WIRELESS WEEKLY

THE HUNDRED PER CENT AUSTRALIAN RADIO JOURNAL

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SPECIAL FEATURE THIS WEEK: **BROADCASTING**

OFFICIAL ORGAN OF THE AUSTRALASIAN RADIO RELAY LEAGUE.

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BROADCASTING

It has been said that Broadcasting will be advantageous to the country man from a business point of view, but will not be of any good use to the city man. This has yet to be proved when Broadcasting commences shortly.

Our opinion is that the city and suburbanite will find just as much use for the service as the country man.

Just as the telephone has become a necessity so will the Broadcast Service. The busy man in his office who now at certain hours of the day rushes down town to get the latest Stock Exchange call or market report or final acceptances or starting prices, etc., will only have to glance at the programme for the day and at the appointed minute plug in and hear just that bit of information that is vital to his particular business.

The foregoing gives one aspect only of the benefit that Australia's first Broadcast Service will give to the public. News, reports, lectures, vocal and orchestral entertainment, educational talks, etc., will be included in the Service, and all the tastes of all classes of the community will be catered for.

Roster for Week ending 7th November, 1923

	7.30 to 8.0	8.0 to 8.30	8.30 to 9.0	9 to 9.30	9.30 to 10
Thur, Nov. 1	2 GR	2 WV	2 WV	2 WV	2 ZG
Friday, 2.....				2 RA 220	
Saturday, 3....		2 ZG	2 GR	2 RA 220	
	7 to 7.45		7.45 to 9.45	9.15 to 10	
Sunday, 4.....	2 2 GR		2 CM		
Mon., 5.....		2 GR	2 ZG	2 RA	
Tuesday, 6....		2 GR		2 GY	
Wednes., 7.....		2 GY	2 RA		

Very few stations are on the Roster this week owing to Trans Pacific Tests.

Broadcasters (Sydney) Limited will be carrying out Tests each day between 3 and 5 and 7.30 and 10 p.m. 2 WV will be carrying out Special Tests on Thursday, 1st November, and again on Wednesday, 7th November, between 8.30 and 9.30 p.m.

Poor Attendance at Wireless Clubs

Very few Radio Clubs can say that they have a good roll up at their meetings. In most cases the experimenter once he learns a bit about the game would sooner stay at home with his "gear" than attend his club meetings. This is a very bad state of affairs, but is certainly the fault of the Clubs themselves. Sufficient interest is not created. We are glad to see that some of the clubs now have their own transmitting sets, and it is hoped that in the near future every Radio Club will be so equipped.

There should be more fraternal visits of one club to another.

If the experimenter intends to hold any status in the land he must co-operate. In England and America to-day severe restrictions have been placed upon the amateur, and such will be the case in Australia when Broadcasting gets into full swing, unless the experimenter puts his house in order, cuts out regeneration, attends his club regularly, and forgets his petty jealousy which has done more harm to experimental wireless in Australia than anything else.

Further Successful Tests by Experimental Station, 2 HP

During last week further tests were carried out each day between the hours of 3 and 5 and 7.30 and 10 p.m., with great success. In nearly every instance the numerous reports given stated that the tests were the best yet heard in Australia. Very few would believe that the power input was only 15 watts and were of the opinion that 50 watt tubes were being used. In fact 4.5 watt radiotron tubes were used, 2 oscillators and 2 modulators.

Occasionally a report comes in

Miss Doreen Douglas, the well-known amateur violinist, who has lately been delighting wireless listeners-in with violin solos from the experimental station, 2HP. Miss Douglas is a pupil of Mr. Vas. Jansen.

Miss Jessie Purcell of 69 Cowper St,. Randwick, who was the first to sing from 2HP experimental station, Phillip Street, Sydney.

Miss Dorothy Deering, a young soprano of Sydney, who has lately been delighting audiences at various concerts in and around town. Miss Deering has done a little broadcasting from Palings, and on Wednesday last, October 24th, was singing at 2HP station, Phillip Street. Glowing reports were received of the reception of her voice.

that the transmission is "rotten," but this is generally the fault of the receiving instrument. Mr. Chas. D. Maclurcan (2CM), who has received more reports of his tests than any other experimenter in Australia, says: "that if one good report from a fairly distant station is received out of every hundred reports then the transmission must be OK, for the very good reason that a receiving station may distort and spoil the reception of a good transmission, but it cannot improve the reception of a poor transmission.

A few only of the reports received by 2HP during the last few days:

Mr. Vox, Leichhardt. Crystal 1 valve audio. Loud enough to fill a small room.

2MM., P.O., Como. Single valve. Very well, modulation very good.

Marden, Medlow Bath, 2 Valves, using loud speaker Enjoying very much; complains of Bergin on same wave length.

Cowdray, Mosman. Getting beautifully, clear as a bell. 3 valves, modulation perfect.

Mr. A. Boyd, Strathfield. 2 valves, dry cell tube. Reports perfect, best he has heard, clear and modulation perfect.

Mr. Strugall, Neutral Bay. 2 stage audio. O.K., everything perfect, has to tone down occasionally.

Keave, Neutral Bay. Reports absolutely excellent, and fills room on loud speaker.

Mr. Ledger, Croydon. Gordon Radio Club. Very strong on Crystal set, strong as Maclurcan on Sunday, from Strathfield.

Commerce, Neutral Bay. 4 valve Herterodyne, improvement after music; Hawaiian items specially good, but absolutely perfect throughout generally.

Williams, Burwood. 2 valves and Baldwin H.S. Every bit as strong as 2CM, who is only 1/4 mile away, says modulation perfect, clear as a bell, best ever heard.

2LO, Shultz, Lane Cove. Excellent.

Don Harris, 2 valves, Sydney, City. Reports very good and clear 2V.W. Electric Co., interfering in same wave length

Spencer Nolan, frame aerial, coming through beautifully, 1 valve, very loud. 1 valve.

Petrie, Lane Cove. Rings up to say they were listening in to "Guardian" concert, could hear it very distinctly, were enjoying it tremendously.

Cawsey, Mosman. Not nearly as clear, blurry, recitation bad.

North 716, Snellgrove Bay, R.S. Coming in very well.

Colin Smith, Penrith, Everything perfect (1 valve).

Crown Star Theatre. Thanks very much, present singer very plain and clear.

Cutts, Croydon Radio Club (crystal), reports OK, modulation excellent, quite as strong as 2CM, who is only 2 miles away and quite the best in Sydney.

Hamilton, 2OQ. Ask Mr. Maclardy to put on "Rocked in the Cradle of the Deep."

Mr. Russ Johnston, the popular composer, whose compositions are known all over Australasia realises the value of wireless broadcasting, and on three nights last week played his latest composition, "Cootamundra," to delighted wireless enthusiasts who were listening-in, and many requests were received each evening for a repetition.

Mr. Johnston has played to thousands of music lovers during his career, but says that never before was he so excited as when transmitting, and he intends to transmit all his future compositions before they are published, so the owners of wireless sets will indeed consider themselves honoured.

Mr. Hunter sung Mr. Russ Johnston's composition, "Cootamundra," at 2HP station last week with great success. There were many requests for an encore, but Mr. Hunter had left the station by the time they arrived.

Barnard, Wollstonestraft, Modulation badly distorted.

Harding, O.I.C., Garden Island, modulation distorted.

Harding, O.E.C., Garden Island, Modulation quite OK now; much improved.

Jones, Chatswood. Best have been, better than last night, OK.

Dalton, Drummoyne, Everything OK.

Seimens, Balmain. Whistling items particularly good, modulation excellent.

Carroll, Cremorne. Items excellent.

Deer, Ashfield. Concert coming through very clear. Couldn't be better.

Brunton, Ashfield. Getting very well indeed.

