



T. & R. Bulletin



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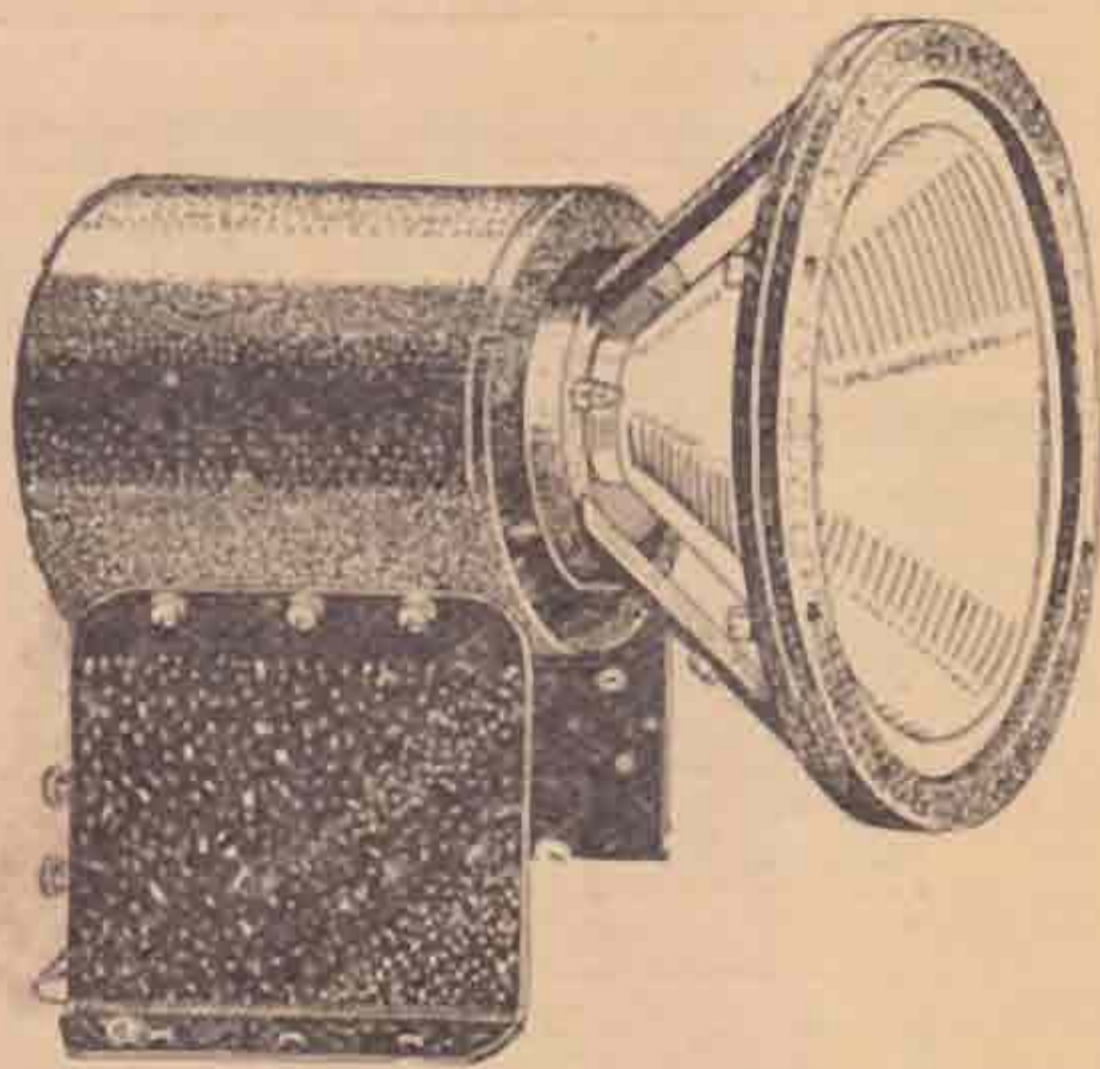
The Journal of the Inc. Radio Society of Great Britain

(BRITISH EMPIRE RADIO UNION)

Vol. 3. No. 13. July, 1928 (Copyright)

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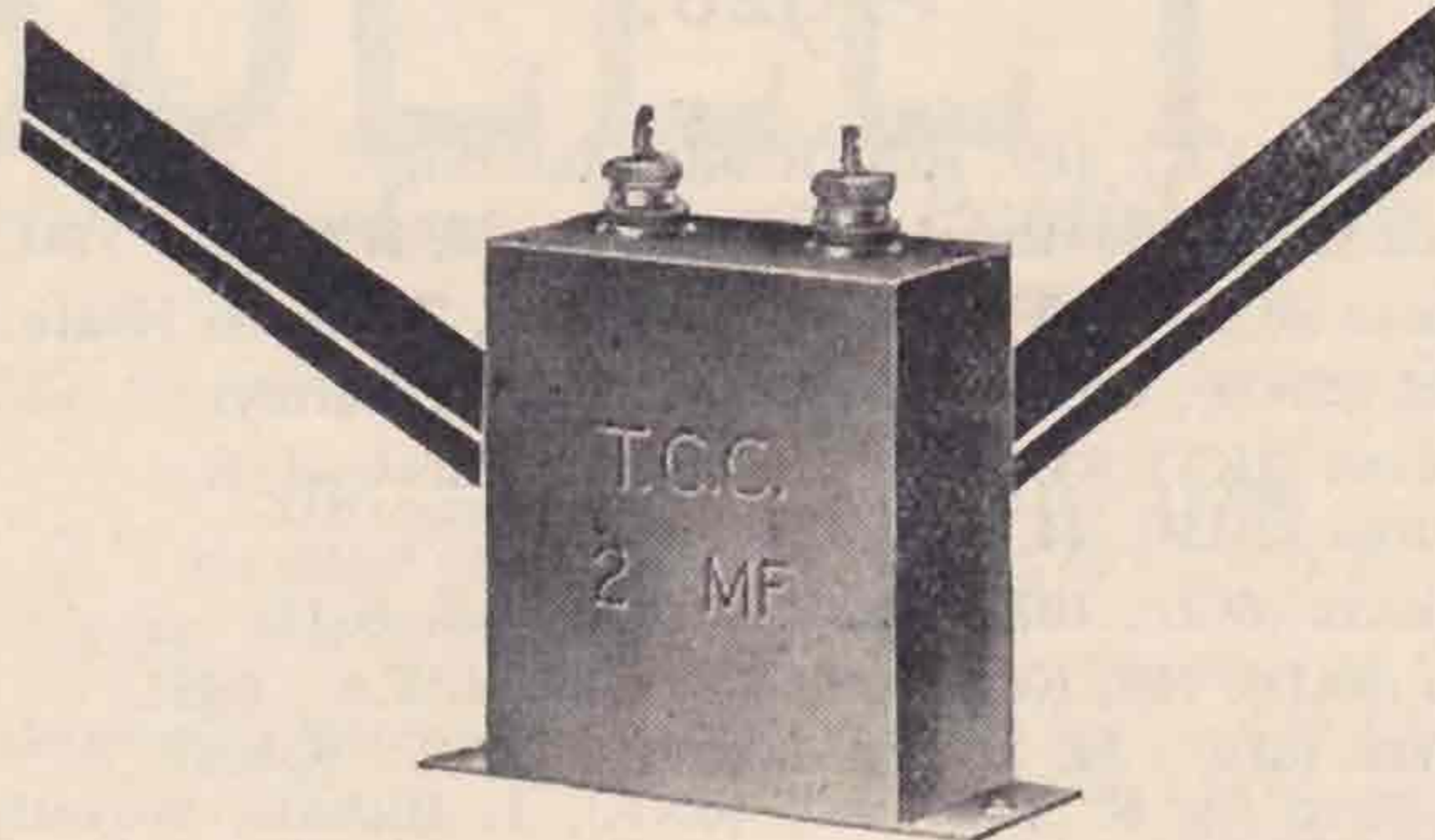
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Full Page	£5 0 0	Half Page £2 10 0
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Series Discounts—5% for 6 or 10% for 12 consecutive insertions.

Advertisements specified for *Facing Matter Positions* are not subject to series discounts.
 The T. & R. BULLETIN is published on the 14th of each month.
 Orders, Copy and Blocks should be received by us on the 25th of each month preceding month of issue.
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1558 T O A R

BULLETIN.

The only British Wireless Journal Published by Amateur Radio Experimenters

*All correspondence and matter for publication to be addressed to the Hon. Secretary, 53, Victoria St., London, S.W.1.
Tel.: Victoria 4412.*

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JULY, 1928

Vol. 4. No. 1.

SOCIETY NOTES

There are some 1,500 members in our Society yet only about 500 have bought copies of the annual and log book. The way the writer and the executive were slated over the lateness of publication led him to expect that every member would want a copy, and yet only one-third of the membership apparently desire them. By far the best customers have been outsiders. Why is this? Have two-thirds of the members so little interest in this publication which absorbed so much labour of its producers, that they intend to ignore it? Or is everyone away on holiday? Meanwhile the printers' bills have to be met. It is hardly supporting the executive and we must say we are disappointed. The writer is always receiving protestations from members who are anxious to help the Society in some way, yet when it comes down to buying a book specially drawn up to help them, their fervour subsides.

* * *

A communication from the Postmaster-General discloses the fact that the terms of the new licences are now virtually settled. In the first place, we are pleased to note that the recommendations of the sub-committee of the Society have been practically adopted, the most important being that the use of raw A.C. and I.C.W. is to be prohibited. We stressed this point, with the advantages to be gained, in a previous issue, and are gratified that the authorities have seen the necessity of prohibition under the new conditions. Other recommendations of the Society include the granting of the 20, 40 and 152 metre bands to all transmitters, while those holding the special trans-oceanic permits issued

upon the recommendations of the Society will obtain in addition the use of the 5 and 10-metre bands. We are pleased in this arrangement as everyone will be able to work upon the short waves and there will not be so much grumbling as previously from those confined to the higher wave-lengths. Perhaps now that the shorter wave-lengths will not be so exclusive we shall find some of our older hands trooping up to 152 metres for a change.

* * *

One band, the 75 to 84.9, will be exclusively reserved for special experimental work, and permits to operate upon this wave-length will be issued only to members of experience upon the recommendation of the Society after full proof is given of the importance of the experiments to be carried out. It must be remembered that this band will be shared by certain mobile and fixed services and that amateurs have only a third call upon it. It is absolutely indispensable that all work upon this band shall be carried out so that interference with the other users does not occur.

* * *

One condition of the new licences will be that everyone shall possess reliable wave measuring apparatus either crystal controlled or of other approved type. It is obvious that in view of the narrowness of the bands, accurate measurements of wave-length is essential and the loose methods hitherto employed by many will have to cease. We shall have to accustom ourselves to working to the decimal fraction of a metre and be able to know exactly where we are. Still, in view of the higher standard of technical precision which we have

latterly attained, this condition should cause no undue uneasiness. With so many users of the short-waves existing it is only to be expected that the authorities should insist upon close working to the permitted wave-length.

We further understand that arrangements are still being negotiated with the National Physical Laboratory for the transmission of calibrated signals at the middle frequencies of all six amateur bands. We hope these negotiations will mature as a service of this nature is most desirable and will enable every worker to check his own instruments constantly and thus lead to the elimination of disputes.

We understand that it is the proposal of the Postmaster-General to put these new licences into being without delay. It would appear that all new licences will be granted upon the new terms while existing licences will be amended to the new conditions. We can therefore advise all our readers to prepare for the new conditions which may descend upon them any moment. We certainly suggest that all those about to grind crystals should mark time for a few days or they may find their efforts nugatory.

We are pleased to notice that the East Mid-Britain Area is to have another Conventionette, with a visit to 5GB, on August Bank Holiday. Our hearty congratulations to Captain Hampson and his assistants, and may they have a successful day. May we have some photos of the proceedings to illustrate the accounts for the BULLETIN?

The Society has been allotted Stand No. 227 at the forthcoming Radio Exhibition at Olympia, on September 22 to 29. The position is nearly identical with that of last year, but the stand will be slightly larger.

We have to record the temporary passing from our ken of the Danish and German correspondents of our Society.

Mr. Erik Poulsen (Danish TMT), who was with us at last year's Convention, is leaving for Canada in July to take up business in Toronto, whilst Mr. Curt Lamm (German K4AFA), who represented his country here at our first Convention, has been honoured by his 'Varsity to accompany his Professor to Ithaca, U.S.A., to take part in a lecturing session at the Cornell University. To both of our colleagues we extend the hand of greeting and wish them success and express the hope that we shall in the future have the pleasure of receiving reports again from them. *Bon voyage*, O.M.'s.

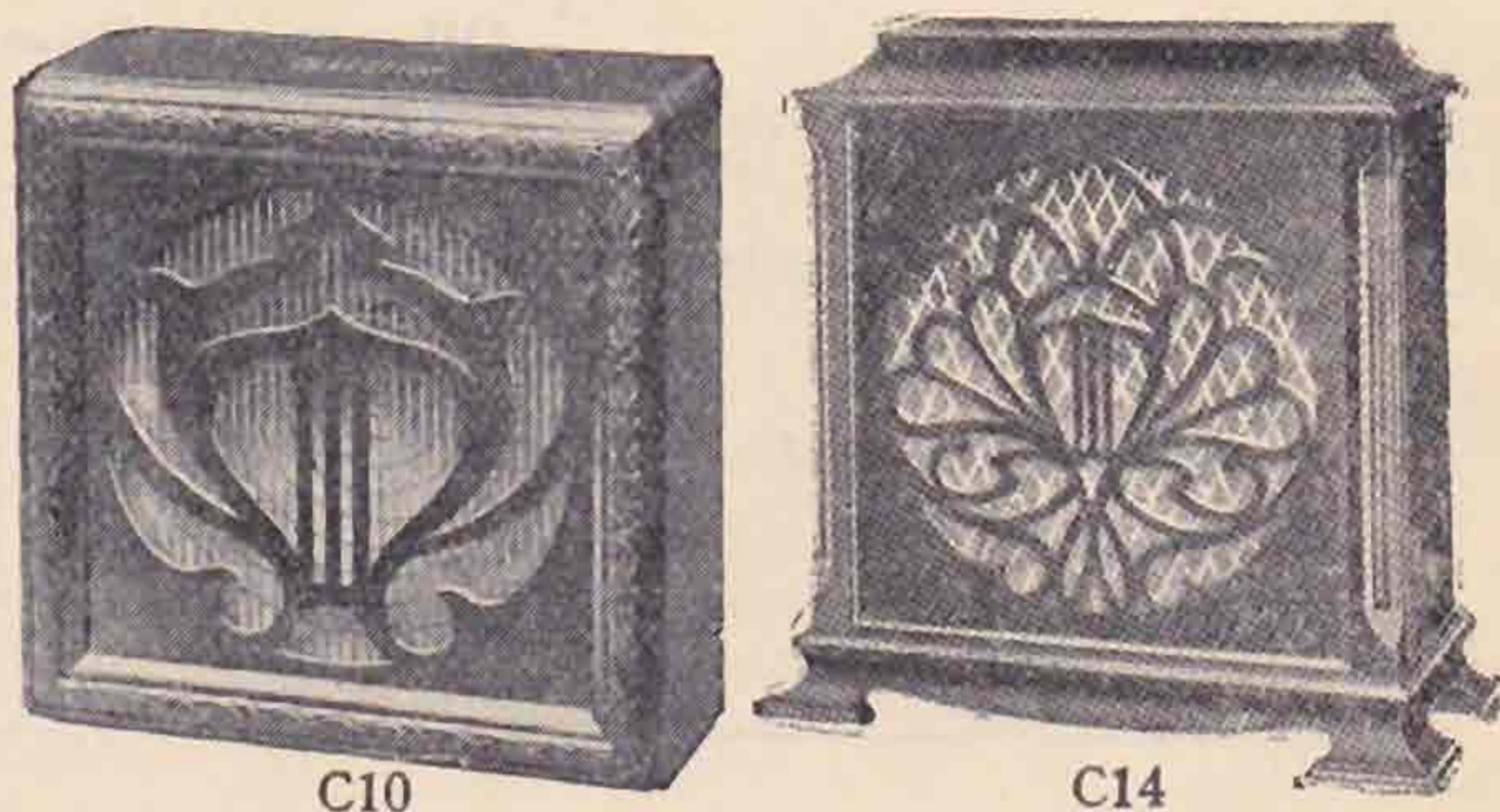
We were pleasantly surprised to see Mr. Thomas Taylor (SC2BJ) in London recently, and hope that his example in coming along to Headquarters will be followed by other visitors to our land.

That well-known American amateur NU111 is now in England. We hear of a surprise to be sprung on the July Hamfest in connection with his visit. Welcome O.M. to EG—we have heard you often—let us see you often during your stay.

Our congratulations to Capt. Courtenay Price, the South-Western area manager, on the addition of a third junior operator to station 2OP.

The Celestion Loud Speaker

As announced in our June issue, by an unfortunate printer's error, the illustrations of models C10 and C14 of this well-known loud speaker got reversed in the advertisement in the annual. As the whole edition was printed before the mistake was discovered, it was impossible to rectify the defect, and we can only continue to offer our apologies to the makers and trust that the reversal has caused them no serious inconvenience. The Celestion loud speaker is so well-known that doubtless many of our readers recognised the mistake at once. That it has made a good reputation



for itself cannot be denied by the purity of the reproduction and the fine quality of the workmanship. The movement does not, as is usual, follow the lines of an enlarged headphone unit, but is more of an engineering job, using cobalt steel for the magnetic field.

We also notice that the Celestion Radio Co. have introduced a gramophone pick-up which no doubt contains the same care in design as the loud speakers.

The two models are reproduced above.

Notice.

I. A. R. U. NOTES.

It has been arranged to send a monthly report to QST. This is being prepared by Mr. K. E. Brian Jay (2HJ). Any special remarks which Members wish to be included should be sent to this office marked "I. A. R. U. Monthly Reports."

Forthcoming Events.

JULY 17. London Hamfest, 6.30.
Pinoli's Restaurant, Wardour Street,
5/-.

SEPT. 28-29. Annual Convention.

The R.S.G.B. "All Screened" Receiver.

BY ETHERWORM.

A series of two constructional articles describing a receiver built from some of the very best of British component parts. A sensitive receiver suitable for use on all wave-lengths, including the short wave-lengths, and capable of being used on a frame aerial for long distance and direction-finding work in its elementary stages.

INTRODUCTION.

The very rapid strides now being made in the radio art are such as to warrant every conceivable effort on the part of the experimenter to keep pace with latest developments in design and practice. In many cases necessity compels the user of the ether to protect himself against all eventualities by using equipment in connection with his reception which will give him margins of safety and power to cope with any emergency which might arise. To quote a few instances, the ether is becoming increasingly crowded, high power stations are opening out every day all over the world, electrical appliances are being used in increasing numbers, and signals are now receivable on wave-lengths all over the radio frequency scale.

The receiver which we are about to discuss has the following desirable features:—

It is highly sensitive. Its selectivity is equal to that of any receiver extant and superior to most. All component parts of the set are entirely screened from electrical interference except that which comes in on the aerial. It is very easy to tune, as when once a station has been logged it is always possible to repeat the performance on the high-grade condensers and dials used. It is not affected by surrounding earthed bodies, is extremely stable and cannot be used in such a way as to cause annoyance to nearby listeners when searching as no reaction effects can be fed back to the aerial. The quality of reproduction is equal to that of any local station receiver used for quality reception. Lastly, but not least, the tuning range is unlimited, as this is covered by means of existing plug in coils in every instance. It will tune down to 15 metres with ease. Colonial readers will appreciate that the case is insect proof.

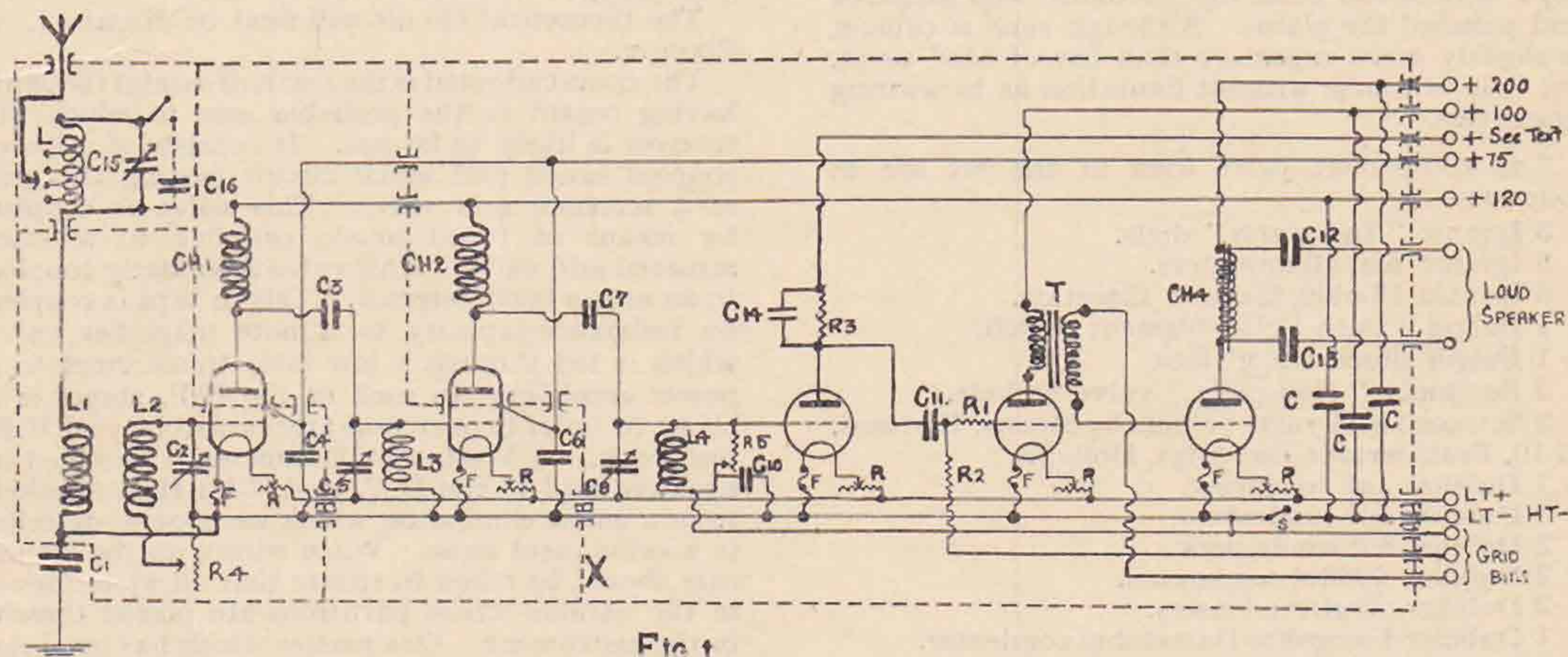
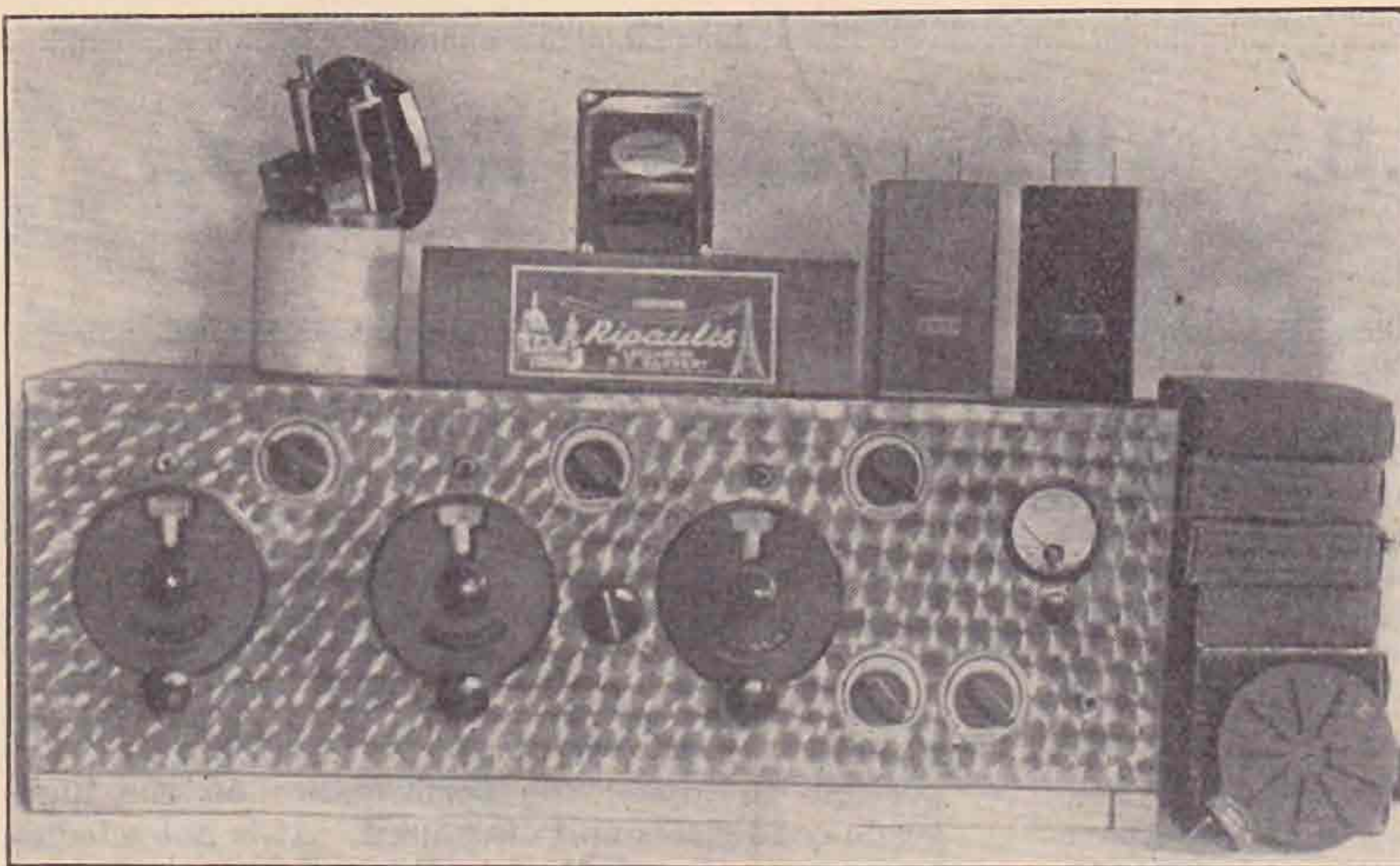


FIG. 1.

