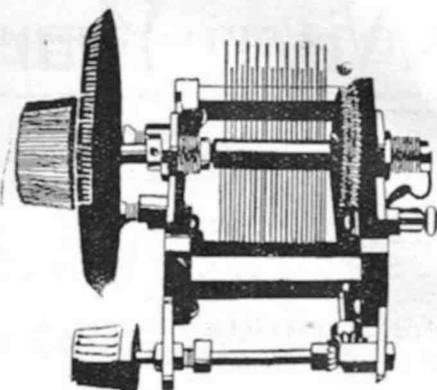
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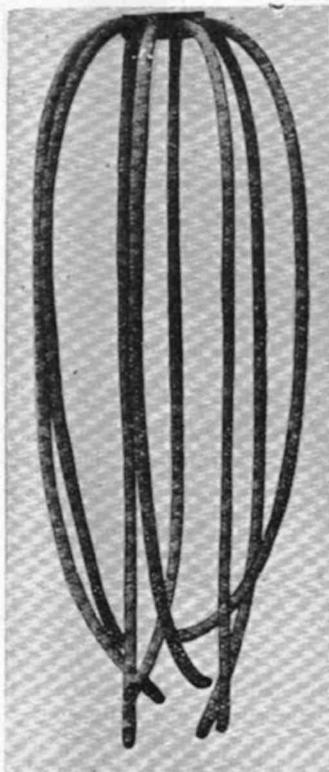
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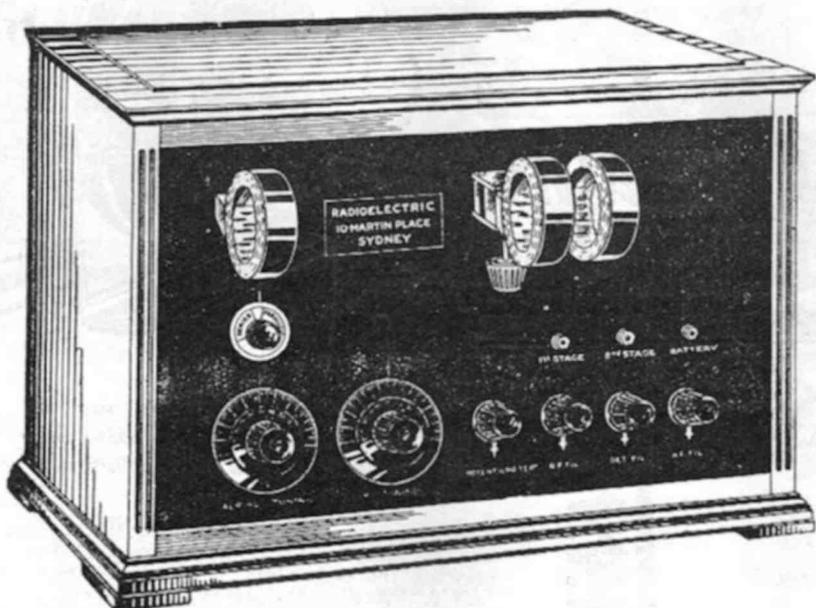
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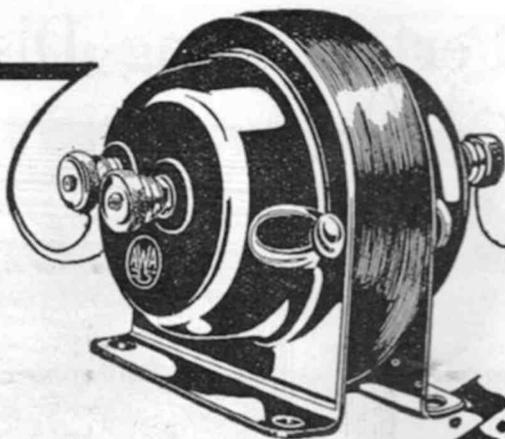
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VOL. 6. No. 10.

FRIDAY, JANUARY 2nd 1924.

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EDITOR:
A. W. WATT

The Editor will be glad to consider Technical and Topical Articles of interest to Australian Experimenters. All Manuscripts and Illustrations are sent at the Author's risk, and although the greatest care will be taken to return unsuitable matter (if accompanied by stamps), the Editor cannot accept responsibility for its safe return. Contributions should be addressed to the Editor, "Wireless Weekly," 12/16 Regent Street, Sydney, N.S.W.

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EDITORIAL

Experimenters & Esperanto

ACCORDING to our South Australian correspondent, a recommendation was received by the South Australian Division from the Victorian Division of the Wireless Institute that its members take up the study of Esperanto. This certainly is a forward step, and one that is in keeping with the times.

Esperanto is unfortunately regarded in some quarters as a fad, but that it is fast coming into well-deserved prominence is evidenced by the fact that almost every prominent wireless journal in the world is now devoting a considerable amount of space to this science. It is, perhaps, natural that Continental journals should take up the subject, because it seems that Continental peoples are more directly affected by the disadvantages of different languages, but there must be a very good reason why British and American wireless journals should during recent months become interested in Esperanto. It cannot be classed as a technical subject, or as one that normally could be offered to readers as an item of general interest as being in a measure distantly allied to wireless. The fact is, of course, that broadcasting has been so largely instrumental in creating interest between peoples, and the problem of conducting amateur relations between those of various nationalities has become so important, that wireless journals have been forced to regard Esperanto as something of extreme interest to readers. On the Continent several wireless papers are published, and our latest to hand is a German publication, printed also in French and Esperanto. Some time ago "The Wireless World and Radio Review" became actively interested in Esperanto, so much so that a representative of the paper was sent to the last Esperanto Conference in Switzerland and in the last issue of "Experimental Wireless" (London) portion of an editorial is devoted to the subject, and a strong recommendation is made to readers to take up the study. This journal anticipates publishing an account of Esperanto every issue, and proposes to publish shortly a complete English-Esperanto dictionary of wireless terms which has already been prepared by Dr. Corret.

Now, to us out here, our nearest amateur neighbours English speaking, perhaps the full

significance of Esperanto as an international language is lost. The American Radio Relay League adopted Esperanto as the auxiliary language for international work, making that decision without prejudice to the merits of other such languages, but simply because Esperanto, being the most used of them, is, ipso facto, the most useful at present.

Signal from Z4AA have been heard by several French amateurs, and with the sweeping tide of short waves there can be no doubt that before long Australians will be in direct communication with Continental amateurs, many of whom are entirely unacquainted with the English language. Progress thereafter will be considerably hampered unless some means of mutually understandable exchange is adopted. Practically every British and American wireless journal recommends Esperanto as the best medium, and with the object of making the path easier, it would be a very good idea if the Secretary of the Australian Branch of the Esperantists' Association endeavoured to formulate a scheme which would be of practical assistance to amateurs.

Amateur Transmitters

IF 1924 had accomplished nothing else in the world of wireless, it proved the absolute ability of the amateur in the handling of low power transmitters, and since triumph has been heaped upon triumph, one marvels at the rapid succession of milestones that have been passed since January, 1924, and wonders what is in store in the coming year. Much has been accomplished, but there is still a great deal to be done. There is one direction in which our amateur transmitters could move, and it concerns a matter upon which we have harped from time to time in these pages—co-operation.

At the present time we have a handful of transmitters standing head and shoulders above the others, and the rest tagging along in a procession of mere followers, the rear end represented by the many who hold transmitting licenses, but who never have and never will make use of them. In connection with the latter, it is refreshing to have the assurance of the Chief Manager

of Telegraphs and Wireless that when the time for renewal comes along, the applications will be reviewed in the light of past achievements. Considering that not one dot has been sent out from these registered but non-existent experimental stations, there is nothing that can possibly be produced in favour of a renewal, although, of course, fresh licenses could be issued, subject to the conditions which have to be fulfilled by those applying for licenses at the present day. The trouble with most of these non-active transmitters is that, having attempted nothing to justify their existence as transmitters, they get up and howl as soon as something threatens to crop up whereby the authorities quite reasonably consider themselves entitled to an explanation of what work has been done by the stations concerned. The old cry that the broadcasting interests want to smash the amateur has been done to death on occasions, and it has been raised mostly by those who for some reason or other seem mighty anxious to retain possession of licenses, although the finest low loss or super het. ever built could not detect one single chirp from the stations which are supposed to be used for experimental purposes. There are, perhaps, instances where transmitting licenses may be applied to work other than purely wireless—for instance, in the medical world; but they are few and far between, and, generally speaking, it would be far better if the experimental slate were wiped clean of all those who are really incubuses and of no use experimentally to the community.

Now to the question of co-operation. According to the dictionary, to co-operate means to act with one another. An admirable quality, co-operation; but we could certainly do with a little more. The achievements of certain transmitters, instead of breeding a healthy spirit of friendly emulation, unfortunately carry in their wake a feeling of jealousy, which, although not common to all, is sufficient to constitute a most unpleasant barrier against the consummation of the ideal towards which we are—or should be—working: a close union of amateur activities. The occasion of another's success along some particular lines of experimentation should give the rest of us almost as much gratification as to himself, because of the fact that fresh laurels have been gathered to the cause in general, and further proof has been tendered that experimenters are doing something worth while. The trouble with most of us is that we are too apt to try and follow in the other fellow's footsteps, instead of branching out in some other direction—and goodness knows there's plenty to be done, and the field is wide enough for a thousand different lines of research. And it is with the object of endeavouring to get everyone moving along some definite lines that we

strongly advocate closer co-operation between transmitters. Let this New Year usher in, not only a better feeling of goodwill, but a definite plan of action whereby the waste is eliminated and the work of amateur transmitters co-ordinated.

Wireless Developments Abroad.

DURING the last year Empire wireless has received a decided impetus. Stations are being erected in nearly all the Dominions, and many others are contemplated. The seven stations being erected to link up the scattered islands of the West Indies are rapidly nearing completion. Those at St. Kitts, Antigua, Dominica, and Barbados are already completed, and are now undergoing tests, whilst the remaining three are expected to be in operation early in 1925. These stations are expected to have a decidedly favourable reflection in the economic situation in this part of the Empire. It is significant to note the improved trade returns, coincident with the completion of some of the stations. The work of erection and installation is placed in the hands of Radio Communication Company Limited, London. This company has world-wide activities, and has installed many transmitters throughout the Dominions.

The stations at Wellington, N.Z., and Willis Island, off the Queensland coast, are equipped with $1\frac{1}{2}$ k.w. spark sets, the station at Wellington having in addition a continuous wave transmitter. The spark sets have attained extremely good ranges under favourable conditions distances up to 4000 miles have been covered, the daylight working ranges of the C.W. sets being of the order of 2000 miles. Many British ships are equipped with Polar transmitters. The advantage of equipping these ships with compact long-range wireless sets is becoming increasingly evident to the shipowner. Obviously much more complete arrangements can be made for docking and unloading a vessel when communication is established a week before she arrives. The s.s. Queenmoor, one of the vessels belonging to the Runciman Line, London, equipped with a $\frac{1}{2}$ k.w. spark set, reports communication established with Colombo at a distance of nearly 1200 miles in daylight. These compact medium power long-range transmitters are being fitted to liner and cargo carriers alike. Not so very many years ago enormous sets were installed in the large passenger vessels to give a range of 500 miles, whilst a range of 100 miles was considered ample for the cargo boats. Nowadays, the value of wireless is appreciated to the extent that liner and

HEADQUARTERS
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N.S.W. DIVISION.

THE monthly general meeting was held on Thursday, December 18, at the Royal Society's Hall, 5 Elizabeth Street, Sydney, when Mr. A. H. Perrett read a paper on "Batteries, their construction, care and maintenance." The paper was illustrated with numerous diagrams, and a collection of apparatus kindly loaned by Exide Storage Battery Service Station, Amalgamated Wireless (Aust.) Ltd., Australian General Electric, and New Systems Telephones Limited, added to the interest of the evening.

Mr. Pettigrew, of the Exide Storage Battery Service Station, and Mr. Malcolm Perry, of New Systems Telephones Pty. Ltd., added a few words regarding some of the exhibits.

Next Meeting.

The next monthly general meeting will be held at the Royal Society's Hall on Thursday, January 15, when Mr. R. C. Marsden will deliver a paper on the "Practical Operation of Transmitters." There is no doubt that the fame of 2JM will go before him, and there should be a good attendance of members on this occasion. No doubt members will be extremely anxious to ask numerous questions, and 2JM will be only too pleased to elucidate any problem that may be put up to him.

Dates of Meetings for 1925.

The following dates have been arranged for the monthly general meetings of this Division of the Wireless Institute for 1925. Members should make a point of noting these dates, and keep them free from other engagements. It is most important that members should attend the meetings of the Institute whenever possible, and, although every effort is made to notify our members in plenty of time, delays in the postal arrangements sometimes prevent due notification being received. So cut this out and keep it in a prominent place, and turn up every evening, and you will make the Institute a bigger success even than it has

been hitherto:—Thursday, January 15; Thursday, February 19; Thursday, March 19; Thursday, April 16; Thursday, May 21; Tuesday, June 16; Tuesday, July 21; Tuesday, August 18; Tuesday, September 15; Thursday, October 15; Thursday, November 19; Thursday, December 17.

Library.

The following rules have been approved by the Executive Council for the issue of the books in the Institute Library. These rules will be strictly adhered to, and members are requested to facilitate the work of the headquarters staff by observing these rules very carefully:—

1. Library to be open to all members and associate members.
2. That members be allowed to take books away for the following periods: Technical and standard works, 2 weeks periodicals, 1 week.
3. That only one book and one periodical be taken away at the one time.
4. That 1/- per week or part thereof be charged for every week over the first during which the book is retained. This is not to apply to periodicals.
5. That the office assistant keep a book and record therein all books issued, and to whom and the date of issue, also the date of return. The person taking the book to sign on the record book for each book taken. The return of the book to be initialled by the office assistant.
6. Members are asked to be considerate regarding the holding of book and periodicals, especially in the case of periodicals.
7. Any book damaged or lost while in the custody of members shall be made good by that member, such damages to be assessed by library officer.

While it is conceded that periodicals are liable to a certain amount of damage due to handling, members are asked to take all reasonable care of them in order to preserve their life.

8. As the number of technical books available are few, a list of members' names shall be kept in

order of the precedence of their application for any particular book.

9. The library officer reserves the right to temporarily or permanently withdraw any of the books from circulation for reasonable causes.

10. The library officer will be glad at all times to consider any suggestion re the addition of new books to the library.

11. A typed list of the books and rules shall be kept in a prominent place in the precincts of the library.

QRM.

2GM reports that he has been heard in the third district on the P1 transmitting circuit. He had 150 volts on the plate, and his input was .4 of a watt.

2JM, 2HM, and 2RJ have been heard by Mr. Hammond on phone at Norfolk Island. This is, indeed, a creditable performance.

2BQ has worked U.S.A. on one 5-watt tube.

Leo. Cusack, one of our old experimenters, is now stationed at Port Moresby.

Since the controversy with reference to 3LO this station has been heard quite easily and satisfactorily by many amateurs in Sydney and suburbs.

