"ELSTREE SIX" WINS WORLD'S CHAMPIONSHIP

MODERN WIRELESS

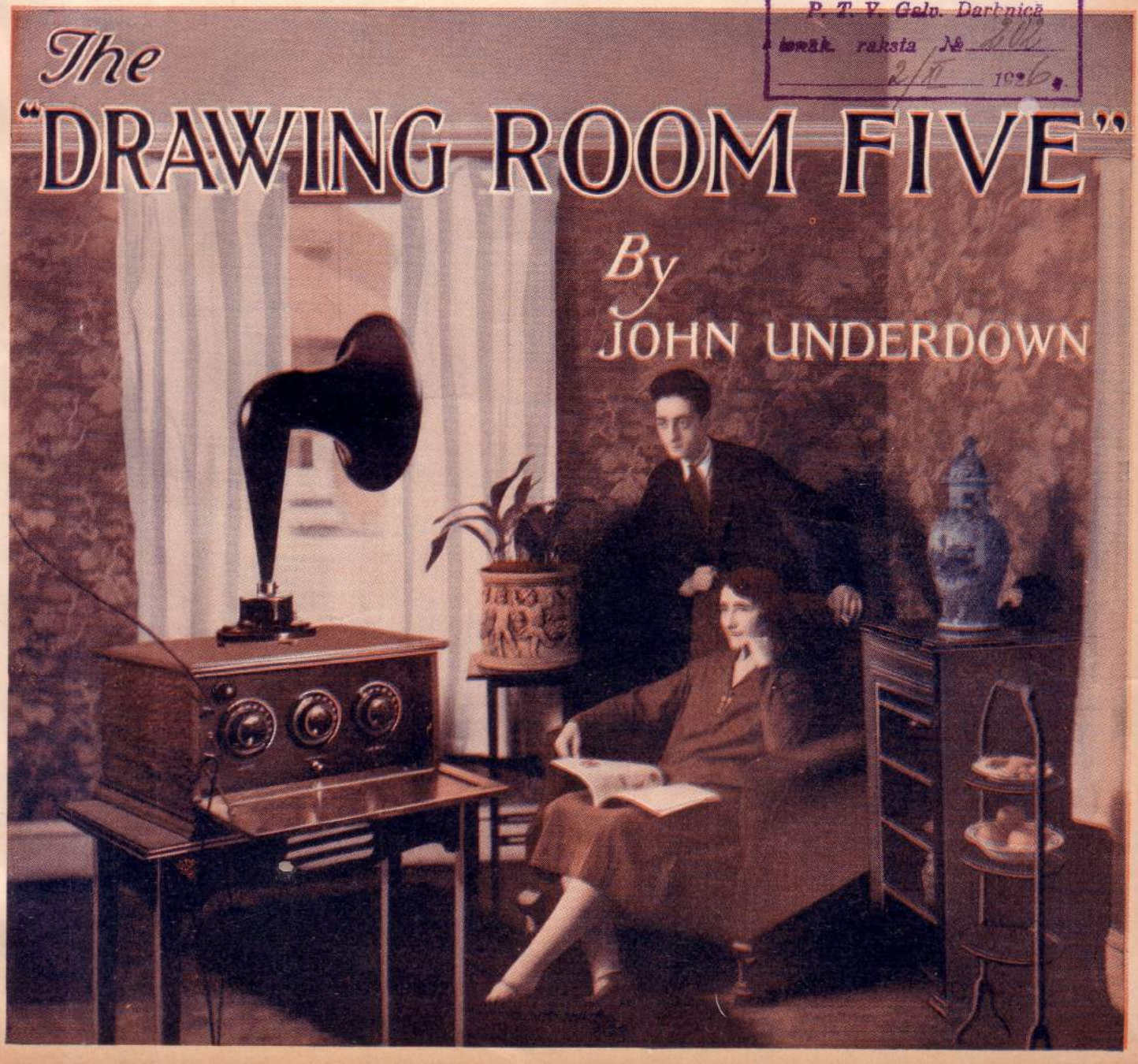
1/- MONTHLY

Edited by
J. H. REYNER
B.Sc. (Hons). A.M.I.E.E.

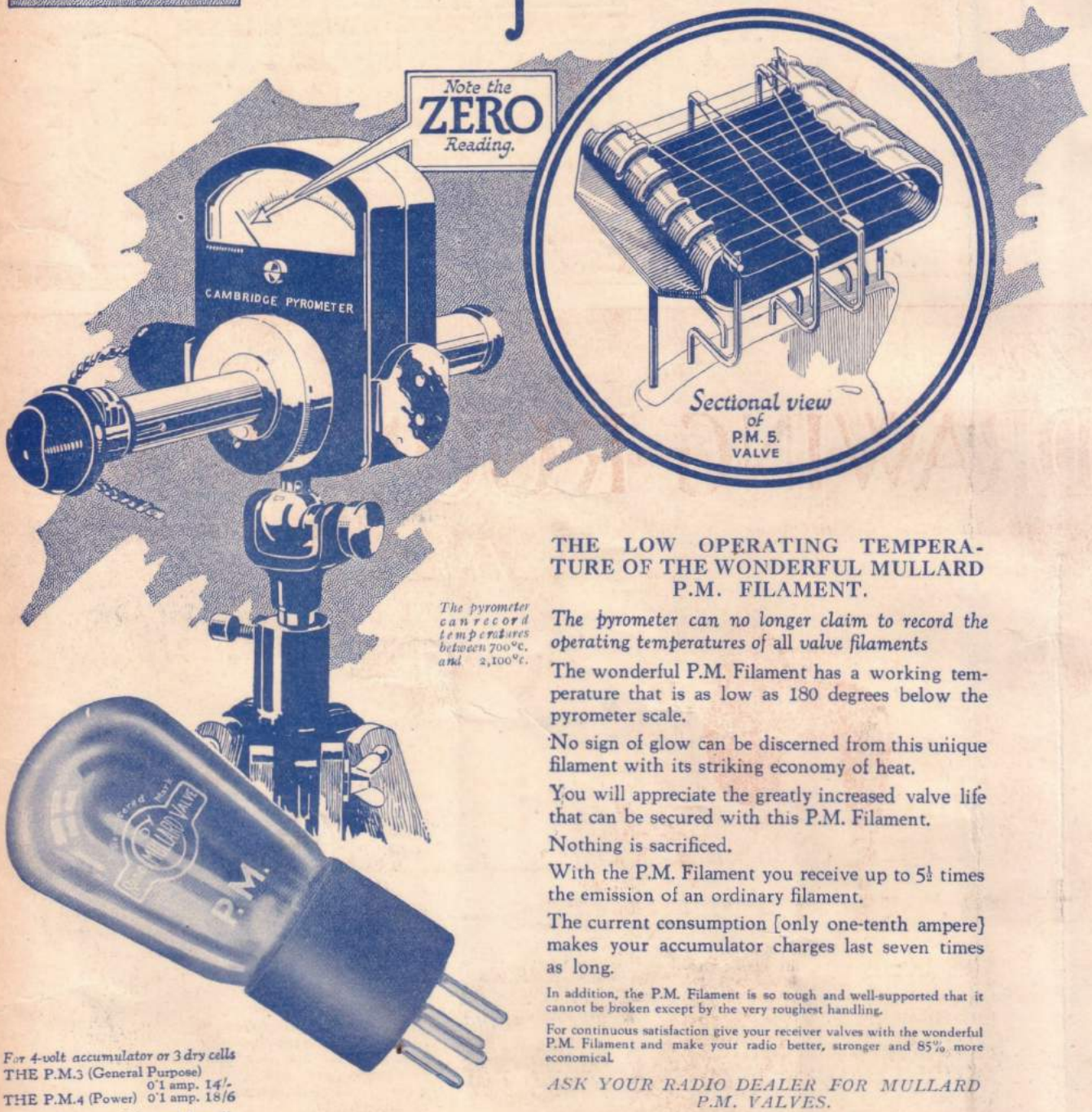
Vol. VI. No. 6. NOVEMBER, 1926.

The "DRAWING ROOM FIVE"

By JOHN UNDERDOWN



Below the Pyrometer scale



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For 4-volt accumulator or 3 dry cells
THE P.M.3 (General Purpose) 0·1 amp. 14/-
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CONTENTS

VOL. VI. MODERN WIRELESS No. 6

Edited by J. H. REYNER, B.Sc. (Hons.), A.M.I.E.E.

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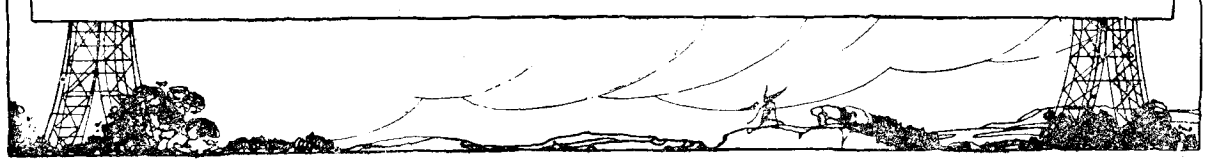
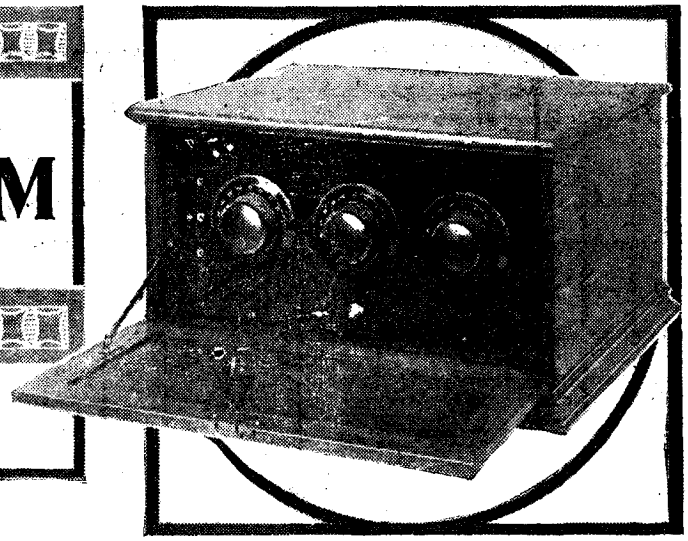


TABLE 1			TABLE 2			
Coil	Inductance in microhenries	Self-capacity in micro-microfarads	Coil	Parallel capacity in micro-microfarads	Wave-lengths in metres	Effective resistance in ohms.
35	61	15	35	300	264	2.8
40	90	15	40	,,	318	2.9
50	150	9	50	,,	406	3.3
60	200	13	60	,,	472	4.4
75	295	12	75	,,	573	5.3
100	540	11	100	,,	774	6.6
150	1,410	12	150	,,	1,250	15.8
200	2,220	17	200	,,	1,580	19.7
250	3,070	17	250	,,	1,860	24.9
300	4,800	14	300	,,	2,320	28.2

Results of independent H.F. tests made by the N.P.L.

THE "DRAWING ROOM FIVE"

By JOHN UNDERDOWN



The set described in this article has been designed with the object of giving good all-round results. It will give excellent reproduction from the local station and very good loud-speaker signals on many British and Continental stations. A volume control is provided which enables very loud signals to be adjusted to the strength required.

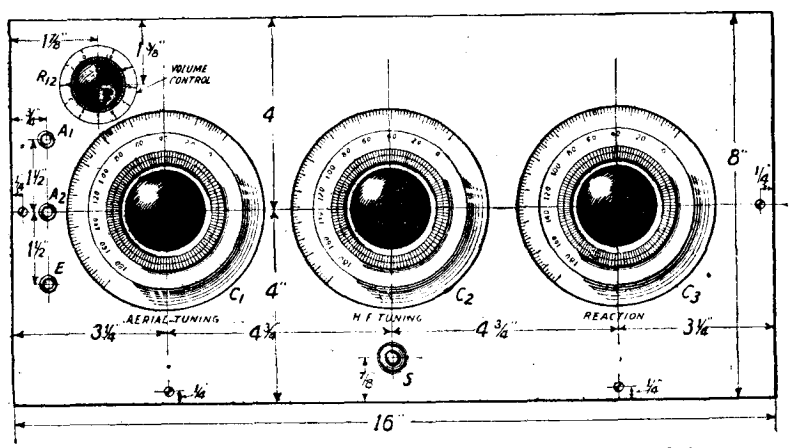
THE excellent reproduction which may be obtained from a correctly operated detector and two or three valve resistance-coupled amplifier receiver is too well appreciated to need comment here, and a set, therefore, on these lines, but with a stage of high-frequency amplification, on modern lines, to give added range and selectivity, will make its appeal. The set about to be described utilises a simple and popular circuit, the tuning coils being screened in order to eliminate interaction between the high-frequency circuits and also direct pick-up when the set is used near to a powerful broadcasting station.