4 valve, only using one and very loud, and getting beautifully. Are they vocal? Something unusual to hear the voices without the least vibration.

Wilson, Newtown, Crystal set, hearing very well. First best and clearer.

Lovett, Artarmon. Very good; clear as ever.

2 PY, Harry Wild. Best ever tonight, very clear. Lost hum of this afternoon.

Mason, Randwick. 1 valve, hearing excellent, music clear, speech much better.

3 LO, modulation quite OK, Strength as usual.

A. J. Smith, Harris Park. Receiving very clear, OK. Modulation very good, 2 valves.

Evans, Wireless Supplies. Music very fine, better than ever before. Crowd of over 40 listening outside door.

Wayker, Canterbury. Excellent.

2ST, Woolcott, Drummoyne. Violin solo, best, but not fully modulated.

Cotter, Summer Hill. Coming in well, little bit of hum.

Boyd, Strathfield. 1 dry cell tube. Modulation good, everything perfect.

McCartney, Newtown District Radio Club. Whistling pieces particularly good, modulation and power good, wave length changing between 5 and 15 metres easily in evening.

Anderson, Punchbowl. 1 valve, strength 5, same strength as Macleurcan.

Radio House. Clear as a bell.

Williams, Burwood. Mother Machree, everything good, enjoying excellent.

Continued on page 20

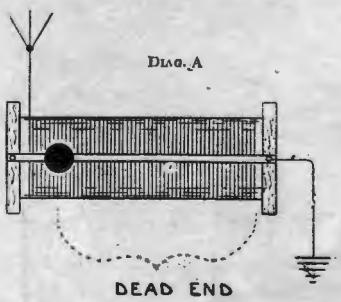
HIS FIRST ATTEMPT AN BROADCASTING

MAKE YOUR OWN

Improving the "Twelve by Four"

DO NOT DESPISE YOUR NEGLECTED SLIDER INDUCTANCE. HERE ARE SOME PRACTICAL IDEAS TO GIVE YOUR COIL A NEW LEASE OF LIFE.

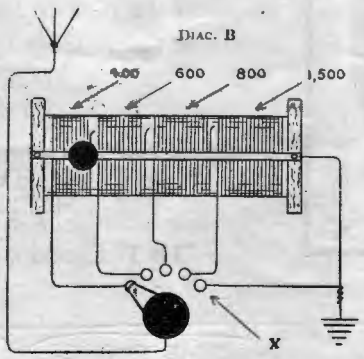
The 12 in. by 4 in. slide inductance is almost inevitable. With beginners the chief attraction is the size, but sooner or later they realise that this is of no advantage. In nine cases out of ten this giant of a coil represents the most important and imposing feature of the home-made crystal set. Now, it has been repeatedly pointed out that the owner of a crystal set should confine his ambitions to the reception of the broadcasting, as far as music and telephony is concerned, and who wants to be bothered with spark signals nawadays? says Oswald J. Rankin, in "The Broadcaster."



DIAG. A

During listening-in time one could call on hundreds of operators and find the inductance slider, in every instance, placed in the approximate position shown in diagram A. About two inches of the coil winding is sufficient to cover the broadcasting wave lengths, the remaining ten inches constituting a dead end which offers a resistance to the incoming signals and results in the inefficient working of the receiver.

Any existing 12 in. by 4 in. slide inductance can be easily divided into several separate coils, and so made more efficient, in the manner



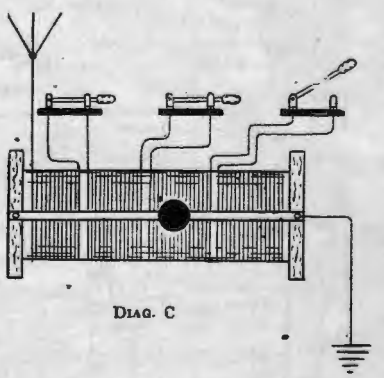
DIAG. B

indicated in the diagram B, which is intended to be self-explanatory. By means of a sharp pointed penknife the wire is cut at intervals, as shown, and a few turns are removed so that a space of about ¼ in. is provided between each separate section of winding. The aerial lead-in is attached to the arm of a five-point multiple switch, which is mounted on a piece of sheet ebonite and attached to the baseboard of the receiver. The beginning of the coil winding (shown on extreme left in diagram) which would otherwise be connected direct to the aerial lead-in, is now attached to the first switch stud, on the left. The other end of this portion of the winding is left open; that is it is not connected to any part of the circuit.

The beginning of the next section of winding is connected to stud No. 2, and so on, until several different values of windings, ranging from about 400 up to 1,500 or 2,000 metres, have been so arranged. The stud X is connected to the earth lead, and when the switch arm engages this it functions as an aerial to earth change-over or "earthing" switch, the aerial lead-in then being cut off from the coil and placed in direct contact with earth.

When cutting the wire, great care should be taken to see that the ends of the windings do not fly out and uncoil. The wire on a great many coils becomes quite loose with the continual sliding movement of the plunger. The two ends where cut is made should be held down and then unwrapped, keeping the wire taut all the time.

When sufficient wire has been removed, the ends in each case should be secured by piercing two or three holes in the former, similar to those at the extreme ends.


DIAG. C

An adjustment of the switch arm will, of course, necesisatate a corresponding adjustment of the slider, since each section of the winding represents a self-contained coil connected to a common earth. The setting shown in the diagram indicates that only the first section is in circuit. This section could be conveniently arranged to just cover the broadcasting wave lengths. By moving the switch arm to the next stud on the right, the aerial lead-in is connected from

this coil and connected to the beginning of the next coil, which is arranged to cover the ship station wave length if desired. At the same time the inductance slider is also moved along to this coil. The earth lead is taken from the end of the slider bar in the usual way.

Diagram C shows another way of splitting up the winding in order to avoid dead-end effects when working on the lower wave lengths. In this case the end of one section of the winding and the beginning of the next are connected to the clips of a simple S.P.S.T. cut-out switch, so that any number of the sections may be joined together to form one continuous winding by simply closing the switches.

The setting as shown indicates that the first, second and third sections are being used, the fourth section being entirely cut out by means of the right-hand switch. If this switch is also closed the whole of the winding is in circuit. If all three switches are open, and the slider moved along to the extreme left, the section or "broadcasting section," only is in circuit. If the first switch is closed, the second section, which we will call the "shipping section," is added to the first section, thus bringing the total value up to 400 plus 600 equals 1,000 metres. In diagram B the aerial lead-in is moved along, by means of the multiple switch, to any one of the separate coils. In diagram C the aerial lead-in remains a permanent fixture to the first coil, the coils being joined together as desired by means of the simple switches which bridge their ends.

