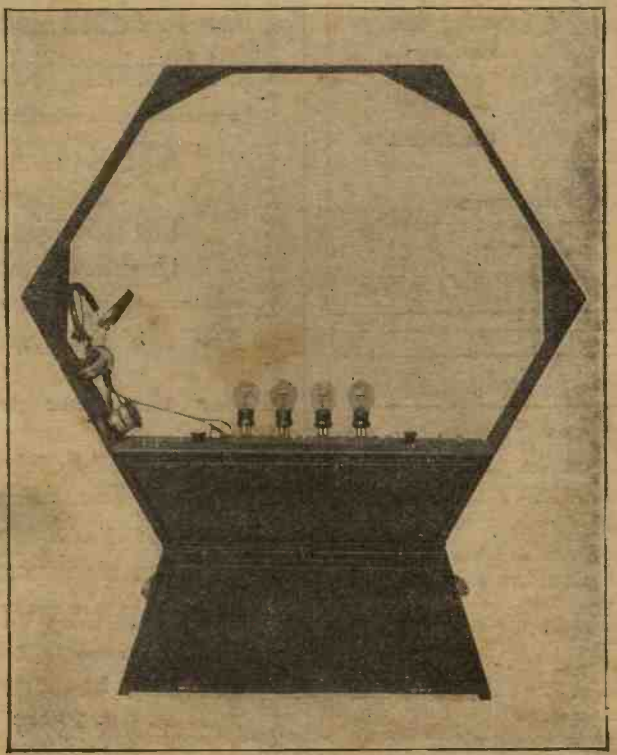
# WIRELESS, "WIRED" AND "PIPED"


# Amateur Wireless And Electrics

No. 16 SATURDAY, SEPTEMBER 23, 1922 Price 3d


## CHIEF CONTENTS





RECEIVING SET WITH ITS OWN FRAME AERIAL (see p. 326)

Amateur Wireless and Electrics

No. 16 September 23, 1922

# A FIVE-VALVE RECEIVING SET

## A Fine Amateur-made Set with Loud-speaker

THE five-valve set shown here consists of two high-frequency valves, a detector valve, and two low-frequency valves, this combination, in the opinion of its maker, Mr. R. Horrocks, a member of the staff of Messrs. Vickers, Limited, being the most satisfactory for all general purposes. The set has been made at home by Mr. Horrocks and covers all wavelengths from 300 to 25,000 metres.

For short-wave working (300 to 2,600 metres) a tuning coil with ball reaction is used, twelve taps being taken off the coil. For long waves a series of basket coils are banked together and twelve taps in all are taken from these.

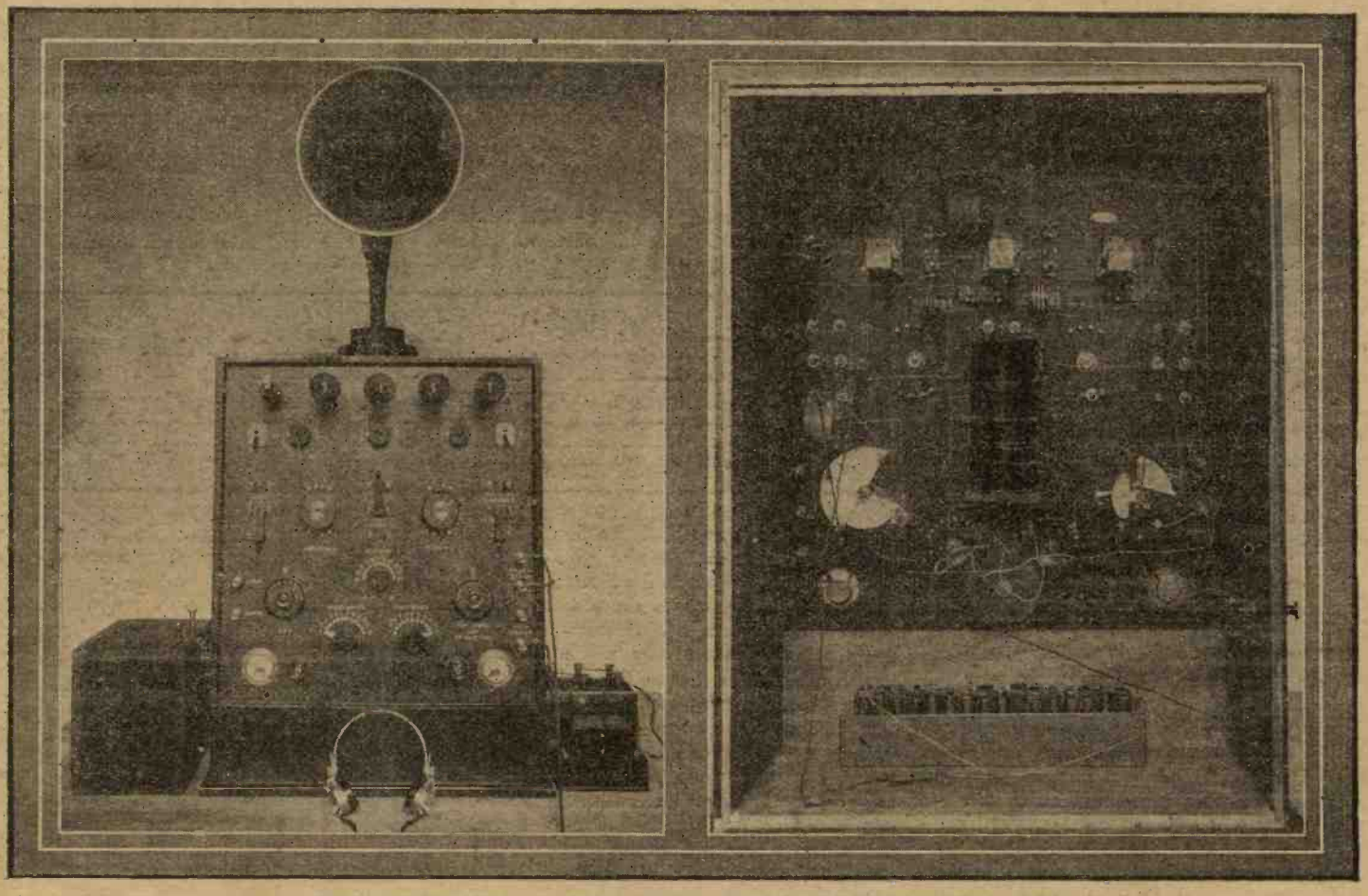
The method of coupling on the high-frequency side is resistance-capacity, and is found to be remarkably efficient for amateur telephony. The low-frequency transformers and also the telephone transformer conform to the standard hedgehog pattern.

For the H.F. valves V.24's are usually employed, the remainder being Marconi Osram "R" type. The filament resistances are of the Marconi pattern, being absolutely silent in working and allowing of a very fine adjustment. One L.F. valve may be cut out when desired by means of the switch shown in the top right-hand corner.

The A.T.C. is of .001 M.F. capacity, and the fine-tuning condenser .0005 M.F. The voltmeter on the left of the panel is for showing the accumulator voltage and the ammeter on the right for registering the amount of current taken by the valves.

When the Marconi concerts are being transmitted the telephony can be heard plainly, if the loud-speaker and microphone are in use, at a distance of more than 200 feet. Telephony within a radius of 350 miles can be heard, and Morse within approximately 3,500 miles.

We congratulate Mr. Horrocks on such a fine piece of amateur craftsmanship and on the excellent results he has obtained.



**A Five-valve Receiving Set Made by Mr. R. Horrocks, of Thornton Heath, Surrey.**

# Telephony Reception on Single-valve Set—I

**Mr. H. H. Dyer, the first-prize winner in our first competition, here carries his competition essay a stage further. Amateurs will benefit from the author's plain and practical instruction on the fuller use of his one-valve set.**

HAVING had experience of the reception of spark signals with the single-valve set described in the article on page 170 of No. 9, you will be in a position to try telephony. You should have been able to receive spark signals from Nauen (3,100 metres) and Karlsborg (2,500 metres), which stations transmit at specified times. If you have not yet heard them satisfactorily as clear musical notes you should try to do so, otherwise it will be quite useless to attempt long-distance telephony. Try varying the voltage of your 60-volt H.T. battery, which should be provided with "tappings," until you find the best value for the particular valve you are using.

### *The Oscillating Point*

The reception of telephony resembles that of weak "spark" in so far as it is necessary to get near to the oscillating point without actually reaching it. If you are close to a high-power station it should be easy to get good speech without approaching dangerously near this point, even with one valve. On the other hand, if you wish to receive over long distances you will have to get almost on the oscillating point, *but on no account must your valve be oscillating.* If this occurs, not only will you be unable to receive, but others round about will be unable to do so. There is nothing so annoying when receiving telephony as when someone starts radiating; in fact, on some occasions I have had to shut down altogether owing to this. I believe that some people have no idea that they are interfering, but the knowledge of this should be quite sufficient to ensure that it does not occur.

### *A Warning*

Those who are selfish enough not to watch this point should remember that they are liable to lose their licence. There are ways and means of tracking down the culprits, and if people persist in this kind of thing I think the different wireless societies will have to take drastic measures. I have said rather a lot about this, for it is one of the things that will determine whether the reception of telephony is going to be a success or not.

Before you can put a value on advice about the reception of "wireless" you must know something of the circumstances under which such advice is given. For instance, if I lived, say, in the northern suburbs of London and, without informing you of that fact, simply told you that I received very good telephony from Writtle without any critical adjustment, you might be led to expect similar results although you are a hundred miles away. Therefore, before going any further, I will tell you that I am roughly 100 miles from Writtle, 150 miles from Croydon, and 300 miles from Paris and The Hague.