Compact Layout

The combination of screened coils on the high-frequency side and resistance coupling on the note magnifier side makes it possible to obtain a very compact lay-out, which in turn makes wiring extremely simple. For use comparatively close to the local station in cases where it is impossible to erect a reasonable outdoor aerial, a frame may be substituted in place of the aerial tuning coil, this arrangement introducing no tendency towards instability, since interaction between the frame and the high-frequency transformer is prevented by the latter being screened. The frame therefore can be orientated without readjustment of the neutralising condenser being necessary, as is sometimes the case where unscreened coils are used for the H.F. coupling.

Stations Heard on the Loud-Speaker.

Liege.	Nottingham.	Oslo.	Newcastle.
Kiel.	Madrid.	Bournemouth.	Birmingham.
Lyons.	Breslau.	Hamburg.	Frankfurt.
Toulouse.	San Sebastian.	Dublin.	Brussels.
Barcelona.	Manchester.	Glasgow.	Daventry.
			Radio-Paris.



The set may be used with a frame or outside aerial as desired. Blue-print No. 184a (free).

Good Selectivity

Tested about twelve miles south-east of 2LO, that station gave excellent volume and quality when an ordinary frame with 2 ft. sides was employed, whilst on the outside aerial selectivity of a high order was obtained, it being possible to receive Manchester with London working, traces of the London transmission being heard only during the silent portion of the Manchester

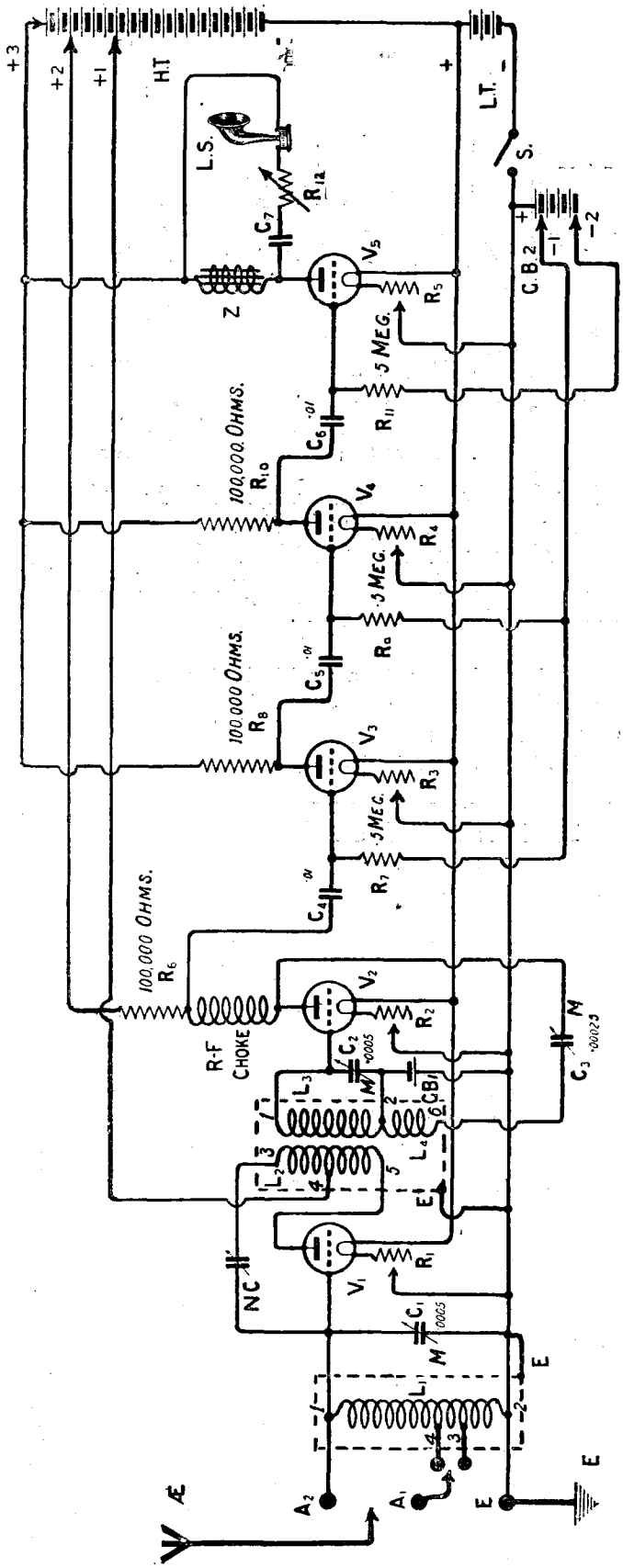


Fig. 1.—The theoretical circuit. Screened coils are employed to prevent direct pick-up and to enable a frame aerial to be used.

THE "DRAWING-ROOM FIVE"— *(Continued)*

programme. Bournemouth was quite free of London and came in at satisfactory loud-speaker strength. In the course of an hour's test on a Sunday evening, between 7 and 8 o'clock, twenty Continental transmissions were tuned in upon the loud-speaker, ranging in strength from fair to really good. Of these transmissions, mostly unidentified, but of German, Spanish and French origin, eight were of adequate strength and sufficiently free from interference to be really worth listening to.

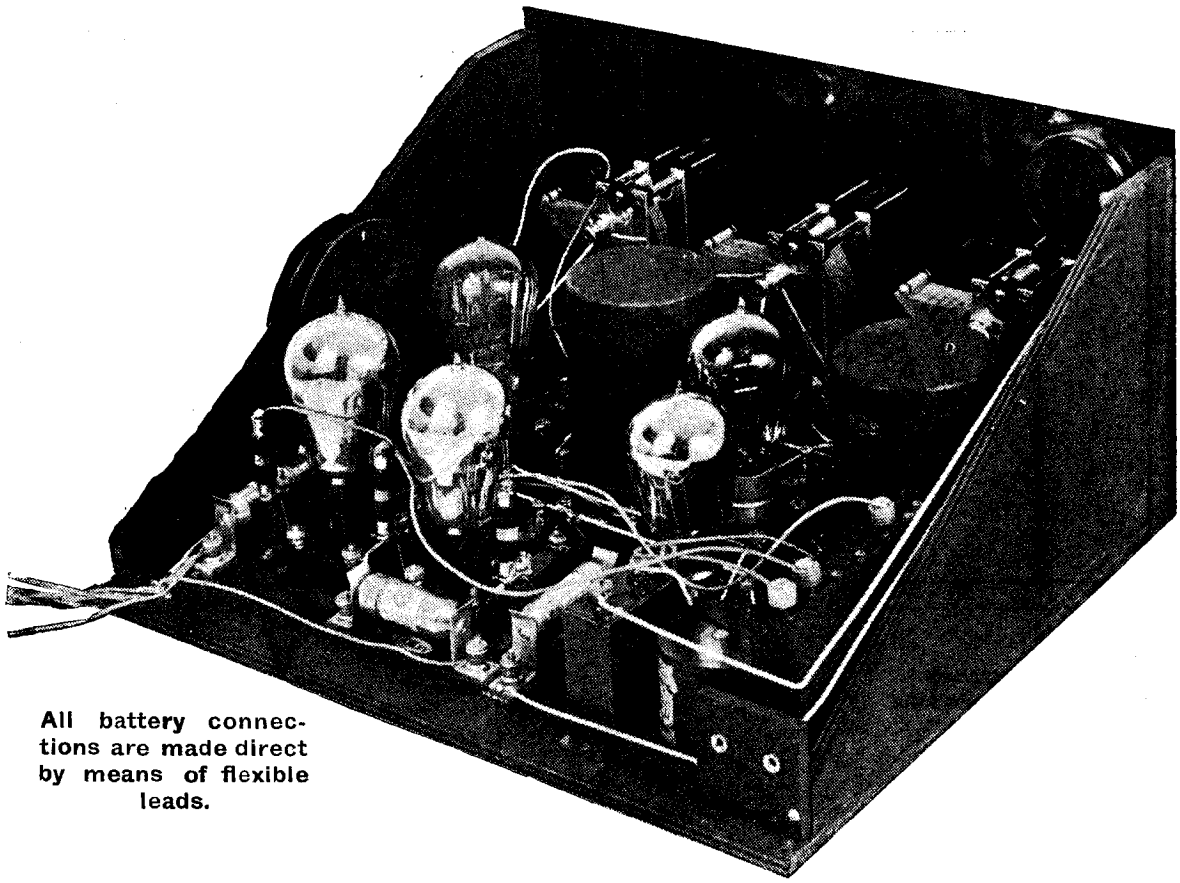
The Circuit

In character the circuit is straightforward and simple, the technical details being given in Fig. 1. When an outside aerial is used it is connected to the tuned grid coil L_1 by the usual auto-coupling arrangement, only one socket, A_1, for this purpose appearing on the front panel and a flex lead being utilised which may be taken to either of two tappings on the coil. An extra terminal, A_2, is incorporated so that a frame may be used, this latter being connected between the A_2 and E sockets. When this is done, of course, the aerial coil L_1 is not required. The high-frequency valve is coupled to the detector by means of a standard split-primary transformer, this providing a very simple neutralising arrangement. Reinartz type reaction is obtained by employing the standard transformer reaction winding. This necessitates that a radio-frequency choke coil be placed in the plate circuit of the detector valve, and here a plug-in coil is used, since the size may be changed when it is desired to go from the lower to the upper broadcast waveband. Incidentally, this choke serves a further useful purpose in keeping high-frequency currents to the H.F. and detector portion of the set, and the tendency of resistance-coupled note magnifiers to amplify high-frequency currents is thus counteracted.

Rectification

Rectification is effected by the lower anode-bend method, and to simplify matters the usual potentiometer is omitted, since by varying the detector H.T. voltage adequate control is obtained. In practice the detector grid bias

GIVES PURE REPRODUCTION



All battery connections are made direct by means of flexible leads.

battery, G.B.1, may generally be a single dry cell when resistance-coupling type valves are used for V_2.

A Filter Circuit

The resistance coupling for the three note magnifiers follows standard lines, but in the plate circuit of the last a filter circuit is incorporated in order that the loud-speaker may have to carry only the fluctuating currents representing signals, this being beneficial from the point of view of protecting the windings. The Duvolcon resistance R12 in series with the loud-speaker is for the purpose of volume control.

The Panel

The design of the receiver is such that only a small panel 16 in. by 8 in. is required, and on it are mounted the aerial tuning condenser to the left-hand side, that tuning the secondary of the high-frequency transformer in the centre and the reaction condenser

COMPONENTS REQUIRED

One Radion panel, 16 ins. by 8 ins. by 3/16th in. thick (American Hard Rubber Co. (Gt. Britain), Ltd.).

One cabinet to take above panel and baseboard, (Pickett's).

Five Clearer-tone valve holders (Benjamin Electric, Ltd.).

Five baseboard mounting rheostats (Lissen, Ltd.). (These should be chosen to suit the valves to be used.)

Three 100,000 ohms anode resistances and bases (Varley Magnet Co.).

Two .0005 S.L.F. condensers (Jackson Brothers).

One .00025 S.L.F. condenser (Jackson Brothers).

One neutralising condenser (A. F. Bulgin and Co.).

One single-coil holder (A. F. Bulgin and Co.).

Three .01 T.C.C. fixed condensers (Telegraph Condenser Co., Ltd.).

One 2 mfd. Mansbridge type condenser (Telegraph Condenser Co., Ltd.).

One standard audio-choke (Beard and Fitch, Ltd.)

One filament "on and off" switch (Igranic Electric Co., Ltd.).

Three ½ megohm grid leaks (Igranic Electric Co., Ltd.).

One aerial coil and one split-primary H.F. transformer and screening cases (Bowyer-Lowe, Burne-Jones, Collins n, Efesca, Lewcos or Peto-Scott).

One Duvolcon (Dubilier Condenser Co. (1925), Ltd.).

One ebonite sub-panel, about 2 ins, square and ¼ or 3/16th in. thick.