DETAILS:—C1 = 1 mfd.; C2 = .0005 Cylton variable; C3 = .0003 Dubilier mica; C4 = .25 to 4 mfd. Dubilier; C5 = .0005 Cylton variable; C6 = .25 to 4 mfd. Dubilier; C7 = .0003 Dubilier mica; C8 = .0005 Cylton variable; C10 = .0003; C11 = .1 mfd.; C12,13 = 8 mfd. Dubilier paper; C14 = .0001 Dubilier fixed; C = Ferranti 2 mfd.; CH1 and CH2 = Varley R.I. air core chokes; CH4 = Ferranti B1 choke; R = 10 ohm. filament rheostats (Igranic); R1 = 100,000 ohms.; R2 = 1 megohm; R3 = 250,000 ohms.; R4 = 400 ohms. non-inductive resistance (not required when reaction control R5 is adopted); R5 = 0 to 1 megohm variable non-inductive resistance (Gambrell "Voluvernina"); T = Igranic type "G" transformer; F = .5 amp. fuses (Gambrell); S = Bulgin "Push-Pull" filament current switch; L1, 2, 3 and 4 = Inductances suitable for a given tuning range (Gambrell Bros.); X = Screen partition not used when R5 is used for reaction control; C15 = .0005; C16 = .0025 (critical value); L = see test (C15, C16 and L are wavetrap component parts).



This photograph illustrates the front view of the set and also component parts used exterior to it. These are from left to right, wave-trap inductance and condenser (Ripault). Ripault H.T. battery for use with screened grid valves and as grid bias; Ferranti B1 choke and Dubilier 8 mfd. condensers for coupling loud speaker or head phones to amplifier.

DESCRIPTION.

Having thus awakened the interest of my readers who might otherwise be apathetic to the appearance of a constructional appetite article, we will now examine this development in receiver design. A circuit diagram showing the layout of the component parts is seen in Fig. 1 and the photograph shows the outside appearance. It will be seen that the receiver is entirely enclosed in a copper cabinet and provides a very handsome design, albeit very plain. This cabinet was prepared by Messrs. Barrousi, of 10, Featherstone Buildings, Holborn, who prepared and polished the plates. Although such a cabinet is slightly more expensive than one of hard wood, yet it is of course without limitation as to wearing properties.

The component parts used in the set are as follows:—

- 3 Igranic "Indigraph" dials.
- 3 Igranic dial illuminators.
- 5 Igranic 10-ohm filament rheostats.
- 1 Bulgin "Push-Pull" filament switch.
- 1 Bulgin closed circuit jack.
- 3 Benjamin "Non-pong" valve sockets.
- 2 Screened grid valve holders by Messrs. Barrousi, of 10, Featherstone Buildings, Holborn.
- 1 Dubilier 1uf condenser.
- 3 Dubilier 4uf condensers.
- 2 Dubilier 8uf condensers.
- 2 Dubilier .0003uf condensers.
- 2 Dubilier .25uf condensers.
- 1 Dubilier 1 megohm Dumetohm condenser.
- 1 Igranic type "G" transformer.
- 1 RI-Varley resistance capacity coupling unit (Type A).
- 3 Cyldon "Log" mid-line variable condensers, by S. Bird, Ltd.
- 1 2" Weston Millimeter (0-200 milliamps.).
- 1 Ferranti type B choke (L.F.).
- 2 R.I.-Varley H.F. chokes.
- Valves by Mullard as per specification to follow.
- Protective fuses to fuse at .5 amps, by Gambrell, Ltd.
- 1 400-ohm non-inductive resistance.
- 10 Clix terminals.
- 1 Ripault's 100-volt type CM dry battery.

It will be seen from the foregoing that the set is not by any means a cheap one, and if it were so it would not be described in these columns. Nobody can expect Rolls-Royce results with an indifferent set of parts no matter what valves are used, and for this reason the reader is warned against departing to any great extent from the specification. The transformers, chokes, condensers, etc., have been chosen as the result of careful testing with a definite object in view and any alterations are likely to cause difficulty unless the constructor displays great intelligence in his choice.

The theoretical circuit will next be discussed.

CIRCUIT.

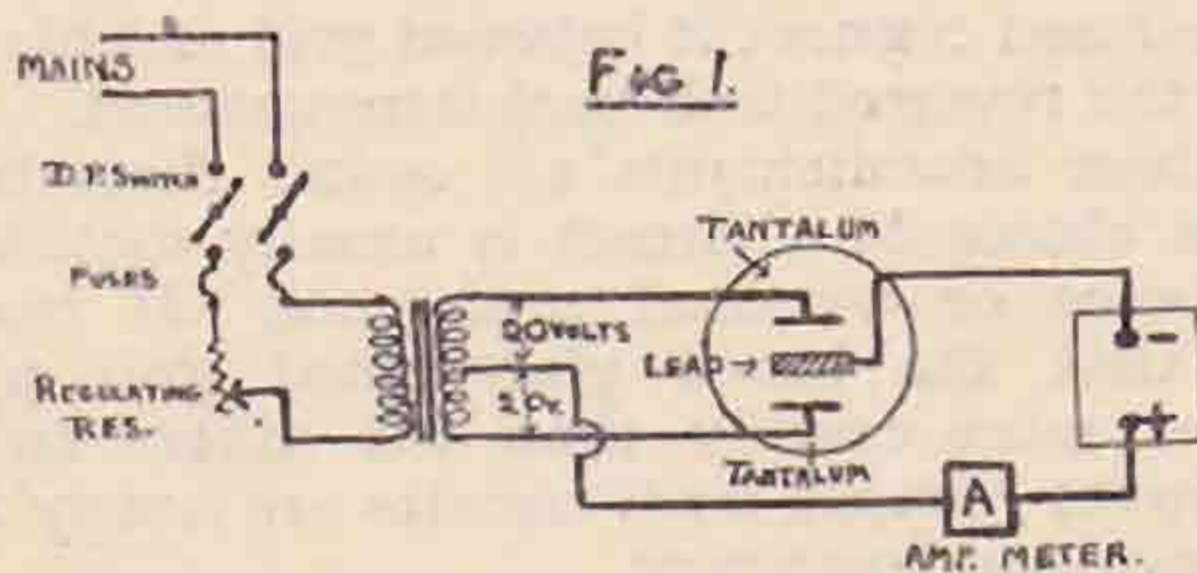
The circuit adopted is the result of careful thought, having regard to the probable uses to which the receiver is likely to be put. It consists of a loose-coupled tuned grid aerial circuit feeding the grid of a screened grid valve. This valve is coupled by means of tuned anode coupling to another screened grid valve. This valve is similarly coupled to an anode bend detector. This in turn is coupled by resistance-capacity to a note magnifier valve which is fed through a low ratio transformer to a power amplifier. In each of the H.F. stages is a choke in order to overcome any possibility of H.F. feed back. A Weston milliammeter is provided in negative lead of the H.T. feed. All H.T. is taken from a mains eliminator, which we hope to describe in a subsequent issue. When wiring up the circuit care should be taken to ensure that all wires shown in the various screen partitions are placed therein in the instrument. One matter which has not been touched upon is the coil LI and condenser which appears in the aerial circuit. This is a series wave-trap, the object of which is to overcome strong unwanted signals from the local station when searching for distant transmissions. The data given for the windings applies only to the medium wave-lengths of from 230 to 600 metres, and data for other wave-bands will be given in the next article. It will be found that this wave-trap will be indispensable on the advent of the B.B.C. Regional scheme. The wave-trap is an auxiliary and is not contained in the present receiver. In the next issue details of the layout of the component parts, the cabinet, etc., and operational data will be gone into.

TANTALUM RECTIFIERS.

The charging of accumulators from alternating current mains has been a problem to many. The various means available have all had their advocates and each has been more or less thoroughly discussed in the various radio journals. Of course, the new dry rectifier of the copper oxide type, as manufactured by Messrs. Ferranti and others under the Westinghouse patents, has many attractions and undoubtedly is the simplest, cleanest and most attractive of all, but at present it appears only to be made for extremely small currents, which, while being ideal for trickle charging, cannot be employed when it is desired to bring up a rundown accumulator to a charged state quickly.

The writer, after struggling for some time with the aluminium plate and lead combination, gave it up. After a few days' use, the impossibility of keeping the phosphate salt within the cell was apparent. Even a very thick layer of paraffin failed to stop the creeping. Chemical rectifiers were in disgrace until it was decided to try the tantalum type as a last resource. To the writer's surprise, this proved successful from the start and has been in constant use ever since.

The use of the metal tantalum in combination with lead in dilute sulphuric acid is nothing new. Those who remember the old days of radio will be reminded of the electrolytic detector of the same type. Naturally, it did not live very long for that purpose, and was soon replaced by the cleaner and more convenient carborundum crystal.



Tantalum is not a cheap metal, but once obtained the strips will last almost indefinitely, if not abused or overworked. The writer obtained his pieces from Messrs. Blackwell's, of the Albany, Liverpool. They are extremely thin and about six inches long by $\frac{3}{8}$ -inch wide. The metal is very brittle and care should be taken not to bend it too sharply or a crack may result, leading to fracture.

The connections used by the writer are shown in the accompanying diagram (Fig. 1). The transformer primary is arranged to operate from the 200-volt, 50-cycle house supply, while the secondary gives a total of 40 volts with a centre tap at 20 volts. This voltage is rather higher than that advised by Messrs. Blackwell's, but the writer had the transformer by him already made and it was not convenient to remove any of the turns. Current adjustment is made by using an old ex-Army potentiometer in the primary, which adjusts the charging current readily to any value.

The cell itself is a large open-mouth glass jar in which a cork was accurately fitted. The two tantalum strips are passed through slits in the cork. The centre element is of lead. This is of ordinary commercial form, about $\frac{1}{8}$ -in. thick, and forming a plate six inches long and wide enough to pass through the opening of the jar. The end is narrowed to a lug, one inch wide, which passes through a centre hole in the cork. See Fig. 2.

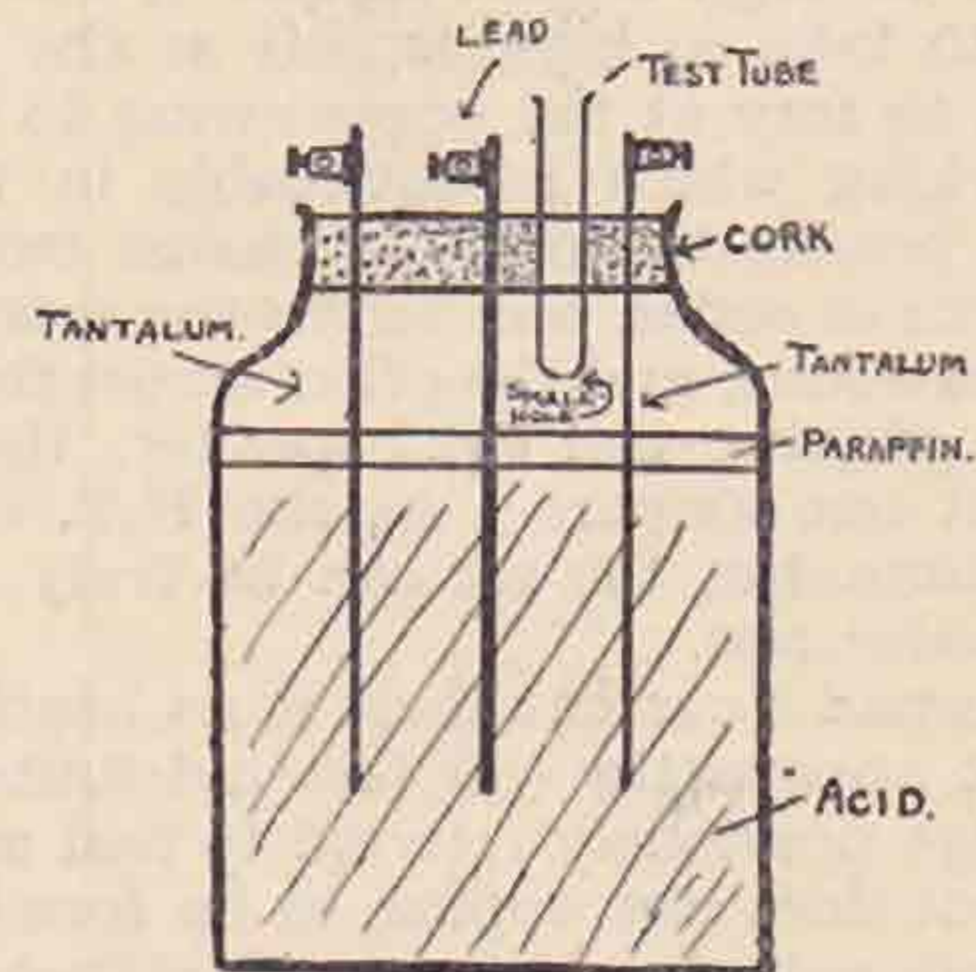


FIG. 2.

As the cell gasses vigorously in use, means must be provided to remove the gas. This takes the form of a glass test tube with a small hole in the bottom. It fits tightly into a hole bored in the cork. When the electrodes are in place, the whole cork is painted over with gutta percha dissolved in alcohol. Alternatively, the cork may be soaked in paraffin wax. Every possible endeavour must be taken to avoid the acid emerging and getting upon the connecting terminals, especially those to the tantalum strips, where any acid will set up a back E.M.F. opposing the working current.

The connections to the tantalum strips are made by punching holes through same and fitting brass screws and washers. The jar must be large enough so that there is about two inches space between the electrodes and the bottom. In practice, a brown sludge forms which must not be allowed to reach the ends of the tantalum strips. Care should also be taken to see that each tantalum strip hangs vertical and equidistant from the lead electrode. Should this not be the case the rectification of each side of the alternating current wave will be uneven and lead to humming, should charging be performed while a receiving set is being operated from the accumulator at the same time. As a matter of fact the writer frequently runs a multi-valve broadcast receiving set from the rectifier with an old, decrepit worn-out six-volt accumulator floating across the charging leads. With careful attention to the balancing position of the electrodes and the use of a small choke and four microfarad condenser across the accumulator, no sign of any hum is noticeable in the moving coil loud-speaker.

The acid employed is ordinary accumulator acid. About one quart is used, and to this is added about

one ounce of a saturated solution of sulphate of iron. This latter is not necessary but improves the working of the cell and raises the current rate.

Upon the surface of the acid is placed a layer of paraffin. This should be of the odourless quality as sold for medicinal purposes. Be sure to obtain the thin quality as it is usually sold in a thick consistency. Ordinary paraffin can be used but is inadvisable as the cell warms up in working and the paraffin evaporates, causing an unpleasant smell. Anyway the cell is best used out of doors. The writer has mounted his in a box fixed to the wall outside the window. Here it is left without requiring any further attention beyond the occasional addition of a little distilled water to make up for evaporation.

The current which the writer can draw from the cell can be as high as five amperes, but it is not advisable to take so high as this as the tantalum strips tend to fray at the edges owing to the occasional sparking which is noticeable in the dark. The writer prefers to normally charge two six-volt accumulators in series, one across the receiving set, as explained above, and the other across the magnet pot of the moving coil loud-speaker, the current being about one ampere. As the H.T. is derived from an eliminator, the set can be truly described as an all-mains one.

With so small a current there is no heating of the cell, and it apparently will last indefinitely. The brown sludge previously referred to had once to be removed but does not appear to be forming again to any great extent. It is possible that this was due to the ordinary scale coating upon the lead plate when first used.

Tantalum rectifiers are also successful for H.T. rectification, the cells being two electrode and arranged in bridge formation in two groups of three cells in series. The writer, however, has constantly employed valves for this purpose latterly and prefers to leave the matter to the pen of some member who has practical experience.

Second Mid-Britain (East) Conventionette.

This function will be definitely held on August Bank Holiday Monday at the Cock Hotel, Kingsthorpe, Northampton, as last year, and the cost of the catering will be the same, viz., 5s. per head lunch and tea. An interesting programme is being arranged, and also will be followed by a visit to No. 5GB (Daventry Experimental) at 6.30 p.m.; this station will then be seen under working conditions, by kind permission of Mr. Hotine (2QM). All "hams," OW's, YL's, etc., are welcome from any area, and applications for tickets should be made not later than July 20, together with remittance, to EG2XV, Mr. Gerald A. Jeapes, 117, Victoria Road, Cambridge. Please do not leave your application until the last minute, as it complicates the arrangement of the meeting. Don't forget all are welcome, so sit down and write off for your tickets now. *Absolutely now—please!*

EG2XV.

Theory and Adjustment of a Transmitter.

By F. G. AUGHTIE (6AT).

NOTE.—This portion was inadvertently omitted from the previous instalments of this Article.

Grid Excitation.

We have seen that when a valve is delivering power its plate potential is varying at the high frequency, while to obtain any output the grid must be excited at the same frequency. Unfortunately, however, the grid excitation must be of opposite phase to the plate voltage swing, i.e., when the plate becomes more positive, the grid must be made more negative. For this reason we cannot simply couple the grid and plate together (through a condenser), but must interpose some kind of electrical see-saw. The simplest way of doing this is to place a coil between the plate and grid (with a stopping condenser to insulate the grid from the H.T.) and tap the filament on to the centre point. This gives the Hartley circuit.

Circuits.

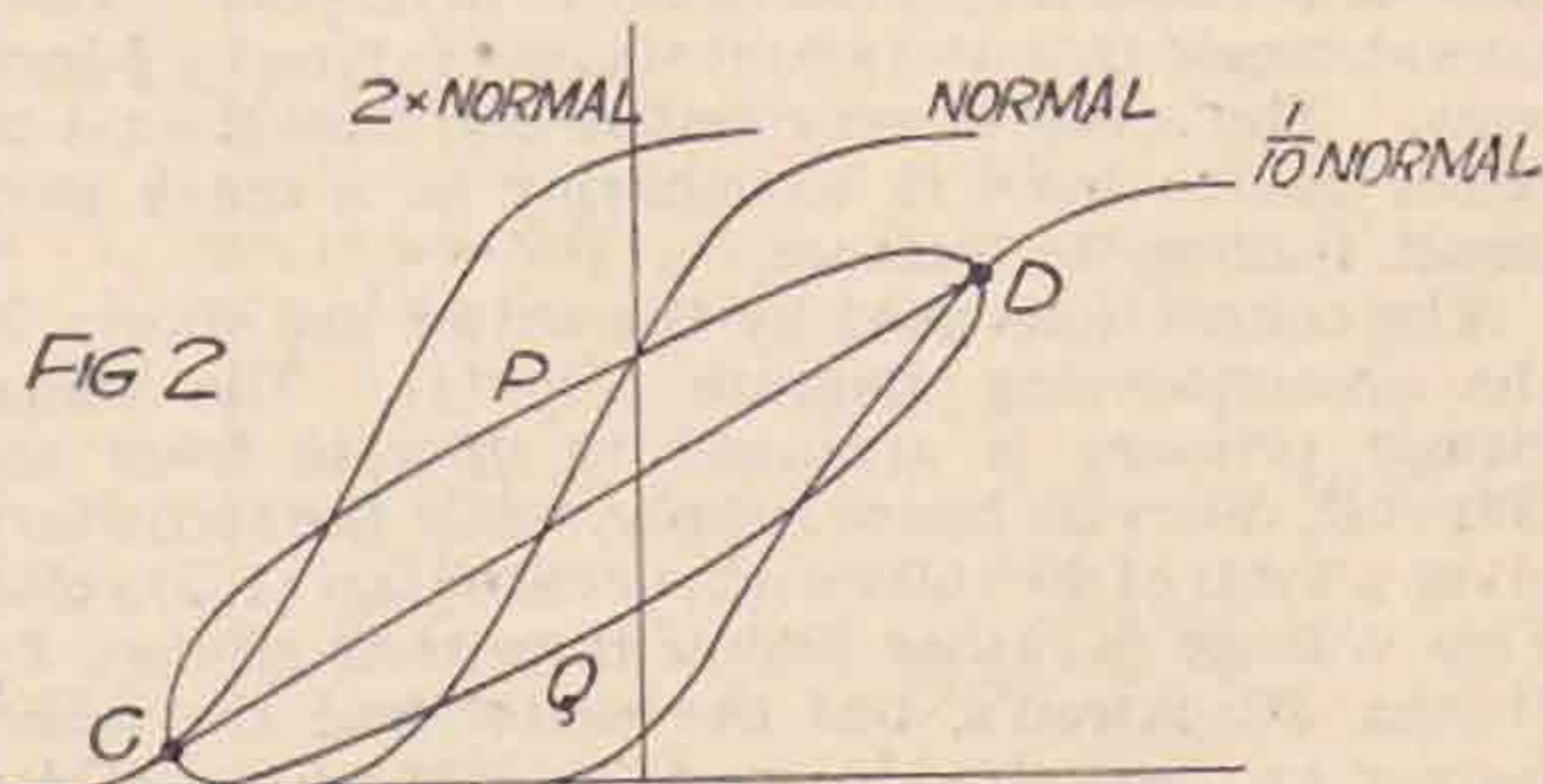
Another way of effecting the phase reversal is to tap the filament on to the centre of a condenser between the plate and grid; this is done by putting two condensers in series to give a centre tap. This gives the Colpitts circuit.