### *Start with Paris*

I consider that the best station to start with is Paris, which transmits on 2,600 metres between 6.10 and 6.40 p.m. (B.S.T.) each day except Saturdays and Sundays. From your previous experience you know the adjustment for 2,600 metres and the exact position of the reactance to be just short of the oscillating point. Having made these adjustments very carefully, switch on shortly before the time for Paris to commence. If, when they come on, you should get a note in your 'phones, without any hesitation loosen your reactance coupling, for your valve is oscillating. You may now tighten your reactance coupling very, very gradually as you approach the critical point. All being well, you should just be able to hear speech. If you do so, do not take your reactance adjustment too far, but try moving your aerial condenser ever so slightly to see if you can improve the speech that way, always being ready to loosen your reactance coupling should your valve start to oscillate. Having got the best adjustment of the condenser, tighten the coupling the least little bit at a time, making a note of the exact position. You will eventually arrive at the point where you get oscillation and must instantly loosen the coupling. You may then tighten the coupling again, stopping just short of this point. You should now be receiving about as well as is reasonably possible with the rough adjustments at hand. With one valve you have to get so near the oscillating point that you do occasionally start radiating, but as you only radiate for a fraction of a second, I think so much is permissible until you have had practice, when you should be able to get to the critical point without causing any interference.

HERBERT H. DYER.

(*To be concluded in our next number*)

# A Commercial Station with a Phenomenal Receiving Range

IN the extreme south of the South Island of New Zealand is the 30 kw. Telefunken wireless station of Awarua (call sign V L B), which was erected in 1913 to ensure day and night communication between that place and Sydney, New South Wales, a distance of approximately 1,225 miles. The aerial—of the umbrella type, consisting of 24 wires—is supported by a triangular-section steel lattice mast 400 ft. high. At this station remarkable receiving results are obtained, using only a single-valve circuit. The powerful stations around Honolulu can be heard easily in the daytime. In the evening Carnarvon, Bordeaux, Lyons and Nauen come in quite strong enough to give complete reception, and at night Annapolis, Tuckerton, New Brunswick, Darien and other high-power American stations are received very clearly.

The circuit used for these results is shown in the diagram. In this A is a variometer consisting of two long coils wound in opposition and so constructed that one may slide completely within the other; B is the plate circuit loading inductance; C and D are condensers, each having a capacity of .004 mfd. The grid condenser is made variable for critical adjustments and no grid leak is used, the valve being of the "soft" variety requiring 24 volts in the plate circuit.

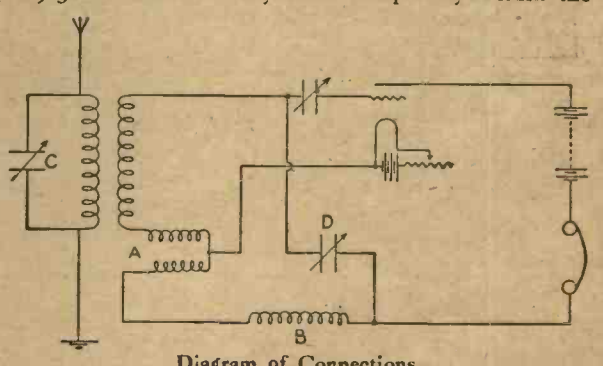



Diagram of Connections.

# WIRELESS FURNITURE

A coming feature of the home is wireless furniture. The furniture of music—the instrument case, the music stool, easels and cabinets for printed sheets, etc.—has been added to within living memory by the gramophone cabinet, which frequently is an elaborate, costly piece.

Now comes the wireless cabinet, and it will soon prove a necessity. A collection of wireless apparatus on a side table can look very unsightly. The article on this page is illustrated by photographs specially taken at the Central Hall Exhibition, Westminster.

AMATEURS might well follow the example of some of the leading wireless manufacturers in enclosing receiving apparatus in suitable pieces of furniture.

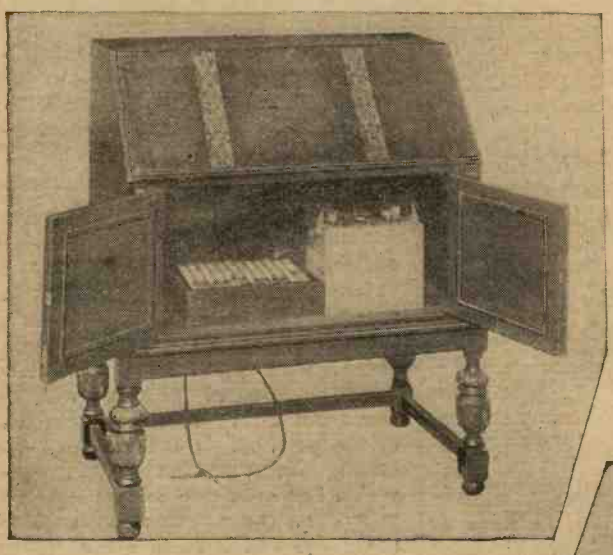
For the people who install a receiver for the sole purpose of listening to broadcast concerts and speech (and eventually such people will probably form the majority of those interested in wireless), the nightly act of bringing out from various drawers and cupboards pieces of apparatus and connecting them together will speedily cause loss of interest except to enthusiasts. The average person will want a self-contained receiver always ready for use and enclosed to keep dust off and to prevent damage to the instruments.

Quite a number of pieces of furniture are suitable for the purpose, including roll-top desks, bureaux, china cabinets, gramophone cabinets, etc. For rooms which have furniture of a decided period—as Queen Anne, Jacobean, Chippendale, Sheraton—a cabinet to match the surroundings can be easily adapted. It should contain the adjustable parts of the apparatus in a convenient position, the high- and low-tension batteries underneath or at the back, and a special refinement would be a built-in loud speaker in the upper part. A frame aerial could be constructed either on the back of a door or on a special framework inside the cabinet, in which case the whole receiver would be really self-contained; but this is not recommended unless at least a three-valve amplifier is used. Otherwise two terminals for the aerial and earth must project in some inconspicuous position.

Although a boxed-up set does not as a rule appeal to the experimenter, he will probably appreciate a cabinet set, especially when tired of temporary connections.

L. W.

EXAMPLES OF WIRELESS FURNITURE

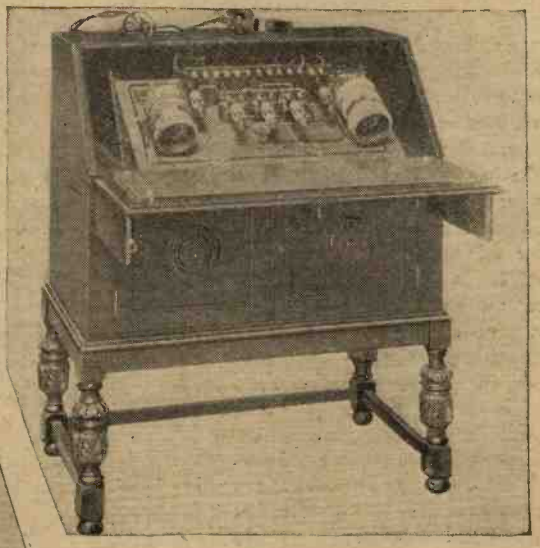


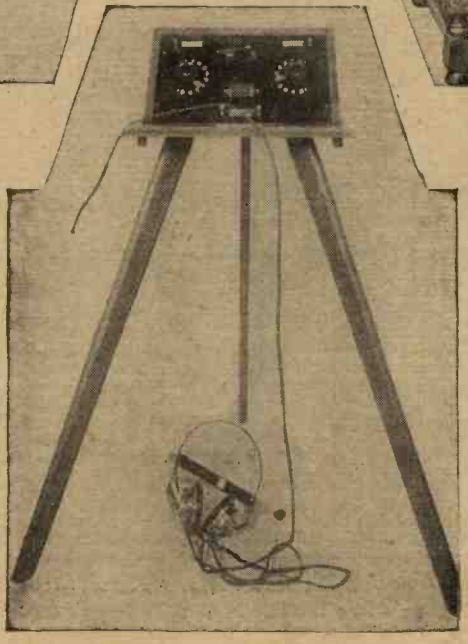
*Top.*—Wireless Receiving Cab net in Jacobean Style. (Maker: R. Scruby)

*Left.*—Cupboard Doors open, showing Batteries.

*Right.*—Panel Reversed, showing Apparatus.

*Bottom.*—Wireless Receiving Easel. (Makers: Union Wireless Co.)





It is now officially announced that the supposed messages from Mars which were received by Senatore Marconi when cruising in the Mediterranean were from Schenectady, the home of the General Electric Company.

■ ■ ■ ■ ■

A wireless telephone exchange now in existence at the Croydon aerodrome (Waddon) enables the officer in charge of air traffic to keep in touch with machines on the Channel.

# Movable Frame Aerial for Direction Finding

An Article to be Read in Conjunction with the Series Appearing in Nos. 10, 12 and 15

THERE is a considerable amount of excitement to be obtained in operating with a movable-frame aerial. The advantages of a frame aerial for the amateur are: (1) It is specially sensitive to one particular wave-length; (2) owing to this fact, combined with the marked directional effect associated with it, it affords great "selectivity," that is, it possesses the quality of eliminating jamming; (3) it can be moved with ease to any part of the house or garden; and (4) there is no danger of it being carried away in high winds or tempestuous weather. As against these advantages there is the fact that it is much less "receptive" than an open aerial. This means that in order to get the same strength of signals as with the latter, a greater degree of amplification is required. A crystal receiver, for instance, would be quite useless with a frame aerial. At least two, preferably three, amplifying valves should be used in order to get good results.

In making a frame aerial one very important point should be borne in mind. The sensitivity of a frame aerial varies as the product of the area of the frame and the number of turns of wire wound upon it. That is to say, by increasing the size of the frame *or* the number of turns you increase its sensitivity. But it must not be forgotten that by increasing the number of turns (the length of your aerial wire) you also increase the wave-length of your aerial. This means that the longer the wave-length you aim at receiving the more suitable will a frame aerial be. Another corollary from the same principle is that if you want to increase the sensitivity for a particular wave-length by increasing the size (area) of your frame, you must decrease the number of turns.