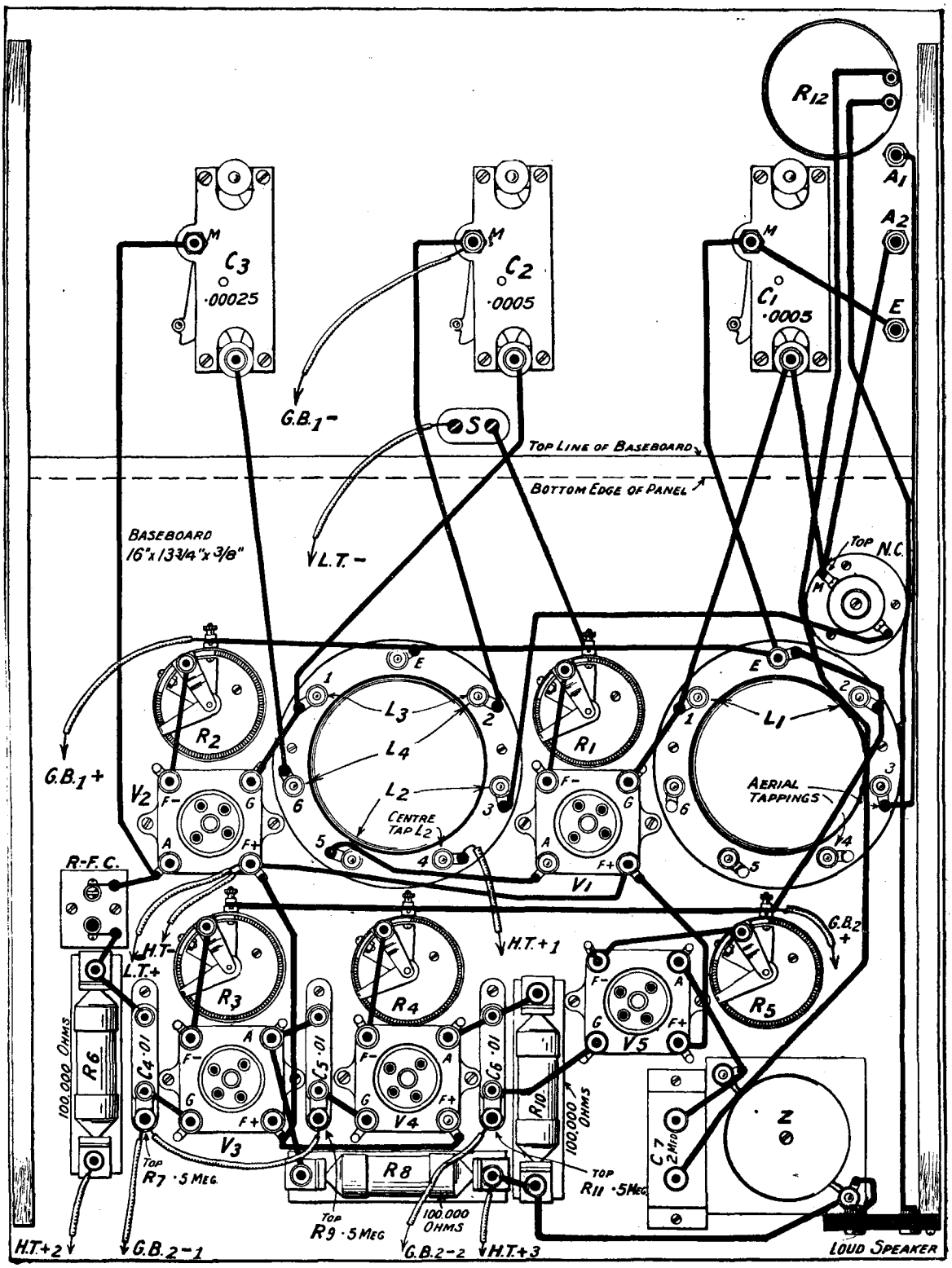
Five Eelex sockets (J. J. Eastick and Sons).

Thirteen Eelex or Clix plugs.

A quantity of Glazite wire, rubber-covered flex, heavy twin flex, screws, etc.

Radio Press Panel Transfers.

THE "DRAWING ROOM FIVE"—*(Continued)*



The wiring diagram. Note that no battery terminals are used, direct flexible connections being employed instead. Blue print No. 184b (free).

IDEAL FOR THE HOME

to the right-hand side. Incidentally this latter control may be used with impunity when the high-frequency valve is properly neutralised, since the circuit is then of non-radiating type. The three Eclex sockets on the left-hand side are, reading from top to bottom, that for the outside aerial, the second for one side of a frame, if used, and the other for the earth lead, or alternatively the other side of the frame.

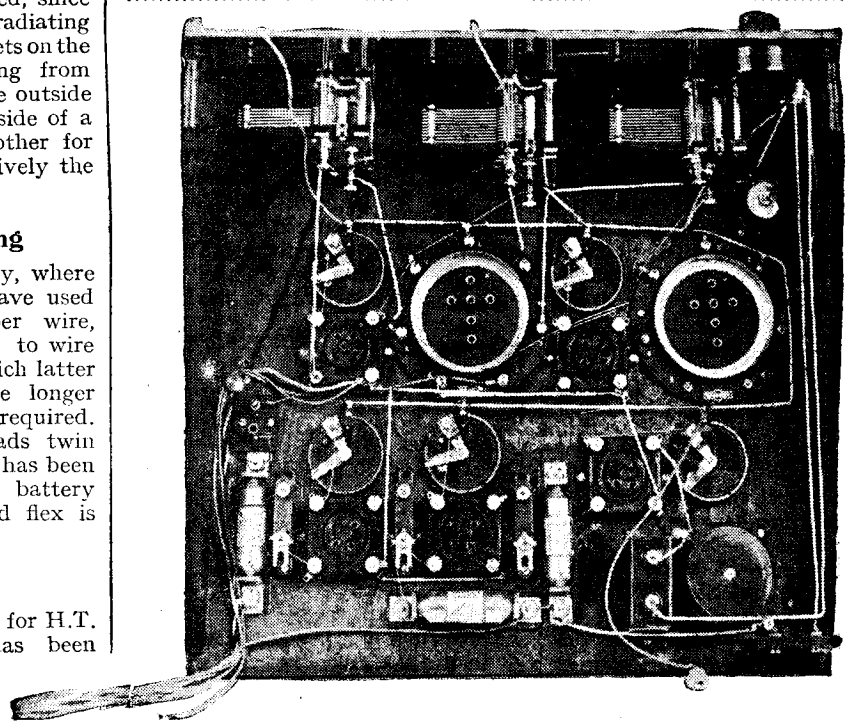
Simplifying Wiring

To make the wiring easy, where leads are very short, I have used bare 20-gauge tin copper wire, since it would be difficult to wire here with stouter wire, which latter is therefore used for the longer leads where rigidity is required. For the L.T. battery leads twin red and black covered flex has been used, whilst for the H.T. battery connections rubber-covered flex is employed.

Battery Leads

The usual terminal strip for H.T. and L.T. connections has been omitted, for the sake of simplicity, and leads are taken directly to the batteries concerned, only one small hole in the right-hand back corner of the cabinet being required for this purpose. For the loud-speaker connections, two sockets, on a small ebonite sub-panel, are required and two small holes in the left-hand back corner of the cabinet

(*Concluded on page 621.*)



A plan view of the receiver showing the method of laying out the components on the baseboard.

WIRING INSTRUCTIONS

Join E to moving plates of C1; moving plates of C1 to E of screen base for L1; E of screen base for L1 to one side of S, and one side of R1; same side of R1 to E of remaining screen base; E of same screen base to one side of R2; attach flex lead to same side of R2 for GB1+. Also join E of screen base for L1 to terminal 2 of L1; terminal 2 of L1 to one side of R5; same side of R5 has flex lead joined to it for GB2+, and is connected to one side of R4; same side of R4 to one side of R3.

Join fixed plates of NC to terminal 3 of L2.

Join A2 to moving plates of NC; moving plates of NC to fixed plates of C1; fixed plates of C1 to terminal 1 of L1; terminal 1 of L1 to G of V1.

Join A1 to aerial tapping 3 with flex wire.

Join flex lead to remaining side of S for LT−.

Join F+ of V5 to F+ of V1, F+ of V1 to F− of V2; F+ of V2 has two flex leads joined to it for HT − and LT + and is connected to F + of V3; F + of V3 to F+ of V4.

Join F− of V1 to remaining side of R1.

Join F− of V2 to remaining side of R2.

Join F− of V3 to remaining side of R3.

Join F− of V4 to remaining side of R4.

Join F− of V5 to remaining side of R5.

Join flex lead to terminal 4 of L2 for HT+ 1.

Join A of V1 to terminal 5 of L2.

Join fixed plates of C2 to terminal 1 of L3; terminal 1 of L3 to G of V2.

Join terminal 2 of L3 to moving plates of C2; join flex lead to moving plates of C2 for GB1−.

Join fixed plates of C3 to terminal 6 of L4.

Join moving plates of C3 to A of V2; A of V2 to pin of holder for R - F.C.

Join socket of holder for R - F.C. to one side of R6; same side of R6 to one side of C4.

Join other side of C4 to G of V3 and one side of R7.

Join A of V3 to one side of C5 and one side of R8.

Join G of V4 to remaining side of C5; same side of C5 to one side of R9.

Join other side of R9 to remaining side of R7 with flex lead, and join flex lead to same side of R7 for GB2 - 1.

Join A of V4 to one side of C6; same side of C6 to one side of R10.

Join G of V5 to remaining side of C6; same side of C6 to one side of R11.

Join flex lead to other side of R11 for GB2 - 2.

Join A of V5 to one side of Z and one side of C7.

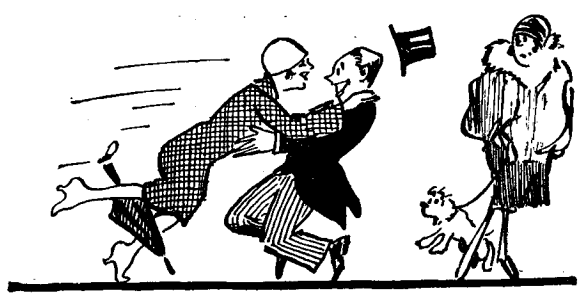
Join one loud-speaker terminal to remaining side of Z; same side of Z to remaining side of R10; same side of R10 to remaining side of R8; join flex lead to same side of R8 for HT+3.

Join flex lead to remaining side of R6 for HT+2.

Join remaining loud speaker terminal to one side of R12.

Join other side of R12 to remaining side of C7.

I HAVE long been a most profound admirer of the fellows who write the gossip pages in the illustrated daily papers. Must it not be delightful to spend one's whole time calling upon Lady This or the Duke of That, to pass the time of day with the leading figures of Society whenever one meets them, to be on back-slapping terms with all the celebrities of the stage, the police court, the betting ring and the treasure-hunting field? But above all things what I most admire is the infinite capacity of these writers for consuming luncheon and their wonderful power of being in at least four places at one and the same time in case of need. I always study their writings closely, to my own great profit. The first paragraph almost invariably begins "Lunching yesterday at the Ritz. . . ." A little lower down the column you find, "Whilst enjoying a light luncheon at the Carlton . . ." Two or three paragraphs with no reference to food follow, then we find "There was quite a crowd yesterday at the Savoy when I dropped in for lunch. . . ." Another most interesting pursuit is to compute the miles covered in a day by the writer.



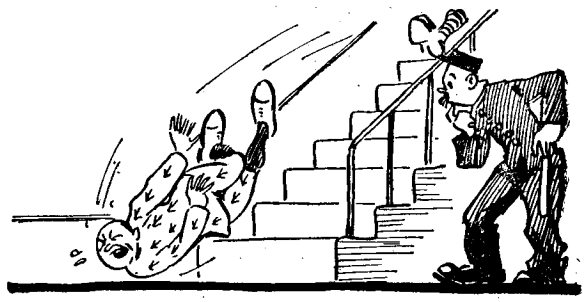
"The catch of the season," she cried gaily.

A Busy Day

The record is, I believe, held by one fellow who last summer attended the Test Match at Nottingham in the morning, lunched at four different London restaurants, spent the afternoon at Newmarket, had tea in Hampstead, Mayfair and Richmond, dined simply all over the place, attended the Tattoo at Aldershot in the evening and topped off a good day's work by supping in most parts of the West End, after dropping in for a foxtrot or two at half-a-dozen different night clubs.