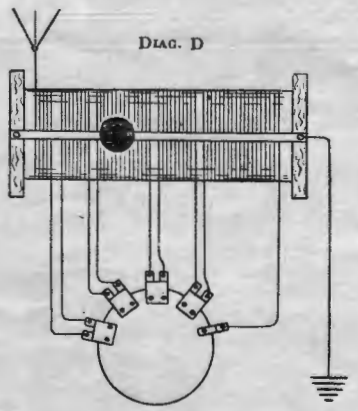
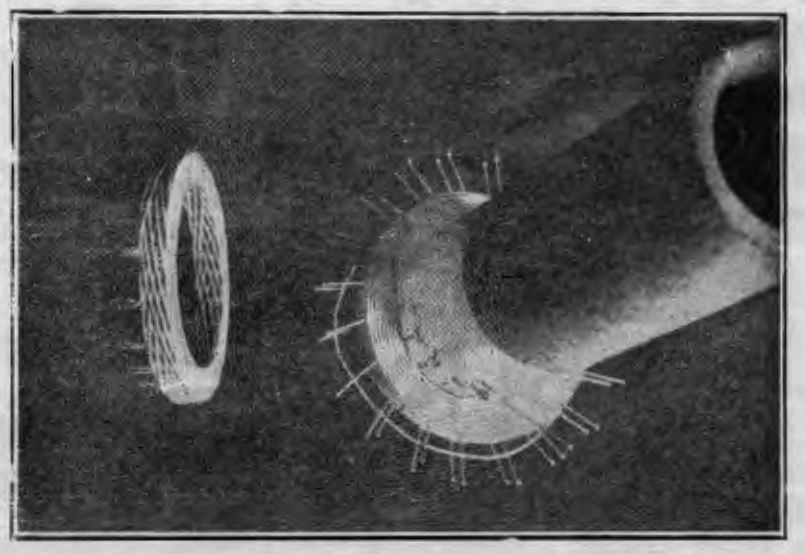


Diagram D shows how a radial dead-end switch may be fitted to a large cylindrical inductance coil. In this instance the ends of the windings are all connected to flat metal contacts arranged in radial formation on a suitable base. A disc of ebonite, carrying metal bridge pieces wide enough to embrace one pair of the narrow contacts, is made to revolve on the base. The general arrangement will be understood by referring to the diagram.

When the switch is in the position shown, the whole of the winding is in use, and when adjusted to the left the narrow leading bridge engages the third stationary contact from the right, and so cuts out the end section of the winding while still retaining the other sections. Another adjustment to the left will cut out the fourth section, as well as the fifth, leaving only the first, second and third sections in circuit. One section is cut in or out every time an adjustment is made, and when the narrow leading bridge engages the stationary contact on the extreme left, then only the "broadcasting section" is in circuit.

An Efficient Honeycomb Coil for Short Waves.

By E. A. SCHALL.



This photo gives a good idea of how the forming tube is constructed, and as to the manner in which the coils are wound.

The general opinion seems to be that standard honeycomb or D.L. coils, while fine for tuning the longer waves, lose much of their efficiency when used in broadcast receiving, or other short-wave work.

The reason is plain, when we consider that a short-wave coil of this type, say, 35 or 50 turns, contains very few layers of wire, is wound on a core and is usually covered with a strap as well so that the wire in the coil is spaced more or less closely to both the core and cover, which must result in large losses due to reaction between these parts. Also each layer contains too many turns for so small a coil, making the capacity betwen layers higher than it should be.

The coil I shall describe was designed with these faults in mind, and will be found to eliminate them to a large degree. It has also the advantage of being very easy to make, and when finished should have the fine appearance of a factery product. It is a true honeycomb coil, and is wound around a 2 in. cardboard tube, but the two

rows of pins used as winding guides are spaced only ¼ in. apart. Nineteen pins are required in each row, 38 in all. They must be evenly spaced in pairs around the tube.

A strip of paper ¼ in. is wound around the tube four or five times between pins; this is to aid in removing the coil later on. It will help, in placing pins, if a double pointed awl is first made by forcing two needles, eyes first, into a stick ¼ in. apart, this to be used in piercing guide holes for pins.

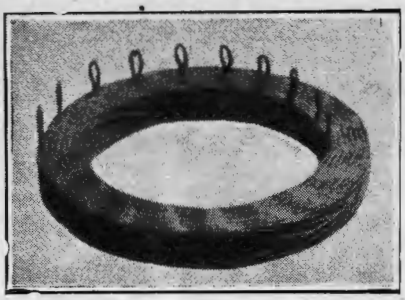
We are now ready to wind, as follows: Outside of pins 1 and 2, across and around 6 and 7, back and around 11 and 12, across and around 16 and 17, back and around 2 and 3, across and around 7 and 8, and so on.

Hold wire with just enough tension to bring it into place, which is easy, as there are no long spaces between pins. Each complete layer contains 10 turns. A 50-turn coil of No. 24 D.C.C. wire will measure only about 3 in. in diameter by 3-8 in. thick, and as many as 140 turns can be readily wound using ordinary pins.

Size of coil is figured the same as you would figure any honeycomb or D.L. coil.

If taps are desired the loops for same can be easily formed while winding, as the pins will keep in place the turns already wound. Every ninth turn can be tapped, which will bring each loop one space behind the preceding one; single turn or 11 turn taps can be taken, each loop coming one space ahead of the preceding one, etc.

When completely wound, go over coil, spacing the honeycomb cells

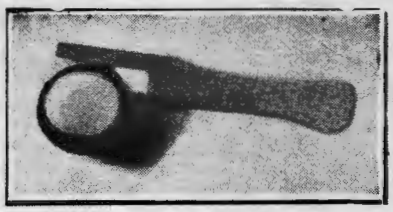


One of the completed tapped honeycomb coils. Note the even winding and the well-formed structure.

with a stiff wire until all the turns of wire line up properly, and see that the two rows of pins also are correctly alligned.

The coils, pins and all, should next be well brushed with insulating varnish. This can be made for a few pence by adding as much scrap celluloid (from auto curtain windows) as will disolve in an ounce or two of banana oil, then thinning with an equal amount of wood alcohol. This varnish can be prepared in a few minutes. It is far better than white shellac as an anti-capacity varnish and when dry the coil will have its original colour.

At that time the pins are drawn, and a thin knife blade carefully worked around under the coil. The coil can be slipped off the tube and any paper sticking to the inner turns removed. The two ends of wire should be fastened in place by sewing through holes in coil with a needle and thread. Give an additional touch of varnish wherever needed. The coil will now be firm and will need no support other than something to hold it in place.



A double-pointed awl used for pierc- guide holes for the pins.

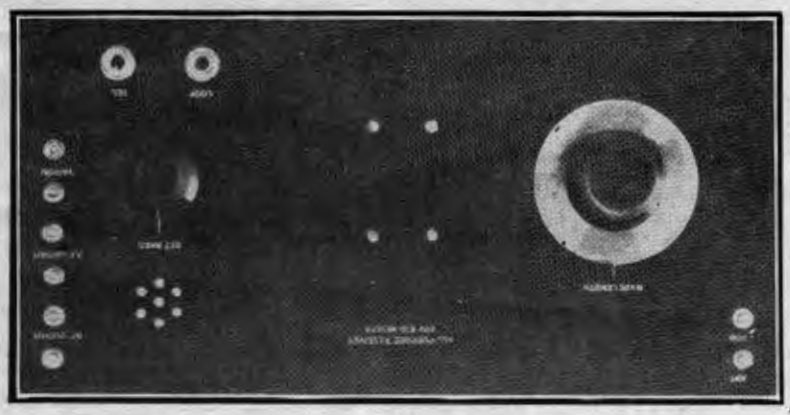
Coils of this construction have been used in place of spider webs, single layer windings, etc., with very gratifying results.

The All-Purpose Receiver.

A RECEIVING SET AND DETECTOR WHICH CAN BE USED IN A VARIETY OF WAYS AND IS DESIGNED FOR THE ADDITION OF RADIO AND AUDIO FREQUENCY AMPLIFIERS.

The idea of simplicity in design has been driven home so strongly to experimenters that the old type of radio set which used to warm our hearts, the outfit oftentimes built on a switch board and built like a switch board, so that no end of various circuits and combinations could be made, has been practically abandoned. In its place has come the single purpose set, ordinarily a complete unit so designed as to accomplish a specific result with one particular type of circuit, writes M. B. Sleeper, in "Radio News."

However, not all of us can afford to build equipment of that sort, a complete set for each different thing we want to do. Therefore, the equipment shown in the accompanying photographs has been developed with the idea of presenting a set which, though very simple indeed in design and operation, can be made to do a great number of different things. So that these will be clear they are listed below:—



A front view of the "All-Purpose Receiver." Note that there is but one wave length control, this being a variable condenser. This set was constructed from the plans given in this article.