In practice, of course, it is not convenient to alter the size of a frame each time it is desired to receive on a different wave-length; so one must adopt means of increasing or decreasing the number of turns of wire. However, even this method is not very satisfactory. It is advisable, therefore, to make the biggest frame you can easily accommodate, and then ascertain by experiment the precise number of turns suitable for reception on whatever wave-length you wish to receive.

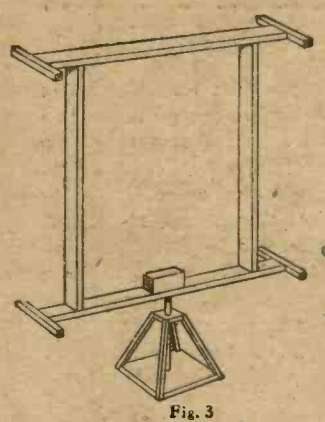


Fig. 3

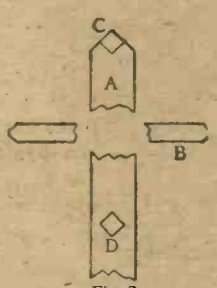



Fig. 2

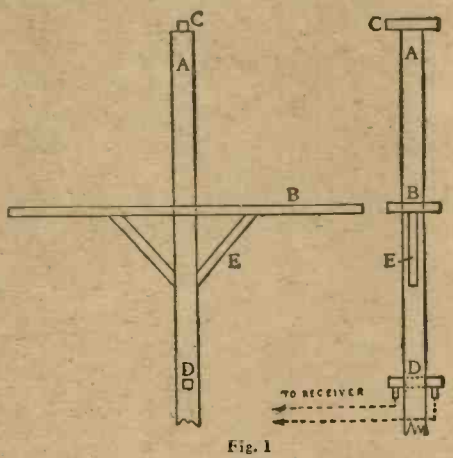
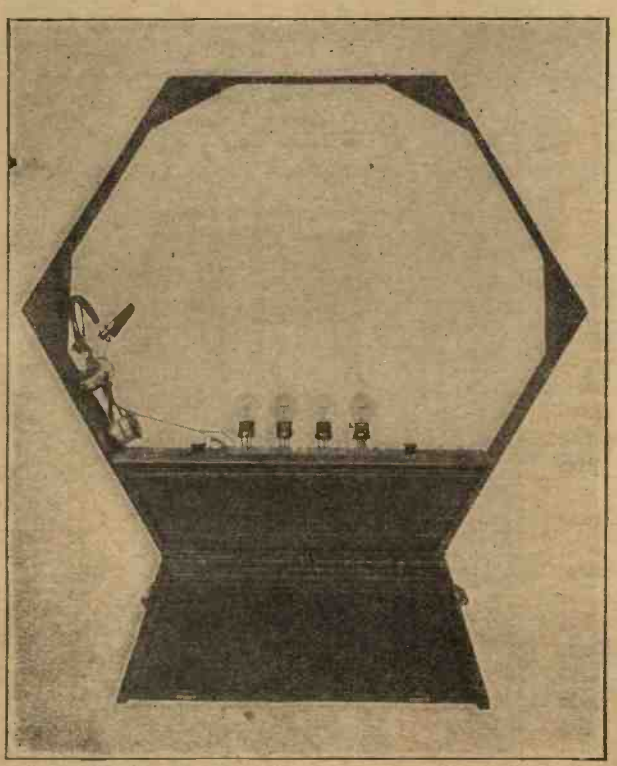



Fig. 1

**Figs. 1 to 3.—Details of Frame Aerials.**



**Receiving Set with its Own Frame Aerial.**
*(Makers: Wireless Exploration Corporation).*

Provided the necessary conditions of insulation and symmetry (preferably a rectangle) are fulfilled, the actual design of the frame is immaterial and will vary with the material resources and ingenuity at the disposal of each experimenter. For the guidance of those who have not yet essayed this task, however, two simple and useful forms of frame aerial will be described.

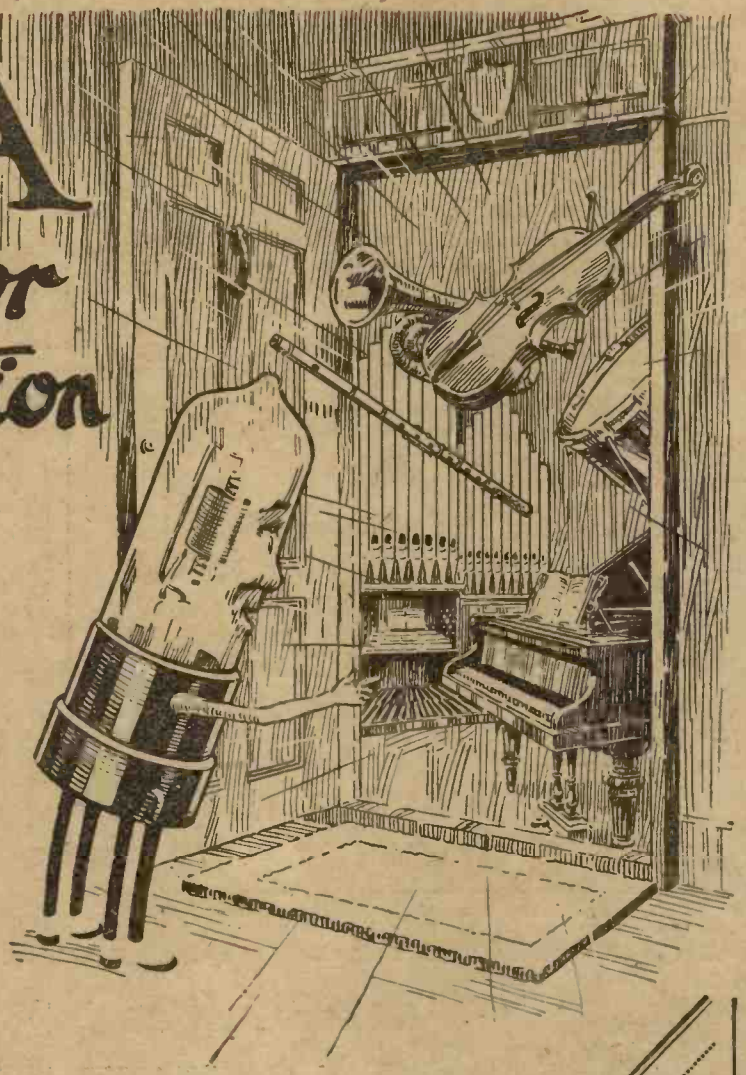
Fig. 1 shows a frame made out of two long and four short pieces of wood. The centre-piece A is a 6-ft. pole of about 2½ in. in diameter. It is pushed through a tight-fitting hole in the centre of a 5-ft. length of board B 6 in. wide and 1 in. thick. On the top of the vertical pole a cross-piece of wood C, 6 in. by 1 in. by 1 in., is screwed at right angles to the horizontal board. The distance from the top of the small cross-piece to the centre of the horizontal board is 2 ft. 6 in. At the same distance on the other side of the horizontal board another cross-piece D of the same size is inserted through a tight-fitting hole in the pole. This lower cross-piece is also at right angles to the horizontal board (parallel to the top cross-piece), and is fitted with two terminals from which leads are taken to the aerial and earth terminals of the receiver.

A variable condenser is connected across these leads for the purpose of allowing fine tuning. Two extra pieces of wood E are used to support the weight of the horizontal board. It will be noticed that at D some bunching of the wires will be inevitable owing to the obstruction of the pole. This can be eased by cutting shallow slots in the pole with a fine saw, care being taken not to weaken the pole too much. For the purpose of keeping the wires in place as they pass over the cross-pieces and the extremities of the horizontal board, it is advisable to cut small notches in each of the latter at equal distances apart.

Great care must also be taken to preserve perfect insulation at these points. For this reason insulated (copper) wire should be used: either enamelled or cotton-covered, preferably the latter. Whichever kind of wire be used, however, its insulation is liable to be impaired at the corner bends. To avoid this the cross-pieces and the ends of the horizontal board should be covered with some insulating substance (ordinary adhesive "insulating tape" will do) before the wire is laid on them. An improvement in this form of aerial

# ORA

## The Valve for perfect reception



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would be effected by cutting the tips of the horizontal board and altering the angle of the cross-pieces in the manner shown in Fig. 2. The object of this is to secure greater efficiency by obtaining all right-angled bends in the wire.

A strong design for a frame aerial is illustrated in Fig. 3. Owing to its increased strength and rigidity much larger frames can be made on this pattern. Four pieces of wood (4 ft. by 3 in. by 1 in.) are fixed at right angles to one another as shown. At each of the four ends of the horizontal pieces a cross-piece (8 in. by 1 in. by 1 in.) is screwed on. (Good insulation can be ensured by using ebonite cross-pieces.) The frame thus constitutes a square each side measuring 4 ft. 2 in. The lower horizontal piece is screwed on to a rod about 1 ft. long. With either of the frames described above, rotation can be effected by pivoting the lower end of the rod as shown in Fig. 3. By fixing a compass card (the function of which has already been explained) to this base block and fitting a suitable pointer to the pole, directional readings of transmitting stations can be taken. On a frame of the dimensions shown in Fig. 3, about seven turns of wire, spaced ½ in. apart, should give good tuning for the reception of broadcasting stations. With longer aerials the spacing distance should be increased. It is with the view to providing means for increasing the number of turns that 8-in. cross-pieces are suggested; they can, of course, be longer. If the frame were made of 8-in. wood throughout it would be both costly and clumsy.

There will be some, however, whose interest in a frame aerial does not emanate from any desire to find the direction of transmitting stations, but simply because of the unfavourable conditions which prevent the erection of an outdoor aerial. The ambition of such may be merely to hear broadcasting stations. In such cases a fixed frame aerial can be made to answer the purpose excellently, especially as, since it is not desired to rotate the aerial, more space will be available and, consequently, it can be made on a large scale. In certain cases the rafters in a loft offer a good opportunity for winding a good-sized frame aerial. Or, again, if you find that one of the walls of your room runs in a line with a broadcasting station, you have an ideal chance for winding a frame aerial on four good wall-plugs!