A. H. PERRETT,
Publicity Officer.



MR. LIONEL T. SWAIN
President
Wireless Society of Newcastle

Queensland Government Radio Station



MR. J. W. ROBINSON, who is well known to most wireless enthusiasts in this State, has been appointed manager of the broadcasting station which is to be established in Brisbane by the Queensland Government.

Mr. Robinson will leave Sydney for Brisbane in about a fortnight's time, and will review the tenders which have been received by the Government for the construction of the station. He will also decide on a suitable site for the station and studios, and will then supervise their construction. The station will be of "A" grade and will have a power of 5 kilowatts.

Mr. Robinson was a keen experimenter for a number of years, and was one of the first honorary radio inspectors appointed by the Federal Government to administer its regulations in 1922. He joined the staff of 2FC when Farmer's decided to inaugurate a broadcasting service, and has been with Farmer and Co. Ltd. ever since.

With Our Readers



A HIGH TENSIONLESS RECEIVER.

To the Editor, "Wireless Weekly."

Sir,—In one of his excellent articles under the caption of "A High Tensionless Receiver," "Insulator" has unintentionally created a wrong impression, which, in justice to the valves used (Phillips' tetrode), we would like to correct.

In the article in question "Insulator" describes the construction of and results obtained from a unidyne set, which, up to the time of writing, had not been entirely successful; and in last week's article he again expressed dissatisfaction with the circuit, and regards his B. battery with renewed respect.

We would like to explain here that Messrs. Philips did not market the tetrode as a unidyne valve, neither do they suggest its suitability for this circuit. In the circuit diagram supplied with the valves, the makers recommend a plate voltage of from 2 to 4 volts for detection, and from 4 to 10 volts for amplification, and used under these conditions the valves will give great satisfaction.

As numbers of your readers rightly regard "Insulator" as a radio authority, they will no doubt reason that as an expert like your contributor cannot obtain absolute satisfaction, their chance of obtaining it is much less, and in consequence the valves will be worthless to them.

In view of the fact that "Insulator" was using the valves in a manner not recommended by the makers, such a conclusion is unfair to the valves, and we feel sure is not the one "Insulator" wished your readers to draw.—Yours faithfully,

WARBURTON, FRANKI, LTD.,

G. S. WARBURTON,
Managing Director.
Per H. C. WALKER.

To the Editor, "Wireless Weekly."

Sir,—In a recent issue of "Wireless Weekly" there was a circuit of a low power transmitter. Now, sir, thousands of young men would like to own a transmitter, I myself for one, but such an instrument as a transmitter is not for them, because they can't use Morse Code fast enough. Could there not be a way of letting them have a low power transmitter such as published in your recent issue, doing without the key and using it for telephony only—of course, making them pay the

transmitting license. Think of what a great help it would be to the country people. I myself am situated twenty miles from my wireless pal, and just consider what it would mean for us if we both had a transmitting station. Many an hour's enjoyment could be passed at night communicating with each other. If you have the space in your paper, will you give me the following information: Could I operate a low power transmitter just for telephony, no Morse Code sending?—Yours, etc.,

R. MALONEY.

Box 115, Griffith.

(Friend, we are entirely in sympathy with you and with many others similarly situated, but there are regulations which must be considered for the good of everybody concerned. It would be quite possible to use the circuit we described for telephony, but you must have a transmitting license before you could use it. We advise you to write to the Radio Inspector, MacDonnell House, Pitt Street, Sydney; state all the particulars concerning your location, etc., and you will, we feel sure, receive sympathetic consideration.—Editor.)

To the Editor, "Wireless Weekly."

Dear Sir,—Referring to a letter from "Experimenter" published in the December 12th issue of your magazine, I have to advise that station RA is "Radio Roviana," Western Solomon Islands.

Referring also to a paragraph appearing on page 54 of this issue, station 5CL, Central Broadcasters Ltd., of the "Grosvenor," North Tce., Adelaide broadcasted a bagpipe selection on November 26th, and was probably the station that Mr. L. Nunn heard.—Yours faithfully,

R. M. ANTHONY.

3 High Street, Unley Park, S.A.

To the Editor, "Wireless Weekly."

Sir,—In reference to an inquiry from Mr. A. R. Andrews, published in "Wireless Weekly," 28/11/24, concerning a freak loose coupler. He states that when he removed the lead-in wire, both the amateur stations were received with the same volume as when the lead-in was connected to his set. This is due to a harmonic effect, the primary coil acting as an aerial. I have had the same experience myself early this month. My set is a loose coupler which was built by myself. Wishing "Wireless Weekly" every success.

Yours, etc.,

W. J. KEOGH.

Arthur Street, Ashfield.

To the Editor, "Wireless Weekly."

Dear Sir,—I desire to thank you for the article "Getting the Best Out of Your ST100" in your much appreciated paper of the 28/11/24. I have built the receiver after these instructions, and must honestly state that I never heard anything sweeter and purer, and anyone who is under the impression that a valve set with a loud speaker is not better than a gramophone has only to listen to the ST100 to have this impression speedily removed.—Yours truly,

L. KENNY.

Seven Hills, N.S.W.

REPLIES TO CORRESPONDENTS.

J. Williams, Trongate St., Granville.—Our letter addressed to you to the address given has been returned marked "Unknown." Kindly send us a diagram of your present receiver, and we shall be happy to advise.

W. G. M. McAuley, Brunswick, Vic.—Please see "Wireless Weekly," December 19th, page 19. This was the station you heard.

LET US SELL IT FOR YOU.

Has it occurred to you that half the odd stuff you have lying around may be useful for somebody else?

Put a reasonable value on it, and advertise it through "Wireless Weekly."

A small advertisement will find you a buyer.

Three lines, 1/6. Six lines, 2/6.

STATIONS HEARD.

Mr. N. H. Full, Redfern, has logged the following stations on one detector valve:—

N.S.W.—2GQ, 2FP.

Victoria.—3BD, 3BQ, 3BM, 3EM (c.w.), 3LO (phone).

New Zealand.—4AA, 4AG, 4AK, 4AM, 2AC, 2AI, 2AP, 1AI, 1AR.

U.S.A.—6BUN.

Mr. W. G. M. McAuley, Brunswick, Vic., sends us the following list of stations heard on two valves:—

2AC, 2BB, 2BC, 2BK, 2BY, 2CL, 2CM, 2CP,

2DL, 2DS, 2ED, 2GQ, 2GR, 2MF, 2IJ, 2JM, 2MK, 2OI, 2WS, 2YG, 2YI, 3UI (Mildura).

4AN, 4AK, 5AG, 5AH, 5BD*, 5BG*, 5BM* (fone).

New Zealand.—2AA, 2AC, 2AG, 2AE, 2AP, 4AA, 4AG, 4AK.

U.S.A.—1AR, 6AWT, 6BCP, 6BCW, 6ALO.

The following list shows the stations logged by Mr. C. Luckman (2JT), Croydon, Sydney, during the week ending December 21st, using a low loss mostly with detector only, but sometimes with a stage of audio.

Mr. Luckman wants to know if A3XX is an authorised station. 2JT has worked him on occasions, but in response to QRA? merely says, "Will send you a card." Can anybody place him?

U.S.A.—1ER, 2BG, 3CH, 5GO, 5UD, 3AG, 6CGW, 6AHP, 9AXS, 9ZT, 9WGH, on continual ABC's, BXI's.

N.Z.—2AC, 2AP, 4AA, 4AG, 4AK.

Vic.—3TM, 3BM, 3AP, 3GB, 3LM, 3XF-3XX?, 3BQ.

S.A.—5DO.

Queensland.—4AN.

N.S.W.—2JS, 2HM, 2GQ.

RADIO CANNOT SUPPLANT NEWSPAPERS.

EVEN radio with its seemingly boundless possibilities holds nothing in store for you that is comparable to the service of your newspaper. The radio is not going to tell you about the wedding of your neighbor's daughter. You won't find the radio telling you how your neighborhood baseball teams knocked the daylights out of the team in the next town. A member of your own club might be entertaining friends but you wouldn't know about it if your newspaper didn't tell you. The radio isn't going to do that. The two fields are different. They say that the average metropolitan newspaper to-day prints about 200,000 words in each issue. If the radio should attempt to transmit that amount of reading matter estimates are that the process would take from 8 to 10 hours. Imagine yourself tuning in for that length of time to get what your daily paper brought you this morning."—Frank Hicks, University of Iowa School of Journalism.

We are notified by Messrs. Bennett and Bridgland that the winner of the competition recently organised by them was Master J. Morris, 47 Norton Street, Leichhardt.

BELOW THE BROADCAST BANDS

RADIO A 2GR.

RADIO 2GR is the experimental station of Mr. J. S. Marks, of Rose Bay, and is well known to listeners-in. This station was one of the first to transmit music before the days of broadcasting, and at one time he could be heard transmitting regularly every night for weeks on end. The aerial at 2GR is rather unorthodox, and consists of a tapering cage suspended between two pine trees 200 feet high. The aerial is practically vertical, and has a twenty-foot hoop at the top. An earth only is used, a counterpoise not being resorted to. The circuit used in the transmitter is the popular three coil, using two five watt bottles as oscillators and two kenetron rectifiers. 2GR attributes the quality of his transmission to the grid leak, which is of his own construction. The microphone is also of unique design, and grid modulation is employed. The receiver is of the usual low loss and one audio, which is so extremely popular at the present time among amateurs. Taken all round, the station is quite an efficient one, and has done plenty of consistent work. New Zealand stations have been worked on fone, while cards have been received from all States, New Zealand, Fiji, and Port Moresby (with regard to the latter, the report received said that he could be heard there practically any night he was transmitting). 2GR has also been received on a ship 200 miles the other side of Fiji. The transmission of pianola items is worthy of note, and quite a lot of experiments were carried out to find the best position for the microphone. However, the transmissions at present are excellent, the modulation being almost perfect. Many transmitters have been in operation at 2GR, but the present one is the most consistent, and certainly seems to be getting out all right.

Key Clicks.

The standard frequency transmissions by the Institute are to be started in the beginning of the new year, and should prove beneficial to both transmitting and receiving experimenters. The way things are at present, no one knows what wavelength he is receiving on.

Interest is being shown all over the world in short wave work. The French, German, and American authorities are at present carrying out extensive experiments to find out the practicability of the shorter waves for commercial working.

Where's the amateur going to? Probably on to about three and a half millimetres. An important part of any short wave set is the tickler or reaction coil. In most tuners this is far too large, and the result is that the "op" has to almost be an expert juggler to bring in any weak signals. Most experimenters take a delight in showing how fiercely their receivers will oscillate, and take great pleasure in getting a deafening click in the phones when the tickler is brought round. This is a mistake, as it will usually be found that when the condenser is all out, the set oscillates fiercely, and it is often impossible to effectively control the oscillations. For this reason, it is better to take some turns off the tickler until the set will just oscillate on the highest condenser reading. When properly adjusted there should be no click as the set commences to oscillate, but it just oscillates steadily. The tickler should be about half as big as the secondary and wound on a smaller former; this is, of course, for the shorter waves.

There has been plenty of DX the last few nights, the N.Z. stations coming in quite Q.S.A.

3BQ still comes in "like a ton of bricks." F.B.O.M.

2DS has been working Yanks quite a lot lately, likewise 2YA on his new set. The Yanks are gradually getting their transmitters down to lower waves, and there are even some as low as five metres, while they are quite numerous from twenty to one hundred metres.

South Australian experimental stations are busy sending music, pending the erection of an "A" class station. Prominent among them are 5DN, 5BN, 5AV, and 5AB.

RELIABLE SERVICE

For reliable service, and expert advice on all radio matters, no matter whether it is for crystal or valve sets, be sure and call on the "Sirius" Electrical and Radio Company of 9 Macquarie Place, City. Here you may choose your purchases with utmost comfort and satisfaction. "Sirius" radio sets and parts are all guaranteed and can be depended upon to fill every need. You will be surprised at the pleasing display of 'phones and loudspeakers. Demonstrations given daily during Broadcasting sessions. For quality radio supplies, visit the "Sirius" Electrical and Radio Company.

BRINY REMINISCENCES

(By "Brasso.")

FRESH from the somewhat doubtful delights of communing with frisky tourists on the Melbourne to Cairns Trunk run, as it is referred to in local shipping lingo, it was with feelings of positive relish that I conveyed the "usual" to Captain Worrall on the Union Company's "Maheno," engaged in the intercolonial run, Sydney-Auckland-Sydney-Wellington. The "usual" is a formal letter from the Traffic Superintendent of Amalgamated Wireless to the ship's captain, assuring the latter that mutual delight will be the result if the bearer is signed on the articles as senior wireless officer. Be it noted that, in this good year of 1921, it was enacted, by virtue of the operations of the Radio Telegraphists' Institute, that the term "operator" be supplanted by "officer," it having been legally decided that those pounding the brass key at sea were duly recognised ship's officers. Therefore, behold me bursting with an added sense of dignity, extremely light in the head, but no heavier in the pocket, over this new and attractive title, leaning over the side one day gazing at the crowds on the wharf and at the mass of streamers which later on would have to be cleared off the decks.

There are runs and runs, but this one of the "Maheno's" was considered the daddy of the lot; she left either end at 11 a.m. on the Wednesday, arriving promptly at 9 a.m. on the Sunday, thus ensuring that the most coveted day of the week—Sunday—was spent on terra firma. On this particular day, however, I was not exactly overjoyed with the situation in general because of the non-arrival of my laundry—a most embarrassing predicament, indeed—and I was just contemplating whether, in view of the fact that I was a newcomer, I could conscientiously approach the deck officers for the loan of a couple of collars and shirts, when, lo! my friend of the Sun Laundry hove in sight, and, battling his way through the crowd, greeted me cheerily from the wharf, somewhat ruffling my dignity by holding the parcel aloft and bawling, "Ere we are." Endeavouring to convey the impression that what he bore was a parcel of important documents, I beckoned him haughtily aboard, and imagine my anguish when he entered into argument with the gangwayman and, in subdued tones that were audible not more than 300 yards away, protested that his mission was to deliver the laundry to the "wireless bloke"—whereat

my fury broke loose, and I gazed around for something large and heavy to drop upon him. Fortunately for him he effected peaceful entry, and, the laundry having been delivered and the usual collection of pierhead jumpers and merry firemen gathered in, we departed, bound for Wellington. The installation on the "Maheno" was a 2½ K.W. Telefunken transmitter, and one of those very efficient German loose couplers. A four-wire aerial completed the outfit. The transmitter and receiver were installed in the living abode, and one went to sleep with one's eyebrows caressing the main condenser. However, the shack itself, situated on the after-end of the boat deck, was very comfortable, and was rendered much more homelike by the addition of a pink light shade which, in a misguided moment, an elderly spinster had presented me with on my last ship. A bit sissy, perhaps, but still very effective.

During the summer months the "Maheno" and her ilk carried hordes of "towrists" bent on examining at close range the glaciers of Mount Cook and the boiling potholes of the thermal regions of New Zealand. One could always pick the returnees, because they invariably came aboard and greeted all and sundry with "Kiaora" instead of the usual "'Ow is it?'"