A third way is to arrange for the drop of voltage across the plate-grid capacity to be greater than the plate voltage swing, by placing a circuit, suitably tuned, between grid and filament. This gives the tuned plate-tuned grid or Armstrong circuit. Yet another way is to place a coil in the field of the plate coil and connect it between grid and filament. This is the reversed feed back arrangement.

All these arrangements are sound theoretically, and the choice of a circuit is usually dictated by convenience or personal preference. It may be added that the tuned plate-tuned grid usually oscillates more readily than the others on very short waves because both circuits are nearly tuned to the working frequency.

Dynamic Curve.

Since the plate voltage is varying as well as the grid voltage, the plate current-grid voltage curve is very different from the static curve. The



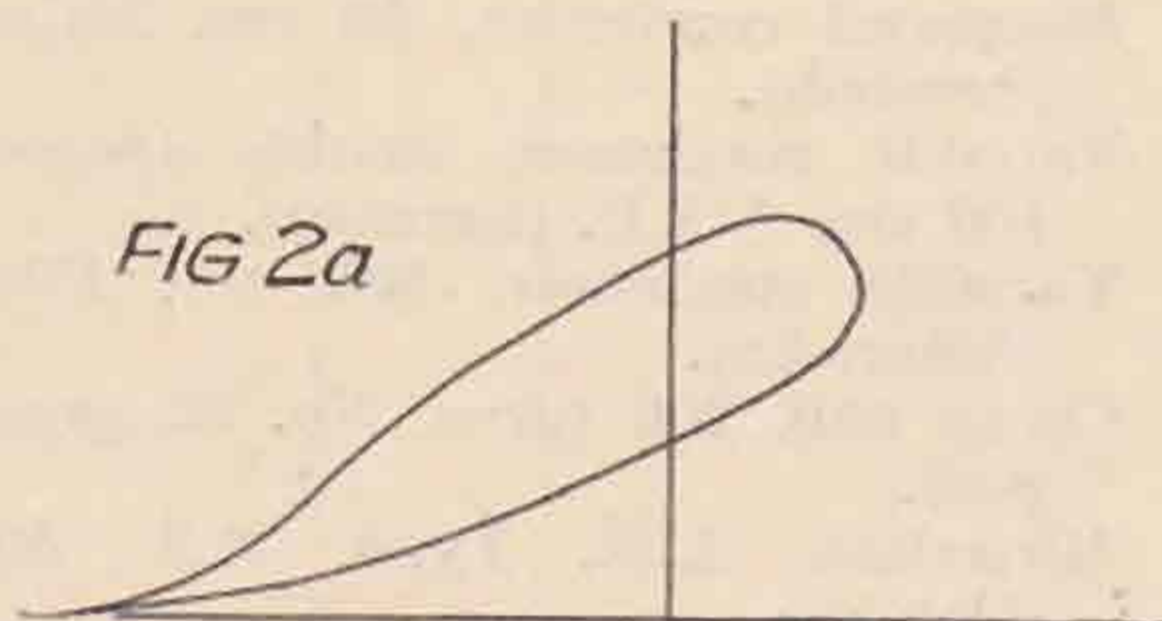
dynamic curve is much less steep and more nearly straight (if the anode circuit corresponds to a pure resistance load). The maximum plate current

flows when the plate voltage is at a low figure (it may be as low as 1/5 or 1/10 the D.C. supply voltage).

This explains why the excitation must carry the grid well positive if any appreciable output is required. Again, when the plate current is a minimum the plate voltage is a maximum—nearly double the supply voltage.

In Fig. 2 a set of static curves for a (fictitious) valve are shown. In particular the curves for normal, twice normal, and one-tenth normal are drawn. Since the plate potential is low when the current is a maximum the top of the curve will be at about D. Similarly, the bottom of the dynamic curve will be at C. If the plate circuit load is a pure resistance, the operating curve will be the line C-D. This is obtained if the anode circuit is exactly tuned to the working frequency. If the plate coil is not exactly tuned, the operating point will trace an ellipse such as CPDQ, clockwise or anti-clockwise according to conditions. The departure from exact resonance required to give an ellipse is so small as to make no appreciable difference to the meters in circuit, so that in practice the operating point almost always traces an ellipse.

When the grid bias is increased to give efficiency, the ellipse is distorted considerably, becoming much thinner at the end marked C. An attempt is made in Fig. 2a to illustrate the kind of operating curve obtained in practice when the valve is worked fairly efficiently, and the anode circuit is not exactly tuned.



Summary.

(1) The dynamic curve is widely different from the static curve.

(2) For efficiency, sufficient bias must be used to bring the mean operating point below the centre of the static curve, preferably to at least the foot of this curve. This bias may be obtained by the use of a suitable condenser and resistance.

(3) To obtain reasonable output the excitation must be sufficient to carry the grid well positive. As a result grid current flows and *Power* is required for excitation.

Having reviewed in some detail the theory of an oscillating valve and knowing something of what is taking place, we can now attempt to answer some of the vexed questions which arise from time to time. Of these the commonest is High *versus* Low impedance valves. The writer will make a serious attempt to debate the question fairly.

High and Low Impedance Valves Compared.

First consider what is the essential difference between the two types; we will take them to be of equal power rating and having similar filament characteristics. The difference lies in the grid. An open mesh grid gives a low impedance valve and a close mesh grid gives a high impedance

valve. At the same time the amplification factor is similarly affected. Take these two valves in turn, remembering that the two terms high and low are used relatively. Also the term "impedance" being somewhat incorrect, and the alternative of "Anode A.C. resistance" clumsy, we will use the symbol R_a as possessing neither of these objections.

A valve of high R_a requires, for optimum efficiency, a high resistance load (remember that this can be obtained easily in practice by using a suitable anode, or load tap, or a suitable value of coupling if loose coupling is employed). Now a high resistance requires a high voltage across it for a definite power. This demands a high voltage on the plate and, for a definite power a low feed current.

A low R_a valve will require a low resistance load and a low output voltage if the power in the load is to be the same. This in turn means a low plate voltage supply, and again for the same power a high feed current. Thus a low R_a valve requires more emission for the same power, and consequently more filament watts.

Amplification Factor.

Consider now the effect of the change of amplification factor referred to in future as "M." A valve of high M value will require a smaller grid excitation than one of low M for the same anode H.F. output voltage. For equal power we have seen that the high R_a valve requires a higher anode voltage than the other. Hence, the grid excitation for the high M valve is not greatly less than for the other. In addition the grid of the high R_a valve being of closer mesh has a larger grid current when at the same potential. The net result is that for a given H.F. output at the same (anode circuit) efficiency about the same power is required for grid excitation. And hence the overall efficiency of the two valves is substantially the same.

The problem reduces, therefore, to a consideration of the power required and the H.T. voltage available. If a high voltage is available the use of a high R_a valve, since this will generally require less filament watts.

One further point should be watched. At the high frequencies now employed the currents through the stray inter-electrode capacities are quite large, and are, of course, proportional to the H.F. voltage. These currents, if excessive, may cause heating of the seals, etc. Hence, for extremely high frequencies low R_a valves are preferable.

WANTED.—A thousand or so members to advertise their surplus gear for sale in these columns.

Station Description.

DANISH 7MT.

OPERATOR, ERIC POULSEN, 6 VIRGINAVEJ, COPENHAGEN.

"My New Schnell Receiver."

The Editorial Board have pleasure in publishing a description by Mr. Poulsen of his new receiver and take this opportunity of thanking him for this contribution and desire to express a hope that the example of our Danish correspondent will be followed by some of our own members.

Having seen numerous short wave receiving sets at various amateur stations I have visited, I decided to build a short-wave receiving set (the 6th) which would surpass all predecessors as regards low losses, maximum efficiency and ease in operation even on the shortest wave-lengths. It seems that I have succeeded in building a receiver which picks up really strong signals and which brings in phone stations remarkably well. In the following I shall briefly describe this receiving set.

THE CIRCUIT.

The Schnell circuit is seen in Fig. 1. As it appears it is a simply two-valve set, detector and one stage audio amplification. The tuning condenser C1 must not be larger than 100 cm.

The coils L1 and L2 are connected in the following way:—The leads which go to the grid and to the plate must be the two outer ends of the coils, while the inner ends are connected to the negative lead and to the choke coil D. The grid leak is not connected in shunt to the grid condenser as usual, but through a potentiometer P. thus allowing a variable grid voltage. on the detector valve.

THE COILS.

The coils are very easily made. Sixty turns of No. 18 gauge copper wire are wound up on a wooden stick of 2 inches diameter. When the copper spiral is taken off the stick it is cut into five pieces of 21, 13, 10, 6 and 5 turns. Two extra turns are added to each coil for use in mounting. Each of these coils is now "turned" through three ebonite strips; the strips may be cut from 1/16th" thick ebonite and drilled with 1/16th" holes for the turns. The distance between each hole is 0.14." Finally the coil is mounted upon an ebonite strip 1/4" x 1/2" x 2"; the distance between the plugs is 1.6".

As the coils are of different lengths the extreme turn at one end is just over the edge of the ebonite strip. The plug in socket for the two coils is made of ebonite and furnished with four brass brackets, and the whole mounted on two porcelain insulators; the strip is 1/4" x 1/2" x 7 1/4". If the coils are made as above their tuning range will be:—

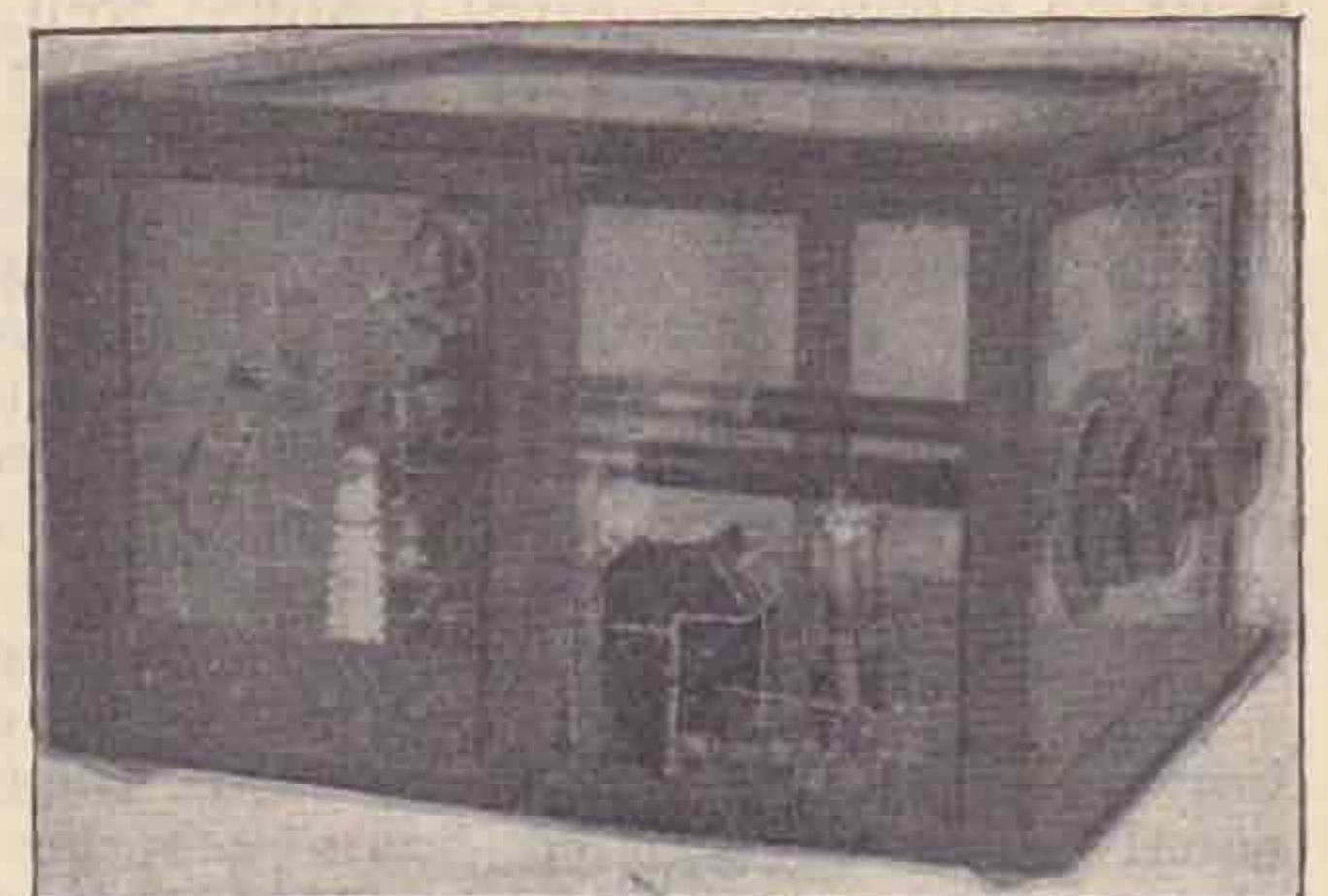
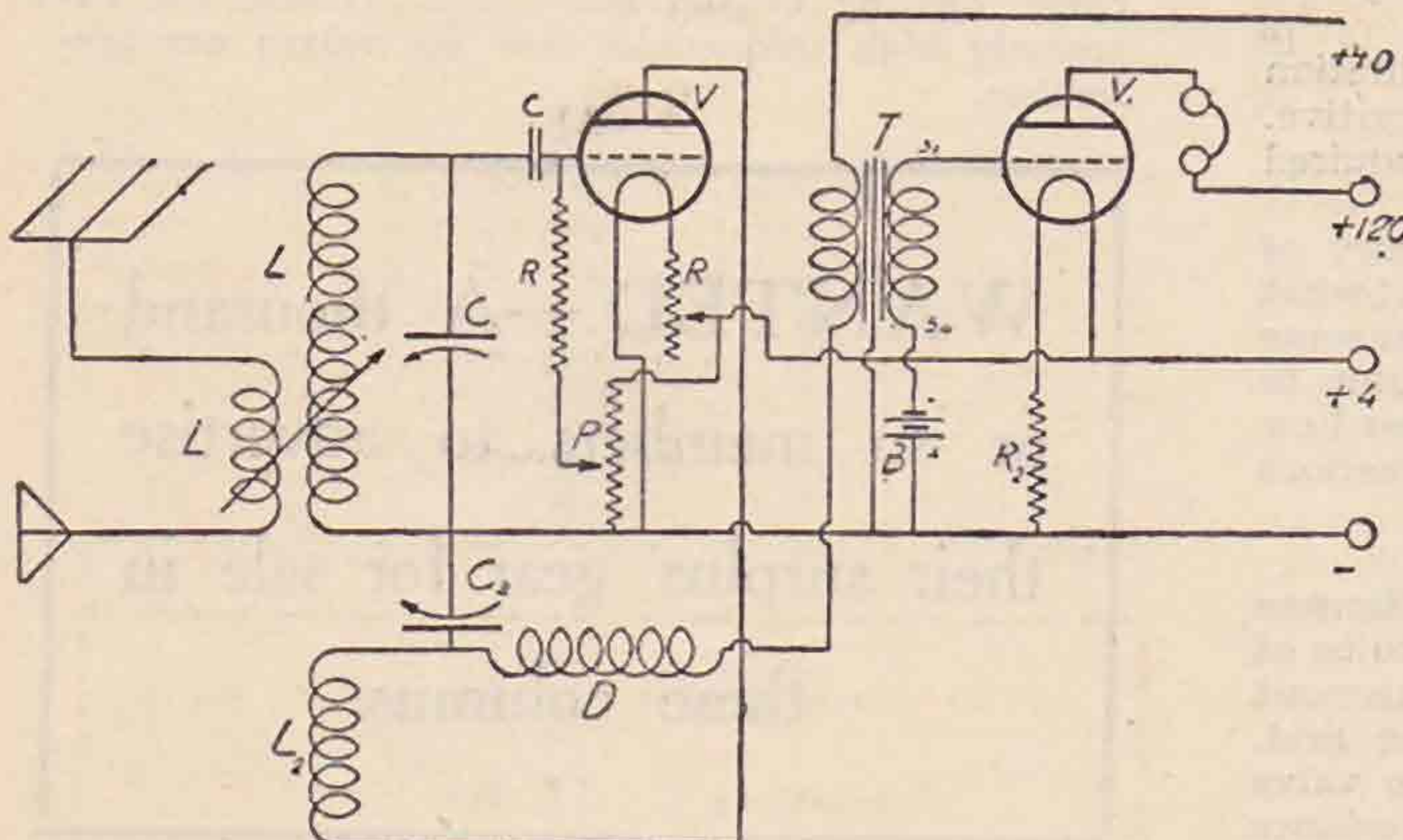
Grid coil.	Reaction coil.	QRH in meters.	
		Max.	Min.
21 turns.	10 turns.	73	34
13 "	5 "	52	24
10 "	5 "	43	20
6 "	5 "	31	14.3

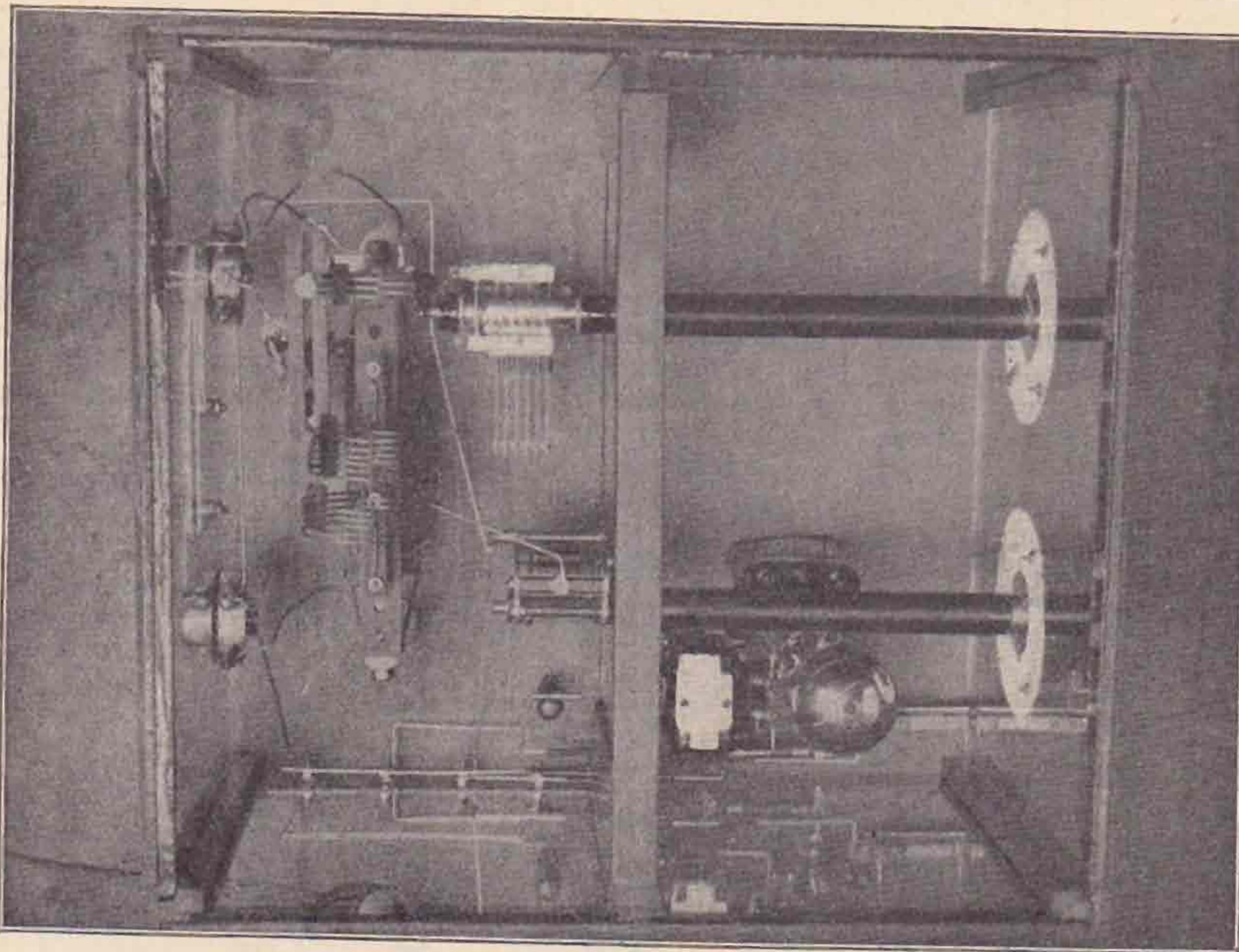
An extra coil is made on a cardboard former with 23 turns wound side by side; this coil goes up to 120 metres. The coupling between the aerial and grid coil (L-L1) may be varied by a slider, which gives a movement of 3 inches.

THE COMPONENTS.

It is necessary to make use of high-grade parts when building such a receiving set if the best results are to be obtained; therefore I give below a list of the parts used in my own set.

B	1	Grid battery, 4.5 volts	Hellesen (Danish).
C	1	Airspaced condenser, 50 cm.	Baltic (Swedish).
C ₁	1	Variable condenser, double spaced, 100 cm.	N.S.F. (German).
C ₂	1	Variable condenser, 500 cm.	Pilot (American).
D	1	Choke coil, 200 turns, No. 32 gauge wire.	
M	2	Microdials, L.K. Type, M.S. 300	(Danish).
P	1	Potentiometer, 400 ohms, D.K. P.M. 400	(Danish).
R ₁	1	Filament resistance, 30 ohms, D.K. G.M. 30	(Danish).
R	1	Grid leak, 5 M.G. ohms, Dr. Loewe Vacuum	(German).
R ₂	1	Amperite resistance type 18.	





T	1	L.F. Transformer, 1/10 L.K.-L.T. 3 (Danish).
V	1	Detector valve, Marconi, type D.E.V., special low capacity (English).
V ₁	1	D.F. valve, Marconi D.E.4 (English).