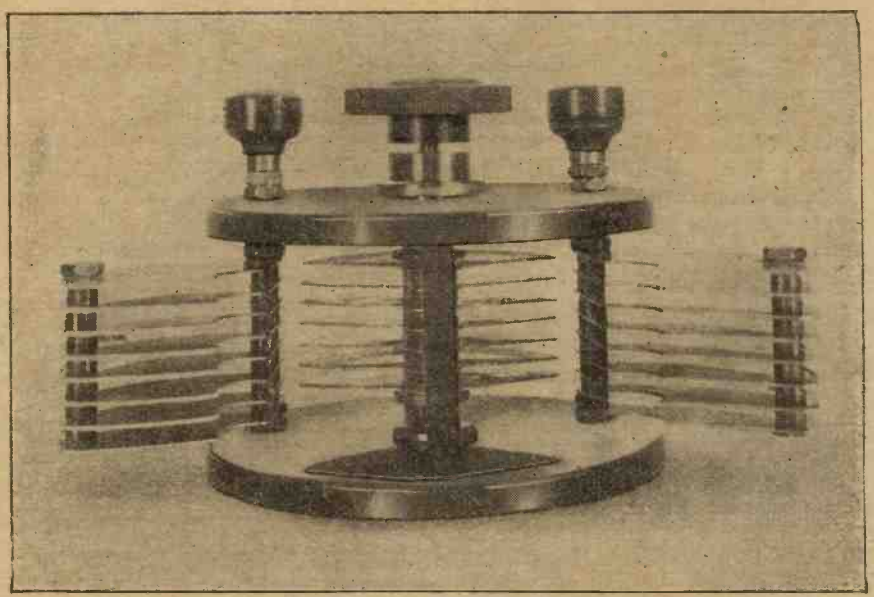
As a last word of advice, keep your frame aerial and receiving gear as far removed as possible from telephone wires and electric mains, etc. Also keep them at least a couple of feet above the ground. The question of making an outdoor directional ("balanced") aerial system has not been gone into because the practical difficulties involved render it outside the scope of the experiments of the wireless amateur at present. M. E.



# A New Variable Condenser

## A Device to Eliminate Re-radiation

THE photograph illustrates a new design of variable condenser which is claimed to eliminate the possibility of re-radiation. The condenser is connected between the plate circuit of the detecting valve and the aerial tuning circuit and provides adjustable capacity coupling between them. By a suitable adjustment the variations in plate-circuit current are made to maintain a self-oscillation in the aerial tuning circuit when this is required for continuous-wave reception. The condenser here shown was recently exhibited by Autoveyors, Limited.



A New Variable Condenser.

# A Gramophone as an Interrupter

AT the conclusion of a recent article on a home-made clockwork interrupter it was mentioned that a gramophone could be used as a tikker by allowing one wire to rub lightly against the turntable. The writer having tried this method, which did not prove very satisfactory owing to the difficulty of obtaining a steady make-and-break, has fitted up the following improvement:

An old single-spring motor gramophone was available, having a turntable of about 8 in. in diameter, the circumference therefore being about 25 in.

A length of thin copper-milled strip, such as is used for ornamenting photo frames, etc., was obtained, the milling being about 40 to the inch. This was secured to the edge of the turntable by means of solder every few inches. It will be seen that this gives about 1,000 millings to the entire circumference.

The felt was removed from the turntable stop and a thin piece of springy copper attached, the stop spring being so adjusted that the copper spring pressed lightly against the milling when the turntable revolved.

In order to make a good connection a piece of strip was attached to the milled copper and carried across the turntable, the other end being soldered to a copper washer which fitted tightly over the centre spindle. A piece of flexible wire was attached to the gramophone motor frame and another to the turntable stop, one of these wires being connected to one of the 'phone leads and the other to one of the detector terminals.

The speed can be regulated to a nicety by means of the motor speed regulator. Set at 30 to the minute, the necessary 500 interruptions per second can be obtained. The motor gives about 300 revolutions, a run of about ten minutes to one winding.

The tension of the copper tongue can also be nicely adjusted by means of the turntable stop. F. B. R.

# The Smallest Wireless Generator

## The Atom and Its Radiations :· Visualising Hertzian Waves

THE atom is really the smallest wireless generator. Of course, it would be impossible for the eye to detect the radiation from one atom, but in the case of monochromatic light, that is, light of one colour only, all the atoms are sending, or preparing to send, "signals" of the same wave-frequency.

In a star, for example, there are millions and millions of atoms; they are not all tuned to the same signal-frequency, so instead of monochromatic light we get light of many wave-lengths. A prism may be used to separate the mixed-up rays into component colours.

### *Messages from the Stars*

And what about the "signals"? What information does the star send across the billions of miles of space? As you might expect, being millions of miles away from its neighbour, all it can talk about is itself. You may reflect that many people are just as bad with far less excuse.

A star tells how old it is, how hot it is, and how big. Also what it is made of. It will also often give a little information about a near neighbour which we cannot always see. Of course, one must be able to decode these messages correctly. That is another matter.

### *How the Atom Sends out a Wave*

The atom itself is very much like a small solar system. But the "sun," the nucleus, is not large. It is negligibly small compared with the size of the atom. Nevertheless, in it is concentrated practically all the mass of the atom. Another important difference is that whereas the electrons move round the nucleus in orbits, they are different from planetary orbits in that they do not gradually diminish. An electron moves from an outer orbit to an inner one in a jump. No one knows just how. But it is during this jump that the electro-magnetic wave is sent out. Only certain orbits are possible, and the electron falls from one to another of these, perhaps passing a few possible orbits on the way. This occurs when the atom is stimulated by heat or electricity.

It is fortunate that our earth behaves differently! Of course, both the electron and nucleus are charged with electricity, whereas the earth and sun are not, at least not to such an extent.

All electro-magnetic waves then are produced by persuading groups of electrons to change their velocities very rapidly in some orderly manner. Hertzian waves are produced by rapid oscillations of electrons in the wires forming the aerial and in the earth below the aerial.

The formation of these waves can be visualised by considering the action of the well-known "tubes of force."

If you can imagine the inner pneumatic tube of a bicycle wheel cut across and then re-sealed so as to form a straight tube instead of a ring, with both ends fastened to two objects some distance apart and at such distance as to keep the tube in tension, and finally with the tube inflated so that there is a lateral pressure, you will have a fairly good idea what a tube of force is like.

The tube of force is attached to a charge at each end—charges of opposite sign. Hence the attraction of opposite charges. But the tube of force shrinks until the charges neutralise, and never sags like the tube of india-rubber. Further, there is not one, but many tubes, and on account of the tension they are crushed together, this crushing force being neutralised—when the tubes have settled quietly in some position—by the lateral pressure.

### *Detaching a Closed Loop*

Now see what happens when the aerial is charged up, first with electricity of one sign then with that of the other.

Consider one tube of force starting from a charge on the aerial and with the opposite end on earth. A signal is being sent, so that next instant the position of the tube is reversed.

What has happened? The two ends of the tube have approached along the conductor and at such speed that the tube has become looped at the mid-point. (It must be remembered that the tubes have inertia.)

The tube immediately breaks off at the crossed part, and the shortened tube rapidly growing pushes the closed loop or ring away. This having now no charge to hang on to, moves away into space with the velocity of light. It is an electro-magnetic wave. At the receiving end it is absorbed by a suitable circuit, in which process it produces a small current.

These tubes of force, which are conceived as made up of "lines" of force, have been the subject of much speculation. J. J. Thomson suggests that a line of electric force may consist of a central axis around which spin with the velocity of light small electron-like bodies, much smaller even than electrons. If the line of force, and of course the tube of force, is a manifestation of the action of material particles, then the ether theory is not required.

Now little is known of the actual process of radiation from atoms; the clue will be given by consideration of the large wireless oscillator.

Working the other way, facts known about atomic vibration may lead to important discoveries in wireless. One important fact in connection with the atom is that it cannot receive or emit energy (radiation) except in certain definite amounts or bundles. If the atom radiates energy, it gives out a definite minimum quantity depending on the frequency of the radiation, or nothing at all; and in receiving, the energy must exceed a certain definite amount (of course very small) before the atom can absorb it.

It is interesting to speculate on the parallel phenomenon in wireless.

When one recollects that on a dark night the light from a small lamp, representing a very small outlay of energy, can be seen many miles away, while the radiant heat can also be detected by sensitive apparatus, it seems natural to conclude that our present wireless apparatus is really very inefficient, and that time will evolve more delicate and less cumbrous devices.

J. H.

# International Wireless Publications

MOST amateurs reading Morse signals are curious as to the names of the stations they hear. When listening in it is decidedly tantalising to read O P K or B V Y or P Q T and not to know the name of the station or whether it is ashore or afloat.

The International Office of the Telegraph Union at Berne publishes an alphabetical list of all call signs ("Liste Alphabétique des Indicatifs d'Appel," 6 francs (Swiss), post free). The last edition—No. 6—was published in April, 1921, and the price includes all supplements to that edition, nine of them having been issued already. This list merely gives the call sign, the name, and whether the station is on board ship or ashore.

A more complete list published by the same office contains an alphabetical list of all stations, the geographical position of land stations, normal range, system, wave-lengths used for transmission and hours of service. This is the "Nomenclature Officielle des Stations Radiotelegraphiques, Edition Anglaise," 18 francs (Swiss), post free. The last edition—No. 7—was published in June, 1921, and the price includes all supplements to that edition, eight having been issued already.

L. W.

# RADIOGRAMS

SEVERAL of the schools about the country are now including instruction in wireless as part of their curriculum.

■ ■ ■ ■ ■

A British Wireless Relay League has been formed in Manchester to organise and safeguard the interests of wireless amateurs.

■ ■ ■ ■ ■

Weather forecasting by means of wireless was the subject of an experiment during the meeting of the British Association at Hull.

■ ■ ■ ■ ■

A wireless telephony station at Madras will probably be converted into a high-speed automatic plant for operation inland and also to Rangoon.