A RECEIVING SET FOR 200 TO 600 METRES.

1. A non-regenerative receiver operating on an antenna and ground (Fig. 1).

2. A non-regenerative receiver for short distance reception operating on a loop (Fig. 1).

3. A regenerative receiver operating on an antenna and ground (Fig. 2).

4. A regenerative receiver operating on a loop (Fig. 3).

5. Any of the above combinations with audio frequency added (Fig. 1).

6. Any of the first four combinations with radio frequency amplification added (Fig. 1).

7. Any of the first four combinations with both radio and audio frequency amplification.

If you will go over the accompanying photographs and diagrams you will see that this receiving set is made up of a fixed coupler having a non-adjustable primary winding with fixed coupling to the secondary coil. The fixed coupler carries the primary winding inside the centre section, while the secondary, divided into two parts, is held by the radial arms of the frame work. When the receiving set is used with the antenna and ground, the loop jack, just below the rheostat control, connects the secondary inductance across the 23-plate variable condenser and on to the grid and filament of the detector tube. Inserting the loop plug, however, disconnects the secondary winding and replaces it by the inductance of the loop. In the plate circuit of the detector are binding posts for connection to an amplifier and also to a variometer. If neither amplifier nor variometer is used, those posts should be short circuited so as to close the plate circuit. With the variometer connected, the set, used with an antenna and ground, becomes a conventional three-circuit regenerative receiver.

AMLIFIERS MAY BE ADDED.

The audio frequency amplifier will be described in the next issue. Binding posts are also furnished for a radio frequency amplifier. They are connected to the variable condenser, so that the tuning circuit goes directly to the first radio amplifier. This unit will be shown in a coming issue. To simplify the design and to shorten the leads, the radio frequency amplifier contains a detector. Therefore, the detector on the receiving set panel is not used. It is only necessary to disconnect the "A" and "B" battery leads and remove the detector tube. This may seem like a duplication to have a detector also in the radio frequency amplifying unit, but the duplication is limited to a rheostat and socket. When the three units are shown together you will understand the advantages of the arrangement chosen.

The tuning unit is mounted on a formica panel measuring 7 in. by 14 in., a standard size available in practically all the radio stores. Moreover, cabinets can be purchased to accommodate panels of that size. Fig. 4 shows the lay-out at exactly one-third scale. Consequently, if you measure the distances on the drawing and treble them, you can lay out your panel very easily. The drawing is shown in this way because experimenters frequently have difficulty in understanding drawings which are covered by dimensioned lines and figures. With the exception of a few holes otherwise marked, a No. 18 drill is used. So as to get the location of the holes exactly, make

sure first that the dimensions of your panel are accurate and that the corners are square and true. Then you can scratch lines with a scriber working against the plate of a combination square to show where the holes go.

DRILLING THE PANEL.

Be sure to make the centre punch marks to start your holes, for drills have a habit of working off to one side unless that precaution is taken. A very handy instrument is the Starrett automatic centre punch, a small device carrying a spring trip in the handle. A hardened point

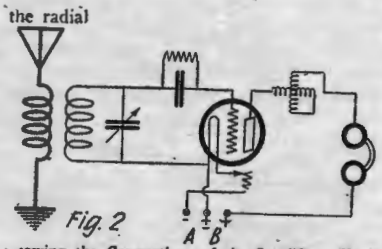
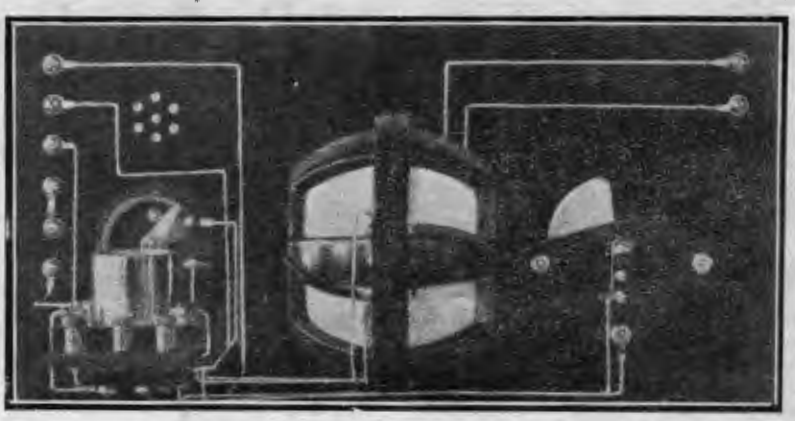


Fig. 2

Showing the Connections of the Set When Used With an Aerial and Ground. An External Variometer Is Included, to Obtain Regeneration

is located on the panel and the spring compressed by pressing the handle. Then the trip releases and a sharp blow is thus given the point. It is possible to locate the punch marks more accurately by this method than with a plain centre punch and hammer.

When you drill the large holes for the jacks you will not be able to use an ordinary hand drill. If you have no press, make a small hole with the hand drill. Then put the 15/32 in drill in your vice and press the panel down on the drill, rotating it at the same time. While that is only a makeshift, of course, it is the easiest method. You will



A rear view of the same set, showing the tuning variable condenser, Fixed coupler and the detector unit. The Fixed coupler is a variometer with no conductive connection between the rotor and stator, as shown in the circuit diagram of Fig. 1.

notice that over-sized holes are specified for the condenser and rheostat shafts. That is to give sufficient clearance so that the shafts will not bind. Fig. 5 shows the base panel at one-half scale. The four holes for mounting the panel on the jacks are arranged to fit Pacent jacks. If you use any other type make sure that you change the holes accordingly. The four holes marked X should only be drilled if a fixed coupler of the make mentioned further is used. If the coupler is built by the experimenter himself holes marked Y should be drilled.

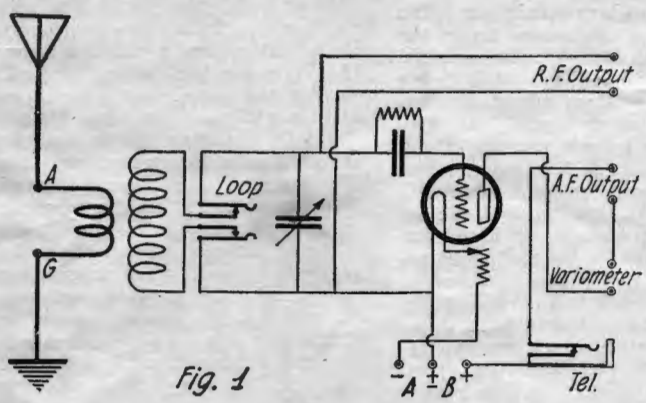


Fig. 1

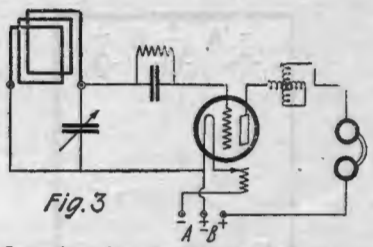
The Wiring Diagram of the "All-Purpose Receiver." By means of binding posts R.F. or A.F. Amplification Can Be Added Without Disturbing the Internal wiring.

Drill all the holes in both panels before you start to do any assembly work. The set illustrated has engraved names for the various controls. This adds greatly to the appearance of the outfit and is not particularly expensive. If there is no one to do this work for you locally you can send the panel away and have the engraving done at quite a reasonable charge.