In the receiver I have taken much trouble to reduce losses. I decided to enclose the set in a case to screen it from dust, etc., but as is known, such a case may give great dielectric losses, so to overcome this I have made it of plate-glass, except for the three panels on which the parts are mounted, when mahogany was used. The dielectric losses due to the ebonite are greater than those due to the glass; it should be mentioned that all leads which are mounted on the glass plates are connected to negative. The connecting wire and the N.S.F. condenser plates are silver-plated and the coils plated with gold to keep the surface clean. The detector valve (V) socket hangs from rubber rings

fitted between the porcelain insulators. The L.F. amplifier is mounted in the "front space" to the left and the leads pass through holes in the wooden upright which supports the glass panel in the middle of the case. Here I may mention a few main dimensions which will give an idea of the size of the receiver. The bottom baseboard is $15\frac{1}{2}'' \times 17\frac{1}{2}''$, and the height of the case is 11". The glass panel on which the condensers C1 and C2 are mounted divides the case into two compartments of the same size. The height of the condenser-spindles from the bottom is 4". The socket strip for the coils is $4\frac{1}{2}''$ above the case. On the back panel

are mounted the resistance R1 and the potentiometer P. The latter on the right. The microdials on the front panel are connected to the condenser spindles through the long ebonite rods, so on even the short wave-lengths it is impossible to observe any hand capacity. The rods are $7\frac{3}{4}''$ long. The receivers are inserted in a jack on the front panel and the low and high tension is connected to the terminal plate on the left of the case.

The photographs give a good impression of the whole receiver. In practice this receiver has shown up many advantages over the old set, phone stations being received at excellent volume from all parts of the world on two valves. The quality of such a set depends alone on a good construction and requires all the best materials. It is of course not necessary to follow my description in every detail, *i.e.*, I should recommend amateurs to use ebonite panels instead of glass because the difference will be very small, but on the other hand I suggest that the sizes, assembling and wiring generally, be followed as much as possible.

Stray.

NOW WE KNOW!

" . . . If a crystal of, say, quartz is subjected to slight pressure, a feeble electric current is produced. Conversely, if a crystal is subjected to electric current, a slight deformation of the crystal results. This is the principle of the crystal in a wireless set."

FROM A LONDON DAILY PAPER.

Have you introduced your new member? Thank you!

Double Modulation.

By T. P. ALLEN (GI6YW).

The writer, like many other amateurs, has been troubled by the increase in the number of telephony stations working on the 45-metre band, and he appreciates the fact that many stations using telephony are in capable hands, and when conditions are bad are quite willing to revert to code working on request. At the same time, a few hours' listening will convince one that there are stations using telephony which only cause Q.R.M. without any excuse for their existence. The faults indicated by a reporting station are not immediately put right—in fact in some cases the faults are still evident after months of transmission and no effort, apparently, has been made to remedy them. Many

The benefit of this type of transmission is that many fone stations can use the same wavelength without interference, but probably some frequency control in the form of a master-oscillator or crystal control will be required.

The use of pure D.C. for the plate is an obvious requirement for any type of fone, though on Sunday night, June 3, the writer heard what he hopes was a Continental station using raw A.C. and attempting to modulate it with speech; he will not say that the station was "using fone"!!

The idea of double modulation is simple, but whether it is capable of being successfully worked on short waves is not known to the writer at the moment.

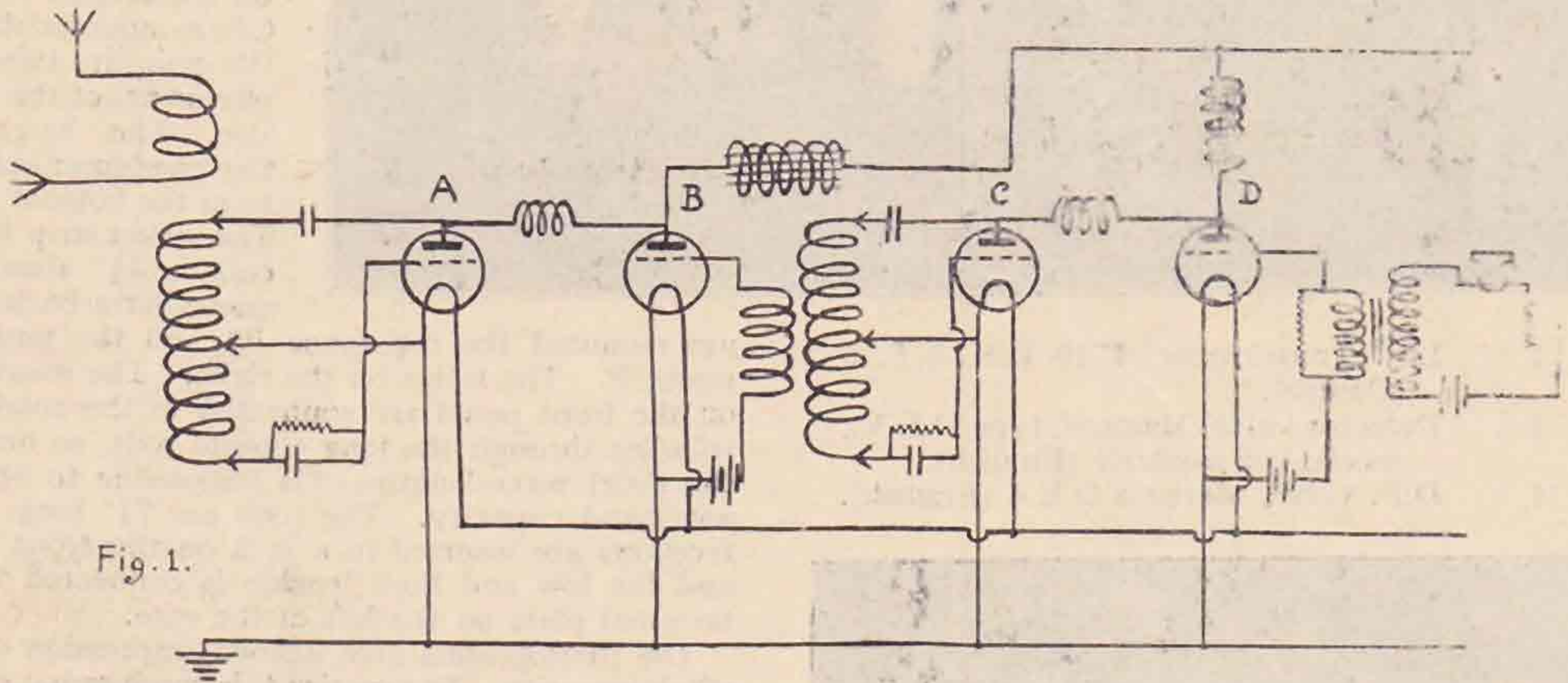


Fig. 1.

of these stations will not, or cannot, use code, and I was told of one station recently transmitting test calls without either wavemeter or receiver! To ban all telephony would be an injustice to the genuine and capable experimenters, but one feels that these are rare where fone is considered, and the iniquities of the few will be the cause of limitations being set upon fone transmissions. While the writer has not experimented with double modulation, not being a fone fan, he believes that the subject is worthy of investigation by amateurs working on short waves.

When we modulate the carrier ordinarily, we vary the amplitude (neglecting frequency modulation), and the amplitude of the received signal is varying with an audible frequency.

If we increased the frequency of the modulation we would go higher up the audible scale, and eventually make the modulation inaudible or super-sonic. If we keep the frequency of the modulation constant and vary its amplitude we obtain double modulation. That is, we have a carrier tuned in, with a steady super-sonic frequency of modulation which is varying in amplitude.

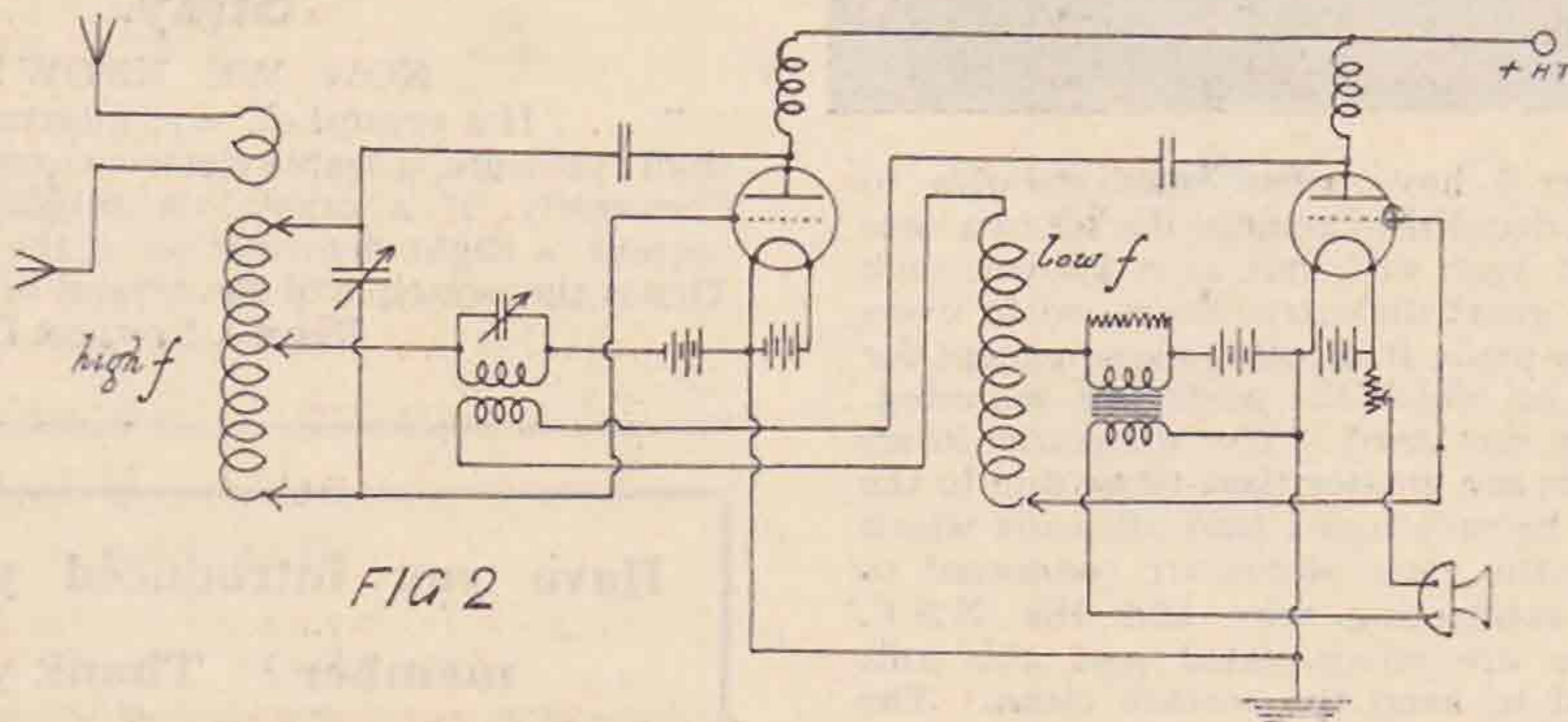
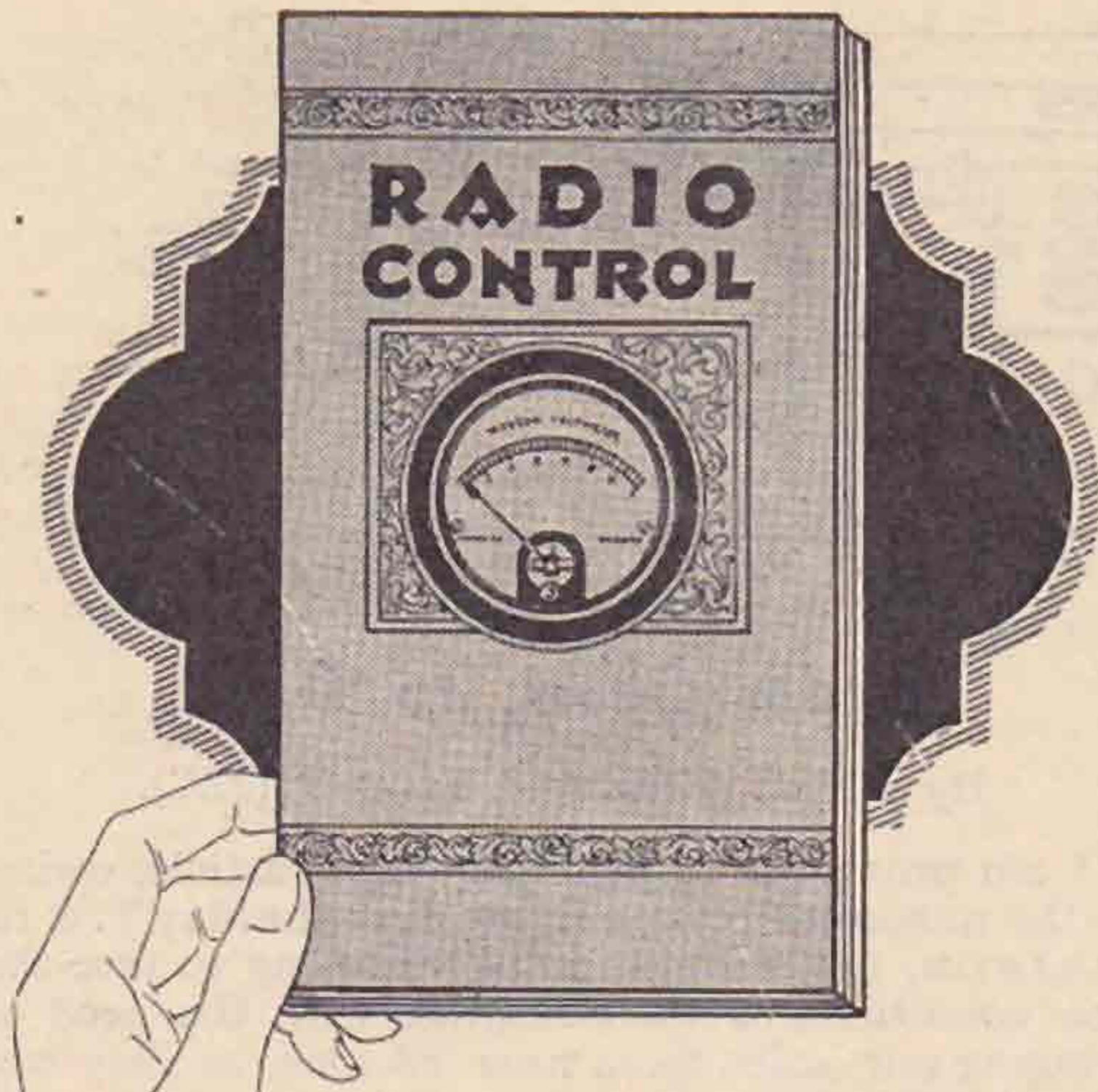


FIG 2



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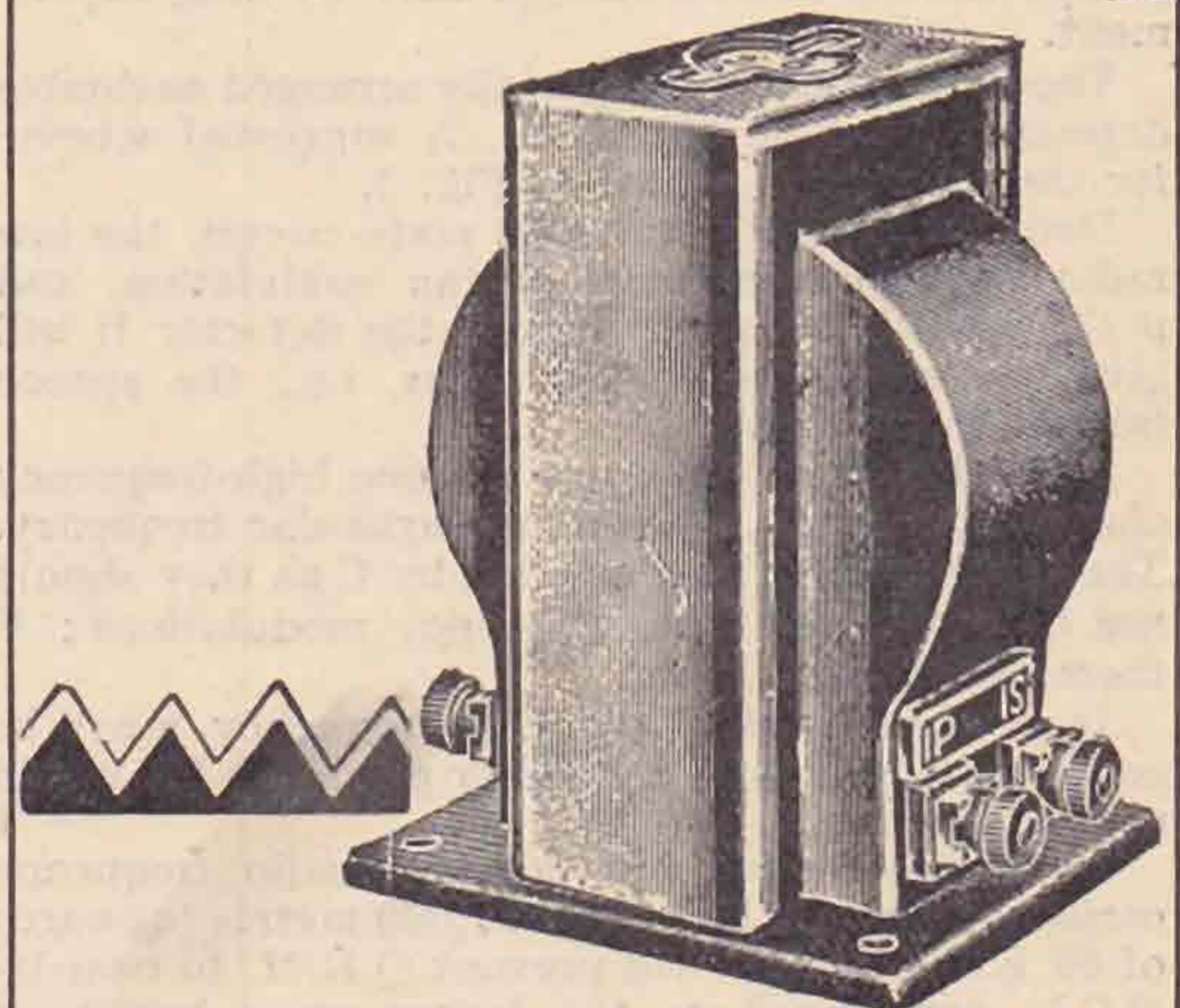
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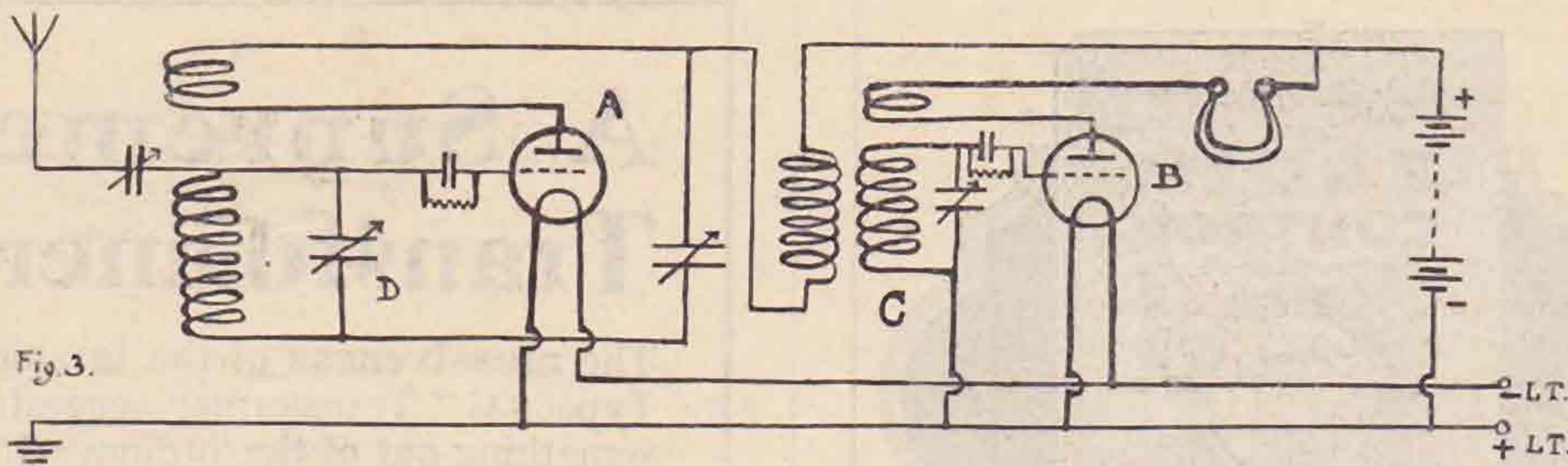


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The diagram (Fig. 1) shows, theoretically, how this can be done:—

C is a long wave oscillator which is modulated on the Heising system by the speech input to modulating valve D. The super-sonic oscillations of C modulate the second modulator B, which modulates the high-frequency oscillator A.

Possibly the above is the most straightforward type of double modulation transmitter, but the amateur cannot always afford the greater number of valves, and it would be worth while considering the grid-modulation system.

With this system the writer would be dubious about getting good quality without excessive frequency modulation of the high-frequency oscillator, but as this article is intended to encourage tests, and not to describe experiments, a suggested circuit is given (Fig. 2). Remember, this is all theory!

Other arrangements will occur to the reader, and it is very probable that the most satisfactory arrangement will be obtained only by long experiment.

The receiver must be specially arranged as double detection must be obtained. A suggested scheme for the receiver is shown in Fig. 3.

Detector A will give, in its plate circuit, the low radio-frequency envelope of the modulation, and if C is tuned to this frequency the detector B will give the envelope of this input, i.e., the speech frequency envelope.

Several stations may use the one high-frequency channel, and D is set for the particular frequency. The stations may be separated by C as they should use different low radio-frequency modulations; C therefore is the selector.

It is obvious that the high-frequency must be constant, and crystal control or good MO-PA would suggest itself.

A suitable value for the low radio frequency oscillations would be 5,000 to 7,000 metres (upwards of 60 K.C.), as this will prevent Q.R.M. to near-by B.C.L. sets tuned to the longer wave broadcast stations.

The radiation of this frequency from the aerial will be extremely small as the aerial system will be untuned for the higher frequency, and if a Hertz type of half-wave aerial is used, the radiation for a higher frequency will be almost zero (except for very close receivers, perhaps in the induction field).

Stray.

OA3AB desires QSO's on 23 metres band, and welcomes reports. His QRA is:—Mr. J. W. Leonard, 18, Love Street, Black Rock, Victoria, Australia.

From Spark to D.C.

By A. M. HOUSTON FERGUS (2ZC).

I am prompted to pen this simple article, owing to the numerous references made in the May T. & R. BULLETIN, to the question of preparing to face the new conditions of wave-lengths, with the need of bringing our notes to as near T8 tone, as they can be got.

Various things can give us bad notes, amongst which I might mention generators, certain dull emitter valves, vibration either in the valve itself, or in the coils, etc., and to those starting the game especially, a few remarks may assist them to make a good beginning instead of a bad one.

My own trouble started by my getting the most varied reports of my QSB, ranging from D.C. with ripple, to spark ("really, OM," as one QSL card on my wall testifies!!) and all from the same generator.