■ ■ ■ ■ ■

A correspondent to a contemporary raises the question of whether the transmission of wireless impoverishes the air of its life-sustaining qualities!

■ ■ ■ ■ ■

The transmission of handwriting, pictures and photographs, it is stated, are made possible by the latest invention in connection with telephotography.

■ ■ ■ ■ ■

A contemporary is waxing furious over the use of the term "wireless" instead of "radio." "The rose by any other name——" Or "What's in a name?"

■ ■ ■ ■ ■

The Government has entered into an agreement with the Marconi Company for the erection of a wireless station in South Africa capable of direct communication with this country.

■ ■ ■ ■ ■

Parents who lost their children at the recent exhibition were quickly enabled to locate them by means of wireless telephonic communication between one part of the building and another.

■ ■ ■ ■ ■

The latest additions to the pseudo-scientific arguments relating to nomenclature in connection with wireless are "far speaker" and "far writer" as substitutes for wireless telephone and wireless telegraph. Next, please.

■ ■ ■ ■ ■

It is reported that the Postmaster-General has not yet approved of the articles of association of the Broadcasting Company. This delay has partly been caused by the difficulty of safeguarding the interests of the public and the small manufacturer.

The progress of the air race for the King's Cup was broadcast by wireless telephony.

■ ■ ■ ■ ■

The Postmaster-General has been asked to receive a deputation representing the wireless trade outside the broadcasting combines.

■ ■ ■ ■ ■

Senatore Marconi prognosticates that in future a Mrs. Beeton will appear to broadcast culinary notions to housewives. Aren't things bad enough as they are?

■ ■ ■ ■ ■

The Glasgow and District Radio Club are shortly holding an exhibition in that city. The secretary's request to the French authorities asking that a short message might be sent specially to the exhibition from Eiffel Tower has been acceded to.

■ ■ ■ ■ ■

In Glasgow an enterprising business firm has installed a wireless time service. An electric lamp is fixed in a prominent position in one of the front windows, and is connected to the firm's receiving apparatus in such a way that the lamp flashes as the signals are received.

■ ■ ■ ■ ■

In France regulations are in preparation under which the public may be allowed to use transmitting as well as receiving installations. At present it will be remembered there is no restriction on the use of receiving apparatus in that country.

■ ■ ■ ■ ■

A meeting of exhibitors at the first Radio Exhibition and Wireless Convention was held during exhibition week at the Central Hall, Westminster, S.W.1. Mr. Alex. Stewart, of the Wireless Exploitation Corporation, was in the chair. The meeting was unanimous in approving this association as being fitted to serve the requirements of the industry, and appointed a provisional committee to consider and settle in draft what should be the aims and objects of the association and the steps to be taken best calculated to achieve them. Practically all those attending pledged their support. A provisional committee has also been appointed for the northern area, which is being operated from 70, Central Buildings, 41, North John Street, Liverpool, the southern area being operated from Dundee House, 15, Eastcheap, London, E.C.3. Any inquiries and membership applications may be addressed to either of the above offices. A general meeting of members will be called at an early date to receive a full report from the provisional committees.

According to the latest reports Captain Amundsen, at present *en route* to survey the Arctic region, will broadcast Eskimo music to the world.

■ ■ ■ ■ ■

It is reported that the Meteorological Office has prepared a scheme to broadcast weather reports to come into operation directly the broadcasting comes into being.

■ ■ ■ ■ ■

Much irrelevant flapdoodle is being published by the daily press on the question of thought-reading by wireless. The credulity of the daily press leaves us cold.

■ ■ ■ ■ ■

The new Wireless Telegraphy and Signalling Act has now been passed and widens the powers conferred on the Postmaster-General by the Wireless Telegraphy Act of 1904.

■ ■ ■ ■ ■

The Postmaster-General, it is reported, has severely criticised not only the tentative agreement between his department and the broadcasting company, but also that made between the broadcasting company and the members of it.

■ ■ ■ ■ ■

A youthful reader, no doubt with his eye to business, made considerable pocket money by selling posters containing the latest information regarding the air race. His set, it is said, was made from instructions in the "Work" Handbook.

■ ■ ■ ■ ■

America promises us a new method of waging war in her promised production of a giant airship capable of carrying large numbers of pilotless gliders laden with bombs. These gliders would be guided to the spot at which it was desired to drop bombs by means of a wireless ray.

■ ■ ■ ■ ■

*Apropos* of a recent concert broadcast from The Hague, the *Musical News and Herald* comments as follows: "What a programme to broadcast! If only the *Daily Mail* would send its own critic and allow him truthfully to criticise we should have even more caustic remarks than come from his pen after he has been forced to attend a *débutante's* concert, and if the *Daily Mail* would take the said gentleman's advice on the arranging of a programme items could be given which would be good even though well known." We should like to know from these musical critics when a spade is a spade. The majority enjoy these concerts. It doesn't matter about the highbrow few.

Will Amateur Wireless Clubs please keep us informed of their activities.

# WIRELESS, "WIRE

## ELECTRIC-LIGHT MAINS A

*EDITOR'S NOTE . .*

OF the subject o that the Briti The inventor of scientist who is w training in Englan could be used as a article (to appear wireless is, descri ceeds to reveal to the amateur the lines on wh Mr. P. T. Beard, gives the results of many first-h even when lighting mains do not exist but where

A RECENT invention in wireless, by which the usual aerial system may be dispensed with, is now the subject of much interest in this country. The scheme consists in using the electric-lighting supply mains as an aerial, the usual earth connection being retained. This invention is the outcome of experiments made some ten years ago, but whereas the original scheme made use of telephone wires running directly from the transmitter to the receiver, the latest invention makes it possible to use electric light mains as an aerial in conjunction with ordinary wireless receiving circuits, irrespective of the position of the transmitting station. That is, it is not necessary to have lighting mains running all the way between the transmitter and receiver.

Before discussing the methods of so using the mains and the results obtained by experiment compared with the more usual aerial system, it will perhaps be as well to say something about the earlier experiments with wired wireless, which in its time has had the attention of most of the well-known workers in the field of wireless.

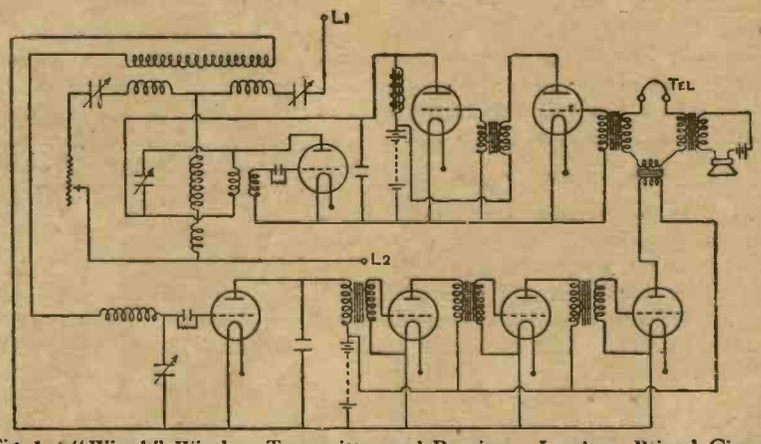



**Fig. 1.—"Wired" Wireless Transmitter and Receiver: London—Bristol Circuit.**

### *The Inventor and Original Patentee*

The inventor of the system appears to be Mr. George Owen Squier (now General Sir G. O. Squier), who, in 1911 or earlier, conducted experiments over a telephone line which at the time was carrying its normal telephone traffic. He employed a high-frequency alternator for setting up the waves, and worked over the line in one direction only. The success achieved in this initial experiment showed the ultimate importance of the invention which, with certain modifications, could be employed for duplex or even multiplex working, and Mr. Squier therefore took out master patents.

It was not until the thermionic valve came into use as a generator of high-frequency oscillations that any practical progress with the scheme was made, but with the advent of valves, such well-known scientists as J. J. Thomson, Fleming, Wagner and Lee de Forest began to take an interest in wired wireless. The problem of devising suitable multiplex telephone circuits was carefully considered in this country, and also in America and Germany, and much good work was done towards overcoming the many difficulties in the way of making the system a practical proposition.

### *The Simple Idea*

With regard to the object in view, the original idea as put forward by Squier was very simple. Waves set up by a telephone transmitter were to be guided by wires to a distant receiver, and both transmitter and receiver were to be tuned to the same wave-length. It was therefore thought that several pairs of transmitters and receivers could be used on the same line without interference, provided each pair employed a separate wave-length. Unfortunately it transpired later that the number of pairs which could be used on one line was very limited, as will be seen shortly.

A curious flaw in the theory of the circuit manifested itself when the first experiment was carried out, using valves to generate the required high-frequency oscillations. Theoretically the transmitted waves should not flow along the telephone lines, but should simply be guided by them to the distant receiver. Accordingly, it was thought that the usual losses in the telephone line would be non-existent or, in any case, very much reduced, and therefore the greater part of the transmitted current should reach the receiver. This turned out to be quite wrong, and it was soon made clear to the experimenters that high-frequency waves in wires follow exactly the same laws as telephone waves, the only difference being that the wired-wireless waves sustained much greater losses by reason of their higher frequency.

### *A Test*

The first test in this country dispelled the "no losses" theory. This test was carried out with a wireless-telephony transmitter (tuned to a frequency of 500,000, equivalent to a wave-length of 600 metres) loosely coupled to an overhead telephone line. The receiver was installed about five miles away, and good speech was heard. The distance between the transmitter and receiver was increased until twenty miles was found to be the working limit. It appears, therefore, that the telephone line did not aid the transmission to any extent; in fact, it is highly probable that a greater range would have been possible without the use of the wires. The results of this test showed that wired wireless had commercial possibilities and would be very useful in cases where strict secrecy is needed, but it is very doubtful if any advantage is obtained over the usual telephone system.