According to rules and regulations a wireless watch must be kept on all Australian steamers for one hour after leaving the wharf, and, this having been successfully accomplished, I repaired to the promenade deck to get a general survey of "who's who," so to speak. They were the usual motley gang, most of them obviously on their first trip and gaily prancing up and down. Hardened travellers you will always find in the smoke-room the moment a ship leaves port, and there they spend almost all of their waking hours until arrival at the other end. Bridge, poker, and tall yarns is their universal occupation, and they view with patient boredom the efforts of their less experienced fellow-travellers to kill time. For some mysterious reason or other it is the ancient and honourable custom for the male first-trippers to appear on deck wearing blazers and sandshoes five minutes after leaving the Heads, while the ladies foregather in cream skirts and either sandals or sandshoes, as though they were on a harbour excursion. Usually they remain gay and frisky for half an hour or so until the heave and lift of the

ship becomes oppressive, when they assume that fixed glassy stare commonly regarded as the preliminary to a hang over the side. However, my first inspection revealed the ordinary crowd of up-country aristocrats, politicians, theatricals, blase clerks, flappers in tow of keep-off-the-grass mammas, commercials, the inevitable mystery ladies, sports, touts, card sharpers, school teachers, business men, footballers, and all the hundred and one types one bumps on these steamers—most of them uninteresting, some dowdy, some just ignorant, and a few that the practised eye immediately classified as interesting. And it is worthy of note that on all my trips I found that invariably the most courteous and interesting people were the much-despised theatricals, and by virtue of my making a good fellow of the second steward, who allots the seats at the tables in the saloon, I always took care that I was surrounded at meals by these bohemians of the footlights. Whether it was the "Driven From Home" Company or the "Maid of the Mountains," I found them all the same, a class quite apart from anybody else. Generally they kept strictly to themselves, went to bed early, and avoided the bar—consequently, for the latter reason, they were not popular with the second steward.

However, on this occasion, being a newcomer, I had to take pot-luck, and sitting at the head of my little table in the dining saloon I observed that my fellow-feeders were distinctly no bon. There were six of them at the table, and a casual glance disclosed that my periods over meals would, for that voyage, be extremely short and snappy. Having got the ear of the steward, I enlisted an ally on the spot. On my left was a young and tender maiden who kept her eyes glued on her plate and her squeaky voice. Next to her was a University professor, whose conversation was confined to the steward. On his left was a guy with a check suit and a stick-on tie—a true sport this, who had early discovered the beaten path to the bar, and had, even in that short time, trodden it often. Regarding me owlishly, he quoth, "Wotcher, Captain, and 'ow's she 'eading?" finishing up with a burst of mirth which nearly unseated me. This lad fed with both feet in the trough, but, despite that and a tendency to drop his false teeth with a click, he was a good scout, and at least had something to say even if everybody else on the ship heard it. Opposite him was a conceited-looking fop, who early incurred my displeasure by calling me "Sparks," a name which by tradition is used only by one's shipmates. On his left was a babbling lady school teacher, and on my right a Yiddisher jewellery drummer who ate pork and bored me stiff with his tales of commercial success. My

efforts to divert the over-flowing river of his eloquence to the inebriated one met with a decided refusal, and as the others assumed an aloof, detached air when things looked as though they were going to be pulled into it, I had to carry the burden. However, to my great relief the only ones left at dinner that night were my boozy pal and the flapper, and, needless to say, I somewhat uncharitably hoped that the others would stay where they were, fondling their foolish seasick remedies and being tenderly interviewed by the stewardess. Horace, as I had mentally nicknamed the check-suited follower of Bacchus, was even more flushed than at lunch time, and evidently under the impression that I was situated some miles away addressed me in a voice like a foghorn, with many hics and spasms of irrepressible mirth. Not being in on the joke, I spoke insultingly to him sotto voce, and, upon him demanding what I had said, assured him I hadn't spoke at all, whereat he burst into violent mirth. This somewhat unconventional performance almost reduced the flapper to giggling hysterics, from which I rescued her by escorting her to the deck with Horace's final "Bye-bye, Captain," ringing through the saloon. A tremendous amount of traffic is handled on these steamers, and the 8 p.m. to 12.30 a.m. watch is usually very busy. On some ships the messages are handed in to the purser, but in this case the passengers toddled up the ladder and passed them over the "counter" in the wireless shack. The "counter" was a small flap which, after entering the shack, I closed down behind me. A bunch of forms dangled on the wall, and, lining up in a queue, the passengers entered one by one, wrote out their loving epistles, stumped up their cash (for business was strictly a cash one), and departed. Although in the beginning I was at some pains to answer all the questions which were hurled at me, I soon grew hardened to them and had a stereotyped reply for them all. This was usually what perturbed them. Question: "How did the messages travel through space?" Answer: "In waves." A pause. Question: "But how do you mean waves?" Answer: "Well, wireless waves travel like this"—illustrating up and down motion with finger—"and if you propel electro-magnetism violently into the ether, then after rebounding off the Heaviside layer and back again off the ocean it follows that its radio frequency is directly affected by the action of the spark gap which stores up the oscillatory currents and discharges them across the negative and positive terminals of the aerial, which in turn energises the motor generator." Long pause, then dawning light of comprehension. "Oh, I see; thank you very much. Good evening." Answer: "It's a pleasure. Good evening." Exit. One ques-

tion always made me itch to throw something. Here it is: "When you send a message, do all the other ships have to stop sending? If so, why? If not, why not? If both, then is the answer a lemon?" Whenever some inward feeling warned me that someone was about to spring this, my left hand reached around for the axe and a red mist floated before my eyes. Jack the Ripper was my blood brother. Other simple ones were: "How do the other ships talk to you?" "Do you have to wear those things on your head all the time?" "Does the wind stop the messages?" "What won the Epsom?" "What time are we due?" "Do you ever get seasick?" "When you are not here, is there anything to pick up the messages?" "How do you know the other ships?"

demonstrated in detail—these were rare, however, and depended absolutely upon who made the inquiry. The explanation thereafter was carried on next day on the promenade deck, usually requiring two deck chairs and a rug. At 11 p.m. on this particular evening, however, after quiet had settled down over the ship, there was the sound of heavy footsteps up the ladder, much subdued cussing, and staggering in the door came Horace, very boozed, but full of pep. At sight of me under the pink lampshade Horace cackled wheezily, and, subsiding into the camp stool, surveyed the scenery from glassy eyes. Observing a strictly neutral attitude, I gazed fixedly upon him, and after a silence of some minutes, during which he betrayed a sudden yearning for sleep, I prodded



Types of Shipboard Advertising Literature Produced by Amalgamated Wireless.

"What is that handle for?" "What is that funny noise?" "Would you get a shock if you touched that wire outside?" And, occasionally, "Can I send one collect?" And so on and so forth. Somehow there was an answer for everything, and, since a reasoned explanation was impossible, any old thing went down. On occasions, however, one took particular pains over explaining things; in fact, an hour or so was usually required while the whole set was

him in the lower vest button and demanded what of the night, whereat he said, "Lo, captain," and collapsed off the chair. This being a case for a mother's fond care, I 'phoned up the bridge and explained matters to the third officer, who advised me to throw the body out on the deck. Horace being a bit weighty, however, I called the watchman, who removed him below. After this interlude I thought me of the company's instructions to see that

"notices are prominently displayed on the ship." These took the form of cards measuring about 18 inches by 12 inches, bearing invitations to passengers to think of their pals ashore and send them a wireless. It being somewhat infra dig. for the wireless officer to parade the decks with a tack hammer and a bundle of cards under his arm, and as the steward disposed of them by dropping them over the side, the job was usually personally supervised and executed at midnight. At one time these notices were just plain affairs, notifying the rate per word, but these were later supplemented by proper publicity matter, which had its effect in increased revenue. Usually the smoke-rooms, lounges, and notice boards were liberally ornamented with "Say it with wireless," etc.

Next morning my sole eating companion at the table was Horace—not a chastened and subdued

Horace as I had anticipated, but one even more hilarious. To my "What, again?" he favoured me with an oozy chuckle, and went on to inform me I had an ethereal job, talking into space with the angels, and so on. However, he did not depart from his custom of calling me "Captain," and throughout the trip was perpetually "oiled" and mirthful. The second steward told me Horace was first in at the bar in the morning and last to be ejected at night, and his daily habits consisted entirely of walking-tours to and from the promenade deck and the bar. There is always a Horace, always a giggling flapper, always a pedant, always the "know-all" every trip—the same old types of human beings—some gay, some frisky, some seasick—few entertaining; and yet, when the gangway went down in Wellington and within half an hour the decks were deserted, I felt somehow lonely, for there is no more melancholy place than an empty passenger ship.

Smoothing Out and Reducing Static Trouble

SOME PRACTICAL HINTS.

By H. Beardsley.

THE majority of static eliminators make their appearance in the winter season when there is little interference to be overcome. When the real season of atmospherics arrives these so-called eliminators disappear. This is probably due to the fact that the inventor discovers to his chagrin that the eliminator is of no value when pitted against the terrific, hissing, crashing discharges of the summer months.

There is then nothing much left for the listener to do since those devices which are of some value are, because of their cost and complexity of construction, beyond his resources.

Practically all listeners are willing and anxious to make any sort of experiment that offers any promise of success in this regard. For this reason only and not with any positive statements as to what may be expected, we venture to offer the following to be of some possible use in reducing the static annoyance.

The methods outlined here will result in some diminution of the volume of reception and the headphones will in many cases be substituted for the loud speaker.

Receiver Silent in Operation.

For the same reason—probable diminution of volume—it is essential that the receiver be ab-

solutely silent in operation. In the winter months broadcast programmes are received with considerable intensity, sufficient to mask slight receiver defect which result in hissing and scratching sounds. But with the increased intensity of static interference with coming summer, broadcast reception seems to weaken. This is probably due to two causes. The conditions which give rise to atmospherics are also unfavourable to transmission; the heavy crashes of static in the receiver so irritate and numb the auditory nerves that they are temporarily insensitive to the intermittent snatches of music and speech. This latter view is corroborated by the fact that the listener usually finds that retreating some distance from the loud speaker or removing the phones a little distance from the ears serves to increase the ratio of broadcast reception to static. For these and other reasons it is extremely important that the receiver be silent in operation. When this has been accomplished and the receiver is at a maximum efficiency, the listener is in the position to pick up with some satisfaction the diminished energy yielded by selective and smoothing devices.

It is well known that high capacities are used successfully in transmitting circuits to smooth out

the generator interference and in the same manner capacities in the receiving circuit absorb some of the harshness of the static discharges.

Condenser and Coil in Aerial Circuit.

To begin with, a very selective receiver is essential. Even with circuits ordinarily considered selective, the use of a separate aerial coil shunted by a condenser for tuning is quite useful. This coil should be connected directly between the aerial and earth, shunted by a variable condenser of capacity .00025 or .0005 mfd., the proper number of turns of the coil to be determined by experiment, probably about 40 to 50.

With a receiver silent in operation, it is surprising the distance to which this separate coil may be moved from the receiver and still an appreciable amount of energy transferred to the receiver. The farther the coil is removed the more the static interference is reduced, but the broadcast reception is likewise diminished. The crashes of static are, however, apparently less frequent. There is a limit to which this selectivity may be increased. At a certain point in the process the static is no longer perceptibly diminished—this is because the windings of the receiver, the transformers, tuning coils, etc., themselves pick up a certain amount of the static directly which is not affected by the coupling. Therefore shielding is useful, but in any event the coils should be a distance where improvement is no longer possible and probably in most instances returned about one-third the distance to the receiver tuning coil. At this point the volume of reception should be fairly good though considerably diminished.

The static crashes should appear somewhat less frequent because of this increased selectivity, though still annoying and of harsh, hissing character, extremely disagreeable.

Telephone By-Pass.

The second consideration is a good telephone by-pass and of not less than .001 mfd capacity. If audio frequency transformers are used, this fixed condenser should by-pass the primary of the transformer.

Across the secondary of the first audio frequency transformer place a fixed condenser of capacity somewhat between .0005 mfd and .005 mfd, this to be determined by experiment. Capacities at the above .005 mfd may result in almost complete suppression of reception. Good fixed condensers should be used, there being little excuse for the paper wrapped fixed condensers, as good mica condensers are reasonable in price. The secondaries of the subsequent audio frequency transformers, if any, should also be shunted by fixed condensers.

It will be found that the higher the condenser capacity, the more completely will the extremely harsh and hissing sound of the static crash be eliminated.

Grid Leaks Required.

Leaks across terminals of the transformers, made with a soft lead pencil, may also improve reception. It is important in any circuit in the static season that sufficient grid leakage is provided from the grid to the filament of each valve as this serves to carry off the static charge which may otherwise result in temporary choking of the grid circuit and result in ragged reception, another static annoyance which is thus partially eliminated.

The condensers across the transformers not only smooth out and absorb the static shock, like shock absorbers on a motor car, but they remove much of the shock and numbing effect upon the ear, thus leaving the nerves sensitive to the intermission in which music or speech is being received. This method of attack has several advantages. In the motor car analogy we do not attempt to remove the rough places from the road; we drive in such a way as to avoid the bumps and provide shock absorbers to make riding agreeable. Similarly, we use an extremely selective coupling to dodge the static bumps as much as possible and then provide leaks and capacities to absorb and remove the charges and render them less irritating to the nerves, thus leaving frequent intermissions in which the nerves are sensitive to the improved reception. A certain amount of atmospheric interference will inevitably reach the receiver, but we drain it off and absorb it as quickly as possible, instead of leaving it to numb the nerves and choke the circuit until another shock makes it continuous. When we view a motion picture we are not aware that the interruptions are taking place as the separate images are impressed upon the screen. In the same manner we may provide intermissions in the static interference so that their constant recurrence leaves upon the ear the impression of an almost continuous programme.

These are by no means intended as positive statements. The reader may try these experiments and decide for himself, whether there is improvement.

Albury schools are going to be in it with wireless sets. Both the High School and Rural School recently held entertainments to raise the necessary funds for the purchase and installation of sets. Both functions were so successful that the High School already have their set installed, and the Rural School have more than sufficient funds for their installation. Both will be five-valve sets (P.B.).