Every remedy was tried in the way of smoothing, etc., but that D.C. generator would simply not deliver D.C.

2NM very kindly offered to lend me another D.C. generator, just to try this out, but here we were treated as foreigners so far as Customs are concerned, and as I foresaw red tape galore in getting it back to him, I had reluctantly to refuse the kind offer, but as this "spark" affair rankled not a little, I decided to alter my whole source of H.T. supply, and while at the time it was an expensive experiment, I can only say that I have never regretted the step.

The generator was scrapped, and H.T. accumulators were substituted, 100 volts of 5,000 m/a capacity, and 120 of 2,500, fed at suitable voltages to a distribution board of Clix sockets, off which not only RX but also TX current is drawn.

Things then started happening, as I found that I could read signals never before heard, on account of the absence of magneto clicks from the petrol motor I used to drive the generator (this had been screened, by the way, but without much success), the hum of the generator, and the noise of the exhaust pipe, not to mention that transmitting was encouraged by the O.W. as there was now silence in working, instead of the whole house being filled with hum. (OM's with OW's will appreciate this part, no doubt.)

Reports now came in of pure D.C., steady, etc., so this showed that I had got so far, but the astonishing thing was that instead of from 9 to 10 watts being used, I found that with QRP I could reach out quite as far, and no rude remarks about band saws came in with reports.

I next tried some condensers in the circuit, namely across the H.T., L.T., and key, which is in positive H.T. lead, and it is very seldom that I ever get anything else but steady, F.B. reports these days on any wave, and I have several times been accused of using C.C. This accusation I do not object to, and it is a decided improvement on spark, at any rate.

I have several B.C.L.'s in the district, one quite near me, with an aerial running parallel, and though I have asked him to try and hear me, he has quite failed to do so, on any wave.

My transmitters are all TPTG circuit, series fed for 270, 32, 23 metres, and parallel fed for 45 metres, so there is nothing unusual about them, though it will be noted that I use a separate TX for each wave used, which saves a lot of time in changing, as switches of the DPDT type control H.T. and L.T. to any set from the power distribution board, and it does not take more than a few seconds to check the wave-length of each, after a change over.

To anyone living in the country, as I do, and wishing to start ham work, I should recommend the use of H.T. accumulators every time, and when installing them, care should be taken to put in really good ones, of large capacity. By using a bright emitter valve and no grid leak on low power, I find this also assists in sending out a really good pure note.

In a recent article, I described the use of the super regeneration circuit, and I should like to take this opportunity of drawing attention to one snag, which I overlooked.

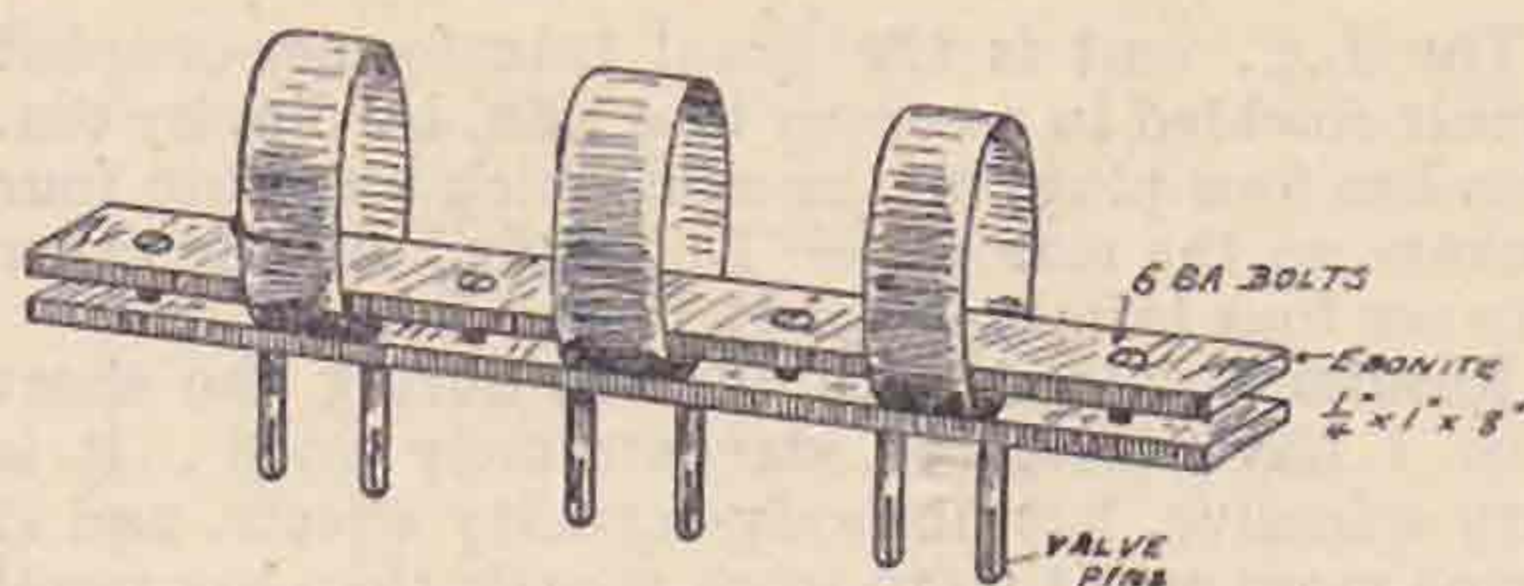
Until one has had a little practice on it, a pure D.C. note may be mistaken for a smoother A.C. one, but there is a distinct musical tone in it, and in any case, if there should be any doubt on the subject, it is an easy matter to switch off the valve, and hear the true character of the note, before reporting back.

A Receiver for the New Amateur Bands.

By A. S. WILLIAMSON (BRS26).

As soon as the result of the Washington Conference came to hand, I decided that my present S/W receiver would have to be replaced by one with greater selectivity, and more narrow tuning range. I turned up all information on the subject in past issues of "QST" and THE T. & R. BULLETIN, and came to the conclusion that the receiver must be selective, free from body-capacity effects, and cover the new narrow bands with a minimum of overlap. My first thoughts were a super-heterodyne with a good band-pass filter, but as this meant at least four valves, the idea was given up, and a two-valve Schnell type receiver was decided upon. This is built in two totally shielded units (det. and L.F.), so that they can be used as first detector and L.F. amplifier of a S/W super-het., if ultra selectivity was desired.

Having decided upon the circuit, I next tried to ascertain, with the aid of the table in "Wireless World Diary," what capacity was required to cover the new 80, 40 and 20-metre bands, but beyond getting an approximate idea, no exact data was



obtained, and the exact capacity was found by experiment.

As everybody is conversant with the Schnell circuit, no useful purpose will be served by giving a detailed account of the receiver, so I propose to deal only with the features that vary from usual practice.

The detector unit is shielded in a copper box 11in. by 12in. by 6in. on a baseboard 11in. by 12in. and panel 12in. by 6in. This is quite large enough for all the components and allows at least 1½in. between the coils and shield on the nearest side. All earth return leads are joined to one terminal and earthed with the case.

The tuning condenser is a "Cylcon" .0001 reaction type with all the moving plates except one removed: this is used with two fixed plates double spaced. But all fixed plates are left on making the capacity, and at the same time the tuning ratio, smaller. For reaction a .00035 S.L.F. condenser is used and, with the coils about to be described, is used practically all out, giving very smooth reaction without effecting tuning to any extent.

The H.F. choke is home-made and consists of about 150 turns of No. 28 S.W.G. D.C.C. on a 1½-in. former, wound in five single layer coils ½-in. apart, no two coils having the same number of turns.

The coils for the 80 and 40-metre bands have 34 and 13 turns respectively of No. 16 S.W.G. D.C.C. wound close on 3-in. former; they were then given a coat of celluloid dope, and when dry slipped off. This makes a very firm self-supporting coil. The aerial coils have six turns wound in the same fashion. The reaction coils consist of 22 and nine turns, both of No. 28 S.W.G. D.C.C. wound on a small piece of "Paxolin" 3in. diameter: these are not doped.

Each set of coils are mounted between two pieces of ¼in. ebonite, as shown in the sketch, and the coupling can be varied by sliding the coils nearer or further apart, until the best position is found for the particular valve and aerial in use and then set by tightening the screws passing through the coil mounts.

The coil mount consists of a piece of ebonite 8in. by 1½in. by ¼in. on which valve sockets are mounted, suitably spaced.

For 20 metres five turns of No. 16 S.W.G. tinned wound on a 3-in. diameter ribbed ebonite former, spaced two turns, and five turns of No. 28 S.W.G. D.C.C. wound between the secondary turns for reaction. The aerial coil has three turns of No. 16 S.W.G. tinned, wound on the same former about 2in. from the secondary.

The wavelength ranges of the above coils and condenser are as under:—

80-metre band,	75 to 86 metre approx.
40	39 to 44 "
20	19 to 21.6 "

The L.F. unit is the usual transformer-coupled circuit shielded in a copper box 12in. by 5in. by 6in. This has four plugs on the side which plug into four sockets on the side of the Det. unit; on the other side are four terminals for H.T. and L.T.

Results obtained with the set during the short time I have tested it are extremely good: it is very selective, has no body-capacity effects, and it seems more sensitive to weak signals than my usual S/W receiver. With a coil of two turns on a 2-in. former the new 10-metre band is covered, but no tests have been made on this waveband yet.

The receiver will be used exclusively for the reception of amateurs, and my present receiver will be kept for expeditions, which, I suppose, will use commercial wavebands, and all stations wanting reports on transmissions on commercial wavebands.

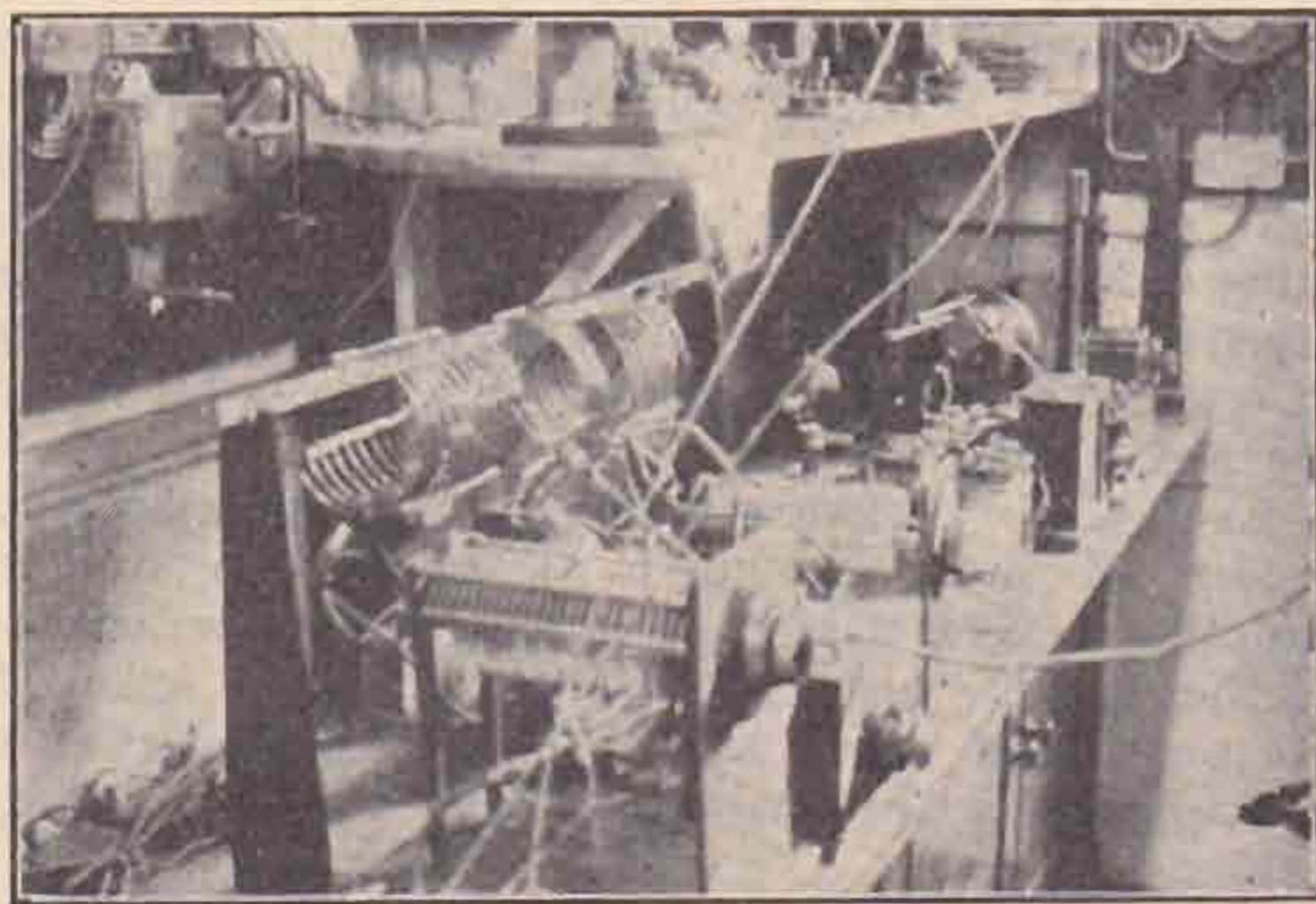
Station BVJ.

We are able to give a few details of BVJ, well known to many of us as the station of the Royal Naval College, Dartmouth. The description and photo are supplied by Mr. R. H. N. Johnston.

The transmitter shown is a balanced Colpitts, using an Osram Det. 1 valve with an anode voltage of 800, consisting of mains and accumulators. On the right of the photo is an experimental Mesny transmitter, using, apparently, a smaller valve.

The receiver is a Reinartz circuit with two stages of L.F. amplification.

The station works on 23, 32 and 45 metres; good work has recently been done on 23 metres, Australia having been worked a number of times with good reports.



Calibration Waves.

Calibration waves will be transmitted from 5YK on July 22 as follows:—

13.00 G.M.T., 46 metres (nominal).

13.05 G.M.T., 45 metres (nominal).

13.10 G.M.T., 44 metres (nominal).

A similar schedule will be transmitted on August 12 at 09.00 G.M.T. The call is R.S.G.B. DE 5YK, and the exact wavelength announced at each change.

MESSRS. S. S. BIRD & SONS inform us that they can supply the special cut-down Cylden condenser described in the R.S.G.B. amateur band receiver at the price of 11s. nett. Members should mention the T. & R. BULLETIN when ordering.

The South-Western Area Conventionette.

The South-Western Area Conventionette was held at Bristol on Saturday, May 19, and although it was the first of its kind in the area, it is certain that it will not be the last.

We were extremely fortunate in obtaining the co-operation of the Bristol and District Radio Society, so that from the outset the success of the enterprise was assured.

The members of the local Society generously entertained the visitors to the Portishead visit to tea and dinner, and also provided accommodation for those who wished to stay the night.

During the morning members gathered at the Queen's Cafe, where it is pleasing to note that coffee is by no means the only beverage sold. Lunch was proceeding when we were delighted to see Headquarters stroll in excellently represented by Messrs. Marcuse (2NM), King (5AD), and Hinderlich (2QY). Our special thanks are due to them for making the long journey and for their support.

Hunger and thirst (sorry, I should say thirst and hunger) having been satisfied, the party embarked in two motor coaches and various private cars to Portishead where, through the kindness of the G.P.O., we inspected the new transmitting station GKU which works with our liners. The station engineer, Mr. Woodward, explained the working of the three tuning fork controlled transmitters in a very lucid manner. The party was photographed in front of the main building at GKU, and we then returned to Bristol where a sumptuous tea was provided at the Merchant Venturers' Technical College, at which about 50 were present.

After tea Professor David Robertson, D.Sc., M.I.E.E., Professor of Electrical Engineering of Bristol University, gave a most absorbing lecture on Sound Waves. The lecture was profusely illustrated by experiments and lantern slides, which were most instructive. Of particular interest was the experiment showing the stroboscopic examination of stationary waves on a vibrating string. These waves were shown from the fundamental to the thirteenth harmonic, and demonstrated in a most wonderful manner the nodes and antinodes we try to imagine in our transmitting aeri-als. At the conclusion the appreciation of the audience was evident from the loud and prolonged applause.

Members then adjourned to St. Stephen's Restaurant, where an excellent dinner was served under the chairmanship of Mr. W. A. Andrews, who is also chairman of the local society.

The toast of the R.S.G.B. was proposed by Capt. Jones (2YX) and the response by Mr. J. H. Reeves (6HQ), a vice-president of the Society.

The area manager, Capt. G. Courtenay Price (2OP), then gave a summary of the Society and Area activities, and paid a special tribute to the volunteer workers at headquarters, on whom the existence and success of the Society and the amateur movement largely depend.

The Bristol and District Radio Society was proposed by Mr. Q. S. L. King (5AD). The response was by the Chairman.

The toast of the ladies and visitors was made by Mr. G. Crispin, a vice-president of the local Society, and the response was by Mr. Poulton (6UG).

Then followed a discussion and pow wow until kicking out time—fortunately 11 p.m. We are informed that the popular hour of going to bed was 3 a.m., while in one case a most excellent fellow never saw a bed at all that night, and in another case a couple of enthusiasts "slept" in the radio den.

The pow wow was continued next day by 2OP, 2YX, 5FS, 6JK, 6RB, and 6ZR, who toured round on Sunday morning to 5FS's station. This we found to be crystal controlled on all bands, excellently designed, laid out, and built, and most efficient.

In the afternoon we visited 6RB's station and thrashed the remainder of a discussion on aerials to shreds. 6RB, although a comparatively new transmitter, has worked all continents in spite of adverse location and conditions. Here again efficiency was the keynote of success. After an excellent tea provided by Mrs. 6RB, the party finally broke up about 7 p.m. on Sunday. Everybody voted it a huge success, and we are looking forward to the next.

Our thanks are due to the Bristol and District Radio Society for their generous hospitality, to the O.M.'s and their O.W.'s who so kindly accommodated us for the night, and to Messrs. Andrews and Hurley for their excellent organisation, to 2NM and the others from headquarters, and to all those who, by coming such long distances, made it the success it was.

Amongst the party, which was about 50 strong, were the following transmitters:—2GW, 2NM, 2OP, 2QY, 2YX, 5AD, 5FS, 6HQ, 6JK, 6QW, 6RB, 6UG, 6VZ, 6ZR, 2ASK.

Social Notes.

Our thanks to Mr. C. H. Targett (6PG) for his very effective "pretty prettys." I am sure those who were privileged to see Mr. Matthews and myself wearing them at the June meeting must have felt envious that the stewards' emblem if not the steward's job was theirs!

* * *

Well, you London fellows, by the time this gets to you it will be right on time for you to get your ham dress brushed up and your lapel badges cleaned preparatory to visiting the famous Pinoli Restaurant. We want *over* 50 this time. Remember the date, Tuesday, July 17, 6.30 p.m. Price five shillings. There are several important matters to discuss regarding conventions, so please come along; if you have missed the first five, begin at this our sixth, and keep coming.

Arrangements *re* Convention Hamfest are now settled. The dinner will be held, as last year, at Pinoli's, Wardour Street. We can accommodate just over 100, so please all you provincial fellows write in fairly soon so that we can estimate our attendance. Tickets will be 5s., and ordinary dress the order of things.

* * *

It is hoped that Captain Ian Fraser will preside at this gathering. An excellent musical programme is under way. Mr. Bradley (2AX) or Mr. Matthews (6LL) will be glad to have offers for items of any character, especially from the provinces. Remember, the audience is *not* critical.

* * *

Offers from London amateurs to provide accommodation are still missing. Is it possible that 400 known licensed amateurs cannot offer hospitality to their provincial colleagues? It is my desire that no amateur coming in from the country districts should be driven to seek hotel accommodation. A man who is keen enough to travel several hundreds of miles to spend a few hours in our company deserves (I think) the hospitality of the Metropolitan amateurs.

* * *

To Mr. Eric Megaw (G6MU), thanks. He only, out of 1,200 readers of last month's BULLETIN, has sent a photograph for the R.S.G.B. stand! We can still do with a *few* more.

J. CLARRICATS,

Chairman Social Committee.

Contact Bureau Notes.

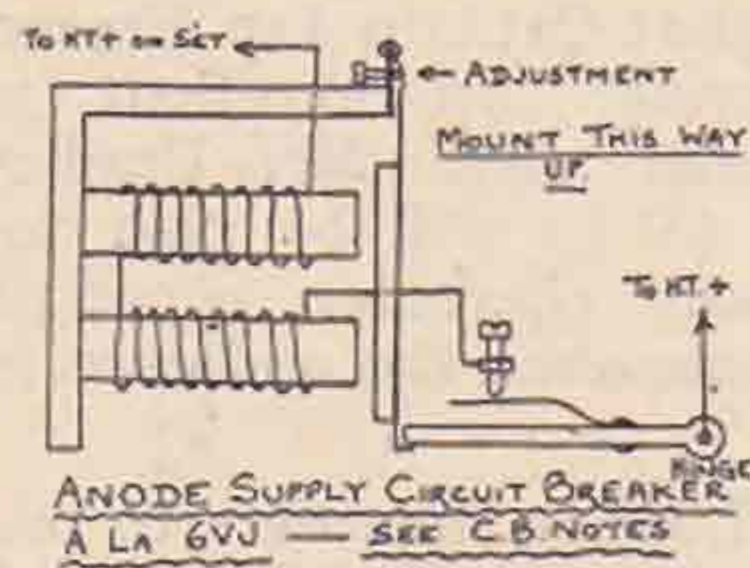
By GI6YW.

The total number of members on the roll is 96 at the time of writing, and there are few subjects in which co-operation cannot be arranged. It is gratifying to know that this service is being more used every month, and that members are sending information regularly for this column; without such information from members the column would have to be discontinued, which I hope is not likely. The second group under 6LN and studying skip problems has now been completed and consists of: 6BB, 6NK, 2YU, 6LN, BRS98 and BRS72.

My description of the valves used at 6MU for fuses brought me a letter from 6FT who is using a home-made circuit breaker. It has been made from some parts of an old bell and works very well. A sketch of the idea is shown, and I find that a somewhat similar device, but fitted with a re-setting push, is described in "James." 6FT rewound the bobbins to a resistance of 10 ohms with 32 S.W.G. enamelled wire, and it was found possible to set the screw so that the switch would open on 20 milliamperes. He suggests that the switch be adjusted to open on 50 per cent. overload. This is a very simple little bit of apparatus and might save your valve from an early demise.

6VJ sends in some interesting stuff on aerials and CC. He was using a half-wave Hertz on 45 metres, and on changing to 23 metres tried to

use the same aerial as a full-wave one. A bulb put at the quarter point lit quite brilliantly, but he could not work any DX. On cutting the aerial to half-wave, through the result was a smaller aerial, the DX appeared immediately, being QSO 12 NU stations in a week. 6VJ thinks that the angle of radiation was altered and is anxious to know if others have had similar results with a V.F.?



6VJ has also had great success with the elimination of Threshold Howl by the 6PA method, and recommends it to others, though he remarks that the filament temperature is rather critical.