The first assembly work to be done is to mount the jacks. If you are going to put the set in a cabinet you will have to cut off a small part of the jacks at the ends which fit against the panel. With the jacks tightened in place remove one of the screws which clamp the springs and replace it with a 1 in. 6/32 F.H. screw. Put a nut on the underside to hold the springs. Repeat this process, one screw at a time, until all four have been changed. That will hold your base panel very securely. Then mount the socket, using flat head screws, from the bottom up, so that there will be no interference with connections to the jacks. Mount the binding posts on the front and base panels, making sure that the lugs point in the directions shown in the photographs. This is important, for it will help you greatly in the wiring. Referring to Fig. 5, make as many connections at this point as possible, using square tinned copper bus bar carefully bent and fitted.

It is very much worth while to take care in mkaing connections, for it adds so much to the appearance as well as the successful operation of the set. Use Nokorode soldering paste, but in such small quantities that there is no extra paste to run around on the panel and provide leakage paths. Make sure that your soldering iron is clean and hot enough, so that the solder flows freely. Fill each lug with solder, but do not leave extra chunks on the terminals.

The grid condenser can be mounted at this stage of the assembly. It is a Micadon of 0.0005 mfd. Fasten soldering lugs to the condenser with 3-8 in. 6-32 R.H. screws and nuts. The simplest way to put on



Connections of the Set When Employing a Loop Aerial and an External Variometer for Regeneration.

the grid leak is to scratch one clamping plate with a scriber and rub on a soft lead pencil. This can be adjusted, when the receiver is in use, to exactly the correct resistance. Be sure that the pencil marks go right up against the condenser terminals so as to make connections with them. A cartridge grid leak may be used with a condenser fitted with clips. Put the rheostat in place, with lugs on the terminals, and put on the connecting wires.

Next mount the fixed coupler, made of 46 turns of No. 20 D.C.C. wire wound round on a 4 in. tube, with the primary wound with eight turns of the same wire as shown in the sketch. Connections from the secondary winding are at the rear, and for the primary winding at the front, next to the panel. Put on the variable condenser and make the remaining connections.

If you are going to use the outfit as a plain non-regenerative set, put jumpers across the binding posts marked A.F. OUTPUT and VARIOM. Connect your antenna and ground to the left-hand binding posts, a 22½ volt "B" battery across the right-hand and centre binding posts on the base panel, looking at them from the front of

Fig. 4

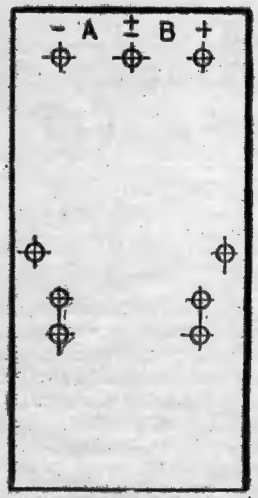


Fig. 5

Layout of the base panel.

the set, with the plus lead to the right-hand post and the minus lead to the centre. A UV-200 or WD-12 tube can be used, or any of the other types with the proper adapters. Make sure that you have the correct "A" battery voltage, 6 volts for the former tube and 1½ volts for the latter. The plus "A" battery terminal goes to the centre post and the minus to the left-hand post of the base panel.

All your tuning will be done with the variable condenser, a feature which greatly simplifies the operation and control of the set. While it might appear that a loss of efficiency would be caused by not having an adjustable primary inductance. actually no loss and some gain is obtained in actual practise. There are several reasons for this. Any tapped coil, particularly when units and ten swiches are employed, has losses which are not found in the fixed coupler. In addition, a loss is caused in the secondary inductance by the presence of the ball which increases the radio frequency resistance and, consequently broadens the tuning. Moreover, particularly at the higher wave length adjustments, there is a voltage step-down between the primary and secondary rather than a step-up. In the fixed coupler there is a step-up ratio, an advantage since the response in the telephones is approximately proportionate to the voltage applied to the grid. The result of these various effects, some favourable and some otherwise, is slightly in favour of the fixed coupler over the ordinary design of variocoupler.

FIXED COUPLER AS EFFICIENT AS VARIABLE ONE.

An easy way to prove, for your own satisfaction, that a variable primary inductance is not necessary is to set the coupling control of a variocoupler type circuit at the normal operation position. Tune in a station, adjusting the primary switches and the secondary condenser until the maximum signal strength is obtained. Then increase the primary inductance and readjust the secondary condenser. You will find that you can bring the signals back to their original strength. Move the switch below the original setting, adjust the secondary condenser again and you will find the signals coming in full strength. That is because the real tuning is done in the secondary circuit for the resistance of the antenna and ground is so high, particularly with a single wire antenna, that the primary tuning is very broad.

To make the set into a three-circuit regenerative tuner, remove the jumper from the VARIOM. posts and connect a variometer across them. You will then have the variable condenser to control the wave length and the variometer to adjust the regeneration. This makes a very fine receiver, for it is highly efficient in operation and extremely selective in tuning. To operate the set, turn the tube at a little below normal brilliancy, set the variometer so that the circuit does not oscillate, and tune in the station, with the variable condenser. Then, moving the condenser a little bit each side of the point at which the signals are loudest, increase the variometer until the set oscillates. That will destroy the quality of the speech or music. Note the exact point on the variometer scale at which the circuit started to oscillate. Turn the variometer back until the oscillation stops. Then increase the variometer again, moving the condenser back and forth slightly, at the same time, to just half a degree before the point at which the variometer caused oscillations to take place. You will then have the setting for maximum signal strength.

Some experimenters have had very good results with regenerative receivers having a plate variometer for regeneration control and a loop shunted by a variable condenser for the grid tuning circuit. To use the outfit in that way disconnect your

Continued on page 13, col. 3

Well Designed Aerial is Vital.

Continued from last week (page 13)

ration between the plates of the series of antenna condenser, in order to get to ground. This produces X's, otherwise known as strays, static and atmospherics. Hence as a rule it is advisable to keep the receiving antenna low, of course, within limits. It has been found that a height of about forty feet is most suitable for good reception. It must be pointed out, however, that strays which come from a distance are not cut down, relative to signals, by using a low aerial. Such discharges are highly damped wave trains and affect the aerial in the manner of an ordinary signal.

Ground.—Since the whole aerial circuit should have a low resistance the ground selected should have as great a surface as possible exposed to the earth. In city districts the best ground is the cold water pipe, it being sometimes desirable to connect both gas and water pipes together for the ground. In country districts several metal plates about two or three feet in area, should be embedded in the ground, surrounded by some charcoal. The plates should be connected to each other by rubber covered wire, soldering the connection. In dry weather the place may be watered, the charcoal retaining the moisture for some time. A type of ground such as this also would be of use as a transmitting ground. The ground wire should be at least of the same size as the lead-in wire and should be short—the shorter the better. The aerial itself should not be more than seventy-five feet in length.

Insulation.—It is of the utmost importance that the insulation of the aerial wires should be nothing but the best if any pretence of efficiency is made. Thoroughly glazed porcelain insulators are the accepted standard for insulation quality, though other materials, such as rubber, bakelite and mica compositions have their adherents. Instead of using one single long insulator it is better to use two or three small ones strung out one after another, as this offers less chance of leakage taking place. The lead-in should be given special attention where it enters the house. Most of the energy losses occur at this point and it does not pay to use the best insulation at the aerial only to lose the carefully hoarded energy by installing a poor lead-in insulator.

Material.—For receiving purposes a single wire is all that need be used. Four wires do not bring in a station better than one. It is a common error to suppose that four wires can pick up four times as much energy as one in receiving. It is true, however, that in transmitting four wires can and do carry a great deal more energy than one. The use of iron wire is not recommended in any form. Instead, use aluminium, copper, or phosphor bronze. The lead-in can be made of the same wire, keeping it well away from the side of the building, six feet not being too great a distance by any means. A rather large size of wire should be chosen for the aerial, the thought to increase the surface being the reason for the heavier wire. A small wire is a poor investment for the reason that it corrodes very soon, leaving but a thin core of metal, surrounded by a coating of oxidised matter. This corosion causes the wire to lose its original strength and, further, the electrical resistance is greatly increased. The latter is the most serious of these two disadvantages. With a heavy wire, or one that is composed of a number of smaller strands, these difficulties are offset for a longer period of time, although they too will not give everlasting service.