AN EFFICIENT CRYSTAL SET

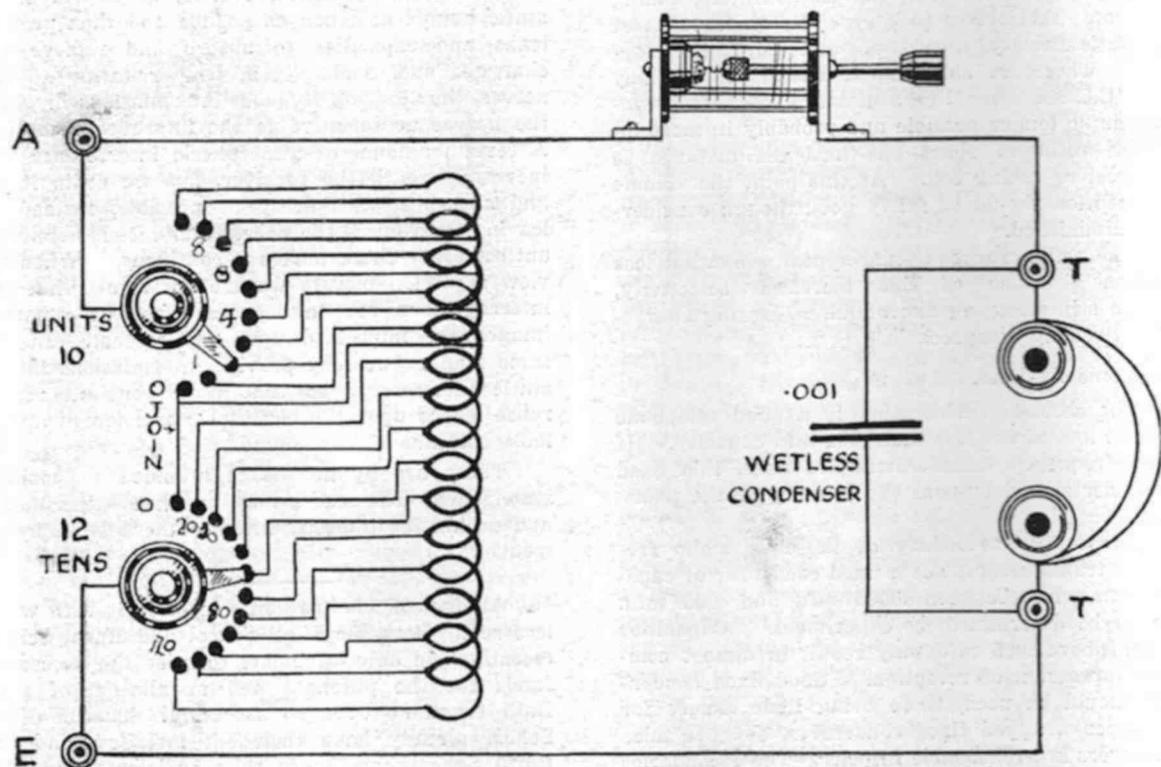
(By "Insulator.")

ANOTHER year beginning! How time flies! Like most other people, I can scarcely realise that 1924 has left us—the year which brought broadcasting to this fair land of ours. Well do I remember the 26th January, 1924—a Saturday morning—when I first heard music by wireless. Amalgamated Wireless transmitted for an hour or so, and the old crystal set perked well; so well, in fact, that Mrs. Insulator and myself had sore ears from wearing the phones. I laugh when I come to think of that morning. The music supplied was from one gramophone record played over and over again, interspersed by a few news items from the "Sydney Morning Herald." Compare the present day to them. Some difference!

The crystal set I used then was a navy type loose coupler primary 6 inches of 24 gauge wire

and a secondary of 5 inches in diameter having 250 turns of 28 gauge wire. Contact studs were unobtainable, so ordinary cheese heads were pressed into service. Good results were obtained in spite of the dead end effect. The old set is still in existence, but it basks under the appropriate appellation of "Drain pipe," such was the size.

Begin the New Year well. If you haven't a radio set in the home, begin now. Build a crystal set and indulge in the joys of wireless. Here is an old-fashioned receiver which is still very hard to beat, and it is very easily made, too. The illustrations will show you just what it is, and also in conjunction with the diagram the wiring of the panel will be picked out. The lay-out will appeal to you, in my estimation, looking quite "naice." The aerial terminal is in the top left-



The Circuit.

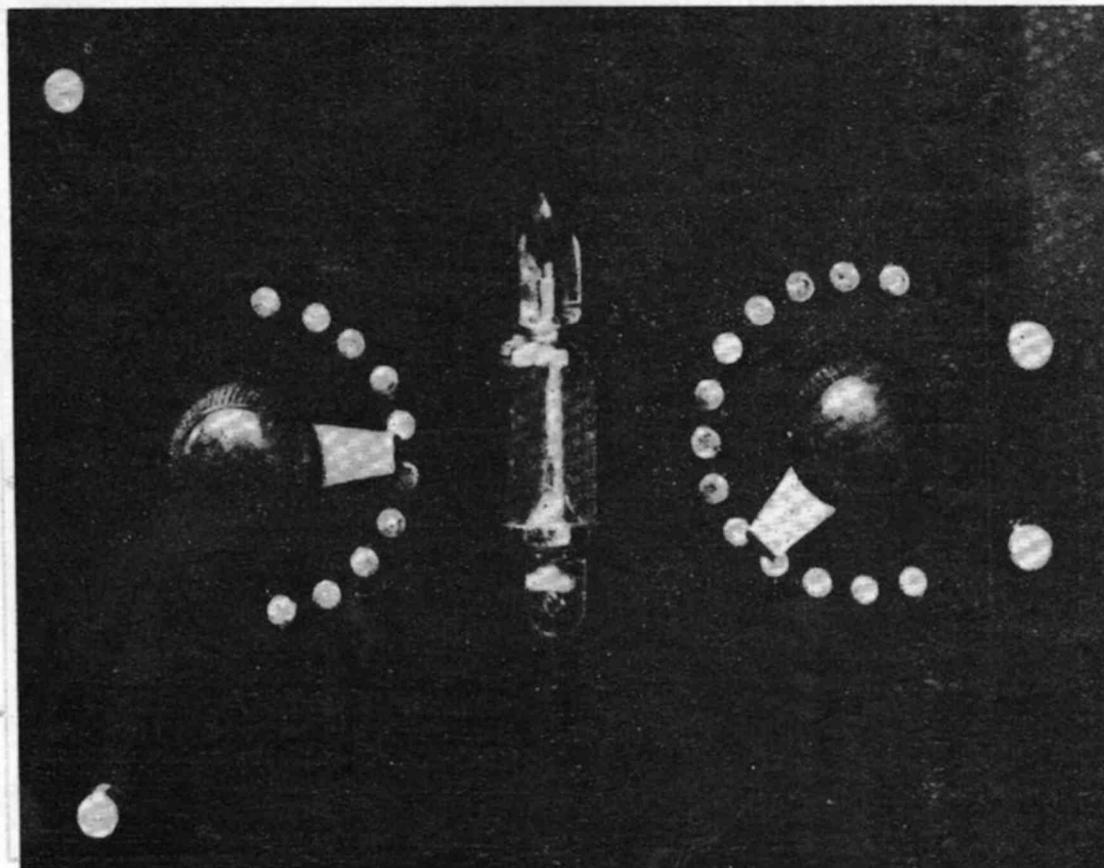
hand corner, the earth terminal being in the bottom left-hand corner, while the two telephone terminals may be seen on the right side. A glass enclosed crystal detector may be seen situated between the switches. The glass enclosed detector is always preferable to the open type, as dust is prevented from settling on the crystal. Again, a more permanent adjustment is maintained, this being the secret of good reception.

Come along with me and look at the wiring diagram. You see those two switches riding on the little black dots? These dots represent contact studs, and you will notice that the bottom one on the top row is joined to the top one on the bottom row. These two joined studs are the 0 (nought) studs, and the tenth turn is connected to one. This system permits, by a combination of the two switches, any wished for number of turns to be selected, actually allows every single turn of the coil to be used, thereby assuring very fine

tuning and overcoming the disadvantage of the slider shorting or resting on more than one turn of wire. Anyhow, let's get on with the constructional details.

Procure the following materials from any of the advertisers in this issue:—

- 1 Bakelite panel, 9 x 7 x 1/8 inch.
 - 2 Switch arms.
 - 1 Glass enclosed crystal detector.
 - 4 Terminals.
 - 22 Contact studs, with nuts.
 - 1 Cardboard former, 3 1/2 x 8 or 4 1/4 x 6.
 - 8ozs. No. 22 or 24 d.c.c. wire.
 - 1 .0001 Phone condenser.
 - 4ft. of panel busbar for wiring purposes.
- too dear, and it is to be preferred to many of the 2yds. Lighting flex.
Solder, etc.
Well-shellaced 3-ply wood will do if bakelite is

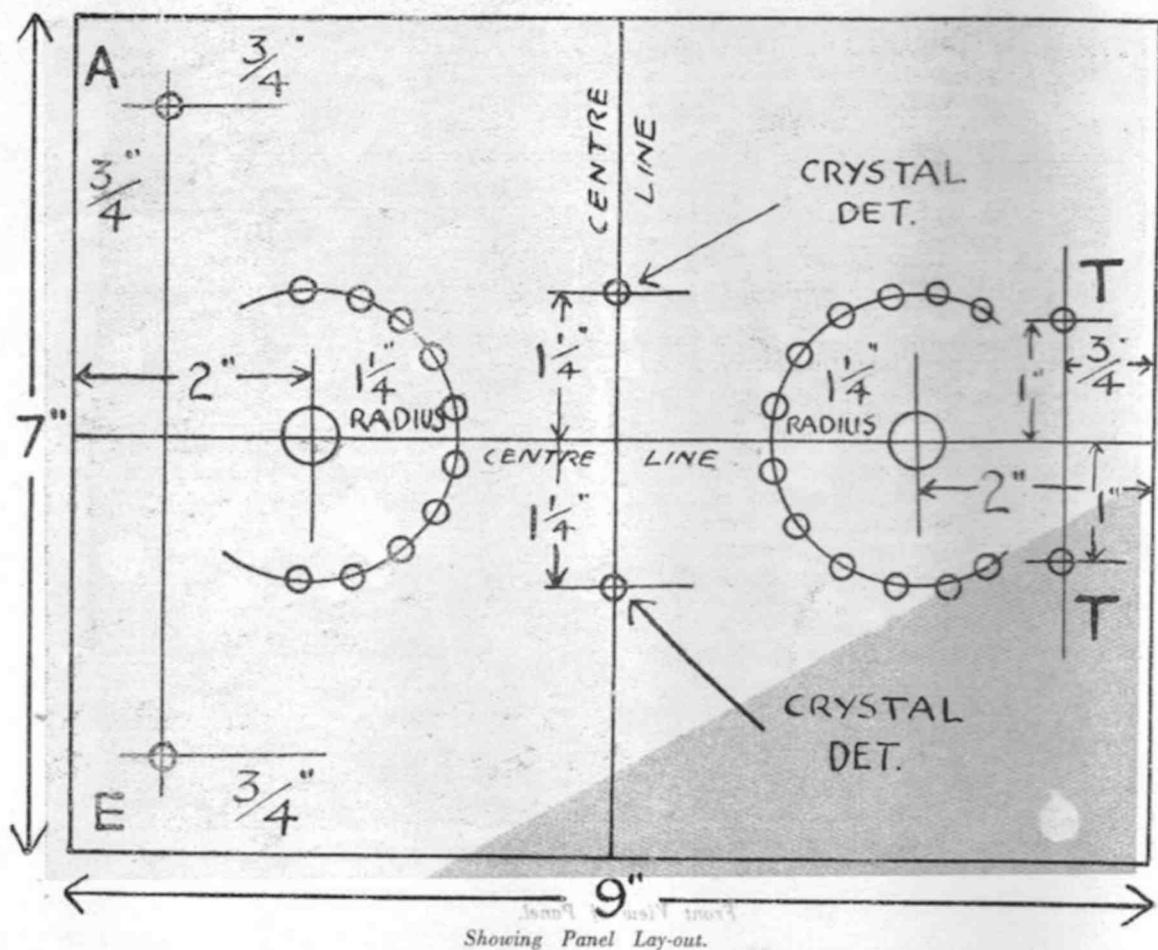


Front View of Panel.

so-called "ites" on the market. Now, let's start. Pick up the cardboard former and pierce three pen-holes, say, $\frac{1}{2}$ inch from one end. Through these holes thread the end of the d.c.c. wire, and wind on closely 10 turns, taking a tap at the tenth turn by making a small loop, and wind on still 10 more turns, taking another tapping as before. Continue the winding and taking taps every 10 turns until 110 turns are wound on them; finish off by winding a further 10 turns, taking taps at every single turn until the end. Thread the end of the wire through the former as before to hold it securely. Always stagger your taps—that is, don't take every tap on the same level; rather take each tapping about half an inch below the previous one, so that no interference will take place when soldering. This winding process is easy, yet tedious, so knock off and enjoy a smoke. I am still

smoking the Christmas cigars kindly sent along by various friends. Very kind of them, I must say! Thanks!

Some folks prefer to give this coil a coat of shellac. If you wish to do so, do so by all means. It will help to secure it. The panel has now to be prepared. The drawing here will give you the measurements, so lay yours out accordingly. I haven't shown it on this drawing, but the distance between stud centres is generally three-eighths of an inch. To assist you, a few hints here won't be out of place. First of all, mark the positions of your four terminals next your switch arms then the crystal detector. The measurements I have given for this just suits the AWA detector. If yours is of a different brand you will, of course, determine for yourself the necessary measurements. Now, using a pair of dividers, describe two semi-circles $1\frac{1}{4}$ inches in diameter, taking the centres from the already marked switch-arm cen-

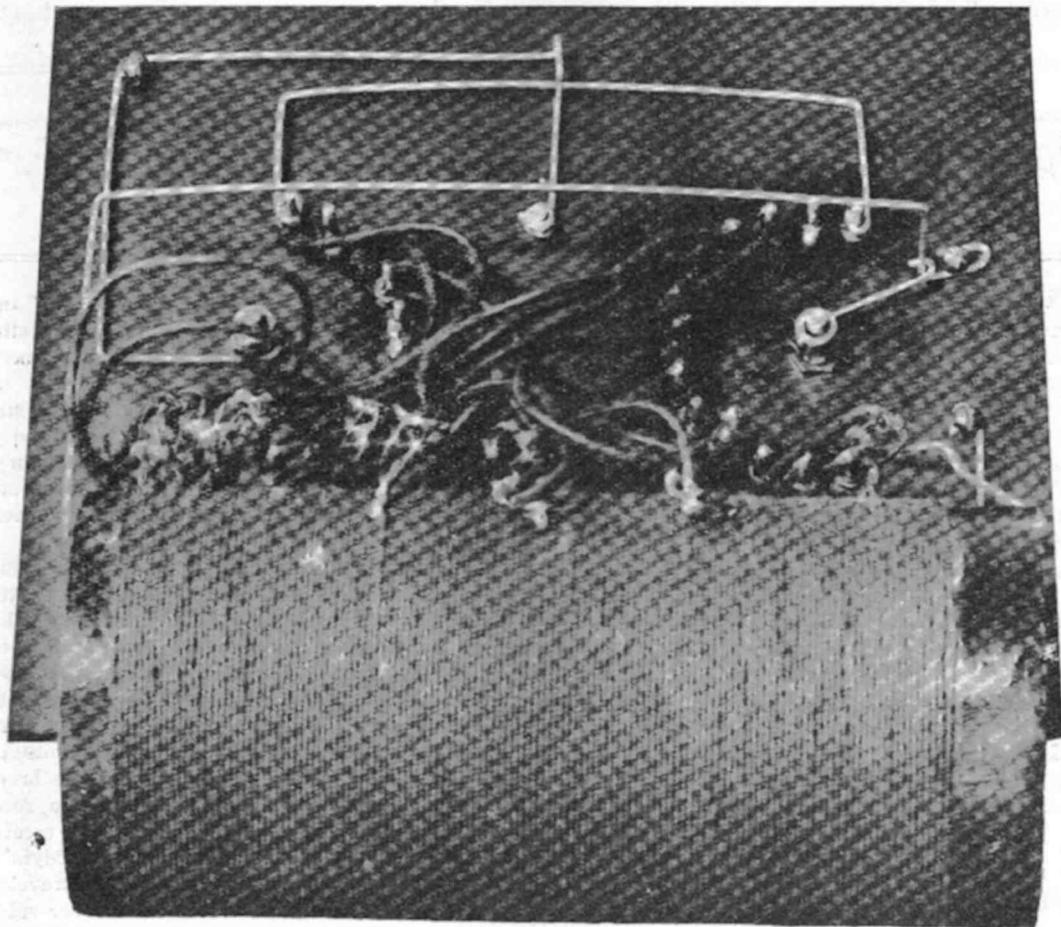


tres. If a pair of dividers is not on hand, sing out over the fence to the next-door neighbour and borrow his. In the event of this method failing, just sigh and drill a 3/8 inch hole for the switch arm and use the switch arm itself to describe these semi-circles.