I was listening to 6VJ's CC one evening and thinking it was very good stuff, and was agreeably surprised to find the next day's post brought a letter from him describing his method of using quartz lenses. I will give you his own description:

"Lay the crystal on the grid coil of RX until you hear the first band of harmonics above 45 metres. If you are lucky you will have a piece with one on the 45-metre band; if so, put it in the transmitter and see if it will control by connecting directly across the grid coil between two highly-polished brass plates. If you are not so lucky, start grinding until the band of harmonics you have heard comes into the 45 wave, grinding one side of the crystal only, as the polished side is important. When polishing apply rouge, first with a leather pad *dry*, and then wet in the manner described by 2BFA in the "BULL." Note that it is not always the strongest harmonic that controls best; mine was the weakest of six when I started, but is becoming more QSA with use. The side harmonics will not be troublesome if the controlling one is well pronounced, but if there are several close together which controls equally well, it may be necessary to grind a little to stop any jumping from one to the other. Don't put more than about 4 watts on the crystal at first or you may have a cracked crystal—I spoiled four like that! If you are troubled by key-lag at first, try de-tuning the transmitter a fraction above the crystal wave; if this is not successful, try without grid leak and use grid bias. It should not be necessary to grind the crystal down to 90 metres, as the fundamental of mine is 180 and is OK. If the crystal goes out of oscillation (loses its oscillation properties, I think is meant.—GI6YW), keep on grinding, as it will come back."

6VJ says that he does not profess to know anything else about CC, and he reminds me that these are only a few remarks that he can make as the result of his own experiences. That is the sort of spirit that we need. Some people won't come forward with stuff because they say they are not experts, and that the experts are the people to give the information about the subject. That is not my idea of amateur co-operation. I think that the whole beauty of amateur work is that we are all seekers and willing to tell others of our difficulties

and successes, and he is a poor sort of man, this "expert," if he cannot learn anything from the less expert but no less enthusiastic experimenter. Don't let this inferiority complex grow until you can't try anything for yourself, but must wait until you see something about it in print or until someone else does it first. Somebody has got to try it first—why not you?

6VJ has some genuine quartz lenses which you may have for 6d. each, plus postage, i.e., to members.

G5UQ wants co-operation from two stations to make a three-cornered test at 13.45 B.S.T. each day on 45 or 23 metres. He wishes to investigate propagation in the directions London-Amsterdam and London-Yorkshire.—Any Yorkshire or Dutch station available at this time?

6FY has been carrying out tests on sunset fading with 2HH and BRS26, using a wavelength of 90 metres. Though these tests have not yet been made over a long enough period to give very conclusive results, some interesting observations have already been made. These three stations are roughly equi-distant, and signals appear to be most satisfactory during a period of from one hour to one and a-half hours after sunset. At the beginning of this period there is often a very sudden rise in strength (R3 to R6 in some cases), and towards the end of the period a slow falling off to a level of between the original and the maximum strength occurs. At the same time a change in the nature of the fading takes place; if regular periodic fading had occurred, its period often changed during the interval. Sometimes fading ceased for part of the period and then appeared again. These effects would appear to be more marked in the case of signals travelling east to west, or vice versa, than in the case of signals travelling northwards. Fading seems to be worst on signals going from east to west, while signals going from west to east are often free of the fading, but at the northern receiving station fading was seldom entirely absent, though it was never very serious.

6FY wishes to get into touch with someone who has been making regular observations on the 45-metre band, with the object of comparing results, especially with regard to certain evenings. 5AD reports that he and 5KU are clearing the decks for 10-metre work, and are now awaiting official permission to commence tests. NU2TP informs me that he is transmitting on 10 metres on Sundays from 14.00 till 22.00 G.M.T.

This month's new members: 2BWB, 6UN, 5UW, EPIBL, EK4AU, BRS72, 6QB, 5UQ.

Membership.

NEW MEMBERS.

- R. S. SPREADBURY, 66, Wick Road, Teddington.
- C. F. SCRUBY (5YU), The Retreat, Pack Lane, Kempshott, Basingstoke.
- A. C. F. DEARLOVE, 68, Ambrose Street, York.
- T. CHURCH (Associate Grade), "Weston," Victoria Road, Tunstall.
- J. N. ROE (2BUW), "Minydon," Ridgway Road, Farnham Surrey.
- W. E. CORBETT (FE1ES), No. 1 Wireless Company, Cairo, Egypt.
- G. WEBSTER, JUNR., 311, Bolton Road, Darwen, Lancs.

- J. N. P. DOUGLAS, 47, Coquet Street, Jarrow, Co. Durham.
 R. H. DENISON, Croft House, Sandy Lane, Bradford.
 J. W. NORTON (2OZ), Daleside, Lincombe Drive, Torquay.
 H. J. SHAW, 72, Nigel Road, Forest Gate, E.7.
 S. A. HAQUE, 68, Leicester Road, Loughborough, Leicestershire.

Resignation.

- G. G. BENNETT (2BQH), 26, Blenheim Park Road, South Croydon.
 J. D. MOLLERUS, Amersfoort, Holland.

B.R.S. Numbers Issued.

- 169.—A. C. F. DEARLOVE, 68, Ambrose Street, York.
 170.—G. WEBSTER, JUN., 311, Bolton Road, Darwen, Lancs.
 171.—J. N. P. DOUGLAS, 47, Coquet Street, Jarrow, Co. Durham.
 172.—R. H. DENISON, Croft House, Sandy Lane, Bradford.
 173.—H. J. SHAW, 72, Nigel Road, Forest Gate, E.7.

B.R.S. Numbers Relinquished.

- 40.—C. ERDINGTON, Sutton, 3, Park Road, Woodside, Wimbledon, S.W.19.
 14.—J. S. DREWETT, 8, Blatchington Road, Tunbridge Wells.
 31.—V. G. MELLOR, 1, Guildford Lawn, Dover.

Notes and News from the British Isles.

NOTICE TO AREA MANAGERS.

Area Managers may appoint an independent representative in the London Area to attend meetings of the Committee and to vote on their behalf. A letter appointing a member to the purpose mentioned shall be addressed to the Hon. Secretary informing him of the appointment.

Members appointed by Area Managers for this purpose shall not already be serving on the Committee as Representative Members.

London Area.

By G. A. EXETER (6YK).

The omission of these notes from the last two issues may have caused some of those members who sent in their reports to wonder what had happened to them. I must explain that their omission is entirely due to my own fault and the fact that for some time past I have had private trouble that has interfered to a great extent with my work in the area.

Under the circumstances, I must crave the indulgence of all those who looked for their reports in vain and offer my sincere apologies to you all with the assurance that I shall take steps to see that it does not happen again in the future.

During my enforced absence from the head of things, another hamfest has been arranged at our usual rendezvous, for July 17, and I trust that you will all give it your support.

Dealing with reports, I shall endeavour to incorporate with this month's those that are of interest which were sent in for publication before.

Northern Division.

By 6CL.

Reports are scarcer than ever—we expect it during the summer, but we hope that although reports are missing enthusiasm is being worked up to give our provincial friends the time of their lives at Convention.

6PP, in spite of a moan about poor conditions, got across to NE8AE (R1) and also QSO'd EQ2AB (in Rumania, not Bulgaria, as his intermediate would indicate). Madeira was also worked in daylight. Input 4 watts all the month.

5GU has worked most of Europe on a half-wave V.F. Hertz, using 6JV system.

BRS92, now 2AGX, will shortly begin experimenting with duplex telephony with 2AGT, using QRP (dry batteries only at present!).

2AX was in France half the month, but reported 23 as being "horribly duffy" before he went.

5QF is plodding along on 45 and has tried 23 with no success as yet, although he thinks a Yank replied to one of his calls. He reports DX dud, but local Europe fairly good at night time.

6PN has commenced operations. He has been testing a loop aerial for transmission and welcomes information from anyone who has worked successfully on 45 with this system.

5HJ has been experiencing grid leak trouble and been QRW. (No report, but a telephone chat gave us this information.)

5HS, we fear, has vanished from our ken., but we hope and trust that he and *all others* in this and the other London divisions will remember to keep open on Tuesday, July 17th, for the Hamfest at Pinoli's.

6CL has been in Glasgow again and renewed acquaintance with 5YG and his new transmitter. The latter is as neat and workmanlike a job as has been seen anywhere.

2WL was with 5YG when we arrived—both were testing crystals. On our way back to town we called at Harrogate and spent an evening with 6WD. A trip to Leeds was made and 2YU, 2XY and 6TY visited. In Harrogate we met 6YR and 2JL. Visitors to Harrogate are assured of a hearty welcome.

Very little work has been done at 6CH. No QSO's on 23 were effected, and only local tests on 45.

East London Division.

By 6LB.

6LB has little to report, having been QRW tennis. He has just had his 45 foot "stick" wrecked. He is trying out the chokeless centre tapped coils, T.P.T.G. circuit.

We congratulate 6UT on having worked OA, OZ, NP and 6th District, U.S.A. This is very fine work and 6UT only wants Asia to qualify for WAC.; as he has been already heard in Arabia this event will only be a matter of a few weeks.

6LL has got his crystal going well on 45 metres and he is grinding one for 8 metres. On this wave he is doing really useful work and has wrecked two big bottles. Whether or not this constitutes good work we don't know, but 5YK and 2NH were highly amused.

6LL has been received by 2NH at R6 on 8 metres, and has had an unconfirmed report from Cambridge.

6TX has spent much time testing different aerials on sked with NU stations. He spends all day putting up aerials and all night working NU's on them.

We hear 2KT working 5QV on 150 metres on Sundays, but don't know much about his short wave dope.

It is understood that there are some active stations in Leytonstone on the 90 metre band and who are R.S.G.B. members. A report from them would be appreciated.

Western Division.

By 6YK.

6JY has worked FS and FF for the first time on 45 metres. He is now using C.F. Hertz and has been trying out QRP with a 2-volt D.E.P. 215 valve. With a 1.8 watt input he has worked the above and was called by NU2CUQ, but the QRM was too bad for a QSO. (Hard luck, OB.) Has now a 23 metre permit but has only worked locals so far.

6CO reports nothing much doing, and has tried out the TPTG with no luck. He wants some dope on it from someone.

5TD during April worked NU 60 times on 45 metres with ten watts input. Also worked Cairo. Reports conditions fairly erratic.

5WF is a new reporter to these notes. He is busy with exams, and has been making a few measurements on wave fronts on the ultra short waves. No difficulty here in making the set perk on 8 metres and wants to know if anyone has heard him. He promises us an article for the BULLETIN on his set and RX, which he says goes down to 6 metres easily. (Let's have it, OM!)

6VP says that by August he hopes to finish his year's work on 23 metres and hopes to have enough data by then to tabulate. Reports conditions little short of marvellous. Worked FK4MS and was told first EG QSO. He is using a Telefunken 5-watter which has perked O.K. for over two years.

2ARV is our old friend BRS102 and is busy building his gear, but has done just a little logging of several new countries—AC, AS, NQ, etc.

A later report from 6JY says that he has worked NU at last, getting an R3-4 report from the 3rd district with 2.5 watts.

Southern Division.

By 6PG.

I must apologise to the gang for the absence of reports in the "BULL." although they have always left here on schedule. In future I shall send them direct to H.Q., so you may be sure they will get in in future. Will all those who have dropped off or who have never reported please find a new nib and drop me a line EACH MONTH? Thanks very much, OM's.

2NH.—Conditions generally have been poor, though several OA's have been worked on 23 metres. Much hard work has been put in on the ten-metre apparatus, but results are practically nil. 6HP has had two reports and has worked one OA (R4), one report and two QSO's with OZ (R4), and has also worked five NU6's (R4), three NU7's (R3); all other districts and AI, AQ, SB, SC, SU. He is hoping to be on C.C. very shortly. 2CX has at last managed to raise S, working SB and SC one night, thus qualifying for WAC. Has been doing a little crystal grinding as a rest cure, and has started to build a MOPA with C.C. He had a visit from NC2AX, who sends 73's to all, and asks G stations not to call "test" for so long on 23 metres as his gang usually hears us the moment we start up. 2CX visited the Cambridge gang at Whitsun, and would like to thank 5YK and 5YX for an enjoyable time. 6QB-6LT sends a report for the last five months! The crime sheet is as follows: Heard three times in OA and worked 1OA (R5), three OZ's (R5), 14 NU6's (R6), six NU7's (R6), also NU5, NC4, four SB's and AI. C.C. is now going on 45 and will probably be OK on 23 by the time these notes appear. 5BQ has been testing with a CF half-wave Hertz and obtained some very interesting dope. (What about an article, OM?). DX with this is NU1, 2, 3, 4, 8, NC, FE and FM. He now intends to erect a VF aerial to compare results. His working hours are now from 05.30 to 09.00 B.S.T.; schedules would be welcome. 6PG is trying to find a decent aerial to work on 23, as the present one is a washout. A Mesny circuit is being tried out and appears to be very promising. 2CB reports that at the beginning of the month conditions on 23 were FB, but fell off towards the end. Two new continents were worked, namely, OA (R4) and SC twice (R5 and R3), all on 23. He only wants Asia to be WAC. His input was only 9 watts.

6QB has invested in a DET1 and has had a good month on 23 metres. QSO's were: 13 NU6's (best report R6), 6 NU7's (best R6), 3 SB's (R7), 4 OZ's, 1 OA, 1 NC4, 15 NU9's, 9 NU5's and AI2KT. Input up to about 15 watts. He is also going strong on 8 metres.

6WY has been doing a lot on 23 metres during the last two months. He has worked all NU except the 6th and NC1, 2, 3, 9, and OA3 5 and OZ. R4 was given on each occasion from Antipodes.

2CX has been off the air lately owing to illness largely due to late nights and early mornings, so that sitting up for DX is taboo. He managed to wangle one morning, however, and worked OA. He received a report from Tasmania of R7 on loud-speaker!

2CB has done little on 45 except a first QSO with NU1. Is now going well on 23 metres and on May 5 was QSO, OA5AX, getting R4 on 9 watts.

2AI reports a few QSO's on 45, but little work has been done owing to exam QRM. He is experimenting with valve filaments. Foreign DX reports are welcome.

6HP has worked all districts NU consistently; also OA, OZ and SB have been hooked, so that he is WAC when the cards come (all on 23).

BRS88 is making special reports on NU2XAD for the G.E.C. of America. He reports a visit with 2BM to 5DT.

2NH sends a very interesting report, reproduced verbatim below. He also says that after one of 6QB's test calls, he heard no less than eight NU6's calling him!

"Although conditions on all waves have been good during the past month, the conditions on 23 metres have been little short of uncanny. For instance, a sked has been kept by 2NH with OZ4AM every morning during April on this wave without a break. The input at first was 40 watts, but for the last half of the month this has been reduced to 12 watts. The NU6 and 7 districts have been coming in regularly every morning, and it has been possible to work them regularly with an input of less than 10 watts. That this is not freak work on my part is born out by the similar amazing results obtained by a number of other stations in the London and other areas. 2OD says in a letter to me that he has never known anything like it in all the years that he has been at radio. 5MA has worked all the DX that he hears, and that is saying a lot! He worked NC5AW early in the month and this is believed to be the first contact from England with the Canadian fifth district. (Please correct us, gang, if you can claim it earlier!) If anybody still does not believe in 23 metres after reading the above, all I can say is that he is past convincing.—(Signed) E. A. DEDMAN (2NH)."

Northern Notes.

Area Manager: S. R. WRIGHT (2DR).

I offer the following without comment, my heart being too full for words!

Yorkshire.

(By 2DR)

5UB is using a TPTG transmitter with an SW50 and MG. NU9ACI has been worked during the first night's testing on 45 metres.

BRS164 has little to report, but even so, I am glad to hear from you, OM. It shows you are not among those in need of a tombstone anyway! BRS164 wants schedules on any wave-length. Transmitters please note. (You see the effect this non-reporting has on a fellow, I nearly put "Friends please accept this, the only intimation," then!)

6DR seems to have done heavy work in the crystal grinding department, but is now busy 44.8 metres with a 179.2 metre crystal. Of the five "active" hams (I hope not, OM!) in East Yorkshire, four are now crystal-controlled. F.B. DX worked include 21 NU's and four SB's, with a 6-watt input to a DE5 valve. Hopes to be working on 23 metres C.C. before long.

6VJ is another of the "C.C. Gang," and says people are reporting him as good as 6MU. Some good work was done on 23 metres with NU. This station is now back on half-wave Hertz after experiments on a quarter-wave on 23 metres.

BRS162 sends a card in memories of olden days. Many thanks, OM, but what I would like is one of those cards every month reporting your activities. Any hopes? Anyway, here's his first report. No DX done, but heard a lot of QRM on 45 metres. (Hear, hear.) Conditions on 90 metres have been good. Complains that English hams do not reply to QSL cards.

6IG has worked NU1, 2, 3, 8 and 9 Districts, also SC, SB, FK and FE, with his very small input, which is FB. I hope that 6IG is going to be the first 5-watt W.A.C. man. Stick it, OM! Only Asia to win!

600 reports poor conditions, but has done good work on 23 metres. Three eighth district N.U.'s, two SB and one SC being the bag. Best QSO SC3AC (Santiago), R4 power, 11 watts. That's the way to hit the Pacific, O.B.! Reported from OZ2GO, which is another fine bit of work.

2DR continues with fading experiments. Can anyone suggest a reliable method for short waves? Oral tests are really not at all worth the trouble. I want 'em on a meter!

Cheshire and North Wales.

(By 6TW.)

2SO is QRW business, and apparatus dismantled for cleaning.

BRS90 has found DX not too bad for 20 and 30-metre band. Logged NC, NE, NG, NU, SA, SB, SC, SU, FE, FM, FQ on 20 metres and DZ, DA, FQ, SG, SA, SB, SC, AF on 30 metres; also new country, SGAJ. QRA's wanted of FEGM, FQSHPG, AFKOL, FT8NON.

BRS98.—Three NU stations have been heard on 10 metres; 8-metre tests have been fixed up with four G stations. Skip distance schedule with 6LN still in progress.

BRS152 has a nine-valve super still under construction, and is gathering speed at morse. He is now taking advantage of the A.C. mains for radio.

6TW is still carrying on with 45-metre work, but facing the turnover to the A.C. mains. 2DR a few months ago offered me sympathy, and now I realise the need of it. Has anyone any spare fuse wire? It is a good job I have a separate control board from the mains.

Derby, Notts and Lincs.

(By 6MN.)

BRS97 is trying crystal work on short-wave reception with some measure of success.

BRS103 is in trouble with his super for short-wave work and cannot get it to perk. Perhaps some member with lots of experience would give BRS103 a lift with the job.

BRS111 has now secured more time for radio, but fails to let out the secret of how he has done it. The A.M. would be glad to hear O.M. Sends in a good list of G stations heard on 'phone.

BRS137 wants schedules with 'phone stations, and has one running with Danish 7RL. 'Phone merchants please note.

2ABI has completed his 45-metre transmitter and receiver for 20 to 80 metres. The latter is the usual 0-V-2 set.

2HD breaks a long silence by sending a report that he has done nothing of interest. That's better than not reporting, O.M.!

5OD seems to be more interested in the open road and a new motor-bike at the moment and has a nil report.

5SP has pushed up a new transmitter, a TPTG, from which he intends to push out pure D.C. Business QRM has kept him occupied of late.

6LI proposes to do a little receiving on 18 to 60 metres from his present QRA: 15, Rue d'Orleans, Pau (BP), France. Any ham requiring a listening post please apply. Hours: 4 p.m. to midnight daily. Sundays: 11 a.m. to midnight.

6LN has been fairly active and schedules are running well with BRS72 and 98. He has reasons to believe that a third harmonic aerial has pronounced directional properties.

6MN is a potential optician; in other words is a quartz-grinder, preparatory to being a quartz oscillator. He hopes to be on C.C. within a few weeks.

6UO is QRW at Sheffield and only on the key at week-ends. He is thinking of rigging the transmitter in Sheffield as a consequence. Do it, O.M., and see what happens!

Lancashire and Isle of Man.

No reports.

Durham, Northumberland, Cumberland and Westmorland.

No reports.

Mid-Britain (East).

Manager: H. J. B. HAMPSON (6JV).

Since writing last month's notes the B.B.C. has kindly offered to conduct a party of 40 members over 5GB on August Bank Holiday, and I am therefore able to announce the following programme:—

Bank Holiday, August 6.—11 a.m. onwards members will assemble at the Cock Hotel, Kingsthorpe, Northampton. 1 p.m., lunch. 2.30 p.m., discussion upon Aerials and Feeders, opened by F. Aughtie (6AT), who has kindly promised, subject to his being free on that day. 4.30 p.m., tea. 6.30 p.m., reassemble at 5GB.

Application for tickets, together with remittance at the rate of 5s. per head, must reach 2XV by July 20 latest, but please do not leave this to the last moment, and apply early. Here is his QRA again:—G. A. Jeapes (2XV), 117, Victoria Road, Cambridge.

Please note that the party visiting 5GB has been limited by the B.B.C. to 40 and that this number will be composed of the first 40 applicants for tickets. Otherwise there is of course no restriction as to the number who may care to join us for lunch and tea, etc.—in fact, "The more we are together, etc.!" YL's, OW's, and friends, also members from other areas will be warmly welcomed, and—let us hope we have a fine day.

I am pleased to say that Mr. J. W. Matthews (6LL) has accepted the duties of Committee Representative for this area in accordance with the notice at the head of Area Notes, and the fact that he has an able ally in 5YK means that our Area will be well represented in future. I am sure we all offer 6LL our best thanks for thus undertaking to guard our interests.

Cambridge.

By 2XV.

"Summeritis" seems to have eaten well into the Cambridge gang since we have had a little nice weather, and although I have left it until the 12th to write these notes, only one solitary report is to hand, and this from a BRS station. Surely you are not going to leave him every month to fill this space on his own? Especially after my hearing rumours of certain activities, for instance, 6CR has been doing some good work on 23 and is wearing the skin off his fingers winding transformers. 5YX and colleague (Mr. Grant) are also wearing off a fair percentage of skin grinding quartz crystals. 2DB has ordered a new rectifying valve, and, 5YK has worked 23 metre telephony to FM and U.S.A.—all interesting work, OM's, so why no official reports? BRS161 has been busy logging telephony stations and has a good bag of EK, EI, EN and EG stations; any hams wanting reports should drop him a line. 2XV has had a very active month on 23 metres, even in spite of poor conditions, and a few new countries have been worked, including SU and SC. Brazil has also been worked on two occasions and the number of U.S.A. QSO's to date since May 1 is almost twenty, also one or two workings to Australia, all on 23 metres, with power about 65-70 watts. Telephony has also been heard by Brazilian 2AX from this station on 23 metres.

Huntingdon.

By 2XV.

Mr. Maddox has now completed his short-wave receiver and has logged numerous stations, preparations are now being made to apply for a sending permit. (Gud luck, OM.)

NOTICE.—I have been asked to publish the QRA of OZ3AB, as he desires QSO's on 23 metre band and welcomes reports. Here it is:—

Mr. J. W. Leonard, 18, Love Street, Black Rock, Victoria, Australia.

Norfolk.

Reports to 2BWB.