Those Seats of Learning

I love, too, the pleasant friendly way in which they write of those who sit in the seats of the mighty, all of whom they have known since boyhood days. "Strolling down Piccadilly yesterday," you read, "I ran into Lord 'Wuffles' Bilger, who was bemoaning the fact that his valet would not allow him to wear pea-green socks and a scarlet tie. Wuffy, as we used to call him at Cambridge, always had an eye for colour. . . . As I turned into Bond Street I met Captain Bingo Punter, who told me something of his latest venture. I remember when we were at Oxford together how he always said that one day. . . . Continuing my stroll down Regent Street I found myself face to face with Sir Ian McKelpie, who had amassed a fortune by selling breeks to Hielanders. In those far-away University days at St. Andrew's we always prophesied that 'Potty,' as we called him affectionately, would go far. . . . I was just stepping into a taxi in Piccadilly Circus when Lady Angostura Bitters tripped over her umbrella and fell literally into my arms. 'The catch of the season,' she cried gaily, as I picked myself up from the gutter. . . . Only those who were at Harrow with him realise what a wit Lord Tufto Bandyshanks is. I shall never forget his retort to the headmaster when he was about to be publicly birched before the whole school for some minor demeanour. 'This will teach you to mend your ways!' thundered the headmaster, brandishing his horrid weapon. 'Please, sir, it wasn't me,' said young Bandyshanks without hesitating for a moment. . . . Turning into the Haymarket, I observed Colonel Gore-Blusterby chatting with Prince Potzanparski. When I was at Eton with the Prince and at Rugby with the Colonel . . ."



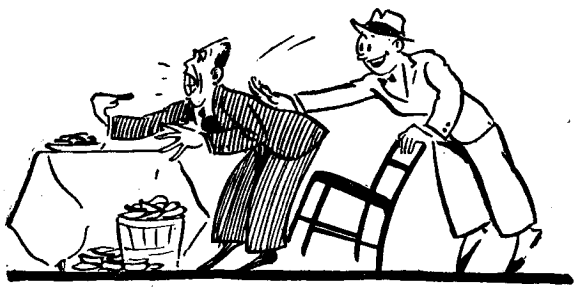
——ne kicked me downstairs.

What About Us?

This is all very well, but what I want to know is where do we poor wireless folk come in? Why should we not run up against or run into or run over or even run down? Day after day I have searched the gossip columns for a little paragraph such as "Dropping into Lockhart's yesterday I found the Listener-in lunching off sausages and mashed. I have always thought that he was quite one of the best-looking men about Town, and he is of course renowned for his excellent taste in clothes. As I passed over to chat with him I noticed that he was striking a note of chaste originality by sporting

IN PASSING — (*Concluded*)

patent leather boots, spats, jazz stockings, plus-fours and a frock coat. The Old Borstalian's tie in a made-up bow round a celluloid collar added just that little touch of colour that all really well-turned-out men value so greatly. When we were at Dartmoor together I was the Listener's fag, and I shall never forget the kind and fatherly manner in which he kicked me downstairs whenever his eggs were not boiled to his liking." That, I think, would be the stuff to give them. If, instead of references to politicians, artists and other queer creatures who do not matter two hoots, we had jolly little paragraphs about wireless people, I am sure that the circulation of the morning papers would rapidly double itself. As I am always ready to step into any breach I will now proceed to a few model paragraphs, giving intimate information about some of the greatest of the great for your edification and for the instruction of those who fill the gossip pages.



"Ecco!" I cried, bursting into Italian.

A Safety Valve

I was just being flung out of the Air Force Club, into which I had strayed by mistake, one day last week when I collided with Captain Pullhard, who was coming in. As we sat together upon the steps, he recovering the wind which I had knocked out of him and I setting my somewhat dishevelled raiment in order, I ventured to ask him the time. "Two o'clock," he said. "A.m.?" I queried. "No, *p.m.*," he thundered with majestic volume. A spiritualist once told me that Captain Pullhard had a remarkably fine aura.

A Treasured Tip

I had hardly taken more than a few steps down the street when I observed Senatore Mark O'Nee about to enter a taxi. Sweeping off my hat and brushing aside the attendant commissionaire I hastened to open the door for him. Feeling in his waistcoat pocket, he produced a small something which he placed into my palm. It was a gridleak. I am having this stuffed by Roland Ward, and when the job is done it will then occupy an honoured place in a glass case upon my mantelpiece. The great man is renowned for his happy knack of making pithy remarks appropriate to all occasions. That uttered when I held open the door of his taxi was no exception to the rule. "Paddington," he said, sinking into his corner.

High-Frequency Choking

Toddling into the Ritz to see if there was anybody there who might stand my lunch I came across the genial Captain Chuckersley in the act of engulfing oysters. "*Ecco!*" I cried, bursting into Italian and slapping him upon the back. "*!!?***—%%% $£C@!!!," he screamed as soon as he was able to speak after dealing with an oyster that had taken the wrong turning; "Please *don't* do it."

No Luck

Entering Bush House, I sauntered jauntily into the Editorial sanctum and was promptly pushed out.

An Old Friend

Crossing the Strand I made my way into Simpson's, where the very first person that I saw was my old friend Professor Goop. Just as I arrived at his table he was raising his voice to anathematise the waiter. "No less than an hour ago," he shouted, "I ordered a chop lightly done. Will you tell me why on earth you have not yet brought it—or have I eaten it?" The waiter having assured him that he had duly put away his chop, Professor Goop was about to rise from his table when I pointed out that I should be delighted to lunch with him. "In that case, my dear fellow," he said, with a beaming smile, "we will begin all over again—waiter, two chops—and now let me show you my new circuit. This roll represents a centre-tapped inductance, whilst here (he picked up a fork) we have a neutralising condenser. This spoon is a 100,000-ohm resistance and the ash tray is a choke with a value of one millihenry. We will use glasses to represent the valves." He took his own and mine, but as he was still two short he went across to a table on his left and borrowed two foaming beakers. The owners of these were still arguing the point when the Professor, who was apparently entirely deaf to their entreaties, discovered that he had nothing to represent the high-tension battery.

He borrowed two foaming beakers.

A Sad Shock

He was just sallying forth in search of this when the manager arrived, supported by two stout fellows, and before you could say Llanfair . . . gogogoch, the Professor and I found ourselves outside on the pavement. I did not mind this so much, but the most unkind of all was that the Professor complained that the rough treatment he had received had entirely taken away his appetite, the result being that I had to go and buy my own lunch.

RANDOM NOTES

By A. V. D. HORT, B.A.

I SEE that a suggestion was made recently by a French scientist that the services of wireless might be utilised to regulate the clocks in observatories in all parts of the world. With modern appliances an accuracy of one-thousandth part of a second can be assured in the checking of time. The idea of thus synchronising the clocks of the world is certainly intriguing, but it must be remembered that such a system would presumably be finally dependent on some one master clock, with which the others would be synchronised. One foresees that complications might arise if the master clock failed in its duties!

✣ ✣ ✣

IT appears that the B.B.C. are contemplating ambitious educational schemes. Mr. J. C. Stobart, speaking at a conference in Cambridge of the British Institute of Adult Education, outlined as a possibility of the future a regular series of half-hour broadcast educational talks; these would presumably be followed at intervals by examinations in the subjects discussed. This would enable the listener to acquire learning without leaving his own fireside.

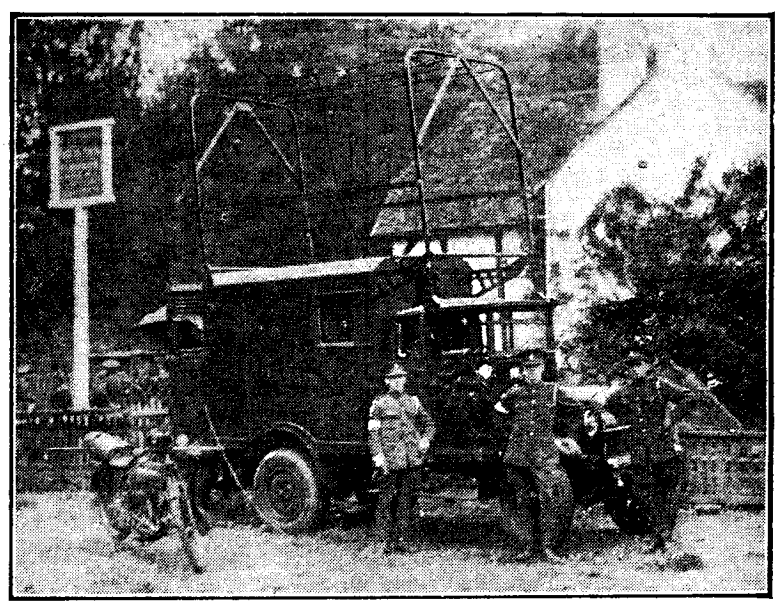
Such a scheme would be dependent on the provision of definitely alternative programmes, so that listeners would not feel that they were being "forcibly fed" with educational talks.

✣ ✣ ✣

BESIDES the National concerts which are being organised by the B.B.C., a series of International concerts is to be given on the first Tuesday of each month. The music of the following countries will be heard during the coming winter season:—November, Italy; December, Germany; January, France; February, Czecho-Slovakia; March, Holland.

✣ ✣ ✣

DURING the past few years little radical alteration has been made in the electrode design of three-electrode receiving valves. Of different shapes, sizes and materials, there is a great variety, but the generally "accepted" relative disposition of electrodes has remained unchanged. Designers are, on the other hand, constantly endeavouring to modify and improve on the construction of the filament, and one design which has recently been patented aims at doing away altogether with the conventional filament-heating system.



A wireless equipment van of the type used during the recent Army exercises in Hampshire.

RANDOM NOTES — *(Concluded)*

In this new valve the arrangement of the electrodes, too, is altered, the filament being outside the grid and anode. The "filament" cannot strictly bear that name at all, since it consists of a cylinder coated to improve emission of electrons. This cylinder is heated by means of an electric heater, which presumably may be supplied with current from the mains or some similar source. Something of this nature has been attempted previously in valve design, and it remains to be seen whether this new patent will prove to be a sound proposition.

❖ ❖ ❖

IT is curious what a number of people there are who appear to imagine that it is unnecessary to take out a wireless licence until the set is in working order. There have been several cases in the courts lately when the plea was put forward that the set did not work, so that no licence was taken out. The regulations state, of course, that a licence must be taken out before the apparatus is installed.

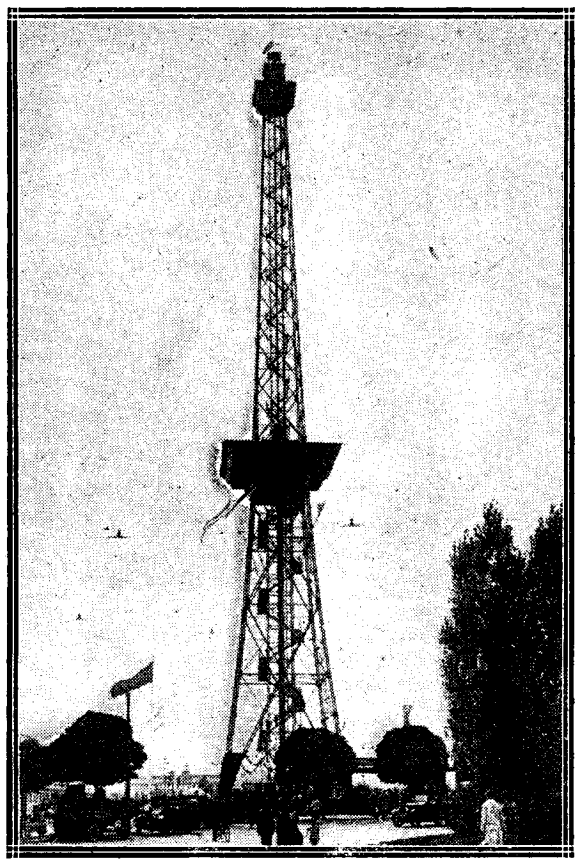
❖ ❖ ❖

A POINT which was noticeable at the National Radio Exhibition this year was that there appeared to be much more "courage" displayed in the design of receivers than hitherto. I mean by this that there seems to be a movement towards making the wireless receiver a piece of furniture, designed on sufficiently attractive lines to allow it to take its place naturally in a room. There will probably always be a certain number of people who like to hide the receiver in some way, often by dressing it up as though it were something else. On the other hand, now that the receiver is becoming, or rather already is, accepted as a necessity and is no longer regarded as a toy, it is only to be expected that the majority of listeners should wish for an instrument which will be no more conspicuous among the furniture than a piano or a gramophone.