Carefully mark off the centres for the contact studs three-eighths of an inch apart, as I have already told you. The best way to mark out this panel is to use a centre punch, or a nail if you haven't such a thing as a centre punch. Place the point of the punch on the desired position and give it a tap with a hammer. A neat indentation will be the result, which will prevent the drill from slipping and badly scoring the panel. Right-oh! Now drill all the holes, being careful not to force the drill too hard, as bakelite is a very flaky stuff

to handle. Mount everything on this panel; better still, get someone, your brother, wife, or a sister to do this while you bare the insulation off the taps on the wound coil. This baring can be done by scraping with a knife or file, or perhaps you would like to burn it off. But off it must come.

Look around and find your lighting flex and cut it into short pieces six inches long. Bare the insulation off each end of these short pieces, and twist one end round each tap. Apply a little flux, and with a good, clean, hot soldering bolt solder well. After this is done, put the soldering iron back to reheat while you wire up the back of the panel. Use the stiff busbar for this job. Connect the unit switch to the aerial terminal, thence to one side of the crystal detector. The other side of the crystal detector is taken to the top tele-



Back View of Panel.

phone terminal, while the bottom phone terminal joins the right-hand switch and thence to terminal E. Join the two top contact studs as I have already told you. Your soldering bolt should now be hot enough to tin the tips of all the contact studs. Apply a small portion of flux to each stud, and with the iron, holding a little solder, tip each stud until a small "blob" of solder is left on each one. I know that during this process you'll burn your hands, spill the solder between the studs—in short, do everything but what you are expected to do; but, never mind, it's all in a good cause. Such is wireless.

Leaving the panel lying on its face, bring the coil up to it and solder the flexible leads to their respective studs. Start with the beginning of the coil, soldering it to the bottom stud of the tens, the first tapping of the tens to the second bottom stud, third to third, and so on until you come to

the second top stud; the top is already engaged, you know. Now the units; the last tapping is soldered to the bottom unit stud, second last to second bottom, and so on until all the flexes are soldered to their studs. You are finished, people. You are finished, and are now in a position to listen-in. Hook up to your aerial and earth, place a piece of good sensitive crystal in the cup, and connect up your phones. Rotate the tens switch until a signal is heard at its loudest, and by rotating the units switch you will be able to indulge in fine tuning. In an hour's time you will have more knowledge of this set than I could tell you by chartering the whole "Wireless Weekly" for the purpose, so go to it. Oh, I forgot to tell you that by connecting a .001 phone condenser across the phone terminals sometimes better results accrue. Try it for yourself and, say, if you are handy with carpenters' tools, a neat little cabinet can be fashioned to enclose the whole. Best of luck!

A Very Selective 3-Valve Receiver

(By "Wireless Weekly.")

BEFORE commencing this article, please let us convey our appreciation of the many letters which have reached us concerning the circuits we have already described. It is a pleasure to us to know that so many are genuinely anxious to build good receivers, and these are certainly tried and proved receivers that we write about—the kind that it will pay you to build when you get that restless feeling that drives you into the workshop on Saturday afternoons or on those evenings when time hangs heavily. Now, one important point we want to impress. The nature of the inquiries we have received shows us that no two persons seem to look at things the same way, which convinces us that no human being can describe a thing so that everybody can understand it. So if in these articles there are any little points which are not perfectly clear, just write and ask us; but, before you do, please read the conditions at the bottom of page 11 (Questions and Answers).

The article this week refers to the kind of set everybody wants—something to bring in that very fine band over at 6WF (Perth) and all the other stations. Read it carefully.

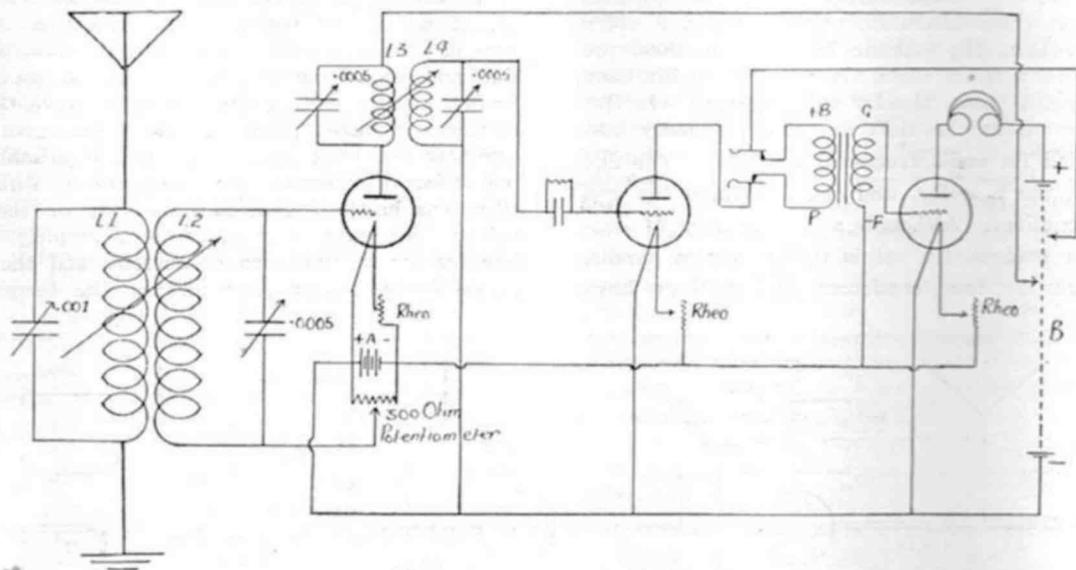
Probably nowhere in the world is a selective

long-range receiver required more than in our capital cities, particularly Sydney and Melbourne and their surrounding suburbs. Here we have our broadcast stations using very large power, to say nothing of the commercial and naval stations which are situated so close and which so often tend to mar the night's programme (even from local reception) by jamming perhaps the best item of the evening or the one which we are most interested in.

The craze of local reception does probably not last long with the experimenter or even with the more advanced listener-in. We feel sure that as soon as commercial receivers are capable of receiving Melbourne or Perth satisfactorily (here in Sydney) that an impression will be made on broadcast listeners generally, and encourage them to buy the better class selective set in spite of the increased cost. In America, where the broadcast stations are very numerous, neutrodyne receivers are most commonly used; this type of receiver is out of the question here, as the neutrodyne principle is not at present efficient beyond wavelengths of 600 metres. In describing this three-valve reflex we want to stress the fact that it is really excellent. In actual test, we recently listened to the whole programme from 3LO and 6WF (Mel-

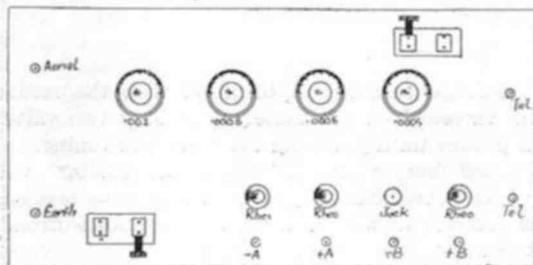
garding the grid return of the detecting tube. Circuit diagrams show grid returns on + A; this is correct for most of the American valves, but quite a lot of the English valves work better with this connection made to the - A.

Check and re-check your connections before you finally test your finished receiver; it is quite



an easy matter to make a wrong connection with reflex circuits. Don't place the two 2-coil mounts relative to one another; if you do, interaction will take place no matter how far apart they are. It is advisable to stagger them. If this is not practicable with the two coil mounts you have, place one at the bottom of the panel and the other at the top.

Front View of Panel



Use separate rheostats for each valve, being careful that they are of the right type to control your particular type of valve. The secondary of the 1st transformer should be placed on the base as near to the secondary coil holder as possible.

If circuit diagram No. 2 is adopted, use a 300 ohms potentiometer as a stabilizer.

The following materials are required to build the three valve reflex:—

- Panel, 24in. x 9in.
- 3 Valves.
- 3 Holders.

- 3 Rheostats to suit valves.
- 1 Grid leak and condenser (good type).
- 1 .001 Condenser variable (preferably with vernier).
- 3 .0005 Condensers variable (preferably with vernier).
- 2 Audio transformers.
- 2 Two-coil mounts.
- A and B batteries to suit valves used.
- 8 Terminals.
- 1 Double circuit jack.

Circuit diagram No. 2 only requires one audio transformer, but requires a 300 ohm potentiometer extra.

The following coils are required to tune to the various broadcast stations:—

Station.	Locality.	Coils.			
		L1	L2	L3	L4
2BL	Sydney	25	50	50	50
3AR	Melbourne	35	75	75	75
2FC	Sydney	100	200	200	200
3LO	Melbourne	150	250	250	250
6WF	Perth	100	200	200	200

If short aerials are used, larger coils will be needed in L1.

VOICES FROM THE ZOO.

The proprietor of a big Canadian hotel lately broadcasted the singing of the hundreds of birds he kept in his aviary. It was claimed that country people were fooled into looking out the window for the birds. The B.B.C., however, have gone one further, and the roar of the Zoo lions and tigers have resounded in the loud speakers all over England. The difficulty is that most animals will not perform to order at a stated time, and many of the most interesting voices are sure to be dumb at the time when the receiving apparatus is presented to them. No doubt the walrus and the rattlesnake, to take two extreme examples, will respond, the first to an offer of food, and the second to a very gentle prodding. But lions and tigers raise their voices fitfully for no particular reason. The offer of food causes a rush and a few growls, but seldom, if ever, a resounding roar.

The dogs and wolves howl only in chorus, and it is most easy to excite them when the Gardens are empty after dark; an unexpected footfall, and, better still, the imitation of their voice will usually set off one or other in the row of dens, and then in a few seconds the whole set are in chorus. A little

encouragement is enough to induce most of the parrots, cockatoos, and macaws to shriek, but even if it were their time for full song, singing birds are not easy to set off against their will.

Some of the most striking voices are heard only at long intervals and under special circumstances. Hyraxes, for example, yell like lost souls, as is well known to all who have visited the African tropics. But usually they are silent, except that now and again one of them will give a warning note, short and husky, and all when pleased twitter gently like a bird. Kangaroos under all normal circumstances are so silent that they have been supposed to be voiceless. But once when one was being held firmly in the sanatorium whilst its skin was having a disinfectant rubbed in, it burst into a very loud and harsh rolling yell, rising and falling in waves, and recalling the most unpleasant voice of its carnivorous ally, the Thylacine or Tasmanian wolf. Probably much curious information as to the affinities of animals could be derived from a study of their voices. But the observations could be made only at intervals when a lucky chance presented itself to an investigator armed with a gramophone.

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1 N.P. Detector Parts	1 9
4 N.P. Terminals	1 4
1 Guaranteed Crystal	1 0

14 8

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1 Piece Drilled Ebonite	1 4
1 N.P. Detector Parts	1 9
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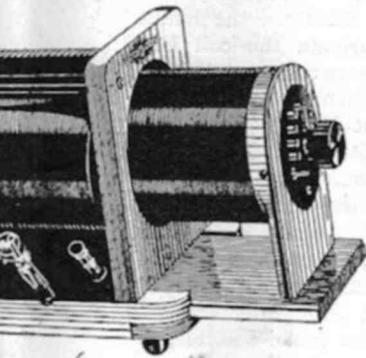
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1 6-ohm. Rheostat	4 0
1 English Valve Holder	1 6
8 N.P. Terminals	2 8
2 Lengths Panel Wire and Screws	0 3
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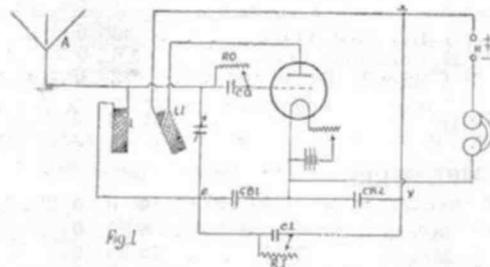
THE FLEWELLING RECEIVER

(By R. Ginders.)

A ONE-VALVE circuit which will give the same signal strength on a small indoor loop aerial as that usually obtained with a reaction coupled single valve when linked up to an outside standard aerial of 100 feet, cannot fail to arouse the interest of every keen amateur.

The Flewelling receiver is capable of doing this and of giving other equally remarkable results in long range work. At the same time it is remarkably selective and free from interference. As the circuit is very liable to oscillate, it is desirable to confine operations to a loop aerial, particularly if there are other receiving sets in the vicinity.

The arrangement can be built up from an ordinary single valve set at very little extra cost. The only additional parts required are three fixed condensers, which can be bought for two or three shillings each, and a couple of variable grid leaks,



which can be made at home from cardboard strips, either soaked in Indian ink or bridged with lead-pencil markings of various thickness.

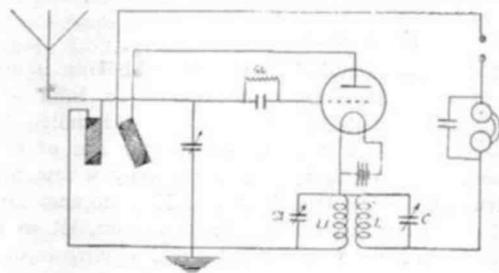
Fig. 1 shows the assembled parts. As previously stated, the aerial is preferably an indoor frame or loop, or it may consist of a few feet of elevated wire. The aerial inductance marked L is a plug-in coil mounted on a two-coil holder. The reaction winding L1 is another coil, one end being connected to the plate, whilst the other end is brought round via the branch XY to feed the grid circuit through the fixed condenser C1. The other lead from the point X passes to the high tension, and through the phones to the filament in the ordinary way. Leaving the branch XY and the associated condensers C1, CB1, and CB2 out of consideration for the moment, it will be seen that, apart from the variable grid leak marked R0, the arrangement is identical with the ordinary back coupled single valve receiver. Signals received on

the aerial circuit are fed to the grid, and are reinforced by back coupling through the coil L1 in the plate circuit. Owing, however, to the introduction of the branch conductor XY, the complex currents flowing in the plate circuit are split up. The rectified or audible components produced by the action of the grid condenser C0 and leak R0 pass through the phones back to the filament in the ordinary way. On the other hand, the high frequency currents (which are necessary to maintain the building-up or retroactive effect through the coil L1) avoid the high impedance path containing the HT battery and phones, and flow down the branch lead at X until they reach the point Y.