Proximity to Other Objects.—If possible the antenna should be stretched over a clear space, free from buildings and trees. It should not be strung in between two tall structures, as then these objects will cut off and screen the passing radio wave. If one end is supported by a tree allow the insulator at that end to extend at least ten feet from the branches. The tie rope or wire only needs to be lengthened to do this. The position of the lead-in has already been touched upon. Keep all wires tightly stretched.

Do not run an aerial parallel to any electric lighting or power line, nor the telephone lines. It is not advisable to get too near any other neighbouring antenna either. When in such a position too much interference is apt to result, being caused by the phenomenon of induction.

It will repay you to go over your present aerial installation, keeping the above facts in mind. You will be surprised at the difference that a few changes can make if carried out in all earnestness.—(From the "New York Tribune.")

Continued from page 12

antenna and ground and plug in the loop at the jack provided. An efficient loop can be made by winding 15 turns of No. 18 annunciator wire on a framework 2 feet square, spacing the turns by ½ inches.

You will probably think up other experiments to make with this outfit while you are operating it.

WESTERN SUBURBS AMATEUR WIRELESS ASSOCIATION.

During the Eeight-Hour week-end, the Hon. Secretary of the Western Suburbs Amateur Wireless Association visited Newcastle and district. Mr. Challenger was entertained by Mr. L. Swain, of Hamilton, who is the Hon. Secretary of Newcastle Radio Club. During Mr. Challenger's stay in Newcastle he heard Mr. Olsen's station working, and he assures those who think Newcastle is asleep that they are mistaken.

Since Mr. Challenger's arrival back in Sydney, the Newcastle Radio Culb have carried out some very successful tests with the Western Suburbs Amateur Wireless Association. Mr. Bowman and Mr. Challenger received Newcastle on two nights, and the following Sunday morning. During last week they heard Newcastle on speech. These two clubs, although far apart apparently desire close touch with each other, and the time is not far distant when the two clubs will work two-way communications.

One of the members of the Western Suburbs Amateur Wireless Association, Mr. E. Faulkener, 2NA, of Newtown, recently reports a number of five stations continually, 5BQ, Mr. Jones, of Westbourne Park, S.A.

On Friday, 20th October, Mr. Bowman, of Western Suburbs Amateur Wireless Association, success fully logged 5AG on a single detector valve.

Any person interested in the Western Suburbs Amateur Wireless Association will have courteous attention by writing to 77 Park Road, Auburn.

CROYDON RADIO CLUB.

On Saturday, October 20th, the Croydon Radio Club enjoyed a very interesting lecture from Mr. Wallace Best (2ER), on "Transmitters." He first explained the principle of transmitters, and proceeded to outline the various circuits used by amateurs in continuous wave work. The lecturer dealt very thoroughly with the three coil transmitter, which he said gives excellent results, and has many advantages over the usual transmitting circuits for amateurs. Members were very grateful to Mr. Best for his lecture, and appreciated his goodness in coming a distance to visit the club.

The club has been granted a transmitting and receiving licence, call signal 2YB, and some transmitting experiments will shortly be carried out.

Meetings are held every Saturday night at 7.30 p.m., at "Rockleigh," Lang Street, Croydon, and the Hon. Secretary will be pleased to hear from intending members, who should address all communications to G. Maxwell Cutts, "Carwell," Highbury Street, Croydon.

LEICHHARDT AND DISTRICT RADIO SOCIETY.

Members of the Leichhardt and District Radio Society held their 53rd general meeting in the club-room, 176 Johnston Street, Annandale, on Tuesday, October 23rd. The evening was spent with the assembling of the Society's new valve receiving set, and the carrying on with buzzer practice.

The next meeting will be the 14th monthly business meeting, and will be held on Tuesday next at 8 p.m.

The Society is desirous of further increasing its already large membership, and with this end in view inquiries are invited from those interested in radio work, and resident in the Leichhardt and surrounding districts. Same should be addressed to the Hon. Secretary, Mr. W. J. Zech, 145 Booth Street, Annandale.

ILLAWARRA RADIO CLUB.

The 34th general meeting of the club, held on 23rd October, was responsible for a good attendance of members. After formal business had been disposed of, Mr. Watkin Brown delivered an interesting talk on "Harmonics." Taking the notes of music as an analogy, it was illustrated that every natural note on the musical scale had its attendant group of definite harmonics which were multiples of the fundamental note, and by applying these same laws to wireless waves it was clearly seen how and why all radiated waves were accompanied by their own peculiar group of harmonics according to wave length and frequency of the transmitted wave.

It was also explained that the same laws governed sound, light, heat, radio waves, etc., and some interesting facts were given relative to reflectoin, refraction and defraction as applied to these various forms of energy. The lecture proved very interesting and instructive giving much food for thought in directions not often considered, and was much appreciated by those present, who accorded Mr. Brown a hearty vote of thanks, to which the latter responded, stating that he hoped at some futute time to go further into the relative forms of energy as applied to radio science.

The next meeting of the club will be held at the club-room, 75 Montgomery Street, Kogarah, on Tuesday, 6th November, at 8 p.m., when Mr. A. Atkinson will give a talk on "Aerials." All members, and others interested, including members of other clubs, are cordially invited.

Members are invited to take advantage of the buzzer practice class which is conducted at club-room from 7.30 to 8 every meeting night.

The Secretary would be pleased to hear from any local experimenter wishing to join the club and any information will be supplied on application. Address: Mr. W. D. Graham, 44 Cameron St., Rockdale.

MARRICKVILLE AND DISTRICT RADIO CLUB.

On Monday the 22nd inst., a most interesting lecture on wave meters was delivered to this club by Mr. Evans, of Wireless Supplies Ltd.

The lecturer treated his difficult subject in such a splendid manner that the veriest junior member of the club understood the theory and principles of wave meters.

The construction of these articles was dealt with at length: the uses they could be put to; the method adopted to determine the inductance value of a coil, the capacity of a condenser, and many other items of interest were clearly explained by Evans. At the termination of his oration, the President, Mr. W. L. Hamilton, moved a vote of thanks to Mr. Evans. This was seconded by Mr. E. B. Crocker and carried by acclamation.

This club meets in the School of Arts, Illawarra Road, Marrickville every Monday night. Intending members are asked to communicate with the Secretary, A. W. Hemming, 23 Central Avenue, Marrickville.

DEMONSTRATION AT NEUTRAL BAY.

Neutral Bay was treated to its first successful public demonstration of Radio Telephony on Saturday, October 20th, at a bazaar held at "Alwyn" School in aid of the Blinded Soldiers' Fund. The set, consisting of a four-tube neuterodyne, built by W. C. Best, Rose Bay, and a loud speaker, was operated by H. K. R. Thomas and R. S. Murray. Mr. Best transmitted music throughout the afternoon his station at Rose Bay. The neuterodyne, employing one stage of radio, detector and two stages of audio amplification, provided markedly loud music, and the transmission was faultless in modulation and adjustment.

The demonstration was held with the Postmaster-General's permission.

NORTH SYDNEY RADIO CLUB.

This club which mainly comprises several practical amateurs, including visiting ships' operators and men who have passed through the Marconi School generally meets on Tuesday evening at Mr. Raymond McIntosh's residence (the present licensed quarters of the club), Burns Bay Road, Lane Cove, where radio happenings are discussed, experiments carried out and an informal smoke-oh is indulged in. However, the members varied the proceedings last Tuesday evening by putting the club's transmitter into operation and some useful testing was carried out.