Some very attractive cabinet work was to be seen at the Exhibition, the increasing use of wooden panels and "fall-fronted" cabinets helping to make the receiver blend with other furniture in a manner which is hardly possible when ordinary black ebonite is there to catch the eye.

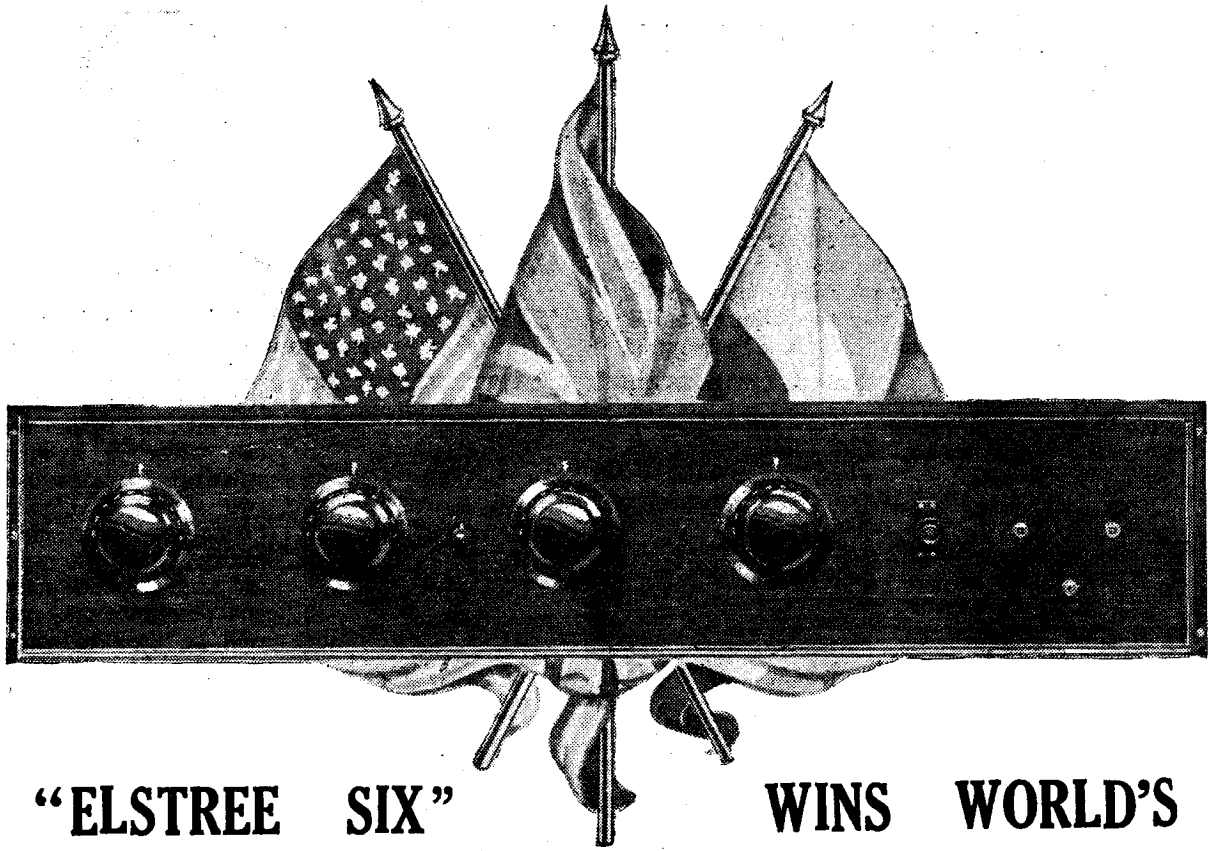
❖ ❖ ❖

IT is becoming the accepted practice in many modern receivers to use one rheostat, or better still, one fixed resistor, to regulate the filament current of more than one valve in a multi-valve set. In a set using two stages of high-frequency amplification, for example, if similar valves are used for both stages, one resistance may quite well be used to control the two. This leads to a slight difficulty when it comes to neutralising the high-frequency stages, assuming as a matter of course in these days that they *are* neutralised. Each stage has to be dealt with separately, and in the older style of receiver each valve would be turned out separately on its own rheostat. It is possible to remove the valve and wrap a piece of thin paper round one of the filament legs in order to prevent it lighting. This, however, is not always easy to do, and if a burnt-out valve of similar type to that in use is available this may be used to get a rough adjustment of the neutralising condenser.



The steel mast of the broadcasting station at Berlin. A novel feature of the tower is a restaurant situated approximately 200 feet above the ground.

The procedure is to insert the "dud" valve in the holder and set the neutralising condenser in the ordinary way, after which the proper valve is replaced and any small extra adjustment is made. Slight differences in the spacing of the electrodes of the two valves will probably prevent the setting obtained in the first instance from being absolutely correct, but an approximate setting may readily be found in this manner. The final adjustment can then be made by rotating the tuning controls in step and noting whether oscillation occurs at any point.



"ELSTREE SIX" WINS WORLD'S CHAMPIONSHIP

Radio Press Star Design Gets Premier Award in Dutch International Competition

Amateurs of all nationalities were invited to submit wireless apparatus constructed by themselves for competition in the International Radio-Amateur Festival, held in Amsterdam between September 18th and 26th. The aim of the Amsterdam Radio Society, organisers of the festival, was to encourage the spirit of good will between Dutch radio amateurs and their friends in all countries.

The result of this international competition, open to the world, has gained for a Radio Press reader and a Radio Press design the first place. THE GOLD MEDAL OF THE COMPETITION, THE HIGHEST DISTINCTION POSSIBLE, HAS BEEN AWARDED TO AN "ELSTREE SIX" set, entered by Mr. R. W. Emerson, of 3, St. Ann's Terrace, St. John's Wood, London, N.W.8. Mr. Emerson is interested in the construction of wireless sets purely as a hobby, being engaged in the fur business.

THE "ELSTREE SIX" ENTERED FOR COMPETITION WAS IDENTICAL IN LAY-OUT AND CONSTRUCTION WITH THE ORIGINAL "ELSTREE SIX," the Radio Press Star Set of which a full description was published in the June issue of "Modern Wireless."

THE WINNER TELLS HIS STORY.

I HAVE been asked by the Editor if I would give Radio Press readers an account of my visit to the Amsterdam Radio Exhibition, also as to why I chose the "Elstree Six" for the competition.

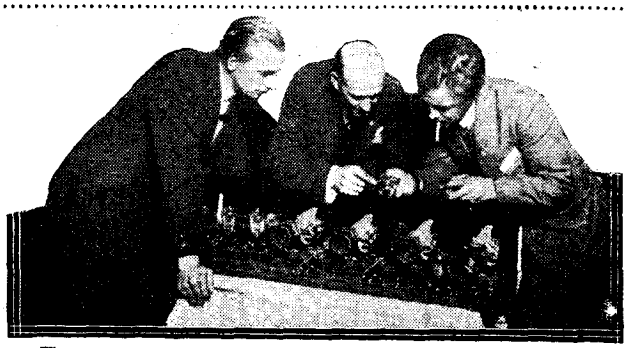
First of all, as to why I chose the "Elstree Six." When the basis of this circuit appeared in *Wireless Weekly* on April 7, 1926, Vol. 8, No. 8, I was rather impressed with its possibilities, especially as to the elimination of the parasitic oscillations which are sometimes present in split coil neutrodyne circuits, but I decided to wait a little (as I was still experimenting with another receiver) to see if Radio Press went any further with this, and I was very pleased to see it arrive in the circuit of the "Elstree Six" which appeared in the June number of *Modern Wireless*. I then decided to leave the other set and make up one stage of H.F. on this principle before making the set, to see how it functioned, and I then tried it in front of a five-valve set, and found it quite good and stable. This settled it, so I started and

THE WINNER'S STORY—(Contd.)

made a set of coils, and built up the set; but, unfortunately, my first attempt was a complete failure, as I was only guided by the wiring diagram, and as I did not get the exact distance between the coils the set failed absolutely to neutralise. Eventually I was able to obtain a full-size blue print, and I made the set again after measuring this, and when it was finished and I had put the last wire on and connected up, it neutralised first time. Although my aerial is screened on all sides and 60 ft. long, and no down lead at all and an earth lead of about 40 ft. to an earth tube, I can hear Bournemouth any day free from London and as loud, and only being one mile away from 2LO's aerial I think this speaks very highly for the set. I have a choice of 20 stations any evening, weather conditions permitting, and I have tuned in over 40 stations on the loud-speaker.

The tuning is fairly sharp but easy, as the dials can be set to give the same setting for each condenser, and I would advise any reader who is in doubt as to what set to make to set about it now and make one, and I am sure they will not be sorry. If any such reader lives within riding distance of my house I should be pleased to demonstrate this set to him, and give him every assistance to make a success.

Mr. R. W. Emerson.



The winner (centre) describing his "Elstree Six" to two of the officials of the Amsterdam Festival.

Mr. Emerson's "Elstree Six" won this gold medal (the premier award).

The Visit to Holland

Now regarding my visit to Holland, I was very much surprised to receive a message to the effect that I had won premier prize in the International Competition, which was the gold medal, and I thought it only right that I should go over and receive this signal honour at the hands of the Society, so I wired to the Secretary to the effect that I would come over to receive same, also to bring greetings from British amateurs. I arrived at Amsterdam at 8.30 a.m., where I was met by the Chairman and Treasurer of the Amsterdam Radio Society, who escorted me to the Belle Vue Hall, where the Exhibition was taking place, and on my arrival, as a mark of esteem, was greeted with "God Save the King" by the band. I was then introduced to all the committee and some of the judges, including Herr Idzerda, the owner of the celebrated PCGG station, of whom British amateurs have all heard before broadcasting commenced.

Prize Distribution

At 8.30 on Sunday evening the distribution of the prizes took place, and I was duly presented with the gold medal, and this was added to by a very kind speech of congratulation by the Chairman, which was translated into English for me by him.

On Monday morning I made a tour of all the stands to see the sets and components that were being offered, which sets were mostly of the straight type and five-valve Aperiodic 2H.F. type. I was rather disappointed at the small amount of components that were made by the Dutch manufacturers, the majority of components being either German or American, but there were a few British parts there; also loud-speakers. During the afternoon I was taken round the town and shown the interesting parts, also the Rembrandt Galleries, by Herr Kroon, and after the exhibition was entertained by several of the exhibitors at the Hotel Americain, where the health of the British amateurs was toasted, and hopes expressed that the relationship between the Dutch and British amateurs would be more firmly united.

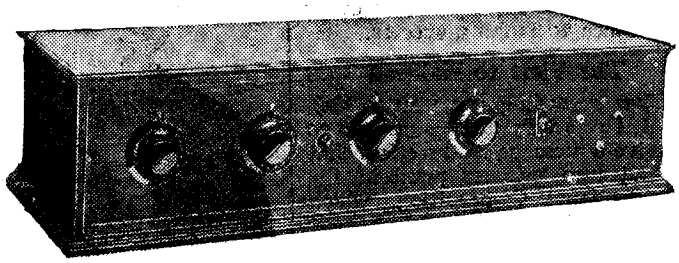
During the evening I proposed giving a special demonstration of the "Elstree Six" for the benefit of the exhibitors and public, but although I tuned in several stations, atmospherics were so bad that reception was absolutely spoilt, but they heard sufficient to show the capabilities of the set, and I made several of the persons present work the set themselves, and as a result I have got to send sets of parts to assemble there for demonstration purposes! I was unable to repeat this on Tuesday, as the set had to be packed ready for despatch to London on Tuesday morning.

A Final Message

I should especially like to thank Herren Verkoeven, Nassau, Tooren, and Bontikoe Irving for the way they did everything to make my

(Concluded on page 506.)

MORE "ELSTREE SIX" APPRECIATIONS



Letters from enthusiastic builders.

"Willing to Demonstrate"

SIR,—Further to my letter *re* my results with the "Elstree Six," which you published in the August number of MODERN WIRELESS, I would like to state that I am willing to demonstrate my "Elstree Six" to anyone interested (by appointment, of course). I have already had some twenty or so visitors, and all have been delighted with the results, followed by wholesale scrapping of old sets and the building of "Elstree Six" sets. If you care to make my offer known to your readers I will do my best to give any assistance possible.—Yours truly,

SIDNEY JOHN ALAND.