2AAK reports the commencement of a period of exam QRM which will work up to R9 in October, with (he fears) very little fading in the meanwhile. 5UF has only worked locals in Europe—WSBS once, and has kept skeds with 6YL and 5YQ with 6 watts to a D.E.5. He hopes to start some work on aerials, etc., very shortly. 6JV is still very QRW with house decoration, which is being carried out with characteristic thoroughness. He has, however, managed to find time to turn out a moving-coil speaker which gives remarkable reproduction. 2BWB has had rain through the roof of his shack, which has not improved things, so has been waiting to see if the R.S.G.B. receiver will be waterproof. Has also been trying to get a ½ h.-p. 83-cycles motor to run on 50 cycles, but has abandoned this amusement as the only things which "went" were 15-amp. fuses. 6ZJ, 2AAS and 2BLA have not reported this month. It would save me both time and stamps, OM's, if you would just mark the 14th of every month on the calendar, so that I needn't send you reminders, and, above all, please report regularly. You can get a lot on a postcard, but I can't write up a story about you if you don't send me a plot. My QRA is Ivy Cottage, Costessey, Norfolk, or 'phone Costessey 23.

Mid-Britain (West).

Area Manager: D. P. BAKER (2OQ).

At the time of writing these notes I have not received a single reply re a conventionette, but I am still living in hopes.

I have received a very interesting letter from the Malvern College Radio Society. Societies of this sort, in my opinion, are a fine thing for the county, and I am looking forward to many more, and I have pleasure in wishing the Malvern College Radio Society every possible success.

I regret in last month's report that owing to a typist's error, it was stated that 5QP used 25 watts, whereas it should have been 2.5.

I am looking forward to longer and better reports when the days are shorter, but after all, we don't get much sun, and who can be blamed for making the best of what we do get!

STAFFORDSHIRE.

Reports to 5UW.

The outstanding feature of the month was a visit made by the Wolverhampton and District Transmitters' Society to 2NV of West Bromwich, where a very enjoyable meeting was held. Members attending were 2OQ, 2AAD, 5LK, 5UW, 5ML, 6AT, 6CI, 6HT, and all were impressed with the very fine aerial system, workshop, and radio room of 2NV, which station, incidentally, is one of the pre-war pioneer amateur stations in this country. Such an array of beautiful instruments, machinery, and apparatus, all kept spotlessly clean, and brilliantly polished, reminds one of the control room of a B.B.C. station, or radio cabin on board a first-class liner. Congrats to 2NV, for his very fine station.

Reports for the month are not as numerous as should be the case, considering the number of stations that are congregated in this sub-area. Please try and make this county the top-dog of the country, OM's; we have enough WAC stations in active operation to do this.

2AAD has been enjoying himself with experiments with Tungsten carbon arc ultra violet rays, and is using apparatus similar to that employed in cinematographic projectors for striking his arc.

5NU reports that he cannot possibly get on the air before the autumn, because his radio room is required for business purposes.

2RR is still foning with 6WF on the 150 metre bands.

6HT has a fine station lying idle, which really won't do, OM.

6OH has been doing big things in the early part of the month on 23 metres, and has been QSO OA NU, 6 and 7, FE, and is still trying to get SB for WAC.

6UZ reports too much Biz QRM for DX, but hopes to start up again in August, when he promises to set the pace for Staffs.

5UW has at last worked 7th District, NU, after many vain attempts. NA7ADY reports sigs. very FB on several occasions. Many South American stations have been QSO, also OA and OZ on 23 metres.

5UW has joined the C.B. and has been asked to form a centre on Hertz aerials and feeders; will any station in this, or other counties, wishing to join in on this centre please write to 5UW.

6SO, using 4 watts input, has QSO AS, all Europe, and has received some very good fone reports of his absorption control method of modulation. 6SO is practically a new one on the air and bids fair to show some of the older OM's the way to do things.

From August 4 to 18, 5UW will be cruising about the Norfolk Broads, and if permission can be obtained, will operate a portable transmitter and receiver, using the wavelength of 45 and 23 metres. Reports of reception of GX5UW during that period to home QRA will be appreciated. Schedules also wanted. Objective of tests will be to gather observations regarding the directional properties of small aerials loaded at the fundamental. The motor cruiser is "The Alsatian," of Oulton.

2OQ has very little to report this month owing to business 6RM, but has received a letter from OH reporting the reception of his sigs. on numerous occasions.

WARWICKSHIRE.

Reports to 6CC.

2YX has nothing to report; regrets he has been too busy to look at the Den.

5ML reports rebuilding has been completed during the month. QSO's include NU6 and 7; NC4 and 5; OA's and SB's. Also fine QSO with FK2MS. But DX is very poor on the whole.

5QP has only just raised Belgium although QSO with Holland is on schedule.

6CC.—Experiments with feed coil for c/f Hertz are progressing; no DX reports yet. Much time is being spent on arranging new battery shed.

6CI—Transmission antenna, experiments temporarily transferred to inside the shack. A short indoor antenna on 45 metres, yielded satisfactory reports from British stations. A report is to hand from Tasmania on this station's normal 23 metre transmissions.

2AFS (Coventry).—Tests with circuits using LS5 on 7.5 watts. Hartley shows up much better than T.P.T.G.

NEW MEMBERS.—Welcome is extended to 6RK, of Birmingham. Best DX, OM. Trust we may hear from you next month.

What are the BRS men doing? There are no reports from them this month.

STATION VISITS.—The only one reported is 6CC to 6TD.

2ZW is doing good work, using half-wave current fed Hertz aerial, and master oscillator. He has done well all over Europe using only low power.

WORCESTERSHIRE.

Reports to 6AT.

2MV reports good phone and CW all over Europe, using low power with a Colpitts circuit on 45 metres. His time for working is somewhat restricted.

SHROPSHIRE.

Reports to 5SL.

5SI has been experimenting with reception on 10 metres, but so far has not been very successful, but hopes to have more to report shortly.

South-Western Area.

Manager: G. COURTENAY PRICE (2OP).

Reports are not so numerous this month, and I expect that the two reasons are—the fine weather and the falling-off in conditions for DX. The latter is very marked on the 45 band.

5PH best QSO NU2AEF on 5 watts 45 metres, R4-5. Hand generator. Is now trying out rectified A.C. Valve used in above QSO was DE5. 5VL found conditions on 23 metres varying and deteriorating towards end of month. Most interesting QSO's with FK4MS and SBGMD, the portable station of the Dyott Expedition encamped in Central Brazil. 6RB also found conditions going from bad to worse during month. Has now worked all Continents. Was QSO with the following on 23 metres: OA2RC, OA5BW, SC3AC, SB2AZ, NP4AGF, NU6AJM and all other NU districts except 7th. Reports visits during the Conventionette from 6UG, 5AD, 2OP, 6JK, 5FS and 2YX. (And most interesting, too.—A. Mgr.) 6UG has been testing tube base coil receiver with excellent results. Also well-known coils in the transmitter with dire results to his R strength. Has now gone back to 12g. copper arranged for quick change. Is testing on 23 metres and asks for reports. Power, 14 watts. 6ZR has nothing of interest to report. Forty-five metre schedules continuing. Modulated D.C. now used and appears more efficient for DX. 2ACG would like skeds with English hams on 'phone or C.W. any time, any day. (Lucky O.M.—A. Mgr.) 6JK and 2YX appear to be still recovering from Conventionette, neither having reported.

Scottish Area.

(By 5YG).

May, at least in Scotland, has been a month noted for almost complete absence of DX other than spasmodic working with SB, NU, and NC (or perhaps I should say VE now). Conditions were universally bad all over the area, and the thundery atmosphere generally, which pertained for more than three weeks, certainly took its toll of amateur transmitting, in addition to producing voluminous QRN. There is nothing outstanding among the reports received, and this is in no way due to any lack of effort on the part of the reportees, but simply to adverse conditions. I am very pleased to note a recrudescence of interest in No. 4 District, which has just been taken over by 5JB following upon 2TF's resignation from district duties on account of business QRW. 5JB is as keen as mustard, OM's, so please do not "take the edge off the knife" of his enthusiasm by neglect. He is there to help you, and his long practical experience of radio should be invaluable to you in this respect. I have to record a farewell visit from VE2CG, who sailed for home on May 18. Although the reports from Nos. 1 and 2 Districts are very poor indeed this month, I am very pleased to note signs of increased activity in No. 4 District, where three or more new radiating licences are pending. Reports due on July and August 10 should be forwarded to the following QRA: Woodcroft, Carradale, Argyllshire.

No. 1 District.

(By 2WL).

2WL, apart from a little work with quartz crystals, has nothing to report. 2BRI has received his radiating licence, and is awaiting his Morse test. 2FV has been QRW with examinations. 5YG continues his NU, VE and G schedules, but will abandon same about the middle of June, as the station will QRT then till September, owing to change to summer QRA. A little has been done with an American crystal received from NU1AOF. 5XQ QRT till September. 6NX, contrary to the experience of most, found May good on 23, and had a large bag of trans-Atlantic stations. 6WL has been working spasmodically and has nothing of interest to report.

No. 2 District.

(By 6IZ).

2AP has been on holiday. 6IZ awaiting delivery of a mast at his new QRA. A little has been done with a very low "hang-up" aerial and quite fair reports have been received from southern "G's."

No. 3 District.

(By 6KO).

2SR has been keeping 'phone schedules on 23 metres with "G" and "Gc" stations with considerable success. 5NW very busy with wireless-cum-gramophone. 6KO is back again at the key and is getting good results on 45 and 23 metres. SB 1 and 2 and NU 1 and 2 have been worked on the shorter wave, and the best report received is that of SB1AW, who gave R7. He wishes to thank all for the many kind enquiries received during and after his recent illness. Is feeling OK now and hopes to continue so. BRS96 reports that he is still "digging in" to Morse between listening to fone from Drummondville (beam); R8 excellently modulated. He promises to keep in touch. BRS158 has been experimenting with indoor aeriels. Has built the RX recently described by 6PA in the BULLETIN, and it is giving great satisfaction on the 45 metre band.

No. 4 District.

(By 5JB).

Ex-2ACR—Ex-6RZ: This station has only just been located after many abortive efforts. 2ACR was replaced by 6RZ, which in turn was relinquished a year ago owing to lack of facilities at the then QRA. A move has now been made to a new QRA, and Mr. Wright expects to resume under a new call-sign in the autumn. 5JB has been testing different forms of aerial and aerial coupling. Has worked 130 stations during the month with 4 watts input, and has now applied for a permit to work "foreign." 6UU is carrying out telephony tests on 158 metres and would be very grateful for co-operation on this QRH. He is building a new R.F.B. transmitter.

Northern Ireland.

Manager: E. MEGAW (GI6MU).

Conditions for DX during the month have been very poor, especially on the 23-metre band, though a few SB stations are coming through at fair strength. A new GI station has appeared and put Londonderry, at last, on the radio map. His QRA is GI5OT, 44, Hawkin Street, Londonderry, and he appears to be getting out very well with a power of 5 watts.

2WK is having some success with his Zepp., but the generator is still giving trouble. 6HI is using a new aerial and is doing experiments on QSB. He suggests that when one is QSO a station without a "star" in the log-book, one should try to get that station to join R.S.G.B. He got one—FB! 5HV, who has been on the sick list, has not been very active, but reports that he has been experimenting with his Mesny and aerial couplings. The Mesny stays! 5HN, having paid a visit to 6MU, says he is converted to wood instead of ebonite! Also to series feed. New 40-foot masts will shortly appear at this station. 2CN has been QSO ED on 2 watts 'fone, and got R8 reports from EE on same power CW. FB work! 6WG is running a sked with EP3MK at Azores and is getting over O.K., but QRM often spoils signals from 3MK. 6TB is busy with a moving coil L.S., making it from the raw materials. 6YW has been QRW, but worked two new countries, viz., Egypt and Yugo-Slavia on 6 watts. He wants skeds with SB and OA to make first contact with these continents. 6MU has been QRW with examinations and has been QRT. He hopes to be active again by the time these notes are in print.

We were very pleased to meet NU1BMS, who paid visits to 6MU, 5HN and 6YW when the U.S. training ship called at Belfast. He is very well known to amateurs on this side of the pond, and it was a real pleasure for us to meet such a fine and enthusiastic amateur.

In view of the fact that, amongst the crowd of visitors expected in Belfast for the big motor race on August 18, there may be amateurs who would like to meet the GI gang, the R.T.U. has decided to hold a meeting on the night before the race. All visiting amateurs are very heartily welcomed and details, which are at present being arranged, can be obtained from the Hon. Secretary (R.T.U.), who is GI6TB. We hope to see you, so don't forget the date!

It does not appear to be widely known that the GI men have regular Conventionettes—not one a year, but several—and visiting amateurs will be most cordially welcomed at any of these.

If you are coming to Northern Ireland, let 6TB (Hon. Sec., R.T.U.) know, or me as Area Manager.

Notes and News from British Dominions.

Irish Free State.

(By 11B).

The alleged summer conditions prevailing over here have caused a considerable diminution in GW activities during the past month, and there is consequently not much to report. The I.R.T.S. held a "Radio Conference" during the month, which, I understand, was on the whole successful. As, however, GW stations always come in so very badly at the writer's station he did not take part in it. 12B has been too busy to be much on the air and consequently only reports European DX as well as the motor-ship XEL AWV in the Bay of Biscay and at Lisbon, and the yacht "Adventuress," GLYK, when north of the Faroes, all on 45 metres. He is now rebuilding. 14B is off the air at present owing to pressure of other work. 18B is trying to get down to 8 metres with a M.O. transmitter. He is using a Zeppelin aerial for 23 metres, but reports very poor conditions on that band. His only DX has been FK2MS and FK4MS, both of Mombassa. 13C reports N.D. 14C has been off the air for the past month owing to business and does not expect to be doing much for some time to come. 15C has been off the air for the past month. 16C has been testing various aerial systems and at present favours a Zeppelin. 18C expects to be on M.O. transmitter soon. He has worked his first NC, 1BR, on 45 metres. 13D has been doing some local 'phone work with 17C on 8 metres and getting good reports from that station. Also worked EU1XR on 45 metres using a Zeppelin aerial. 17C has been doing local CW and 'phone on 8 metres with 13D using a full wave Zeppelin aerial 9 feet high with 3 watts input. On 45 metres with 3 watts input he was reported R6-7 by the ship XEL AWV when at Lisbon, and on 23 metres he has worked 12 NU's 1, 2 and 8th districts with 9 watts maximum input, whilst two reports have been received from OA 3 and 7 districts. 11B is back on the 45 metre band as he found little doing on 23 metres and has nothing of interest to report. QRM on his crystal wave is so bad at times that he has been obliged to cut out the CC and shift his wave in order to get out at all.

Notes and News from Europe.

Belgium.

By EB4FT.

At the 15th of June, 4AU, who is very fond of 20-metres work says that conditions on this band are absolutely bad now, and that since the last fourteen days there is nothing good to do.

4FT, on 32 metres, reports regular and good DX: has worked a good number of times a ship who is running along the West African coast, as far as Port Gentil in Gabon. The report of his signals is regularly R6, and O.K. at the first time owing a good D.C. note, which is absolutely necessary to be read on the Equator Line. Wkd also three AC stations at Peking and Tientsin, beside an R6 report in Valparaiso. Received a report from AJJXIX at Osaka, Japan, who wants to work Europe and is on every Saturday and Sunday at 21.00 G.M.T., on 38 metres.

4CB some time ago worked an SC on 20 metres with an R7 QRK. He is using an Armstrong Ckt and proclaims it FB.

4XS works DX, but is not testing those 10 metres and wants foreign reports of his signals.

4AU on 20 metres in May made the first contact Belgium and Japan, where he was to his astonishment R7. This may be the first contact Europe-Japan on 20 metres.

Holland.

By EN0CX.

Conditions during May were found to be excellent on 20 metres, but not so good on 45. Several good contacts were established as early as 23.00 G.M.T. on the lower band.

0VN was our star station, over 80 QSO's with DX stations having been recorded. His input was 60 watts R.A.C.

Germany.

By EK4CL.

The most important event last month was our third annual convention, which took place from May 26-28, at Dresden.

Besides 70 amateurs from all parts of EK, we had much pleasure in welcoming the representatives from Austria and Hungary.

Some resolutions might be of general interest:—

- (1) No EK will be allowed from January 1, 1929, to use raw or even bad rectified A.C.
- (2) The use of the marking and spacing wave system will be strictly prohibited.
- (3) The use of the 80-metre band is highly recommended for night traffic.

A very interesting lecture and demonstration was given by Dr. Busse, of 4AAL, assistant to Prof. Esau, on the possibilities of 3-metre waves, which are likely to have a greater future than 5-metre waves. It seems that these ultra-short waves are not at all affected by shielding effects of metal buildings, etc. Dr. Busse succeeded in working a distance of 150 miles on three metres, using five watts in the antenna.

Dr. W. Schmitz, of 4ACI, then demonstrated the development of his station from the early days of amateur radio in Germany up to his new crystal-controlled transmitter.

4KV, of Cassel, made several fine QSO's on 40 metres from a portable five-watt transmitter. The station was built in his car, and the aerial was only 13 feet high, of Hertzian type. He expects to continue his experiments and asks all listeners to send a report via DFTV.

As this will be the last report written by 4CL, who is leaving EK for some time, he wants to thank all amateurs abroad for their interest and to wish them every success. 4KU and 4AN will continue to report regularly on German short-wave activities.

Correspondence.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—The letter of 5YX in the June "BULL." should be thoroughly digested by all our BRS members, and I would venture to enlarge upon his second "grouse" with the following suggestions to them:—

- (a) BRS stations should only send reports to G transmitters under the following circumstances:—
 - (1) When reports are asked for.
 - (2) When a station is known to be using very low power.
 - (3) When a transmission is thought to be unusual, i.e., freak conditions, etc.
 - (4) Schedule reports to particular stations with whom tests are being carried out.

(b) Reports should be a lot more explicit and detailed. Some of the cards received here omit the time, wavelength, strength of signals, etc., but *none* of them omit "Pse QSL."

(c) The same remarks as above apply more or less to reports to Yanks. With a little more care, one can easily ascertain whom to report in that country. Try reporting those hams who are very little heard in this country, such as 6th and 7th districts, and the low-power stations in the other districts.

If BRS stations were to follow somewhat on the lines I have suggested, I venture to think a lot of unnecessary time, trouble and postage would be saved both to 5AD and themselves.

May I, in conclusion, refer to a practice which seems to be growing among transmitters, particularly on the Continent and in the U.S.A., namely, that of saying "QSL sure OM," when apparently they have not the slightest intention of doing so. If they do not intend to QSL, why say so? It would save a lot of time and trouble to the other fellow who keeps his part of the contract if they would say they do not QSL, besides helping in the QRM question.

I should be the last person to say abolish the QSL, as I believe it has done a great deal in fostering the true "ham" spirit of which we are so proud; but I do say that the practice should not be abused.

Yours faithfully,

R. A. BARTLETT (6RB).

Brisbane, Australia,
12/5/28.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—I desire to congratulate your society upon its organ, THE T. & R. BULLETIN, and the European and British District Notes are very interesting to us, particularly when we notice, firstly, the very low power used in most cases and, secondly, the comparatively short distances which are referred to as DX. Of course DX is comparative only, but North Africa, even on 8 watts, say, would not be the equivalent of U.S.A. from Australia on about 10 watts, which is an every-day occurrence in this country. We never hear English amateurs on their 32 or 45 band, though they are often heard on 23, but mostly seeking for NU6 or NU7, and even when they call Test DX they invariably answer a Yank. Aussies are there each day, a score or more of them all after the EG's, but few click. A word to them in the "BULL" might help, for they, perhaps, don't realise that Aussies are on 23 from 04.00 G.C.T. to 09.00 G.C.T. in small numbers, while the period from 07.00 to 09.00 G.C.T. sees many men on that band. We QSO NU there from 04.00 to 09.30 G.C.T. daily.

Best wishes for the success of the R.S.G.B. and with fraternal greetings.

Yours for Radio,

LEO. J. FEENAGHTY (OA4LJ).

Captain.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Allow me to congratulate G2BFA and G5MU on their excellent article in the April issue of the "BULL." After many failures, I have eventually succeeded in getting crystal control working here FB, and all stations report my signals as good as if using a commercial crystal. I found it an advantage to polish the crystal first applying the rouge dry with a chamois leather pad, and afterwards in the manner described by G2BFA.

The crystal I use has a fundamental of 180 m. approximately, and I believe it is controlling on its fourth harmonic, so it may interest hams who are grinding their own crystals to know that they need not grind them so far. I have not found it necessary to have the two sides of the crystal dead parallel, and I know of at least one station in Yorkshire who is using his crystal entirely unground! I also would like to know how to get my crystal back as clear as plate-glass. Wishing you every success with THE BULLETIN.

Yours faithfully,

A. CROSS (G6VJ).

To the Editor of T. & R. BULLETIN.

DEAR SIR,—A few months ago there were quite a number of people who declared that more use ought to be made of the 90-metre band. They said they would do some work up there themselves, and for a month or so they did so for one night each week. Now, however, they have all disappeared, and one can listen for hours and hear nothing. What has happened to them all? Can it be they have done all the experimental work it is possible to do up there, or has the DX fever caught them all? Apparently they prefer to spend all their time in the 45-metre QRM fight, or perhaps it is because there are so few stations working on 90 metres.

Well, why don't they add their numbers to the few already there and make the band more popular. They will not be quite alone for there are still two or three of us who have not forsaken 90 metres. Let them just drop any one of us a line and we shall be very pleased to test or "chew the rag" with them any evening after 23.00 B.S.T.,
Yours, etc.,

THE LONE TRIO ON 90 (2BI, 5MU, 6PA).

(We have, however, to advise our correspondent that the existence of the 90-metre band is just about to end under the new licence conditions.—Ed.)

To the Editor of T. & R. BULLETIN.

DEAR SIR,—A call to a station just finished working seldom gets a reply and usually finds them busy calling test. If G stations would listen for a few minutes after each test they would often hear their call, and giving QRX K would let others know they were ready. Thanks.

J. E. WETHERILL (5UB).

The Mullard Company have received a letter from E. A. Dedman, Esq., New Malden, Surrey (Radio G2NH), in connection with a Mullard 0/150 transmitting valve which he purchased in 1923, the filament of which has only just burnt out. It has been in continual use since it was first purchased, first as an oscillator on 440 metres, and later in successive transmissions on 200, 100, 45, 23 and 8 metres. An interesting feature in connection with this valve is that it was in use at Mr. Dedman's station when he was successful in obtaining the first communication between Europe and South Africa on a wave-length of 23 metres. The total number of stations that have been communicated with runs into thousands situated in 44 different countries in all the continents of the world.

The Mullard Company announce the opening of a new depot at Newcastle-on-Tyne as from July 2 next. The address to which all future communications should be sent is as follows: The Mullard Wireless Service Co., Ltd., 16, Clayton Street West, Newcastle-on-Tyne. Telephone: City 83. Telegrams: Mullard, Newcastle. Mr. W. J. Maxwell, recently technical representative for the Scottish and northern counties area, has been appointed the new depot manager. The existing depot at Handyside Arcade, Percy Street, Newcastle-on-Tyne, will be closed on June 30.

QRA Section.

MANAGER: M. W. PILPEL (6PP), 54, Purley Avenue, London, N.W.2.