Experiments in multiplex telephony followed this development, but it was found that only a definite band of wave-lengths was suitable for working with wired wireless. This limitation in itself placed a limit on the number of pairs of transmitters and receivers which could be worked over the same line, but in addition there was the difficulty that the modulated carrier wave covered frequencies of 2,000 on each side of the carrier-wave frequency, and consequently sharp tuning was an impossibility. The number of pairs of stations which could be efficiently worked over the same line was thus still further reduced.

Two ways were found of overcoming the latter difficulty to a certain extent. The first method was to suppress the carrier wave and employ a separate heterodyne at the receiver end. The second way was to employ a "filter" to pass a band of

# ED" AND "PIPED"—I

## ND GAS-PIPES AS AERIALS

this specially-written article it is truthful to say amateur knows less than his American cousin. wired wireless" is a distinguished American known in Great Britain (he acquired part of his ), and who, in 1904, discovered that living trees eans of receiving wireless signals. The complete in about three instalments) explains what wired s a commercial example of the system and pro- ch he may experiment for himself. The author, and experiments, some of which can be performed gas mains do! "Piped Wireless," eh?—ED.

frequencies of about 2,000 which would offer considerable "resistance" to frequencies outside this range.

### *Bristol-London Circuit over Telephone System*

Fig. 1 shows a wired wireless circuit which has been in use for nearly three years between Bristol and London over the telephone system. There is nothing unusual about the circuit, which a little study will show to be a three-valve wireless telephone transmitter at the top, with a four-valve receiver at the bottom. The line wires are connected to the terminals marked L1 and L2, and the receiver portion is energised through the coupling coils at the top left hand of the diagram. The two transmitters working this system employ carrier waves of different frequencies, and although in theory no filter arrangement was deemed necessary, it was found that some arrangement of this kind had to be used in order to obtain good results, and accordingly a bridge was employed. A number of repeaters, or relays, are inserted in various parts of the circuit between Bristol and London.

It is interesting to note that this circuit was designed and put into use by the Post Office engineers some considerable time before descriptions of anything similar to it were given by the technical publications of America or Germany.

Figs. 2 and 3 show two kinds of filters which are designed to pass low and high frequencies respectively. By means of suitable values in the condensers and inductances the filters may be made to pass bands of frequencies of any width within certain limits.

### *Wired-wireless Circuit over Lighting Mains*

The wired-wireless system could very well be adapted to the electric lighting mains, using apparatus similar to that just described, but in the writer's opinion very inferior results would be obtained as far as range is concerned. It must be remembered that the various lighting systems do not extend for more than a few miles from the generating station, except in special cases where electricity at very high voltage is transferred from a source of electrical energy to a town many miles away. In such cases it is usual to transform the generator voltage to one of a much higher value, and to lower the voltage again by means of a step-down transformer when the distributing station is reached. Although it cannot be stated with certainty, it is highly probable that these transformers by reason of their impedance would effectively damp out any wired-wireless waves transmitted along the system. On the other hand, it is possible that the capacity effect between the primary and secondary windings would allow the radio-frequency waves to flow in the circuit. Another difficulty in the way of employing the mains as a medium between transmitter and receiver for long distances is the practical impossibility of introducing any kind of repeater or relay into the circuit. It would appear, therefore, that any system making use of the mains for long-range working has very little to recommend it, although there would be two obvious advantages, namely, the system would be secret and directional, and there would be plenty of power available at both ends of the circuit.

### *Broadcasting Might Use Wired Wireless*

Another possible use for wired wireless, employing the lighting mains as a carrying medium, immediately suggests itself. It should be quite a practical proposition to use the system for broadcasting purposes in the larger towns. The wireless telephony transmitter could be located at the generating station and a receiving set could be connected to any lamp socket by means of the apparatus to be described later.

The idea certainly seems good, but there are several difficulties in the way of its successful operation, some of which may be discussed here.

Taking London as an example, numerous electric-lighting companies possess their own separate and distinct systems, and in most cases there is no connection between any two systems. Therefore, for any broadcasting scheme to be a success, each company would have to install its own transmitter. Then, again, some companies supply direct current and others alternating; some run one wire to earth and others do not, and there is often difficulty in discovering which wire is earthed. It is not unusual for the generating station to reverse its connections and thus earth the opposite pole, and this of course would add considerably to the risks run by the operator of the receiver, as will be shown later.

### *Combined Light and "Wireless" Service?*

It is doubtful whether any broadcasting scheme by means of wired wireless *via* the lighting mains will materialise yet awhile, and it is rather difficult to decide whether such a scheme would come under the jurisdiction of the Postmaster-General. In any case it would be an excellent means of popularising electric light; and enterprising companies would probably incorporate a small receiver in the meter, with suitable rectifiers, resistances and transformers for supplying the filament and

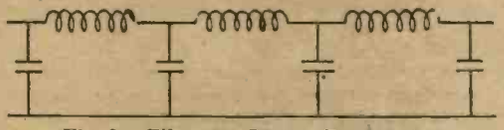


Fig. 2.—Filter for Lower Frequencies.

plate of the valves straight from the mains.

### *The Amateur's Adaptation*

It now remains to be seen how wired wireless can be adapted to the needs of the amateur who is unable, through lack of space, to erect an outdoor aerial, and who at the same time is fortunate enough to have electric-lighting mains available for use. In cases where no mains are available, an indoor aerial in conjunction with a costly multi-valve receiver may be used; but yet another method of getting fair signals with a single-valve receiver and

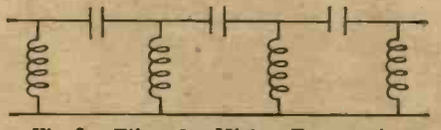


Fig. 3.—Filter for Higher Frequencies.

no outdoor aerial would be to use the gas pipes.

Many American firms, and at least one English firm, are now advertising a piece of apparatus which is inserted between the aerial terminal of any wireless receiver and any electric lamp socket, the usual earth connection to the set being retained. The same General Squier is responsible for the invention, which is probably covered by patents. Somewhere in the circuit between the lamp socket and the receiver there must obviously be a device that allows radio-frequency oscillations to pass, but which prevents the flow of direct or alternating current from the mains. This suggests a condenser, very high resistances, or probably a combination of the two similar to the usual grid leak and condenser.

P. T. B.

# OUR INFORMATION BUREAU

## Expert Replies to Readers' Questions. Hundreds of Replies are sent by Post.

TO ENSURE A PROMPT REPLY PLEASE OBSERVE THE FOLLOWING RULES

**Write distinctly, give all necessary details and keep to the point. Ask one Question at a time—never more than two. Send a Stamped and Addressed Envelope. Send the Coupon cut from page 336.**

**5-Valve Amplifier Not Working**

Q.—I enclose particulars of my 5-valve amplifier set which, despite repeated attempts to rearrange connections, etc., does not function well. Will you please advise?—H.B. (1596)

A.—Querist's set comprises five valves arranged as follows: Two H.F. amplifying valves, which together with the detecting valve form a complete and separate unit; and two L.F. amplifying valves, these latter also forming a separate unit. The H.F. valves are "resistance-capacity" coupled, whilst the L.F. valves have the usual type of iron-core, intervalve transformers. Querist states that the three-valve portion works all right, but if so, surely he has heard something of the Dutch Concert with the three valves only. If not, it would appear that this portion can be made to work in a more satisfactory manner than at present. When using the resistance-capacity coupling between valves, it is necessary to provide leaks (grid to filament) for each of the valves except the first. The usual valve of these leaks is in the neighbourhood of one or one-and-a-half megohms, and the provision of the same will no doubt lead to improved results. Presumably when connecting the 2-valve L.F. amplifier set to the terminals marked A and B in querist's diagram (not reproduced) the primary of the telephone transformer is disconnected. The howling effect complained of will be greatly reduced if not entirely eliminated on all adjustments by the provision of small mica-foil condensers (capacity, say, .0002 mfd.) across the primary windings of the L.F. iron-core transformers. Another important point in connection with querist's diagram (unless merely an oversight in drawing), is that although inductive coupling is employed the secondary coil of the tuner is not shunted by a variable condenser, that is, it is not a tuned circuit. Either provide the necessary variable condenser, or dispense with the coupled circuit (temporarily at all events) and connect grid and filament of the first valve direct to aerial and earth ends of the A.T.I. respectively. The condenser may be removed from the reactance coil and used as above mentioned. On the whole the writer does not much care for the resistance-capacity coupled arrangement, and accordingly would recommend querist to change over to transformer coupling between the H.F. valves, using air core transformers as sold by advertisers in this journal, which will prove very effective over a wide range of wave-lengths, though not the best possible for the Dutch Concert.—CAPACITY.

# Broadcasting: The Situation

SINCE our last issue went to press there has been a resumption of the conference between the Postmaster-General, with his officials, and the representatives of the British Broadcasting Company. Previously the Postmaster-General had sent to the company his criticisms of the proposed articles of association, and the conference was called with a view of discussing the criticisms and arriving at a basis of agreement. There is no doubt that the conference was fruitful of discussion, but it was given out that it had failed to reach an agreement and that the Postmaster-General would issue a statement on the subject. Up to the time of our going to press this statement has not appeared.

***The "Big Six"***

It is understood that the "big six" of the Broadcasting Company are the British Thomson-Houston Co., the General Electric Co., Marconi's Wireless Telegraph Co., Metropolitan Vickers Electrical Co., Radio Communication Co., and the Western Electric Co., and that all *bona fide* manufacturers of wireless apparatus in Great Britain may qualify for membership by taking up one or more shares. It is stated that Marconi's Wireless Telegraph Co. and Metropolitan Vickers Co. have stations ready for broadcasting immediately an agreement is reached.

***"The Rumour"***

Nothing in confirmation or in denial of the "rumour" which we published a fortnight ago has been issued. The matter stands exactly where it did. The daily newspapers have been giving attention to the subject, however, and in no uncertain way have voiced the very strong feeling to which the "rumour" has given occasion. We ourselves firmly believe that any such restriction is not likely to be made, or would have no chance of being effective even if it were made.