9, *Kilmaine Road, Fulham.*

"Every Station"

SIR,—As a dealer I was interested in the reports of the "Elstree Six" and its claims for selectivity and distant reception and the ability to tune in so many stations on the loud-speaker. I obtained the necessary components strictly to specification and assembled the set, with the result that I am able to tune in every station, both long and short wave, on the identical condenser settings as given in MODERN WIRELESS of June and July.—Yours truly,

W. B. FORD.

Merly Wimborne.

"Very Satisfactory"

SIR,—*Re* results obtained from the "Elstree Six," I am pleased to state that this receiver has been working now for a month and the results obtained, up to the time of writing, are very satisfactory. I have certainly not yet received 70 stations, but I feel quite sure that with a little more practice, the number of stations I receive will compare very favourably with the number of stations that the set is claimed to receive.

May I mention that I have been a constant reader of both the MODERN WIRELESS and *Wireless Constructor*, having built several of your designs.—Yours truly,

W. HARVEY.

Gateshead-on-Tyne.

"Almost Incredible"

SIR,—I have just returned from the Channel Islands, where I have been demonstrating the "Elstree Six." This receiver is the finest I have yet handled for simplicity of working, and the way station after station can be tuned in is almost incredible; as regards volume and purity of tone, everyone who has heard it agrees that they have never heard its equal. The receiver, as I have proved by my demonstrations, is fully up to your claim for it. All B.B.C. stations could be heard quite clearly for over 500 yards away.

Wishing you every success, and I hope for nothing better than the "Elstree Six."—Yours truly,

Stoke Newington. C. WILSON.

Part of the apparatus used at the weather forecast bureau at Washington, U.S.A., by means of which weather forecast maps are transmitted and received by wireless.

An article is being prepared giving further details, operating notes, etc. of the Screened Coil Superheterodyne described in our last issue. It was unforunately impossible to include it this month, since it is desired to give details of the results obtained with a number of makes of intermediate transformers, some of which are not yet available for testing.

Treasures which crumbled at a touch

NOT so long ago the whole world was thrilled with the accounts of the exquisite treasures being exposed to the light of day at Luxor. Superb jewels worth a king's ransom—marvellous carvings typical of the splendour of the Pharaohs—georgeous sepulchral furniture — and most wonderful of all, tapestries and draperies which, until they were moved, retained the beauty and freshness of the day they were woven.

But—whilst the jewels, the carvings and the furniture have now been added to the museums—the fabrics and the tapestries have gone for ever. Their delicate, gossamer-like threads could not withstand even the most careful handling. After thirty centuries, the fibres had lost their pliability—at a touch they shivered into a thousand fragments.

This tragedy of crumbling treasures affords a striking parallel for wireless enthusiasts. Once the filament of a valve is crystallised with age it is liable to become fractured at the slightest blow. Even the ordinary wear and tear of everyday use will shorten its life. Now, however, a filament has been discovered which—because it operates almost without heat—permanently retains its pliability. Age cannot affect it. Even after several thousand hours of use its electronic emission is as prolific as ever. This Kalenised filament is one of two vital improvements introduced by Cossor this season. The other is Co-axial Mounting—a system of construction acknowledged to be one of the greatest steps forward in valve design for several years. Ask your Dealer to-day for our latest Folder describing the many exclusive features of these new valves.

Read about their amazing economy—their greater sensitivity and improved tone, but above all, their guaranteed uniformity of performance. Never before have such remarkable valves been available.

The new Cossor Point One
With Black Band. An ideal supersensitive Detector. Consumption ·1 amp. at 1.8 volts **14/-**

The new Cossor Point One
With Red Band. Pre-eminent among H.F. valves. Consumption ·1 amp. at 1·8 volts **14/-**

The new Cossor Stentor Two
With Green Band. For Power Valve use—ideal for Super Sets. Consumption ·15 amp. at 1·8 volts **18/6**

Cossor Valves

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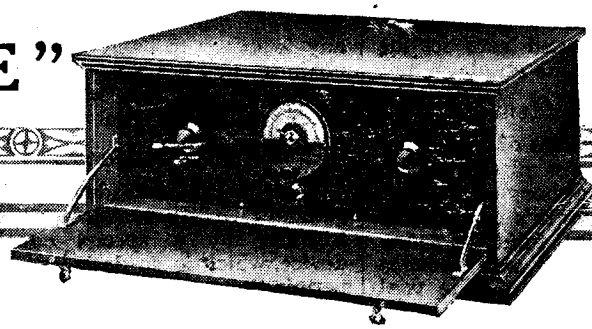
SOME FURTHER NOTES ON THE "SOLODYNE"



THERE are many readers who have by now constructed the "Solodyne" and are obtaining their first results with this receiver. As far as can be seen at present little difficulty is being experienced in obtaining satisfaction, but there appears to be one or two small points upon which further information is desirable.

One of the queries which is often raised is that of the reaction control. This at times is inclined to be "ploppy," and not to give the full and progressive increase of signal strength which is desirable. This will be found in practically every case to be due to the fact that the receiver has not been properly balanced up.

Balancing

In last month's issue instructions were given concerning the method of balancing up and neutralising this receiver. It will be remembered that the sequence of operations was briefly as follows:

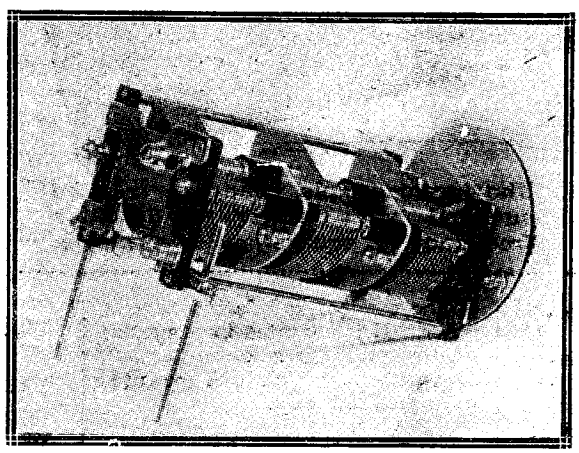
1. Tune to the local station.
2. Adjust aerial condenser until aerial circuit is approximately in tune.
3. Neutralise the first valve by removing the fixed resistor and adjusting the neutralising condenser until a zero is obtained.
4. Neutralise the second valve in a similar manner.
5. Tune in to a distant station.
6. Balance up all the circuits again.

Now it is in this final balancing up that the satisfactory operation of the receiver is obtained. With an approximate balance it is possible to obtain quite a variety of stations, but they lack the kick and volume that one would expect, and moreover the reaction control is not smooth and progressive.

An Interesting Point

If this is found to be the case, then a little more care should be taken in the balancing operations. It may be that several attempts have to be made in order to obtain a final state of affairs, but this is a matter which will quite easily be found by trial. As a matter of fact the second "Solodyne" receiver which we constructed down at Elstree behaved in a remarkable manner, and we began to wonder if there was not some fluke in the construction of the first one which gave such excellent results, because the second model was at first disappointing in its performance.

It was not until we had tested the receiver in quite a number of different places, expecting to find a fault, that we turned our attention again to the balancing of the various condensers, and after re-adjusting them some three or four times, tuning in different stations on which to re-balance, we found that the trouble really lay in this aspect of the question.



The Ormond triple "gang" condenser.

Choosing Distant Stations

It is essential to choose the distant station which is crisp and clear cut. This nowadays is a matter of some difficulty owing to the continual heterodyning which is only too prevalent. It is usually possible with a little care to find some station somewhere about the middle of the dial on which the tuning is sharp and well defined, and on this station the balancing operation should be carried out.

Particular care should be paid to the balancing of the second and third condensers. The aerial condenser can always be balanced quite easily, but the other condensers are apt to be a little critical. The definite test as to whether the circuit is properly balanced up really lies in the reaction control, and it will be found that when the last two circuits are correctly adjusted the reaction will cause a progressive and smooth increase in signal strength until the receiver finally oscillates.

Aerial Circuit

The aerial circuit also affects the reaction control to a small extent, but this can be slightly out of balance without causing serious trouble. We have dwelt upon this subject at some length because this is really the only part of the operation of the receiver on

SOME FURTHER NOTES ON THE "SOLODYNE"—(Concluded)

which any trouble is likely to be experienced, and it is simply a matter of time and care for the correct results to be obtained.

Triple Condensers

Many other makes of triple condensers have been placed on the market, and although, as was stated in last month's issue, many of these appear to fulfil the necessary conditions, it was thought desirable to make a definite trial of these alternative condensers before definitely recommending them for use in the "Solodyne" receiver. This has been done in the case of several of the alternative condensers, while certain other makes are at present undergoing test and will be reported on next month.

Cyldon Condenser

This condenser is made up by mounting three standard Cyldon condensers on an ebonite base plate. Each of the condensers is provided with a long rocker arm, all of these being linked up by a solid rod. Thus the rotation of the first condenser carries with it the other two. Independent adjustment of each condenser is possible by unscrewing a set screw and advancing or retarding the condenser by means of a tommy bar. The adjustment in practice was found to be quite simple, and the results obtained with this condenser were very satisfactory.

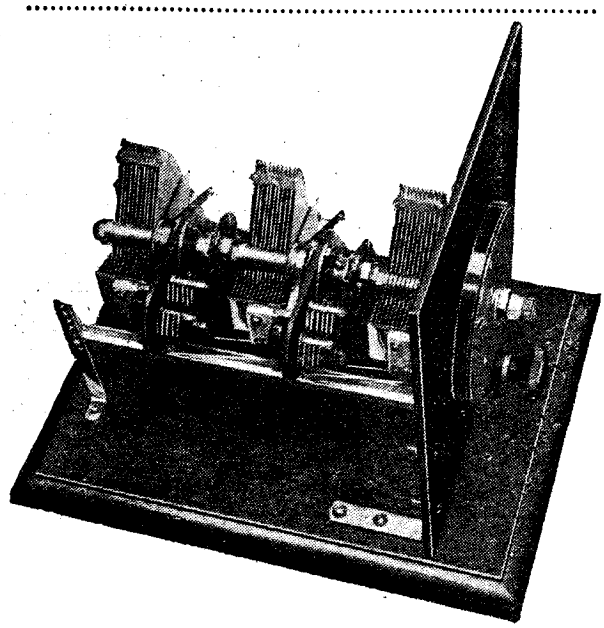
Three-hole fixing is provided with a special support to take the weight of the remote end. Any tendency to hand effect is avoided by an earth shield which completes a well-constructed unit.

Ormond Condenser

This condenser comprises three Ormond units mounted in a skeleton chassis, and provided with an insulated coupling between the several condensers. By undoing the screw and rotating the spindle of the condenser in question with the tommy bar provided, the condensers may be balanced up as required. Feet are provided to take the weight of the end of the condenser, single hole fixing being utilised at the panel end. An earth shield is also provided to avoid any tendency to hand effect. Self-aligning ball-bearing construction is adopted, and the whole makes a very neat and useful component.

Utility Condenser

This unit is made of three standard Utility condensers linked together by a special coupling device, which is so designed as to permit the variation of the settings of the condensers relative to each other. It is mounted in a suitable chassis and gives quite a neat arrangement which can be used quite satisfactorily.



The Igranic triple condenser can be supplied with either straight-line frequency or square-law type plates.

Igranic Condenser

Messrs. The Igranic Electric Co. have submitted to us a "gang" condenser for use in the "Solodyne" which uses a somewhat different principle of compensation. The arrangement consists of three standard condensers mounted up in a gang, while two small balancing condensers are connected across the second and third condensers respectively. It is suggested that these two condensers may be set to a value which will duplicate the effect of the aerial capacity connected across the tapped portion of the first tuned circuit. At the same time, if there is any slight discrepancy between the second and third coils, it can be allowed for by means of this balancing condenser.

Provided that these three coils used for tuning purposes are accurately matched, as is in fact the case with the commercial screened coils, then this method of compensation appears to be quite sound, and in actual practice this has proved to be the case. This condenser has been tried in an actual "Solodyne" receiver and has given results equally as good as those obtained with the original method of compensation.

The method has the advantage that either Square-law or S.L.F. condensers may be utilised, whereas this is not the case with the ordinary method of compensation by rocking the rotors of the various condensers.