Have YOU got your copy of the 1928 Annual yet? If not, sit down right now and send for it. There is only a limited edition, and you should make sure of your copy before it is too late. This really excellent publication is worth many times the reasonable price asked for it, and should be in the hands of everybody who professes to be interested in Amateur Radio. The first supplementary list is published this month, and a copy of it will be found in this "BULL." Owing to unforeseen difficulties, it was held over from the last issue, but I can assure you that it has in no way suffered by the delay, on the contrary, it is richer by over 100 new QRAs. If you have already got your Annual, you will appreciate this useful addition, but if you are still undecided as to whether the Annual is really worth getting, just look through this supplement and it will give you some idea of what the main list is like, and I am sure you will realise that you cannot possibly do without the Annual for another moment. But hurry up or you may be disappointed.

Calls Heard.

By OZ2BG, J. G. TINNEY, 74, Kainui Road, Hataitai, Wellington. —EG—2nh, 2od, 2sr, 5by, 5hs, 5ma, 5ml, 5yk, 6hp (2od, 5by, 5ma, 5ml at good strength).

By OZ2GO.—EG—2it, 2wj, 2cc, 2nm, 2sw, 2jb, 2kz, 2kf, 2od, 2qb, 2sz, 2nh, 2bi, 2bz, 2gf, 2oq, 2dn, 5ml, 5is, 5bd, 5yx, 5uy, 5kh, 5ls, 5ku, 5nj, 5mq, 5ma, 5dn, 5pz, 5sz, 5lf, 5by, 5dh, 6mu, 6fa, 6jv, 6pu, 6nf, 6oc, 6yu, 6yv, 6pp, 6hp, 6td, 6bd, 6iz, 6rw, 6nf.

QRA—W. A. Bousefield, York Street, Bellerive, Tasmania, Australia. Calls heard from January 1 to April 20, 1928, using O-V-1, on 20 to 45 metres:—EC—2un, 2yd. ED—7fr. EG—6ci, 5ml, 2oq, 6rb, 5br, 5lf, 2bm, 6wy, 5sw, 6wi, 5by, 2xb, 5yk, 6vp, 6hp, 5uw, 6vj, 5qv, 2nh, 2cx, 6yq, 5ma, 5hs, 5yx, 2od, 5jw, 5ku, 6dh, 6yv, 5nj, 6mu, 2sr. EK—4vr, 4yae, 4uah, 4yo, 4dbs, 4uf, 4uu, 4uai.

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PATENTS obtained, Trade Marks and Designs registered, British and Foreign.—GEE AND CO., Patent and Trade Mark Agents (H. T. P. GEE, Member R.S.G.B., A.M.I.R.E.), 51-52, Chancery Lane, London, W.C.2. Telephone: Holborn 1525.

TRANSMITTERS please note.—We are making a Rectifying Valve to cost you 15s. Specifications: Fil. volts $5\frac{1}{2}$, plate volts 1,000 with an output of 50 m.a. Guaranteed.—Send for price lists of new valves and repairs to NORTH LONDON VALVE CO., LTD., 22½, Cazenove Road, Stoke Newington, N.16.

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XTALS.—Quartz Crystals, guaranteed to oscillate with airgap in the following bands:—83.2-85.6 metres (suitable for work in the new amateur bands), 88-92 metres, price 30s.; 166.4-171.2 metres, price 25s.; cash with order. Wave-length of each crystal stated to within .1 per cent.—5YK, G. W. THOMAS, 169, Hills Road, Cambridge.

MORTLEY SPRAGUE ROTARY TRANSFORMER; input 50 volts D.C., output 1,800 volts 100 milli-amps.; in perfect order; sole reason for selling, change over to A.C.; price £20 or near offer; would consider H.T. Transformer in part exchange.—M. C. ELLISON, 2JP, "Brooklands," Follifoot, Harrogate.

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FOR SALE.—The Ideal H.T. Supply. Rotary Converter, 220v. D.C. (or could be driven by a separate motor), giving 3 phase 300 cycles A.C. at 120v., with Zenith transformer to 2,500v. Three rectifier filament windings for U.50s and one oscillator winding for WO.50. Very compact outfit, excellent condition, silent running. Can give up to 500 watts A.C. or 200 watts H.T. Needs only a small of condenser to smooth it. £12 or near offer.—2SH.

TRANSMITTERS know that Electradix Valves are bargains. We offer Cossor 25s. Rectifying Valves to cost you 8s. 6d. each. Specifications:—Fil. volts 6, plate volts 1,000 with an output of 50 m.a. Guaranteed good life. A.C. to D.C. chargers, not the feeble Trickle type. List £5. Output 6 volts 6 amps. Sale 50s. All new.

THE DIX-ONEMETER. The 55 range "Rolls Royce" of radio. An instrument of exact precision reading, 40 microamps to 20 amps., 2 milli-volts to 2,000 volts. Measures crystal signals or resistances from 50 ohms to 50 megohms. Instrument De Luxe, 55s. Multipliers, each 6s. 6d.—ELECTRADIX RADIOS, 218, Upper Thames Street, London, E.C.4.

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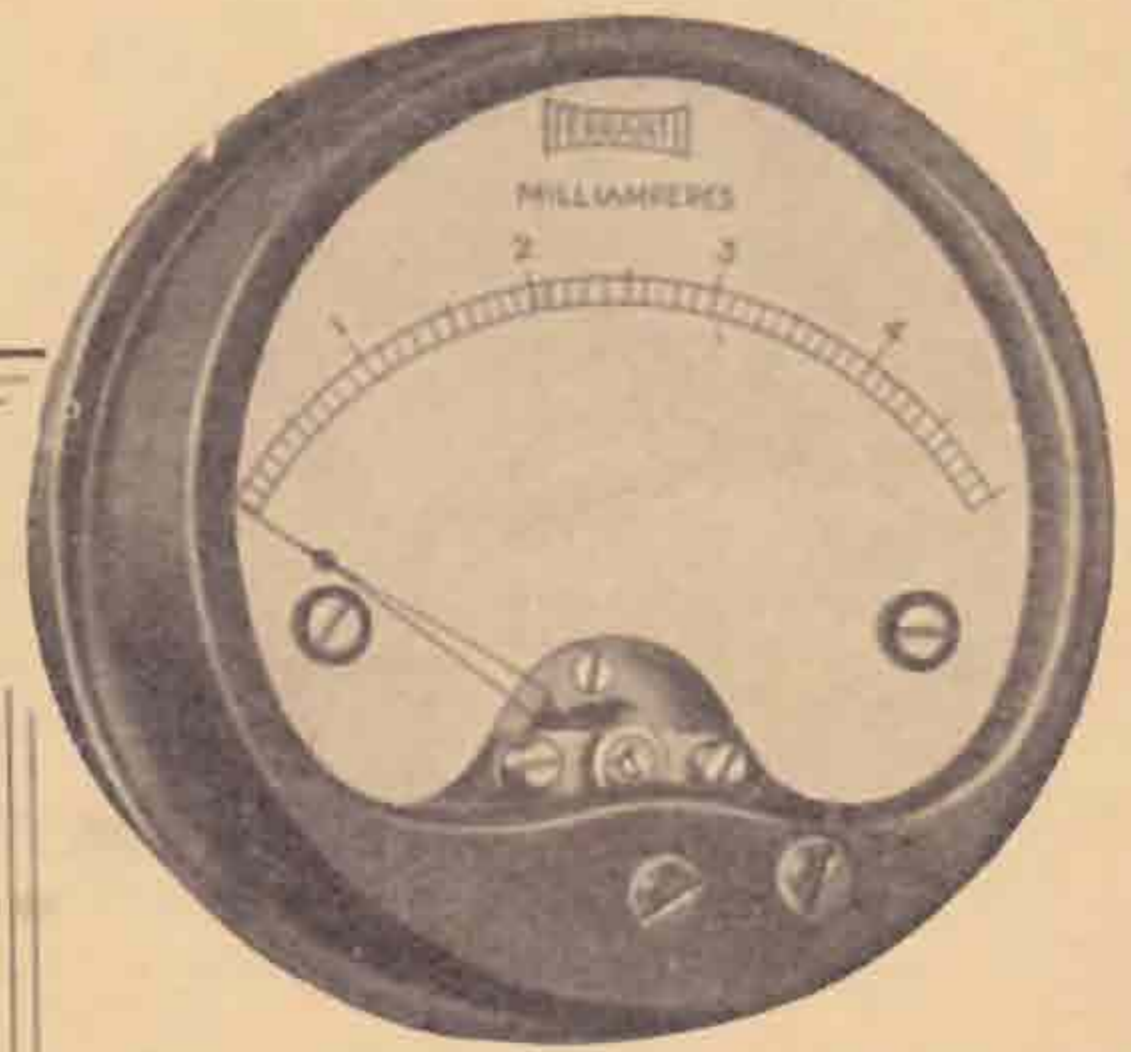
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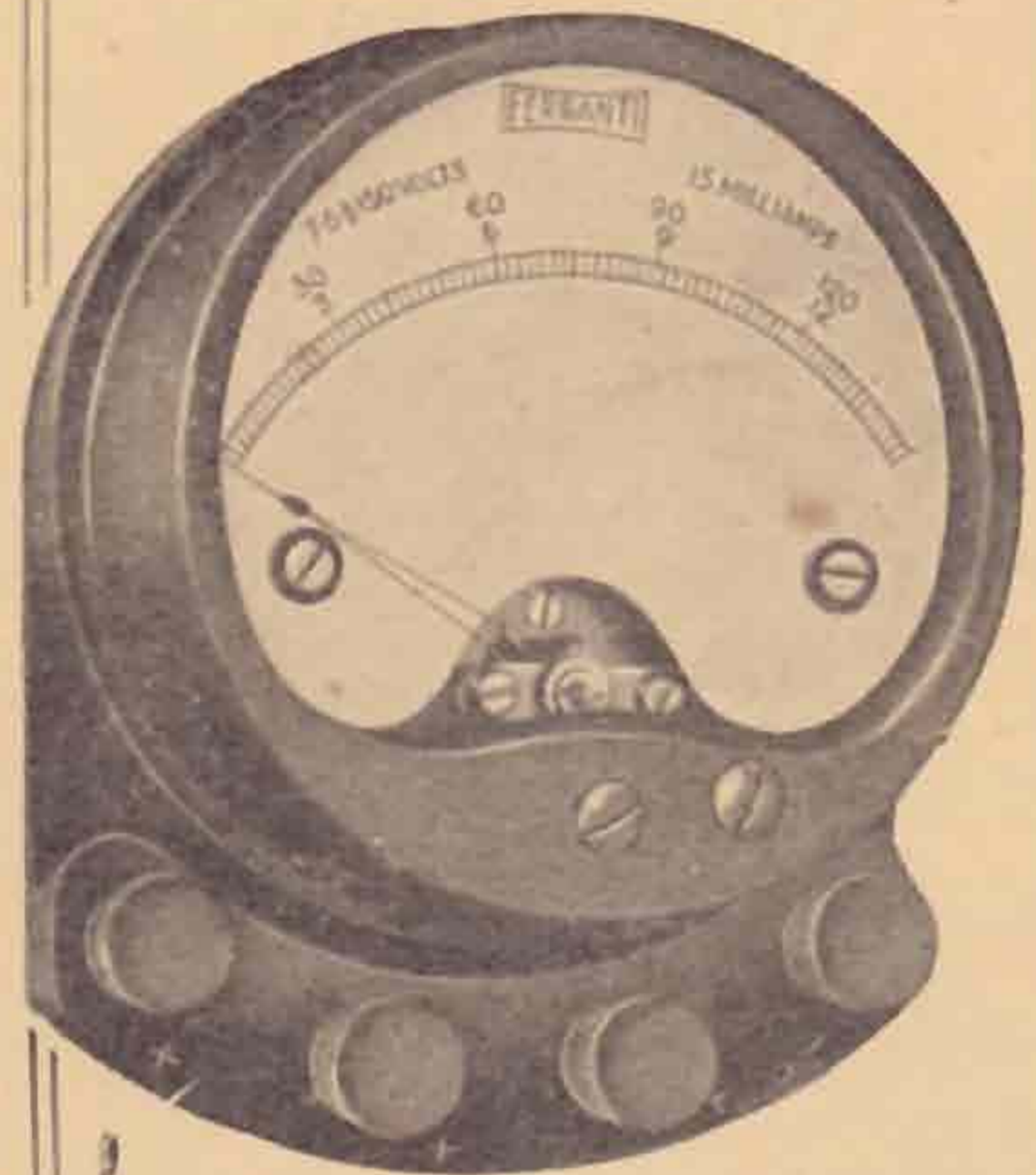
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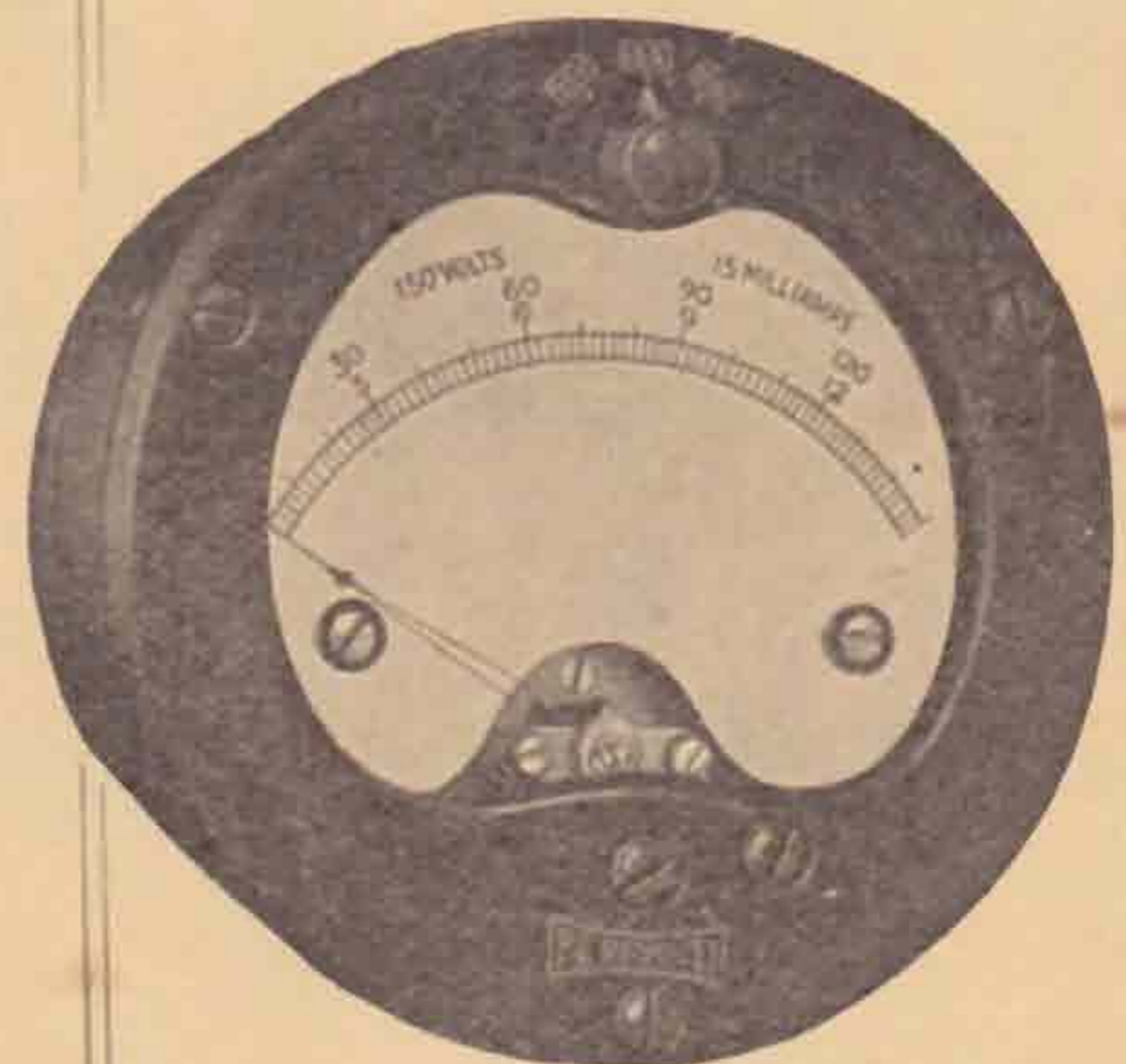
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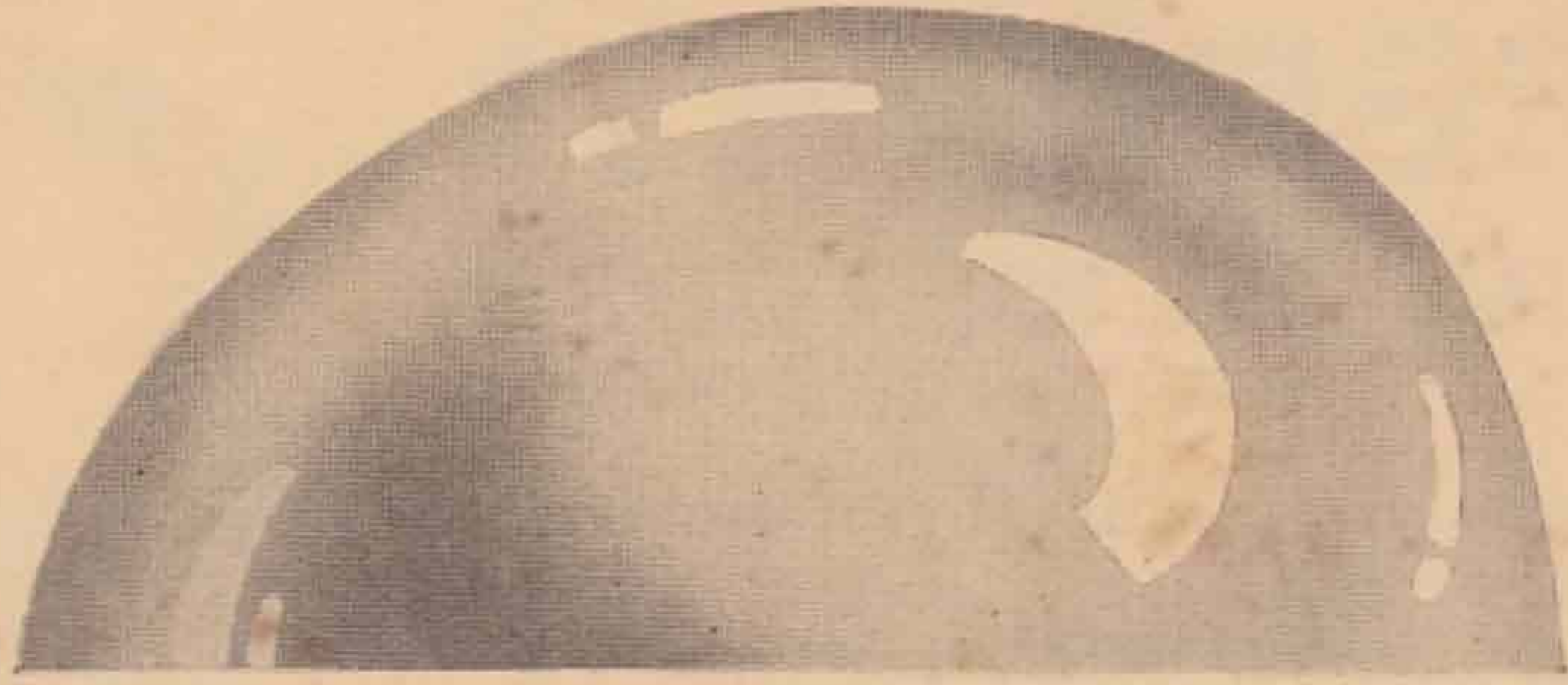
Projecting Pattern Type RIPa.



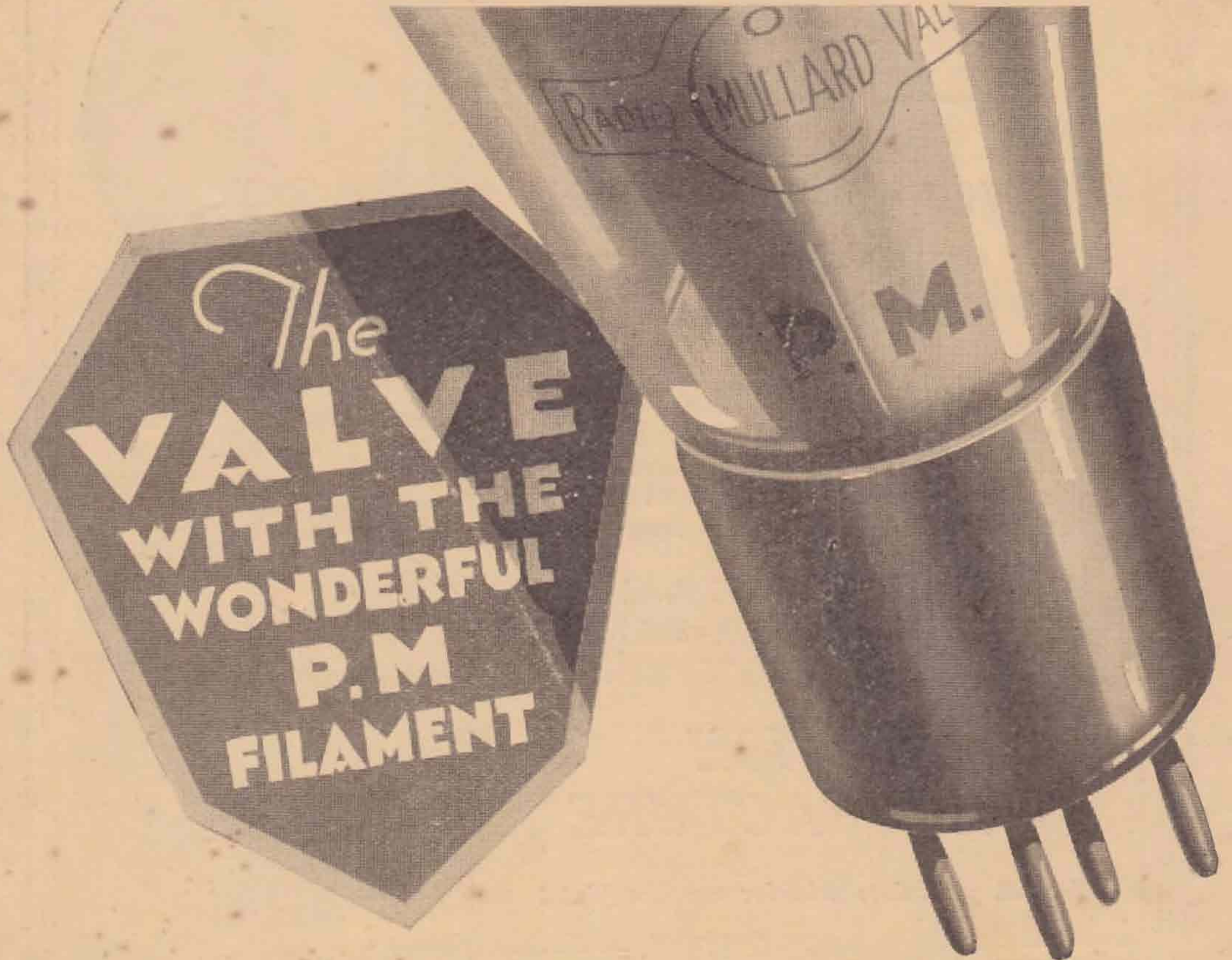
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