# Forthcoming Exhibition

THE All-British Wireless Exhibition and Convention, to be held under the auspices of the Wireless Society of London and affiliated societies, will be open from Saturday, September 30, to Saturday, October 7, at the Horticultural Hall, Westminster. There will be a series of daily lectures, and a demonstration stand has been erected close to the lounge where the public can "listen-in." It is stated that the exhibits will be confined exclusively to wireless apparatus. Our next issue will contain many further particulars of this exhibition.

# CORRESPONDENCE

### Improving a Short-wave Set

SIR,—Those readers of "Amateur Wireless" who have constructed, or intend to construct, the short-wave receiving set described in the Handbook "Wireless Telegraphy and Telephony" will no doubt be interested to know that it can be adapted for picking up the Paris time signals by making a few temporary alterations to the wiring. I have wound my set to receive up to about 1,000 metres, as recommended in AMATEUR WIRELESS No. 10, page 193. Paris, however, transmits on 2,600 metres. One obvious method of getting the set to tune to this wave-length is to load both the primary and secondary circuits with external inductances. This method is not efficient, and means a further outlay.

A much better way, in my opinion, is to loosen the coupling and join the two coils in series after disconnecting the detector, 'phones and variable condenser from the closed circuit. The aerial is then connected to one free end and the earth wire to the other end of what is equivalent to one long inductance. The detector and 'phones are now joined in series and the two connected across from the aerial to the earth. The variable condenser is also connected across these two points. If the wiring has been arranged exactly as in the book, the fresh wiring should be done as follows: The aerial and one lead of both the variable condenser and the detector should be connected to the original aerial terminal. The earth lead, the second lead from the variable condenser, and one lead from the 'phones should be connected to

the right-hand telephone terminal. The second leads from the 'phones and the detector should be connected to the left-hand telephone terminal. The original earth terminal must now be connected to the moving arm of the secondary tuning switch by a short piece of wire. Provided that the original wiring for the detector, 'phones, and variable condenser runs outside the box, this change can be effected in less than five minutes. Eleven p.m. B.S.T. is about the best time to test this arrangement. The primary switches should both be set to their highest value and the secondary switch slowly moved from left to right, during which time the experimenter should listen in carefully. In my case I hear the Paris clock ticking before this switch has reached its maximum, but if this does not occur with any particular set, the condenser should be slowly turned full on. If there is still no result, and the crystal is properly adjusted, the coupling should be slowly tightened, as this will act as a variometer and further increase the wave-length. If there is no result by 11.5 p.m., when the ticks generally cease, the experimenter must wait until 11.35 p.m., when Paris transmits Morse until 11.44 p.m., when the regular time signal commences. Briefly this consists of dashes for one minute with a dot on the stroke of 11.45 p.m. After an interval of one minute one hears d's for another minute with a dot on the stroke of 11.47 p.m. A further minute interval occurs, then a minute of sixes (dash and four dots), with a final dot on the stroke of 11.49 p.m. Sometimes a little more Morse follows this. The same sort of thing occurs just before noon, but there is more chance of hearing it at night. If the experimenter intends getting Paris frequently, it is a very easy matter to arrange three change-over switches to effect the transformation. The set should then have a wave-length range of about 200—3,000 metres.—H. G. E. (London, N.).

## FORTHCOMING EVENTS

**The Leeds and District Amateur Wireless Society.** Sept. 22, 7.30 p.m. Annual general meeting.

**Ipswich and District Wireless Society.** Sept. 24. At 55, Fonnereau Road, Ipswich. Sale and exchange of apparatus.

**Redhill and District Y.M.C.A. Wireless Society.** Sept. 27. At 111, Station Road, Redhill. Lecture by Mr. White on "Phones and Loud Speakers."

**Nottingham and District Radio Experimental Association.** Sept. 28. At Room 74, Mechanics' Institute. Discussion on Mr. Ford's lecture on "Radio Measurement." Subscriptions due.

**The Tuxford and District Amateur Wireless Society.** Sept. 28. Morse practice. Coils of various shapes, their advantages, etc. Discussion.

### TELEPHONY TRANSMISSIONS

**Eiffel Tower** (F L), 2,600 metres. Each afternoon (Saturdays excepted).

**The Hague, Holland** (P C G G), 1,085 metres, B.S.T. Sept. 21, 24, 28, 8-9 p.m.

**Writtle** (2 M T), 400 metres. Sept. 26, 8 p.m.

**Marconi House** (2 L O), 360 metres. Probably Friday, Sept. 22, and Saturday, Sept. 23, respectively, at 5-5.30, 6-6.30 and 7-7.30 p.m.

# CLUB DOINGS

## Wakefield and District Wireless Society

*Hon. Sec.*—MR. ED. SWALE, 11, Thornes Road, Wakefield.

A MEETING of the above society was held in the Physics Laboratory of the Grammar School at 8 p.m. on Sept. 8th., last. G. E. Welch delivered his lecture on "Simple Facts and Experiments in Electricity."

For upwards of an hour Mr. Welch described the composition of batteries of various kinds, building of an ammeter, voltmeter and galvanometer, measurement of voltage, resistance electro-magnetism, etc., with apparatus and blackboard illustrations.

All are looking forward to Mr. Burbury's (jnr.) visit on the 22nd, probably at the Y.M.C.A., Grove Road.

## Ilkley and District Wireless Society

*Hon. Sec.*—MR. E. S. DOBSON, "Lorne House," Richmond Place, Ilkley.

THE fourth general meeting of the above was held at the Tower Buildings, Ilkley, on Sept. 11th. The chair was taken by Dr. J. B. Whitfield.

Mr. Law gave his lecture on "The Theory, Use and Maintenance of Accumulators."

Programme for the month of September, 1922: Monday, Sept. 25th, at 8 p.m., at the Regent Cafe, Morse Practice. Monday, Oct. 2nd, at 8 p.m., at the Regent Café, Morse Practice. Monday, Oct, 9th, at 7.30 p m., at the Regent Café, general meeting, followed by a lecture on "Capacity and Condensers," by E. Stanley Dobson.

## North Middlesex Wireless Club

*Hon. Sec.*—MR. E. M. SAVAGE, "Nithsdale," Eversley Park Road, Winchmore Hill, N.21.

THE 98th meeting of the club was held on Sept. 6th.

The lecturer for the evening was Mr. W. A. Saville, and his subject was "Instrument Construction for Beginners."

Mr. Saville described the construction of a valve panel. In wiring up the completed panel, Mr. Saville pointed out the necessity for making the connections as short as possible, so as to avoid the danger of extra unwanted capacity and inductance of long leads.

The lecturer then dealt with the different types of valves on the market, and passed round for inspection examples of these types.

Mr. Evans, the chairman, spoke in support of the crystal detector.

Particulars of the club may be had from the hon. secretary.

## West London Wireless and Experimental Association

*Hon. Sec.*—MR. H. W. COTTON, 19, Bushey Road, Harlington, Middlesex.

"LISTENING-IN" on club's apparatus and an informal chat took place on Aug. 31st. Many questions as to the restriction in connection with the use of reaction circuits were asked, and a question in the form of a resolution was sent to the Wireless Society of London in connection therewith.

Meeting held Sept. 7th. Morse practice class well attended. Mr. J. F. Bruce related his experiences in connection with the Armstrong circuit and loop aerial.

It is hoped to have many lecturers from the Wireless Society of London down during the winter session. The secretary will have much pleasure in replying to any inquiries as to membership, etc.

## South Shields Y.M.C.A. and District Amateur Wireless Society

*Hon. Sec.*—MR. T. TEASDALE, 38, Readhead Avenue, South Shields.

A MEETING of the above society was held on September 12th in the Y.M.C.A. Rooms, the chair being taken by Mr. G. Busbridge.

A neatly arranged and compact German single-valve set was exhibited by Mr. M. Tuohy, which aroused great interest, excellent signals being received with the club's aerial, which had been recently extended.

The objects of this society are to assist and bring together local amateurs, the furtherance of all matters and studies connected with wireless telegraphy and telephony, and allied subjects, and the promotion of intercourse and exchange of ideas between experimenters in wireless telegraphy and telephony.

A series of lectures which has been arranged by Mr. G. Busbridge on elementary theory of wireless telegraphy commenced on Friday, Sept. 19th.

The hon. sec. will be pleased to hear from any gentleman desirous of becoming a member; the subscription is 7s. 6d. per annum.

Meetings are held every Tuesday and Friday at 7.30 p.m.

## Peckham Wireless and Experimental Association

*Hon. Sec.*—MR. GEO. SUTTON, 18, Melford Road, S.E.22.

ON August 23rd the above association had the pleasure of listening to a very interesting and instructive lecture by Mr. Haynes on the Johnson-Rabek loud-speaker. The lecturer went through every point of the construction of the apparatus, giving enough of the theory to enable his listeners to appreciate the various parts and their uses. Full instructions were given to enable one to cut and polish agate cylinders.

The association's wireless receiving set was not available for purposes of demonstrating the capabilities of the loud speaker. The lecturer afterwards demonstrated the use of the Neon tube as a generator of oscillations, and more than one present had an idea that it might be very useful in the Armstrong receiving circuit.

## Walthamstow Amateur Radio Club

*Hon Sec.*—R. Cook, 49, Ulverston Road, Walthamstow, E.17.

ON August 23rd Mr. Tyler gave a lecture on the advanced members on the "Ionisation of Valves," and Mr. Webb lectured to the more elementary members on the approximate cost of constructing a valve panel and the necessary apparatus used. The secretary will be pleased to welcome prospective members.

## Hornsey and District Wireless Society

*Hon. Sec.*—MR. H. DAVY, 134, Inderwick Road, Hornsey, N.8.

AT a meeting of the above society held on September 1st, members brought up their sets which were photographed; afterwards a demonstration was held, affording an opportunity for comparing various methods of valve and crystal circuits, etc.

A further programme was arranged concerning listening-in, lectures, Morse practise, etc. It is hoped that the club set which is almost completed will be in use by September 11th.

Applications for membership are cordially invited; meetings every Tuesday and Friday.