Misses Rae and Priscilla O'Brien —friends of Madam Clara Butt— helped the club in its tests with some excellent vocal contributions and violin obligato and a very pleasant evening was spent at the station with the kind help of Mrs. McIntosh.

The club welcomes new members and those desiring tuition in practical transmitting and receiving; intending members requiring information should apply to the Secretary, 324 Pitt St., Sydney or to Mr. Raymond McIntosh.

The club's wave length is 235 metres and the call sign 2GY will be now heard in the ether every Tuesday evening.

THE USES OF PARAFFIN WAX.

Properly used, paraffin wax is probably the most valuable insulating and damp-proofing compound at the command of the amateur constructor. Improperly used, it fails to achieve its object, and, moreover, does actual harm in increasing the internal capacity of windings.

The two essential points to grasp in connection with its use are these: first, remember that its specific inductive capacity is fairly high (about 2.5), and consequently, when damp-proofing a coil take care not to leave all the interstices of the winding full of wax. To avoid doing so, see that the wax is hot enough to run out freely, and drain the coil thoroughly, giving it a little judicious shaking and jerking over a spread-out newspaper if necessary.

The second important point to bear in mind is that paraffin wax is not capable of making absorbent materials proof against moisture, but also of actually expelling such moisture as may be present in them at the time of impregnation. To do this, of course, it is necessary

to adjust suitably the temperature of the wax bath. Here a centigrade thermometer is a great convenience, for with its aid one can obtain and preserve the right temperature (somewhat above the boiling point of water, say 140 degrees C.) and is then an easy matter to soak the object to be impregnated until bubbles cease to rise from it, thus indicating that the expulsion of the moisture is complete.

Lacking a thermometer, one may rely upon guess-work, taking care not to over-heat the wax (which would result in troubles from scorching and boiling), or one may use some sort of double-boiler, such as a jam-pot standing in a saucepan, containing a liquid of higher boiling point than water, such as strong brine. Keep the brine boiling briskly and again employ the cessation of bubbling to denote the completion of the process of impregnation.

A final word: it is well worth while to spend a little more and obtain wax of good quality, whose insulation is above suspicion.

G. P. K.

FINISHING EBONITE PANELS.

Nothing has a greater effect upon the appearance of a home-made wireless set than the quality of the finish given to the ebonite panels. If left with scratches and tool marks upon them, or with rough, only partly trimmed edges, these defects attract the eye and divert attention from workmanship that is otherwise good. External finish makes no difference at all to the set's performance, but far more pride is felt for any piece of apparatus that is well finished in appearance, and further, one takes more pleasure in using it. The extra time needed to make a really good job of things will not exceed ten minutes or a quarter of an hour in the case of a 9 by 6in. panel, and the results are so satisfactory that it is well worth while.

No matter how careful one may be, the surface of the panel is pretty sure to be scratched a little during the process of cutting, drilling and tapping. You need not sigh over the spoilt beauty of its glossy exterior, for the high polish that it bears is an eyesore from the wireless man's point of view. The more shiny the ebonite the more likely is it to be a poor insulator of oscillating currents, for that polished surface, especially when it has collected a thin film of moisture deposited by the natural dampness of the air of the room, is very apt to provide high resistance leaks in all directions. Much of the ebonite now sold receives its gloss by being pressed when hot betwen tin plates. A little of the metal may be deposited, with the results fatal to insulating qualities.

The polish, then, is best removed. Do this with a piece of the finest grade of emery cloth, working smoothly and evenly over both sides of the panel. The underside may be left with no further attention, but the other must be polished with a mixure of knife powder and turpentine, applied with a rag. This gives a dead-black semi-matt finish which, besides looking extremely well, is thoroughly efficient from the point of view of insulation. When this has been done give the panel a thorough washing under the tap to remove all traces of corundum powder, which is of course a conductor.

—The "finishing" tool.

The edges of the panel should be made smooth and square with a fine file. They should then be finished up with the very useful tool shown in the drawing. This consists simply of a block of hard wood to the lower concave of which is glued a strip of emery cloth. Its use enables the edges of the panel to be very slightly bevelled off, which adds much to its appearance. Once shaped, the edges should receive a final treatment with knife powder and turpentine.

One final hint. Never clamp a panel between the bare jaws of a vice. By so doing you may cause deep indentations to be formed which are most difficult to polish out. Cut out two pieces of stout cardboard and bend them to the shape of the jaws. They can be

kept lying handy on the bench and slipped into place whenever a piece of ebonite is to be held in the vice. A little care, however, should be taken to keep them clean and free from grit, metallic chips, or other abrasive matter capable of producing scratches on the finished surface of the panel or other work.

R. W. H.

ADJUSTABLE FEET FOR BASE-BOARDS.

When a flat baseboard is made to receive the various components which make up the circuit, it is not usually efficient if it is not provided with four feet. However true it may be from a constructional point of view, unless it rests evenly on a table, irrespective of the surface of the table, a baseboard is of little use for those who employ a cat-whisker crystal detector. A simple device for providing feet, which are both rigid and ornamental, for a baseboard, is made by screwing four telephone terminals into each corner on the underside. By adjusting the heads of the terminals a perfect level can be obtained with very little trouble. For those who desire feet of a more ornamental nature ebonite knobs may be used. In this case four ebonite knobs of a suitable pattern are procured with 2 B.A. tapped bushes. Short lengths of 2 B.A. rod are screwed into each corner of the baseboard on the underside, and the knobs screwed on to the projecting portion. To adjust to a true level the knobs are simply unscrewed for one or two turns.

H.B.

MAKING BRASS WASHERS.

It is not always convenient to run out to procure a few urgently needed brass washers, and it is the little odds and ends that count in wireless construction. Brass washers are easily made by procuring a piece of strip brass, marking it off in squares, and punching a hole in the centre of each square with a riveting punch and die. After the holes are punched, cut up in squares; these may be trimmed round if desired. The process is quite quick and easy.

H.B.

A.C. FOR FILAMENTS.

When using a transformer for heating the filament of a valve, the alternating current produces a noise in the telephones which renders reception almost impossible; a method of overcoming this consists in shunting the secondary of the transformer by means of a potentiometer of 200 or 300 ohms resistance, to the sliding contact of which is connected one end of the secondary of the transformer (the end which would be connected to the positive terminal of the accumulator if such were used for heating the filament in the ordinary way). In moving the sliding contact slowly towards the centre, it is possible to find a point where the sound due to the alternating current is practically nil, and under these conditions reception is practically as good as with direct current.

The above information, given in a French contemporay by Moye in 1921 in an article on the employment of lighting-current for heating valve filament, has resulted in the manufacture of the Ferrix transformer, which gives the heating currents and also the high-tension voltage. The primary is constructed for the voltage and frequency of the ordinary electric supply, that is, in France, 110 to 120 volts or 200

to 220 volts at about forty to fifty periods. There are three secondary coils. The first secondary coil is made of extremely fine wire and is solely for the production of the plate voltage; the following voltages may be obtained: 20, 40, 80, 100, 120, and 140. The second secondary coil which is wound concentrically with the first, provides a current of about 1 ampere at four volts, suitable for the heating of the filament of the first valve. The third secondary coil provides for the heating of the filament of a second valve.

POSITIVE AND NEGATIVE.

One is apt, sometimes, to overlook the fact that electrical potential, like position and time, is purely relative and that just as height is measured up or down from a reference datum so is electrical potential positive or negative in relation to an arbitrary zero.