The L.F. Side

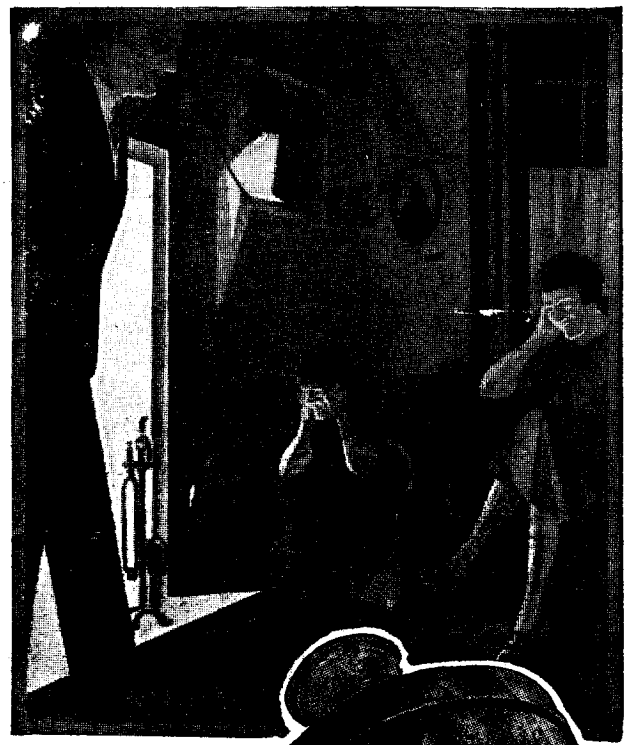
With the "Solodyne" receiver, as with the "Elstree Six," the low-frequency side is quite standard, and can be altered if desired by the constructor. For example, some constructors may prefer instead of using a volume control to insert jack switching so that they may cut out the last stage altogether. This has been tried out experimentally and is perfectly satisfactory.

LATE NEWS.

THE "SOLODYNE" IN CHICAGO.

Following on the result of the success of a Radio Press Star Design at the World's Fair, New York, we have received cabled news of further interesting successes at Chicago. From the meagre information at hand, it would appear that a "Solodyne" receiver constructed by Mr. Anspach, of Dartford, Kent, has won a first prize, and that the "Mewflex," set constructed by Master J. A. E. Black has secured the second award. Mr. Anspach, who has for many years been an enthusiastic home constructor, occupies a position of responsibility in the works of a well-known manufacturing chemists, and Master Black needs no introduction. These results are, of course, subject to written confirmation, and further details will be given in our next issue.

Build your own loud speaker



GONE ARE the days of troublesome 'phones. The LISSENOLA brings loud speaker convenience to every home at a record in low price. For 13/6—less than the cost of headphones—you can buy this wonderful loud speaking unit, needing only the addition of a horn to make it a powerful, full-sized instrument yielding results equal to an expensive speaker. And you can build a horn yourself—with each LISSENOLA we give you full size exact patterns and clear instructions how, for a few pence, you can build a big horn of proved efficiency. In addition, the LISSENOLA will fit the tone arm of any gramophone. The secret of this efficiency rests in the remarkably effective manner in which the electro-magnetic sound-reproducing system is concentrated.

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—before you buy go to your dealer and make this test : Ask him to put on the best loud speaker he has in stock—then use the same horn on the LISSENOLA, *and see if you can notice any difference.*

THE LISSENOLA

Now no home need lack a loud speaker.

PRICE

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EACH.

The illustration shows the effective horn you will build yourself—it can be covered with fancy paper, or wallpaper, and painted so as to resemble a factory article. Get a LISSENOLA for your home.

By using the Lissen Reed (sold separately for 1/-) the Lissenola will carry a cone or any other diaphragm working on the reed principle.

Your dealer will gladly demonstrate and supply, or the Lissenola can be obtained post free by return from the makers—

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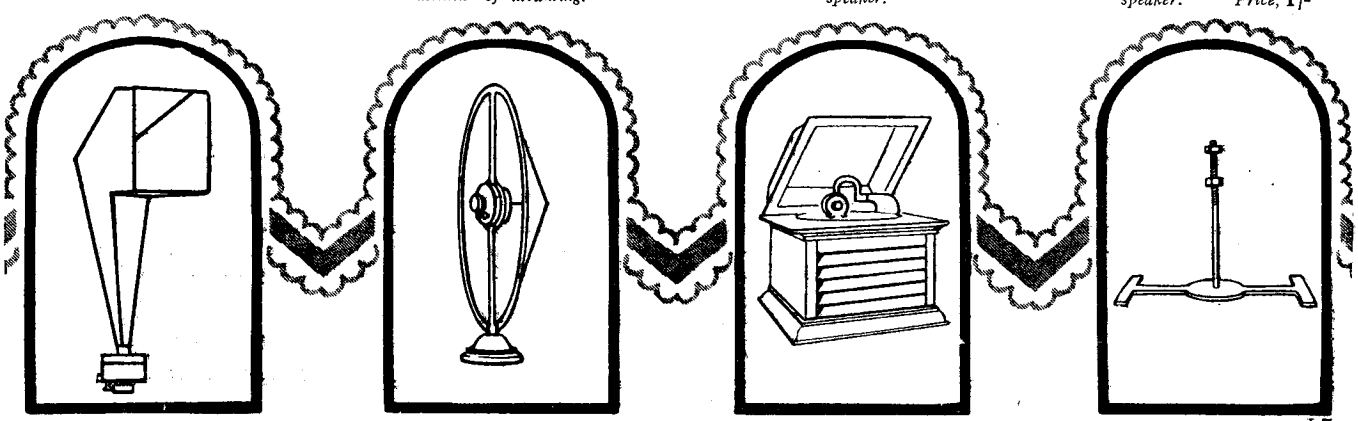
Phone: Richmond 2285 (4 lines). *Grams: "Lissenium, 'Phone, London."*
Managing Director: T. N. COLE.

Full directions for making this horn are given with every "Lissenola."

A cone diaphragm loud speaker can easily be constructed. The illustration shows one method of mounting.

The "Lissenola" instantly converts any gramophone into a loud speaker.

The "Lissen" Reed attachment (pat. pending) for use with cone diaphragm loud speaker. Price, 1/-



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1. Eliminates hand rheostats—thereby simplifying control and giving compactness.
2. Greatly simplifies set wiring, therefore makes for greater efficiency.
3. Prolongs life of valves from 2 to 3 times.
4. No moving parts—therefore no grinding noises.
5. Permits use of various types of valves or combination of valves.
6. No filament meters necessary.
7. Brings the most out of each individual valve—automatically—no guessing.
8. Makes perfect valve operation absolutely fool-proof.

AMPERITE operates on the thermo-electric principle. Contains a specially treated filament hermetically sealed in a glass tube and surrounded by an inert gas. This filament has the unique property of automatically changing in resistance as the L.T. battery voltage changes—so that a practically constant current is maintained in the valve filament. Consequently the valves are constantly operated at maximum efficiency. No knob to turn. Nothing to get out of order. Amperite mounts conveniently inside the set. Really takes the place of a good hand rheostat, a delicate meter and an expert operator.

Tested by the Elstree Laboratories and used in the "Elstree Six" and other good receivers.

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Telephone: **Mayfair 578-9.**

24-26, Maddox Street, Regent Street, LONDON, W.1.

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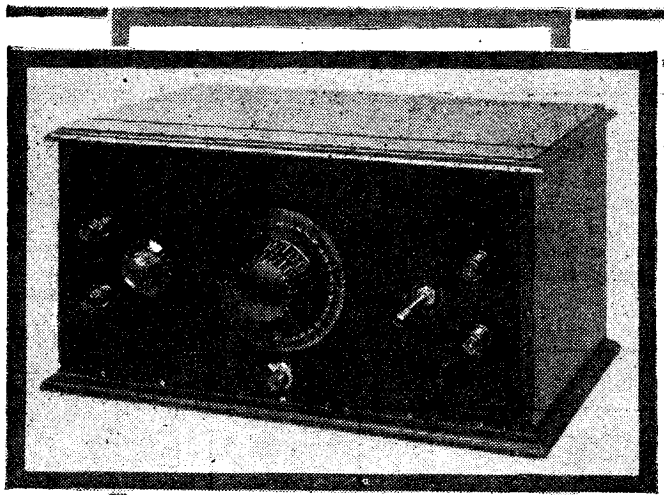


A "PUSH-PULL THREE"

By STANLEY G. RATTEE, M.I.R.E.

Have you a stock of general-purpose valves which you want to use in a loud-speaker set? Here is a design for a receiver which employs such valves throughout and yet gives really good loud-speaking.

THE purpose of the receiver to be described is to enable the local and Daventry stations to be received at loud-speaker strength up to distances of 15 and 100 miles respectively.

This does not necessarily mean that the instrument is useful only for this class of work, for by using telephones instead of a loud-speaker many of the Continental stations can be tuned in at good strength.

A Question

It is possible that some readers will ask themselves why push-pull amplification is used in this particular set, since the low-frequency stages are preceded only by a detector valve. It is true that the grid swing with this arrangement in normal circumstances is not so great as would justify the use of push-pull amplification and power valves, but the present arrangement allows, and is intended to allow, the use of general purpose valves throughout in order to produce results which are not appreciably different from those given by power valves when used in an ordinary straight L.F. amplifier.

The Transformers

The transformers used in this form of amplification are different from those usually associated with low-frequency work in that the first is arranged with a split secondary while the second has a split primary, there are therefore five terminals on each transformer instead of four.

Use as a Family Set

The receiver as illustrated has been in use for some weeks now as a family loud-speaker set, and for this purpose has been used with three .06 valves and an 80 volt high-tension battery.

The simplicity of the panel and the fact that an "on and off" switch is incorporated renders the receiver particularly suitable for use by womenfolk who, so far as

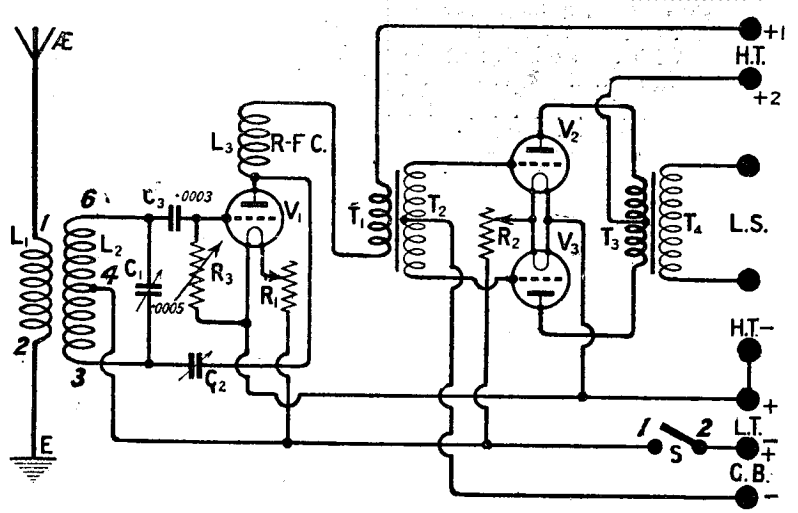


Fig. 1.—The theoretical circuit. C_2 is the reaction control condenser.

The connections when using these components are such that the two low-frequency valves are in parallel, and in consequence the signal energy is split up equally between the two valves, reducing very largely the possibility of overloading them, and thus preventing distortion arising from this cause.

A "PUSH-PULL THREE"—(Continued)

my experience goes, are usually somewhat frightened of more than one knob; visions of burnt out valves and other disasters looming largely in their minds should they touch the wrong one.

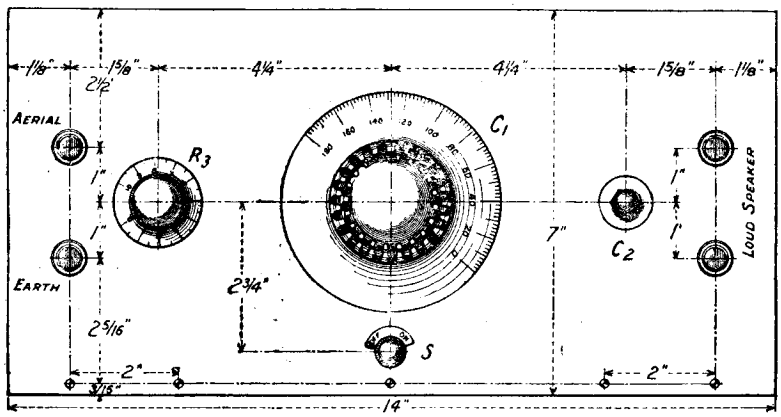
Reaction is incorporated in the set and is controlled by a small condenser of the neutralising type, and in order that there may not be any difficulty in making the receiver oscillate with this small condenser when various valves are used a variable grid leak is also provided.