## Swinton and District Amateur Radio Society

*Hon. Sec.*—MR. GEO. T. BULTITUDE, The Slade, Swinton, nr. Rotherham.

THE inaugural meeting was held on Aug. 25th. Mr. A Hammerton presided. The committee elected were Messrs. Greenfield, Oxby, Woods, Twigg, Trowbridge, Hammerton. Henson and

Finn. Mr. A. Hammerton was elected treasurer, and Mr. Geo. T. Bultitude, secretary and librarian. The question of fees and subscriptions was put back for subsequent discussion. The Co-operative Guild-room has been secured for weekly meetings.

### Wireless Society of Liverpool

*Hon. Sec.*—MR. C. L. LYONS, 76, Old Hall Street, Liverpool.

A MEETING of the above society was held on Aug. 24th at the Royal Institution, Colquitt Street, Liverpool.

Special arrangements had been made with The Ashley Wireless Telegraph Co., Ltd., of Renshaw Street, Liverpool, whereby they would transmit telephony and musical items from their experimental station, 2 KH, the same being received on a five-valve receiving set of their own manufacture (W. 2 H.F. : 1 Rect. : 2 L.F. valves).

There were six-minute transmissions with intervals of five minutes between each. The receiving set was operated by Mr. C. G. Williams, of Messrs. Ashleys (who is also a member of the society). The whole of the items were received extremely satisfactorily, and were made clearly audible to all present through a loud speaker. The programme was varied.

The five-minute intervals were occupied in answering questions deposited previously in the question box.

The next general meeting of the society will be held on Sept. 14th, at the same address, and all interested persons are invited.

### Barnoldswick Wireless and Technical Society

*Hon. Sec.*—MR. A. BALDERSTON, 6, Clough Terrace, Barnoldswick, via Colne.

A MEETING of the above society was held on August 30th at the Gladstone Liberal Club.

At the termination of the usual thirty minutes buzzer practice, a lecture was given by the hon. sec., entitled "Electro-magnetism."

The secretary solicits applications for membership from any gentlemen in the locality.

### Durham City and District Wireless Club

*Hon. Sec.*—MR. G. BARNARD, 3, Sowerby Street, Sacriston, Durham.

A MEETING of the above society was held on Aug. 25th. After Morse practise the hon. Sec. gave a short lecture on diagram interpretation, using twenty-two diagrams upon the blackboard to represent various apparatus. These diagrams were copied by the members.

After the announcements, the chairman commenced the question period.

Several new members were enrolled.

The sixth meeting of the society was held on Sept. 1st at headquarters. The lecturer for the evening, Mr. Ainsley, of the Henley Cable Co., was unable to be present, and his place was filled by the secretary, who gave a lecture on simple circuits.

Potential, Ohm's Law, closed circuits, earth-return circuits, series and parallel circuits and simple wireless receiving circuits were explained in a simple fashion.

There was a debate, during which the Rev. Bottomley enlarged upon the lecturer's description of Ampere's rule. He drew several sketches on the board and also explained Maxwell's corkscrew rule.



It was announced that Capt. Donnisthorpe, of the Marconi Co., is to give a lecture on the 22nd of this month. This meeting will be open to all interested, and members are invited to bring their friends. It will be held at 7 p.m. in the gymnasium of the Y.M.C.A. Lantern slides will be used.

The next meeting, on Oct. 1st, will chiefly consist of buzzer practice.

The seventh meeting of the above took place at headquarters on Sept. 8th.

It is hoped that the three chief northern societies (Durham, Newcastle, and Sunderland) may co-operate in the exchange of lecturers, demonstrations, visits to works, etc.

A letter sent by Mr. G. Barnard made an appeal to the members to advertise the forthcoming event on the 22nd, when Capt. Donnisthorpe will deliver his lantern lecture. Arrangements are being made for two special concerts to be transmitted from Newcastle and Ashington during the evening so that those present may have the benefit of a first class "Listen-in."

### Stoke-on-Trent Wireless and Experimental Society

*Hon. Sec.*—MR. F. T. JONES, 360, Cobridge Road, Hanley.

AT a meeting of the above club on Sept. 7th, a library of wireless literature was suggested. If any members have any books on wireless or electrical subjects, the secretary will be pleased to receive them.

A demonstration on how to wind coils for wireless receiving sets was given by Mr. F. T. Jones.

A pleasant diversion was provided by Mr. R. W. Steel in the form of a lecture on "Reminiscences of the Wireless Service."

### Fulham and Putney Radio Society

*Hon. Sec.*—MR. W. DEWHURST, 52, North End Road, West Kensington, London, W.14.

A MEETING was held at the new headquarters on Sept. 8th.

Mr. Barker switched on his set and the members heard the result of the air race through a Brown loud speaker. A new committee was formed to deal with the rules, etc. Friday was found to be the most suitable for meetings. It was decided that the first Friday in each month be devoted to lectures, and we hope to start the October meeting with one.

Mr. E. Vernon Barker, who is a member of this and the Willesden Society, explained his apparatus to the members, and with five valves and a loud speaker produced music and singing that was rendered clear and free from the usual disturbances.

All amateurs in the district are invited to join.

### Barnes, Mortlake and Richmond Wireless Society

*Hon. Sec.*—MR. E. L. ROGERS, 17, Leinster Avenue, East Sheen, S.W.

THE first meeting of the above was held at "Inglenook," Sheen Gate Gardens, East Sheen, on Sept. 20th.

Mr. Blake of Richmond has consented to be our President.

## ANNOUNCEMENTS

**"Amateur Wireless and Electrics."** Edited by Bernard E. Jones. Price Threepence. Published on Thursdays and bearing the date of Saturday immediately following. It will be sent post free to any part of the world—3 months, 4s. 6d.; 6 months, 8s. 9d; 12 months, 17s. 6d. Postal Orders, Post Office Orders, or Cheques should be made payable to the Proprietors, Cassell & Co. Ltd.

**General Correspondence** is to be brief and written on one side of the paper only. All sketches and drawings to be on separate sheets.

**Contributions** are always welcome, will be promptly considered, and if used will be paid for.

**Communications** should be addressed, according to their nature, to The Editor, The Advertisement Manager or The Publisher, "Amateur Wireless," La Belle Sauvage, London, E.C.4.

### Fulham and Chelsea Amateur Radio Society

*Hon. Sec.*—MR. R. S. V. WOOD, 48, Hamble Street, Fulham, S.W.6.

A MEETING of the above was held at the temporary headquarters on Sept. 6th. The crystal set was discussed by the members and numerous question papers were handed in.

### Proposed Watford and District Radio Club

IT is proposed to form a radio club for Watford and district.

Will all those interested please communicate with Mr. F. A. Moore, 175, Leanesden Road, Watford, Herts.

### Leeds and District Amateur Wireless Society

*Hon. Sec.*—MR. D. E. PETTIGREW, 37, Mexborough Avenue, Chapeltown Road, Leeds.

A MEETING was held at the Leeds University on Sept. 8th, Mr. A. M. Bage taking the chair at 8 p.m. The chairman called upon Mr. H. Mortimer, of the P.O. Telephones (Leeds), to deliver a paper on "Automatic Telephony." The Leeds exchange is the largest automatic exchange in the British Isles, and Mr. Mortimer successfully conveyed to the meeting the principle upon which the complicated mechanism installed therein, functioned. The principles upon which old hand-operated exchanges worked were considered, in order that one could appreciate fully the great advantages attached to automatic operation. The methods of automatic operation were explained. The circuits were traced from a subscriber to the exchange by open and underground wires.

The second annual general meeting (for members only) will be held on Sept. 22nd. Meetings next session will probably be held weekly, formal (general) and informal (instructional) meetings being held alternately.

### Portsmouth and District Wireless Association

*Hon. Sec.*—MR. R. G. H. COLE, 34, Bradford Road, Southsea.

ON Sept. 6th the monthly meeting was held at the Pile Memorial Rooms.

In future it has been decided to hold two meetings each month, the first and third Wednesdays suiting the majority of the members.

The members paid a visit recently to the local electric light and power station. This visit was arranged by Mr. Lawrence.

### Wireless Society of Hull and District

*Hon. Sec.*—MR. H. NIGHTSCALES, 16, Portobello Street, Hull.

A MEETING of the above was held on Sept. 11th.

Mr. J. Nicholson proceeded to give his lecture on "Aerials," detailing the preparation of a mast and the fittings required. He gave demonstrations on the making of guys, splicing of same, etc., and finally the method of erection and fixing of the mast and aerial.

Future meetings, Friday, Sept 22nd and Monday, Oct. 9th.

## PREPAID ADVERTISEMENTS.

**B.A. Screws, Nuts, and Washers**, assorted gross, 2s.; list, 2d.—J. H. Bennett, Station Road, Willesden Junction. [34 F

**Accumulator.** Batteries, Willard 6-volt 80-amp. hour, continuous rating. Regular price, 115s., our price, 90s., or fully charged, 93s. 6d. f.o.r. Liverpool; packing 3s. 6d. extra, returnable. These batteries are in ebonite boxes and wood crates with handles, and will give real satisfaction. They are not the cheap ignition or intermittent rated cells in celluloid boxes which need such frequent charging. Money refunded if not satisfied and battery returned in good condition within seven days.—Herd and Smith, Ltd., Electrical Specialists, 9, Edmund Street, Liverpool. [A

**Portable Bridge Sets** for 6-way capacity fuse testing. Complete with all accessories. Suitable for calibrating wireless coils and experimental work. Absolutely new. Made by Sullivan, Elliott, Brown, etc. Price 21s., post free.—Rentell, 36, Maiden Lane Strand, London.

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**Valve Panels.** 7 × 5 ebonite, complete with filament resistance, condensers, wired up ready for use, 16s.—Davidson, 196, Gladstone Avenue, Wood Green. [7 s

**Telephone Receivers re-wound** up to 1,000 ohms, 5s. each; 2,000 ohms, 7s. 6d. each; cash with order.—M. E. Hampshire, 139, Sydenham Road, Sydenham, S.E.26. [8 s

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