Here a further division takes place. A part of the high frequency energy completes its circuit back to the filament through the fixed condenser CB2, which in effect is placed in shunt across the plate battery and phones, i.e., it takes the place of the ordinary by-pass condenser. The value of this condenser is therefore not essentially critical, although .005 micfarads will be found suitable, in combination with the other condenser values set out elsewhere. The remainder of the high frequency energy takes the second path open to it, i.e., through the condenser C1, which, it will be noticed, is connected to the grid circuit of the valve at the point E. An electrostatic transfer of energy therefore takes place between the grid and plate circuits through the medium of this condenser, which, as shown, is shunted by a variable resistance or leak, R1.

Beginners in wireless will not, perhaps, understand clearly why the capacity C1 is able to transfer energy in this manner. It must be borne in mind that, although a condenser prevents the passage of a steady or direct current, it does not act in the same way in the case of an oscillatory current. The higher the current frequency the more readily does it pass across a condenser of given value. The same action is involved in the resistance capacity coupling sometimes used to connect a high frequency amplifier to the succeeding valve. In just the same way the high frequency plate currents, with which we are at present concerned, are able to "jump" across by a process of charging and discharging the opposite plates of the condenser C1, and so find their way on to the grid of the valve. The variable grid leak R1 serves to regulate and control this action. The

effect of the transfer of this energy is to throw additional potential variations on to the grid of the valve. This in turn "upsets" the steady retro-action between the coils L and L1, which by themselves tend to throw the valve circuit as a whole into a state of steady or sustained oscillation. When correct adjustments have been made, the valve should be in a state where it is alternately being pushed forward to the point of oscillation by the coils L, L1, and immediately afterwards is being damped down or restrained by the effect of the potential variations applied through the condenser C1. Those who are acquainted with the Armstrong super-regenerative circuit will know that a valve set on the "threshold" of oscillation in this way is capable of producing the highest degree of amplification possible. The correct "setting" of the valve necessary to obtain this result is mainly controlled by the value of the variable leak R1. It also depends in part upon the value of the condenser C1, in combination with the size of the parallel condenser CB2, and lastly to some extent upon the setting of the second variable leak R0. In practice it is found that good results are obtained by making the condenser C1 equal to CB2, i.e., about 0.005 microfarads each.



The resistance R1 and R0 should cover at least two to three megohms, but the effective amount in circuit can only be determined by actual trial, and it will be found that the precise setting is decidedly critical.

The main purpose of the third condenser CB1 is to prevent the high-tension battery from being "shorted" by the resistance R1. It will be seen that the point Y carries the positive voltage of the plate battery, so that unless the resistance R1 is kept very high there will be a closed circuit from the positive HT through the leak R1 to the filament, and then through the phones back to the negative pole of the HT. The same purpose is also served by the by-pass condenser CB2, which prevents a direct short-circuit of the high tension through the telephone windings. The value of the grid condenser C0 is 0.003 microfarads.

For the ATC, the usual variable condenser may be used, but it is advisable to keep the aerial capacity as low as possible in order to get the best results. If an ordinary aerial is used the system is earthed at the point E. In practice the earth lead frequently proves a source of trouble, owing to the resultant disturbance of the electrostatic coupling between the grid and plate through the condenser C1. It will be found somewhat difficult at first to get rid of internal "noises," which generally take the form of a high-pitched whistle. This is caused by the frequency of the "pulses" from the condenser C1, which, as previously explained, result in "stopping down" or interrupting the self-oscillation of the valve. With a little care, however, this pulsation frequency can be made so high as to become practically inaudible, without interfering with the extreme sensitivity of the set.

A similar difficulty with internal noises is also met with in the case of the Armstrong circuit, in which, it will be remembered, a separate "damping" generator is usually employed to prevent persistent "self-oscillation." For purposes of comparison a simplified diagram is given in Fig. 2 of a single-valve Armstrong super-regenerator, for which a separate "damping" oscillator is not required. It will be seen that the electrostatic coupling provided by the condenser C1 in Fig. 1 is here replaced by an electromagnetic coupling between the tuned circuits L, C, and L1, C1. The frequency with which the "self-oscillation" of the valve is stopped down or interrupted is controlled by the separate tuning of the circuits C, L and C1, L1 in the Armstrong arrangement, whereas in the Flewelling circuit the same result is achieved by the easier expedient of using the variable grid leak R1 to regulate the discharge period of the coupling condenser C1. The construction of the Flewelling receiver is sufficiently simple and the results obtained are of such a nature to warrant investigation by every amateur.

It should be remembered, however, that, as already stated, as the current is extremely liable to oscillate, either a frame aerial should be used or the experiments should not be carried out during hours of broadcasting.

Some Notes on Loop Aerials

(By R. H. Langley.)

THE loop aerial is a very interesting device. It is quite different in its method of operation from the outdoor aerial, which is in effect nothing more or less than a condenser. It is a very large condenser, to be sure, so far as its physical dimensions are concerned, but electrically it is a relatively small one. The loop, on the other hand, is an inductance. This fundamental difference between the two is the reason why it is necessary to use different methods of tuning in the two cases.

Let us examine this special form of inductance, which we call a loop, and see why it serves as a pick-up device for wireless signals and how it should be made effective.

There is a very close parallel between the ordinary direct current generator or dynamo and the loop aerial exposed to passing electro magnetic waves. In the dynamo a number of coils corresponding to the loop aerial are rotated in a powerful magnetic field. The purpose of rotating them is in order that they may move with respect to the field, and thus have a voltage generated in them. The amount of this voltage depends, of course, upon the strength of the field and the speed at which the wires are swept through it.

In the radio case the coil stands still, but the field moves swiftly past the coil, thus accomplishing the same result. The speed at which the field moves cannot, of course, be varied, and is always the speed of light—that is, 186,000 miles per second.

Voltage Generated.

Let us see now what form of loop would have the greatest voltage generated in it by a passing radio wave. Let us think of this radio wave as very much like great smooth waves on the ocean, which, of course, move forward with a very definite velocity. The turns of wire on our loop aerial are necessarily in series with each other—that is to say, they form a continuous winding. If the maximum voltage is to be generated in any one turn of the loop, then the voltage generated in the two sides of this turn should be in opposite direction, so that they may add and not oppose each other. If the voltage generated in both sides of the loop were in the upwards direction at any one instance, then these two voltages would cancel each other, but if the voltage on one side of the turn was up and on the other side of turn it was down, then they would add, and if the loop were connected to a receiver, a

current would flow around the turns of the loop. This is, of course, exactly what we wish to have happen.

Now, in order to have the voltage generated on one side of the loop in the opposite direction to that generated on the other side of the loop, the loop would have to be one-half a wave length long—that is to say, it would have to be long enough in the horizontal direction so that one side was in the crest of the wave when the other side was in the trough of the wave. Since the distance between the crest of the wave is the wave length itself, then the distance from the crest to the trough is one-half the wave length.

The higher the sides of the loop are, that is the longer the vertical wires are, the greater will be the voltage generated; and, of course, the voltage generated in each turn is added to the voltage generated in all the other turns.

Wave Length of Loop.

But a loop one-half a wave length long is quite out of the question. It would be as long as a steamship and almost as difficult to handle. The loops which we are using every day are of quite reasonable dimensions. They are only a few thousandths of a wave length long. How do they function? In order to answer this question, let us ask ourselves how we would build a coil of wire in order that absolutely no voltage should be generated in it by the passing wave. The only way in which this could be accomplished would be to so build the coil that the same voltage would be generated in both sides of it, and that the voltage generated in the two sides would be opposed to each other. This would give a complete cancellation, and no voltage at all at the terminals of the loop or coil. It is obvious that the only way in which this could be done would be by so arranging the loop that it had no length at all. That is to say, arranging it so that the two sides were exactly in the same position in space. This would mean that the horizontal wires across the top and bottom of the loop would cease to exist, and the loop would become nothing but a wire laced upon and down between pegs on the plain surface of a board.

If there is any distance at all between the two sides of the loop, then, there will be some difference, not in the amount of voltage generated in the two sides, but in the time at which this voltage is

generated, and there will consequently be some voltage at the terminals of the loop since complete cancellation of voltages cannot occur.

Directional Properties.

If the loop is rotated so that its horizontal wires are at right angles to the direction in which the signal is coming, then the loop has no length so far as those signals are concerned. The passing wave strikes both sides of each turn in the loop at exactly the same instance, and the voltages generated are, therefore, equal and opposed, and there is no terminal voltage. This is, of course, the fact which gives the loop aerial its very useful directional property. It has to be noted, however, that if the loop is turned ever so slightly from this zero position, then the voltages no longer cancel and there is a voltage at the terminal. This means that the zero position of the loop is very sharp, but the maximum position is very broad.

In applying the loop aerial to an actual wireless receiver, it is necessary that provision be made to tune it to resonance with the desired signal. This is accomplished by means of a variable air condenser, and since this condenser has a very definite maximum capacity, the amount of inductance which the loop can have is also limited. This maximum inductance, with the maximum capacity of the variable condenser, must give resonance to the longest wave to be received. The specification for the best loop aerial, therefore, is that it shall have just as many turns as possible, each turn being just as long as possible and just as high as possible, and still have no more than the required maximum inductance. The higher the loop is, the greater will be the voltage generated in each side of each turn, and the longer it is, the greater will be the difference in time at which these voltages are generated in the two sides of the loop, and consequently the greater will be the voltage at the terminals, but it must not have an inductance value greater than that required for tuning.

Now, the inductance of a coil of wire increases very rapidly as the turns are wound closer together. The maximum inductance is obtained with the minimum number of turns when they are wound just as close to each other as possible.

In order to get the maximum number of turns for a given inductance, which is what our loop requires, the turns should be wound just as far apart as possible. Now, it is found that this spacing is best accomplished by winding the loop on a frame which has the form of a vertical cylinder. The wire goes up one side of the cylinder, across the top and down the other side, and across the bottom, and turns are spaced around the circumference of the cylinder so that the complete winding covers an arc of about 120 degrees on each side of the cylinder.

The Winged Clocks of Wembley

AMONG the many public services which contributed to the success of the B.E.E. at Wembley and the convenience of visitors, mention must be made of the electric impulse clocks operating on the pulsometric system and installed by the makers, Messrs. Gent and Co., Ltd., Leicester.

These clocks were fixed in prominent positions in various parts of the exhibition, and were recognised by the unique winged design made and registered for the purpose of the exhibition.

The time circuit on which these clocks operated, and which involved over 2½ miles of wiring, consisted of ordinary 18-gauge electric light wire. This was stapled to walls, fixed in casings, run in tubes and laid underground, and all the difficulties of wiring in modern works were met and surmounted.

The time transmitter driving all the pulsometric clocks, both in public positions and fixed on exhibition stands, could be seen just inside the Watt Gate of the Palace of Engineering, at the base of the largest piece of plate glass in the world; and, incidentally, raising the eyes when looking at this transmitter, one saw through the big sheet of glass an 18 inch diameter winged clock over the main entrance.

The complete arrangement of pulsometric clocks at the exhibition demonstrated the important part which such a system plays in modern industry and commerce.

The energy required to operate the pulsometric transmitter and impulse clocks is so small that leclanche cells are used for the purpose. The transmitter sends electrical impulses every half-minute round the complete circuit, and thereby advances the hands of all pulsometric impulse clocks a corresponding degree.

These impulse clocks range from small 12 inch diameter clocks to larger sizes 36 inches in diameter. There are also four turret clocks. These clocks are driven by waiting train movements in lieu of impulse movements to meet the requirements of large turret clocks having hands exposed to the elements, but for timekeeping they are controlled by the impulse transmitter. These waiting train movements are of the same type as those driving the hands of the large clock on the Royal Liver Building, Liverpool, which having four 25 ft faces is the largest electric clock in the world.

Not the least important feature of the pul-

synetic system is that existing workmen's recorders can be included in the time circuit by means of the patent reflex control fitment which ensures these instruments also keeping time with the other clocks in the circuit, and incidentally with each other, and maintaining throughout a factory, works or other industrial establishment one factory—one time. Some of these "reflex" fitments were seen operating on workmen's registers at the exhibit of the National Time Recorder Co. Ltd., Bay 4, Avenue 5, of the Palace of Engineering; and it should be remembered when these were viewed that they were simply connected to the circuit on which all the pulsynetic clocks, large and small, were operating.

ESPERANTO AND THE AMATEUR.

Like Australia, Great Britain framed wireless regulations for the amateur years ago that in their application to present-day methods of transmission and reception are about as useful as a ton of coals in the Sahara. Quite aside from the ever-present problem of international relations, there can be no harm in times of peace and racial harmony in British amateurs communicating with their fellows in foreign countries. Overlooking the fact that under the banner of experimental wireless there are no creeds, no colours, and no religions, this international amateur communication all helps towards the attainment of that ideal politicians the world claim as their life objective—world peace, and a tolerant attitude towards the rest of mankind. Years ago the British Wireless Regulations laid it down firmly but nicely that, in effect, the British experimental transmitter must not hobnob over the ether with foreigners. That rule is still in force to-day, but as is shown in the following correspondence between the Internacia Radio Associa and the British P.M.G., you have but to toe the carpet, smile pleasantly, and the wide world is yours (on the key):—

9th October, 1924.

The Postmaster-General,
Department of Wireless Telegraphy,
G.P.O., E.C.

Dear Sir,—I have been instructed by the Council of this Association to communicate with you on the subject of amateur radio communication between this country and abroad.

My Council feel that the new restrictions which have been introduced will undoubtedly prevent the natural development of international relations between wireless amateurs of different countries. At such a time as this, when almost every day countries are giving more freedom to

amateurs for receiving and transmitting, and when the valuable work done by amateurs in the past and at present has enabled communication to be set up under what have hitherto been considered impossible conditions, it appears to us to be a serious retrograde step to place restriction on free intercourse between amateurs of this and other lands.

Surely the barrier of language is at present a sufficient deterrent against indiscriminate and unnecessary transmissions abroad! A number of amateurs in this country and other countries have been preparing to commence tests in Esperanto, by means of which they hope to obtain better results than previously on account of the greatly extended field Esperanto opens out to them, but the new restrictions will, I am afraid, be a very severe handicap.

We trust that this matter will be reconsidered by you, and that you will see your way to abolish a restriction which will hinder the valuable work of the radio amateur.

Believe me to be, sir,

Yours faithfully,

(Signed) H. A. EPTON,

Hon. Sec. Internacia Radio-Asocio.

General Post Office, London, E.C.1,

17th October, 1924.

The Hon. Secretary,

Internacia Radio-Asocio.

Sir,—With reference to your letter of the 9th October concerning wireless licenses, I am directed by the Postmaster-General to say that the restriction which you mention is not new. When the conditions respecting experimental wireless licenses were settled after the war, experiments were limited, as a general rule, to those carried out in co-operation with not more than five specified experimenters in this country. Early in 1922 the limit of number was abandoned, but the scope of experimental communication was not extended to other countries.