In the case of the thermionic valve it has become customary to regard the negative end of the filament as being at zero potential—i.e. to make this our datum—and in receiving valves the anode or plate is maintained at a potential some 50 volts positive in relation to the filament. In other words, the anode, on account of the "HT" battery, carries a considerable excess of positive electricity. The grid carries a small excess of positive or negative electricity, and is relatively positive or negative as the case may be.

Now the incandescent filament emits particles of negative electricity or electrons, just as boiling water emits steam, and as these travel to relatively positive points, when free to do so, most of them will flow to the anode where a continuous neutralisation of positive electricity gives rise to a make up current from the H T battery.

One end of the incandescent filament is positive in relation to the other, hence there is a constant though much smaller stream of electrons from the negative end through the vacuum to the positive end; and if the grid is positive in relation to the filament, it will receive its stream of electrons also. If the grid is negative in relation to the positive end of the filament, but positive in relation to the negative end, it will still collect electrons, for there remains a portion of the filament that is relatively negative.

When we say that electrons travel to relatively positive points, we are referring to points relatively positive in the circuit, for although the individual electrons may be said to have potential — this varies during its travels according to its position in the circuit. In practice it is with the circuit therefore that we are concerned when we talk of electrical potential or voltage. Thus, when free to do so, an electron will flow from a point in a circuit that is highly positive to a point that is more highly positive, just as it will flow from a point that is negative to one that is positive, and it may be noted that in so doing it will reduce its own (negative) potential.

H.McC.

A CHEAP AND EFFICIENT VARIOMETER.

A simple little variometer that will give good results on the broadcast wave lengths can be made without difficulty, its total cost not exceeding eighteen pence. One great advantage of the type to be described is that it has no brushing contacts. Many variometers have two of these, and they are almost bound to become, sooner or later, a source of trouble as the spindles and brushes wear.

The former for the stator consists of a 1¼in. length of cardboard tubing with a diameter of 4in. Two 2B.A. clearance holes are bored exactly opposite each other to take the spindles. A pair of smaller holes are then made quite close to one edge and 13 turns of No. 26 d.c.c. wire, one end of which has been passed two or three times through the two small holes to form an anchorage, are wound tightly and evenly round the stator. The wire is now carried diagonally across so as to clear the spindle holes, after which a further thirteen turns are wound. The winding is finished off by being anchored as before, a short end 2 in. or 3 in. in length being left protruded.

The rotor, a 1½ in. piece of tubing 3 in. in diameter, is drilled and wound in the same way, the number of turns being just as before. Both rotor and stator windings should be shellacked to keep them in place.

Three ebonite washers, two ½ in. in diameter and one 1 in., all drilled with 2B.A. clearance holes, are now prepared. Two of these are glued to the windings of the rotor so that their holes coincide with those for the spindles drilled in it. Their purpose is to protect the insulation of the wire when lock nuts are tightened down. The third and largest washer is fixed by means of screws over the upper spindle hole of the stator. Besides protecting the windings, it forms a bearing for the spindle. To the lower part of the stator is fixed, by means of 4B.A. bolts, an ebonite plate which may be provided with terminals, a plug and socket, or a pair of valve legs, according to the type of mounting desired for the finished instrument. A 2B.A. clearance hole to coincide with that in the stator is drilled in the plate.

We are now ready to assemble the variometer. A 1½in. length of 2B.A. screwed rod is inserted through the holes in the ebonite plate and the stator. Over the end within the tube are placed a flat washer, a spring washer, a second flat washer and a nut. The upper spindle, a 2in. length of the same rod, is also passed through its hole, a single nut being placed upon it. The rotor is now placed inside the stator, and the point of the bottom spindle inserted in the hole drilled for it. The rod is now turned to screw it through the nut already placed upon it until a quarter of an inch or so protrudes into the inside of the rotor. A second nut is then put on and clamped down.

A nut is screwed on to the portion of the spindle which projects from the bottom of the mounting plate. This nut is adjusted until the rotor is drawn to an exactly central position within the stator; a second nut is then placed under it, and the pair are locked tightly. The upper spindle is then screwed in through an ebonite washer and through the rotor, to be fixed by a clamping nut on the inside. The beginning of the windings on the stator is now connected directly to one of the terminals on the plate. To the far end is soldered a short length of thin rubber-insulated flex, whose outer silk or cotton covering has been removed. This is taken to the "in" end of the rotor windings, and soldered to it. Another piece of flex is taken from the "out" end of rotor winding to the second terminal, thus completing the circuit, and this quite efficient little tuning device.

R. W. H.

Continued from page 4

Roberts, Strathfield. Violin Solo excellent.

Walker, Canterbury. 1 det., 1 audio. Coming in perfectly, little heterodyning.

Thomas, Leichhardt. Everything OK., no improvement on last night. Pennant Hills badly jammed.

T. Good, Rockdale. Coming through very well.

C. B. Minnett, Neutral Bay. Hearing OK., enjoying items very much.

Chatswood, 2 p.m., coming in splendid, using loud speaker on 2 valves. Modulation perfect. Haven't heard better since opening on new set; if any more reports let know by radio.

Ramsay Sharpe and Co., 2WS. Getting O.K., very clear, modulation good, 2 stages and loud speaker. Customers all agree very good Violin solo now very beautiful, enjoyed by several people in shop.

Petrie, Lane Cove. Coming through splendidly. Enjoying "Shipmate of Mine" very much.

2JM, Marsden. Burnt out choke and shorted condensers.

Captain Russell. Coming in excellently, single valve.

Petersham. Excellent. Crystal indoor aerial.

Stanmore. 2 Q.T. Best 10 watter so far. Fading a little to-night. Not quite so good as last night.

Nangle. Very good; excellent.

Royer. Very good; excellent.

Harding, Garden Island. Very well to-night.

Captain Russell. Excellent, 1 tube.

Bruce, Nth. 2895. Have you anything Scotch? Coming through very well. Licks J.C.M. hollow; twice as loud

2YB, Cutts, Croydon. Very good, hear 15 feet away, crystal detector 1 valve amplifier. Also voice very good, hearing better than ever. Violin stands out on its own. Accompaniment not heard at times for vocal items.

2NH, Strathfield, Coming in very well, either on crystal or valve. crystal detector, 1 stage radio can be heard across room.

Kensington. Very well.

Radio House. OK. to night.

McKittrick, Mosman. Listening in everything very clear, would like to hear some applause. Coming in good and very nice.

Lawson, Ashfield. Getting real good on crystal set.

Mulligan, Perry's set, Cremorne. Reports A.W. hetrodyning us. Suggest Mr. Maclardy close down for 3 minutes and listen in. Reports music good, will report later on, hetrodyning after listening.

Crown Star Theatre. Thanks very much; present singer very plain and clear.

Bruce, Greenwich Point. Coming through very clear.

Scott reports that either piano and voice are too close together or valve is too far away from microphone.

Katoomba reports. Very good reception and (cut off).

Again!

ADELAIDE EXPERIMENTERS ASKED TO TAKE OUT PERMITS TO USE PATENTS.

(To the Editor, Wireless Weekly)

Sir,—A letter has been received from the Amalgamated Wireless Ltd., offering to members of the Wireless Institute free permits to use their patent rights in conducting wireless experiments.

We should deem it a favour if you would give us your views as to whether any company has the right to require any person to produce a license to use their patents when such patents are not being used for the purpose of trade or profit.

Trusting that you may be able to enlighten us on this matter.

Yours etc.,

Wireless Institute of Aus.

S. A. Section.

(We advise you to see a patent attorney. The advice obtained by us when the matter came up here some little time ago and 5/ from every experimenter was asked for, was "**That provided the apparatus was used for experimental purposes only, it was not necessary to pay a license fee or sign any agreement.**—Editor.)

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