It has been the recognised practice for licensees to apply for special permission where they wished to carry out experiments with places abroad. Many such permits have been given, and the Postmaster-General is still prepared to give permission at once in approved cases.

I am to add that he is now in communication with the Radio Society of Great Britain on the general question of the conditions under which wireless sending licenses are issued.

I am, sir,

Your obedient servant,

(Signed) J. F. BROWN.



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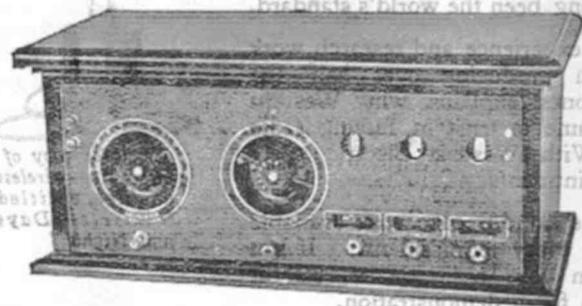
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A TALE OF AN AERIAL

By Insulator.

IT is sometimes nice to cause excitement—and sometimes not. This week end I caused some excitement and it wasn't in any way nice. I'll tell you all about it so that some of my readers will "read, mark, learn and inwardly digest."

Recently I changed my residence. Like all good wireless men the aerial went up before the lines went down. As I didn't bring the old flag-pole I resorted to a vacant allotment behind me and "found" some timber that a builder had left behind. Jimmie was with me—Jimmie is always with me when there is hard work to be done—and between us we built a mast (?). Two pieces of 4in. x 3in. each 20 feet long were nailed together. Not being sufficiently long for the purpose a 16 foot length of 2 x 1 was nailed on as well. Then one insulator was tied to the top and the aerial tied to the insulator, a single backstay was fitted, and everything was ready for erection. Taking the backstay with me I repaired to the aforesaid vacant allotment and steadied things while Jimmie raised the pole. When almost up Jimmie yelled "Give me a pull, Bill!" I did and with a vengeance—pulled the pole over the fence and Jimmie, for he was hanging on to the base. This operation was repeated but finally the pole was erected and nailed to the fence. The single guy was made secure and we adjourned to the back street to survey our handiwork. Beyond a list of 30 degrees everything was alright. Of course this was only a temporary job—just how temporary we didn't know at the time. But that wasn't the excitement. It arrived with the first blow of wind last week end. And didn't it blow? I didn't pay much attention to the weather until a child called, saying, "Mother ses your wireless is going to blow down on our house, and would you mind stopping it?" Stopping it! Glory, nothing on this earth could have stopped that blessed timber if it wished to come down. The whole afternoon was spent watching that old pole dipping over the house next door. All the neighbours were out assisting me in the watching process and called cheering words, such as, "She's over," "Next time does it," and so on. Then did I wish that I had spent a few more moments before sticking it up and added a few guys instead of only one. A mighty heave and a long drawn creak made my eyes nearly bulge out of my head but the old pole still weathered the gale. Noble thing I thought.

When this gale is over I shall build a pole like Brown has two doors away. Brown's pole will last any storm I felt sure for there were more guys than anything else. I cast envious eyes at Brown's 40 feet standing as solid as a rock and then at my own apology wobbling, swinging, and creaking.

At midnight the old pole was still swinging so off to bed I went. In the stilly hours I woke with a crash as if the whole roof had fallen in on me. "The aerial," screamed Mrs. Insulator. Out of bed I jumped and on reaching the top of the yard in blinding rain, I found the old pole still intact. What was the noise I wondered? Everywhere was searched to no avail. Back to bed thinking I had dreamt about the crash. Dawn came and still more wind. With feelings of awe I gazed at the old pole still swinging in the wind. A careful examination of the fence proved that everything was still alright, not even a nail sprung. Not such a bad old pole after all, thought I. What was the crash in the middle of the night I wondered? Strange thought I, and strange it was, for turning my gaze to Brown's direction I saw that his nicely painted, well insulated and splendidly guyed 40 ft. mast had blown through his roof!

ARTARMON RADIO CLUB.

We have been advised that a very enjoyable evening is being arranged by the members of the Artarmon Radio Club to close the year by a New Year's Eve dance and gala night, which will be held at the Masonic Hall, Artarmon, on Wednesday, 31st December, 1924.

By permission of the Deputy Director of Navigation a grand display of rockets, throwing star shells and other fireworks will be held at midnight close to the dance. This will be something new for the residents of Artarmon, who are looking forward to the event.

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SOLE AUSTRALIAN DISTRIBUTORS

(Continued from Page 13)

cargo boats are fitted with similar sets.

This is made possible, largely, by the advance of knowledge in wireless science, and the eagerness of wireless engineers to avail themselves of the results of extended research. One immediate effect is that transmitters are greatly reduced in size and weight. This is particularly noticeable in sets designed for installation on ships, the present-day method being to build the entire set at

the factory, where it is given a rigorous test, after which it is packed as a whole and sent by rail to the vessel. Once received on board, it is unpacked, placed into position and bolted down. All that now remains to be done before it is put into operation is to connect the various parts to the ship's mains—an hour's work.

The wonderful growth of broadcasting has greatly increased the limits of the radio engineer's activity. Broadcasting in its inception presented a

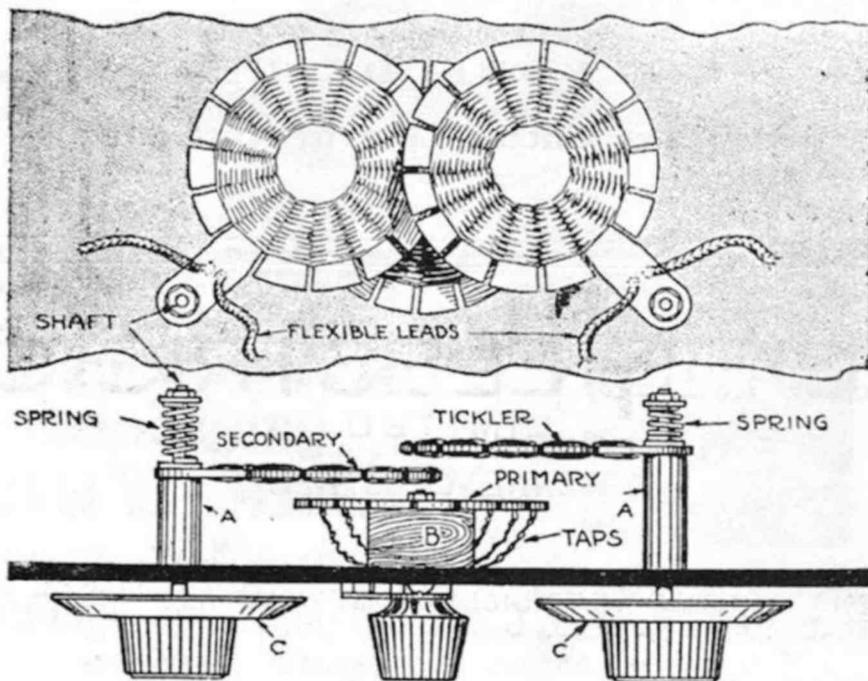
A New Method of Mounting Basket Coils

Primary Coil is Tapped for Selective Tuning.

THE coil control described in this article takes the place of three honeycomb coils and gives it many advantages over these coils. The coils are mounted at the back of the panel, thus improving the appearance of the set and protecting the coils from dust. The primary coil may be easily tapped for fine tuning, and the panel in the front of the coils is shielded with a piece of tinfoil, thus reducing capacity effects.

The coils are similar to spider web coils in construction, and the form for winding the coils is the same except for one of the winding legs which is made longer for connection to the shaft, as shown.

All arms of the primary or stationary coil are the same length and the coil is fastened to the panel with a small block B, and a bolt is shown. The stationary coil may be very easily tapped, the leads being brought to contact points of the panel. A threaded shaft is required for each moveable coil, this being fastened to the coil form with two nuts. A section of brass tubing A is cut and used to space the coils and keep them from touching. A spring, together with necessary washers and nuts keep the shaft with the coil mounting pressed against these pieces of tubing. A dial C is fastened into the other end of each shaft to turn the coils away from the others. The coils are arranged in order as is clearly shown in the illustration.



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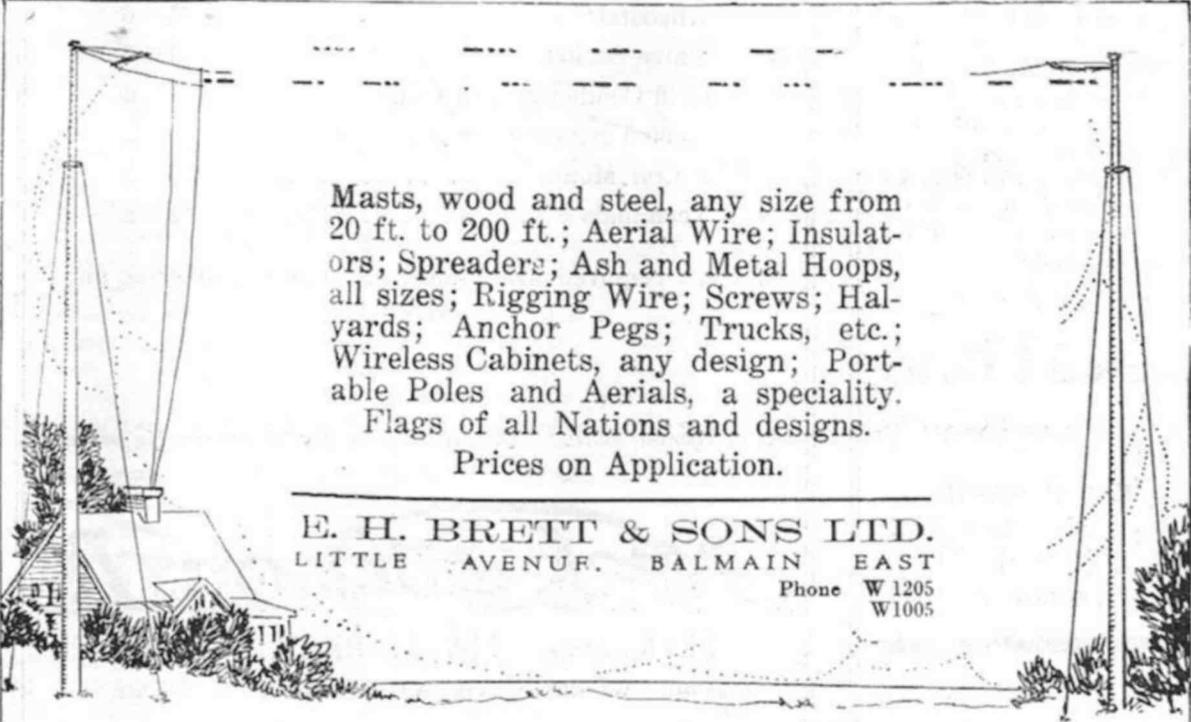
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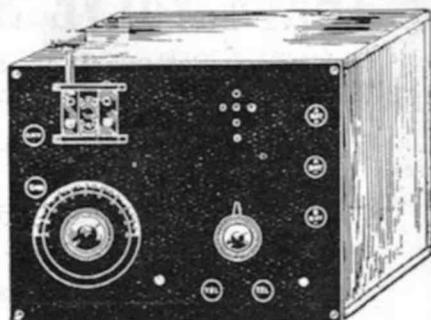
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INTERSTATE NOTES

WESTERN AUSTRALIA

TWO performances of the "Geisha" have been broadcasted from His Majesty's Theatre by 6WF. Every word uttered on the stage was clearly reproduced and it can be safely counted amongst 6WF's most successful broadcasts.

Traders, wholesale and retail, are now preparing their exhibits for the radio exhibition next week. A great assortment of new goods will be on view and good advertisement is being given the display. It is essential, however, that loud speaker demonstration be limited, as these always tend to create a wrong impression of wireless music. The headphones can be used quite satisfactorily and leave nothing to be desired in reproduction.

A radio enthusiast has combined the joys of motoring and listening in by attaching a shelf for his portable set to the wind shield of his automobile. Tuning operations are conveniently carried out by the individual sitting on the front seat with the driver.

At the conclusion of general business at a recent meeting of the Subiaco Radio Society, a lecture by the Club's technical adviser (Mr. A. E. Gray) was given on "Low Power Transmission." A complete transmitting set was used, and the different circuits were enumerated and explained during the lecture. For purposes of demonstration an artificial aerial was used; the meanings of the various metre readings were made clear and a temporary circuit of a modified Hartley type was used and comparisons were drawn between tube ratings as used by American amateurs, and the power input method, which was the correct method for the determination of power used, and which was standard with Australian experimenters. In this case with 600 volts on the plates a plate current of 40 milliamperes was registered which was shown to be 24 watts power input and the aerial ammeter registered 5 amp, which, of course, was in the artificial circuit and not being radiated. VIP is now on Tonic Train transmission, and his note has the same warbly effect that makes VIS so easy to distinguish. Even with the worst of non-selective circuits, listeners-in should be able to tune him out during 6WF's transmission as the wave is very sharp.

I intend to spend the Xmas holidays in the ranges in company with that warm friend, the portable radio set. The one I have is a two-valve, 1 high and low "Crossley" receiver, a beautiful little instrument enclosed in a morocco case which, when closed, leaves no suspicion of a wireless set within its cover. I anticipate some pleasant evenings in the company of this friend.

A little incident which I fear cannot escape my pen, occurred in a large departmental store the other day. A loud-speaker was in operation in the wireless section giving out pretty poor reproduction. A man stood listening for a few minutes and enquired of me the price. This I gave him, also other particulars of the wonders of wireless. The price was £45. He walked away and the next I saw of him was in the gramophone department, enquiring the price of a gramophone which was also in operation. The price of this instrument was £60. He bought it! And that's that.

The Cabin Tea Rooms have discarded the loud speakers previously arranged on stands around the hall, and have now one speaker, placed in the centre of the ceiling, which gives added satisfaction, enabling easy distribution and economy in speakers.

A mild sensation has been caused here by the cancelling of the licenses of about fourteen out of eighteen amateurs who had been authorised to transmit. In no way is anyone but amateurs themselves to blame, for readers will remember that I have several times in the past referred to the backwardness of our transmitters. Such men as 6BN, 6AG, 6AM and one or two others, very rightly have been permitted to retain their license; for what opportunities have been missed by the fourteen "duds" have certainly been made up in splendid DX work by the former. The Affiliated Radio Societies are going into the matter at last, and hope to put the amateur situation on its feet.

On Wednesday last the council of the Wireless Institute of Australia (W.A. Division) met in the President's room, E.S. and A. Bank Chambers. The President, Mr. B. Holt, presided over a full council. Notice of motion was given to alter the ex-

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Ratio
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RIMM HEADPHONES ARE PROFESSIONAL
PRICE 45/- PER PAIR

THE TRIMM PROFESSIONAL HEADSET is the established standard of those to whom radio means much more than mere entertainment. Dr. Donald B. MacMillan, who is now exploring the Arctic, and also the Wm. Hale Thompson Expedition which is setting out on an exploration of the far South Sea Isles, chose the TRIMM PROFESSIONAL HEADSET as the VERY best for scientific reproduction. The TRIMM PROFESSIONAL was proved to be the most sensitive Headset available to-day through the exhaustive tests conducted by members of both these expeditions.

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(Continued from Page 49)

isting rules: (1) No person be admitted for membership under the age of 21 years after January, 1925, except in special cases when the council shall decide; (2) The annual subscription be raised to £1; country members' subscription to remain the same.

The Fremantle Radio Club are holding some interesting meetings. The main feature of a recent "meet" was a lecture given by Mr. Saxon, the subject being "Generators." Mr. Saxon illustrated and described in detail the different types and their merits. The lecturer demonstrated very ably with several pieces of apparatus, which had been brought for the occasion.

(Continued from Page 44)

large variety of difficult problems to be solved. Many of these have been overcome with remarkable success, but there are still many at present unsolved. These outstanding problems do not affect the wireless public to any great extent. The purity and faithfulness of reproduction in many cases is irreproachable. It is still possible with badly designed receivers to produce excruciating howls and shrieks, which rob the possessor of all possible enjoyment and at the same time mar the pleasure of neighbours. The modern tendency in broadcast receivers is to combine faithful reproduction with beauty of appearance. This kind of development is nowhere so evident as in the cabinet sets made by the Radio Communication Co. Ltd. These are made in period styles of unexcelled appearance, and give unquestionable performance. For up-country dwellers these sets are ideal, bringing the wide world to the fireside of dwellers in sparsely populated districts.

Two men with the same name were members of a certain Club. One day a letter addressed to one of them was left at the club. The wrong man opened it first. It was a dun from a tailor.

He knew the missive did not belong to him, so he put it back in the letter-rack.

The next night both men happened to come to the club at the same time. Both went to the letter-rack, the man for whom the letter was intended reaching it first.

He read the epistle very carefully. Then he tore it into bits, which he tossed carelessly into a waste paper basket.

"Poor little girl!" he said, "How she loves me!"
—Tit-Bits (London).

Q. S. L. CARDS

THESE handy little reminders are absolute necessities in every home where there is a receiver.

When you hear a distant amateur, don't tire yourself out by writing a letter. Send him a QSL card!

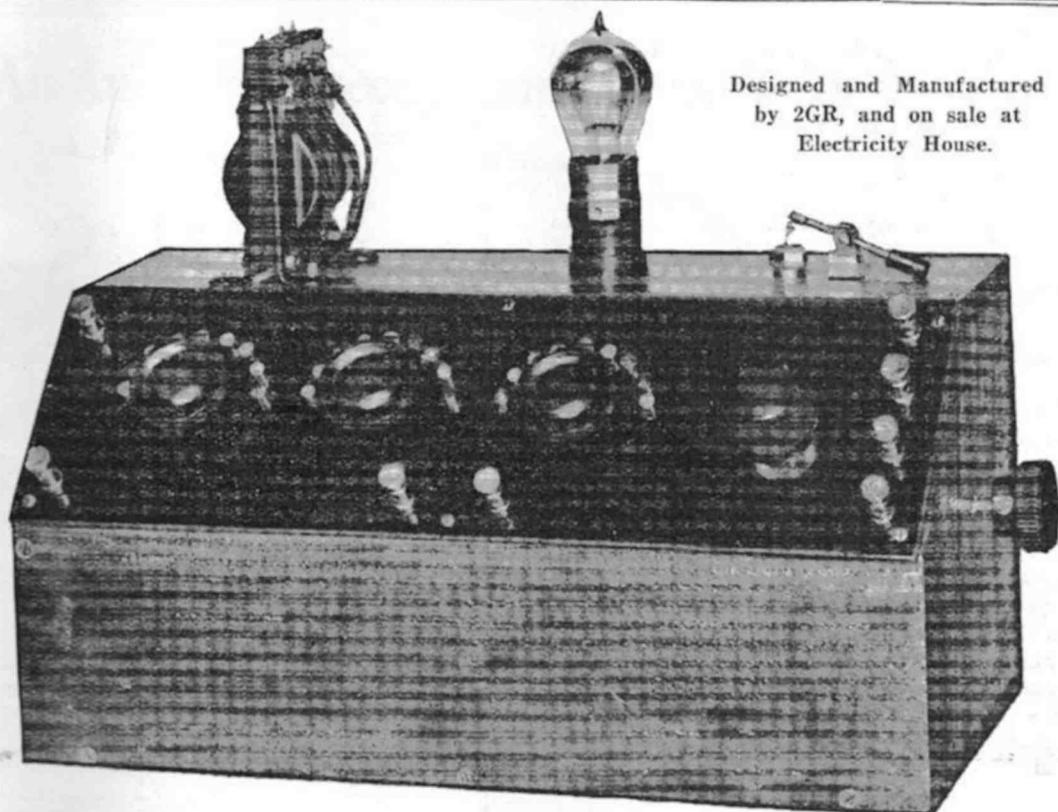
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Mother—Yes, dear, your father and I first met at a dance.

Boy—Oh, that's why he's always telling me to keep away from dance halls.—Chicago Phoenix.

Doctor—Have you taken every precaution to prevent spread of contagion in the family?

Rastus—Abs-lutely, doctah, we've eben bought a sanitary cup and we all drink from it.—Drexlerd.

"What's your 'urry, 'Arry?" a friend asked of an English ambulance driver.

"It's 'awlf pawst haight, the hour when the Prince of Wales takes his ride," retorted 'Arry, "and I must follow 'Is Majesty." — Washington Dirge.

Construction Superintendent—You big bone-head, you've gotten us into a damage suit. I told you to fire that man—notto hit him with an axe.

Swedish Foreman—Vell, boss, dose axe she have sign vot say, "For Fire Use Only," so I use her.—Washington Columns.

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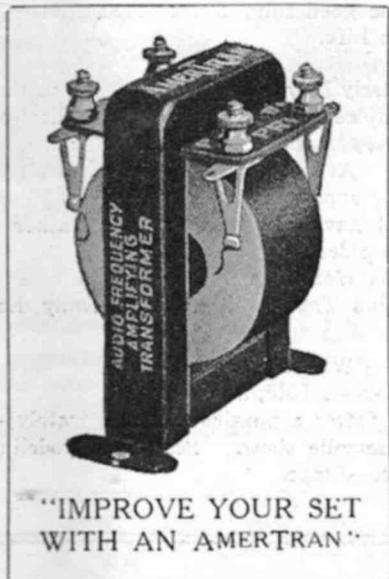
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Each battery consists of a number of cells assembled and connected in series by soldered connecting leads. The exclusive design and construction features of Ray-O-Vac Batteries make them highly desirable and most satisfactory for radio use. The cells are carefully manufactured from special formulae developed for radio requirements.

Between periods of use the battery will "re-cuperate" and build up its voltage ready for another period of service.

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The Lefax Radio Handbook is written in every day language, by men who know radio—both in theory and in practice. They have studied it for years. They are working at it every day. There are probably no other men so favorably situated to know all that has been developed in this fast moving science. They have the best-equipped radio laboratory in the world at their command to settle all doubtful points. That is why the Lefax Handbook is so complete and so accurate.

No one interested in Wireless should be without this wonderful Radio Handbook.

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Willie—Won't your pa spank you for staying out so late?

Tommy (whose father is a lawyer)—Naw, I'll get an injunction from ma postponing the spanking, and then I'll appeal to grandma and she'll have it made permanent.—Ladies' Home Journal.

The more clothes the missionaries put on the uncivilised ladies, the more clothes the civilised ladies take off.—Life.

A colored woman consulted the village lawyer. "Ah want to divo'ce mah husband," she said. "What's the trouble?" asked the lawyer. "That nigger's done gone an' got religion, and we ain't seen a chicken on de table foh two weeks."—Progressive Grocer.

A proposal to charge for building permits is being considered. Why not fine a man a couple of hundred dollars for erecting a building and let it go at that. It amounts to the same thing.—Argus.

"One more filling-station, gentlemen," announced the President of the Board of Selectmen, happily, "and the village will be able to remove all lamp-posts on Main Street."—Life.

"And now," said the good fairy, "you may have your three wishes—anything you want."

Well," said the lucky one, "I'd like to shoot a par on Number Nine, and—"

"Yes, yes, what else—?"

"And I'd like to have Bill Green there to see me do it, and—"

"Hurry up, what's your other wish now?"

"Well, if it's all right, I'd like to do it in one under par the next day—"

But the good fairy had fainted dead.—Millard Crowdus in Life.

An elderly lady from the provinces on the train for the Empire Exhibition asked her fellow-passengers at every station if she had arrived at Wembley Park. At one stop she inquired of an ancient man sitting opposite: "Is this Wembley?"

"You'll have to speak up; I'm rather deaf," replied the elder.

"Is this Wembley?"

"No; it's Thursday!"—London Daily Express.

Judge—"What's your name?"

Prisoner—I. Lehigh Low.

Judge (after a puzzled moment, irately)—This isn't a vaudeville show. Stop your yodeling and answer me.—Judge.

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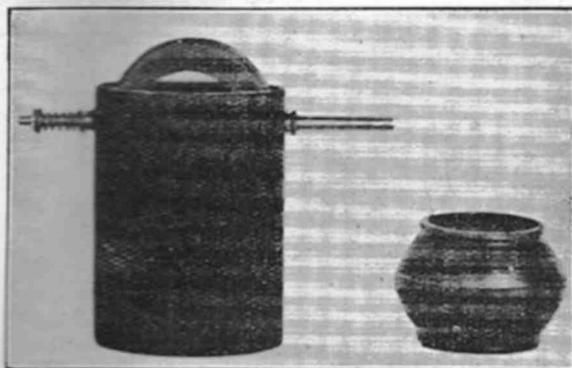
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Amplifier L.F.	80
Impedance in ohms	36,000
Amplification Constant	6.0
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Cap	4 Pin Standard, Full Proof
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Filament Amps	0.6
(General)	20—100
Plate (Detector)	20—30
Volts (H.F.)	30
(Amplifier L.F.)	50—100
Circl Bias Volts, Negative	1—3
Impedance in ohms	37,000
Amplification Constant	10.5
Emission Milliamps, Approx.	
Total	5
Cap	4 Pin Standard
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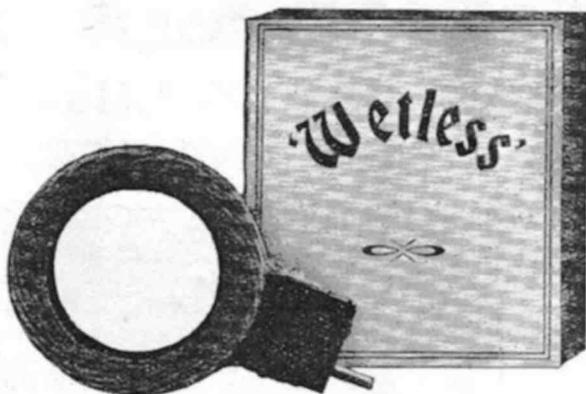
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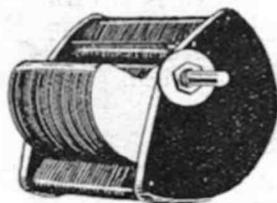
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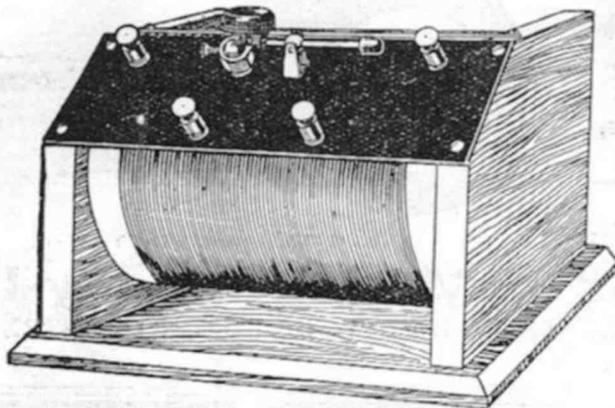


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The Panel may be purchased separately complete for 5/-.

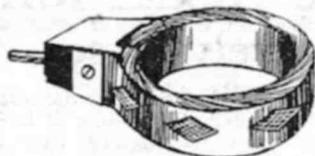
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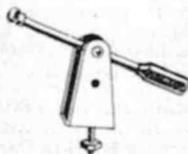


Honeycomb Coils.

Coils.	Mtd.	Unmtd.
19	4/9	2/6
25	4/9	2/6
35	4/9	2/6
40	4/9	2/6
50	5/-	2/9
75	5/3	3/-
100	5/3	3/-
135	5/9	3/4
150	5/9	3/4
200	6/-	3/9
225	6/-	3/9
250	6/-	3/9



In Plated Slide Complete, 1/6.



Catswhisker Holder, 1/3.



Crystal Cup, 6d.



Bushed Switch, 1/6.

SUPERSENSITIVE.



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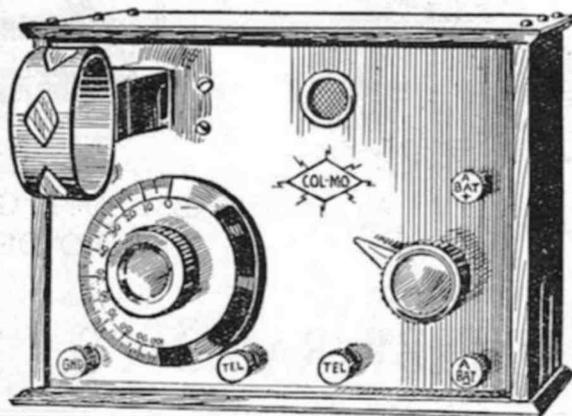
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		201A	1/10/-
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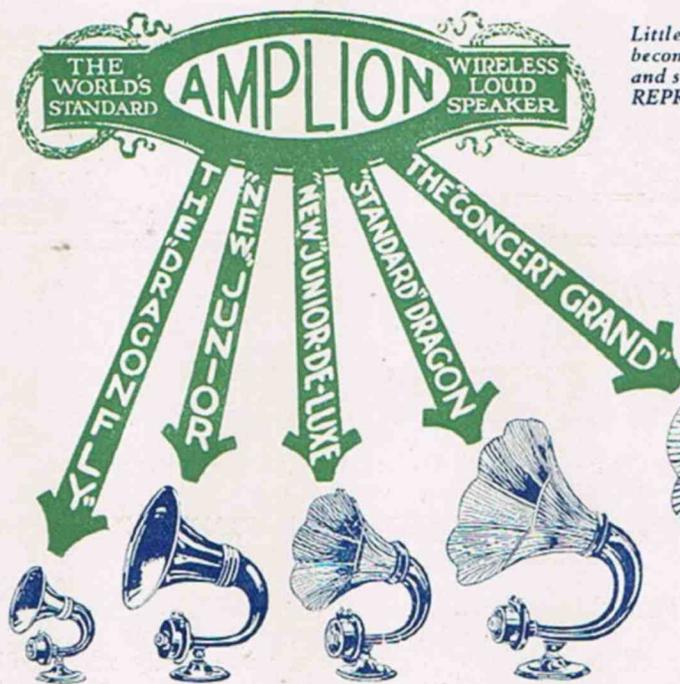
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