Points in Design

In order that the set may be reasonably selective for those occasions when it is desired to listen to distant stations on telephones, the receiver is designed for use with "fieldless" coils of the plug-in type, thus allowing an inductive coupling to be used for the aerial circuit. With the exclusion of the aerial, earth and loud-speaker terminals, all the terminals are fitted to an ebonite strip situated at the back of the set, thus doing away to some extent with the untidiness of trailing battery wires. The American type of cabinet is adopted so that valves and coil may be enclosed, and a lid is provided to permit of access to the interior.

The Circuit

The theoretical circuit accompanying this article shows L_1 and L_2 as the aerial and grid coils, and these are embodied in the "fieldless" component previously referred to.



The panel drilling diagram. Blue-print No. 183a is obtainable free of charge.

The form of reaction used is, it will be seen, of conventional type and is controlled by the condenser situated between the radio-frequency choke and one of the ends of the coil L_2.

The first transformer it will be noticed is arranged with a centre tapping which is connected to the grid bias negative, the two ends each being connected to the grid of a valve; this particular transformer is called the "input" transformer.

The second transformer is different from the first in that instead of having a centre tapped secondary, it is the primary which is thus provided, the centre point being connected to the H.T. positive. The two ends of the primary windings are each taken to the plates of the low-frequency valves, while the loud-speaker is connected across the secondary winding.

It will be further noticed that the L.F. valve filaments are controlled by a common rheostat, and since this is done for simplification, it is recommended that the valves V_2 and V_3 be of the same type, particularly as a common grid bias is used.

Components and Materials

There will be found separately a list of components and materials used in the set as illustrated, and though it is not advised that values where given be departed from, it may be taken that other suitable components will be found in the advertisement pages with the exception of the transformers, these being of special type only just recently placed upon the market.

The tuning condenser used is fitted with a slow motion device, and in distant reception this refinement will be found exceedingly useful; the receiver can, however, be easily operated quite satisfactorily without using this device.

COMPONENTS REQUIRED

Cabinet to take panel and baseboard, 14 in. by 8½ in. by ¾ in. (Camco).
Ebonite panel, 14 in. by 7 in. by 3/16 in. (Camco).
"Yaxley" switch. (Rothermel Radio Corporation, Ltd.).
"Duvarileak" variable grid leak. (Dubilier Condenser Co., Ltd.).
"Neutravernia" condenser. (Gambrell Bros., Ltd.).
.0003 fixed condenser. (Dubilier Condenser Co., Ltd.).
.0005 S.L.F. condenser. (Ormond Engineering Co., Ltd.).
Three "Lotus" valve-holders. (Garnett, Whiteley and Co., Ltd.).
Two "Push-Pull" transformers. (Radio Instruments, Ltd.).
Two baseboard mounting rheostats. (A. F. Bulgin and Co.).
One "Fieldless" coil and six socket base. (Lissen, Ltd.).
Radio frequency choke. (Varley Magnet Co.).
Ten terminals: "Aerial," "Earth," "L.S." (2), "L.T.–," "L.T.+," "G.B.–," "H.T.–," "H.T.+1" "H.T.+2." (Belling and Lee, Ltd.).
Panel brackets. (Burne-Jones and Co., Ltd.).
Quantity No. 16 "Glazite" and wood screws.
Ebonite terminal strip, measuring 6 in. by 2 in. by 3/16 in.

The set referred to in the "Evening News" article is fitted with "CYLDON" Condensers—which is further testimony to their ability to meet the exacting conditions necessary for such demonstrations. If YOU too wish for perfect reception, you MUST fit "CYLDON" Condensers.

Evening News OCTOBER 7 1926.

DANCING AND

...T WOULD ...G. ...WITH

ALMOST PERFECT WIRELESS.

LONDON DEMONSTRATION NO ONE SHOULD MISS.

MUSEUM CONCERT.

From Our Wireless Correspondent.

During the past few months I have been asked almost daily: "Where can I go and hear a wireless set that will give me a fair idea of what a first-rate reproduction of music sounds like?"

Until very recently no such set has been permanently available for public demonstration as far as I know but now any London listener may obtain a free hearing of the very latest model of receiver and loud-speaker

Most up-to-date apparatus has been installed in the wireless section of the Science Museum in South Kensington.

After 4 p.m., on every afternoon except Mondays and Thursdays this set is at work receiving the London programme, with a strength and purity unrivalled by any apparatus I have ever heard.

7-Valve Set.

The expert in charge of the wireless section of this museum told me many details which will interest enthusiasts.

The set is one of 7 valves. The ... one stage of high-frequency amplification, followed by a detector. The ... of rectification used is a secret ... understand, a decidedly ... ...m of anode

Still further triumphs for CYLDON Condensers

1. Premier Award. Mr. R. Waldo Emerson, who was awarded the International Gold Medal for 1926 by the Amsterdam Radio Society for his "Elstree Six" has written us saying that his success was due "in great measure" to his use of "CYLDON" Condensers.

2. Second Prize. Radio World's Fair, New York, September, 1926. 2nd. Prize awarded in senior section of the Junior Competition for a "Mewflex" Receiver fitted with "CYLDON" Condensers.

3 Third Prize. Radio World's Fair, New York, September, 1926. 3rd. prize awarded in the multi-Valve Class in the International Competition for the 'All British' Set. "CYLDON" Condensers and Temprytes were fitted.

The above competitions were open to the world—including American and European receivers. Verb. sap.

Three Popular "Cyldon" Condensers

Triple-gang Condenser	- -	Price **£3 - 10 - 0** without dial.
2-gang Condenser	- - -	„ **£2 - 10 - 0** „ „
4-gang Condenser	- - -	„ **£4 - 10 - 0** „ „

Get full particulars of all CYLDON Products from your dealer or write direct to the makers. Other CYLDON Condensers comprise Square-Law, Square Law Dual Pattern, and the S.L.F. model. 4-in. Knob Dial, supplied free with Square Law and Dual Models, and 2/- extra with S.L.F. or 2, 3, and 4-gang models.

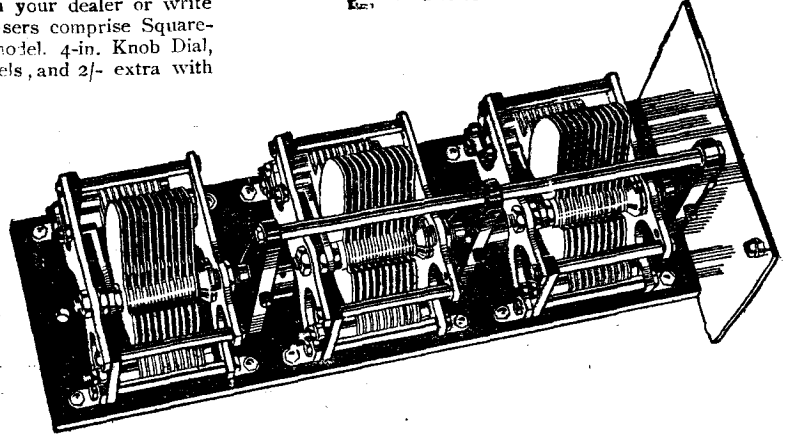
CYLDON

(pronounced Sil-don)

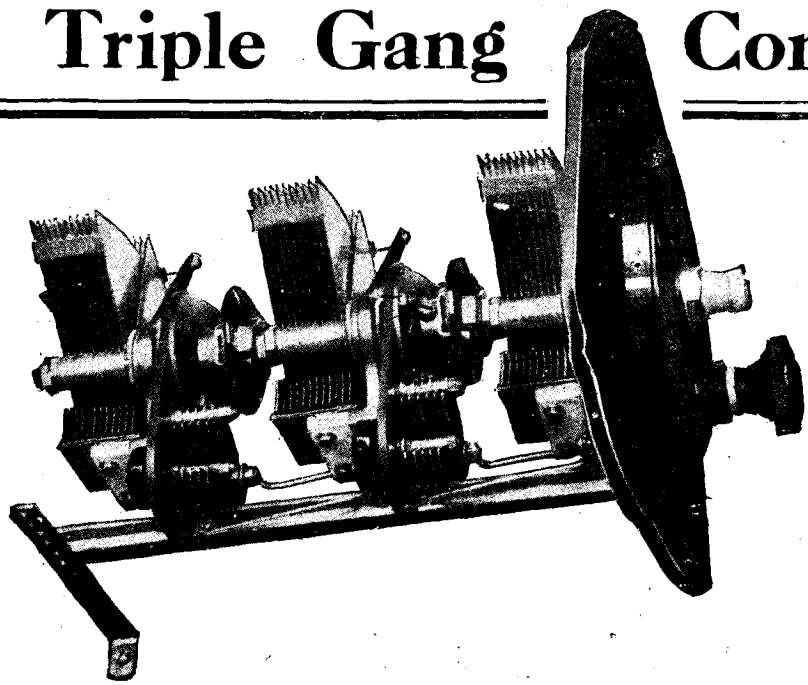
SYDNEY S. BIRD & SONS

"Cyldon" Works, Sarnesfield Road, Enfield Town, Middlesex.

Telephone: Enfield 0672.



Igranic Triple Gang Condenser



The Triple Gang problem solved

THE new Igranic Triple Gang Condenser successfully overcomes the difficulties of tuning three circuits with a single control. Two miniature condensers are incorporated in easily accessible positions so that each circuit can be exactly equalised, after which all tuning is effected through the main control knob.

The Igranic method of equalising the three circuits does not necessitate altering the relative settings of the three main condensers, and the wavelength variation for a given movement is the same in each condenser, thus preserving the accurate square-law characteristic of the Igranic Triple Gang Condenser over its whole range.

The Igranic Triple Gang Condenser is unique. It makes the tuning of the "Solodyne" as simple as a single-valve receiver.

PRICE **£3 15 0**

PRICE without equalising condensers, but with adjustable couplings **£3 10 0**

Igranic Triple Gang Condensers are built up from three Igranic-Pacent .0005 mfd. Square Law Condensers. The whole construction is particularly robust; losses and minimum capacity are negligible, and the movement is extremely smooth.

The Igranic Indigraph Vernier Knob and Dial is particularly recommended for tuning. PRICE 7/6

See the full range of Igranic Radio Devices at Stand No. 55, Manchester Wireless Exhibition, Oct. 26 to Nov. 6

SEND FOR THE NEW IGRANIC CATALOGUE J. 149

IGRANIC ELECTRIC CO., LTD.

149, QUEEN VICTORIA STREET, LONDON.
Works: BEDFORD.

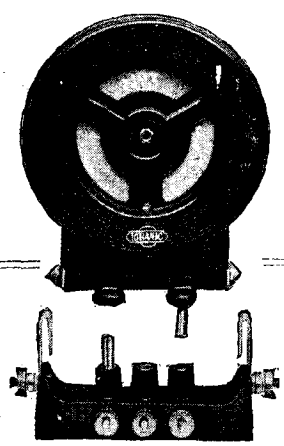
IGRANIC CENTRE TAPPED "XLLOS" (EXTRA LOW LOSS) COILS.

Igranic Centre-Tapped "XLLOS" Coils are particularly suitable for modern neutrodyne circuits.

Igranic Centre-Tapped "XLLOS" Coils actually contain two separate inductances, which may be used separately or may be joined in series to form a single coil from which a centre tapping may be taken.

Five sizes, giving wavelengths of approximately 110 to 3,500 metres.

No. 1	7/-	No. 4 ...	9/3
No. 2	7/6	No. 5 ...	10/6
No. 3	8/3	Mounting Base	4/6



A "PUSH-PULL THREE"—(Continued)

Wiring in Imagination

With all the components collated together and the panel drilled in accordance with the instructions laid out in the drawing illustrating the panel layout, arrange the components upon the baseboard in such a manner as to simplify the wiring. Do not, of course, depart from the layout given, but make sure that the components chosen are placed the best way round for any connections before securing them to the baseboard. Imagine the connections between the various points and make up in your own mind the most attractive manner in which to wire up. If the components as listed are used, then, of course, all that is necessary to do is to copy the practical wiring diagram.

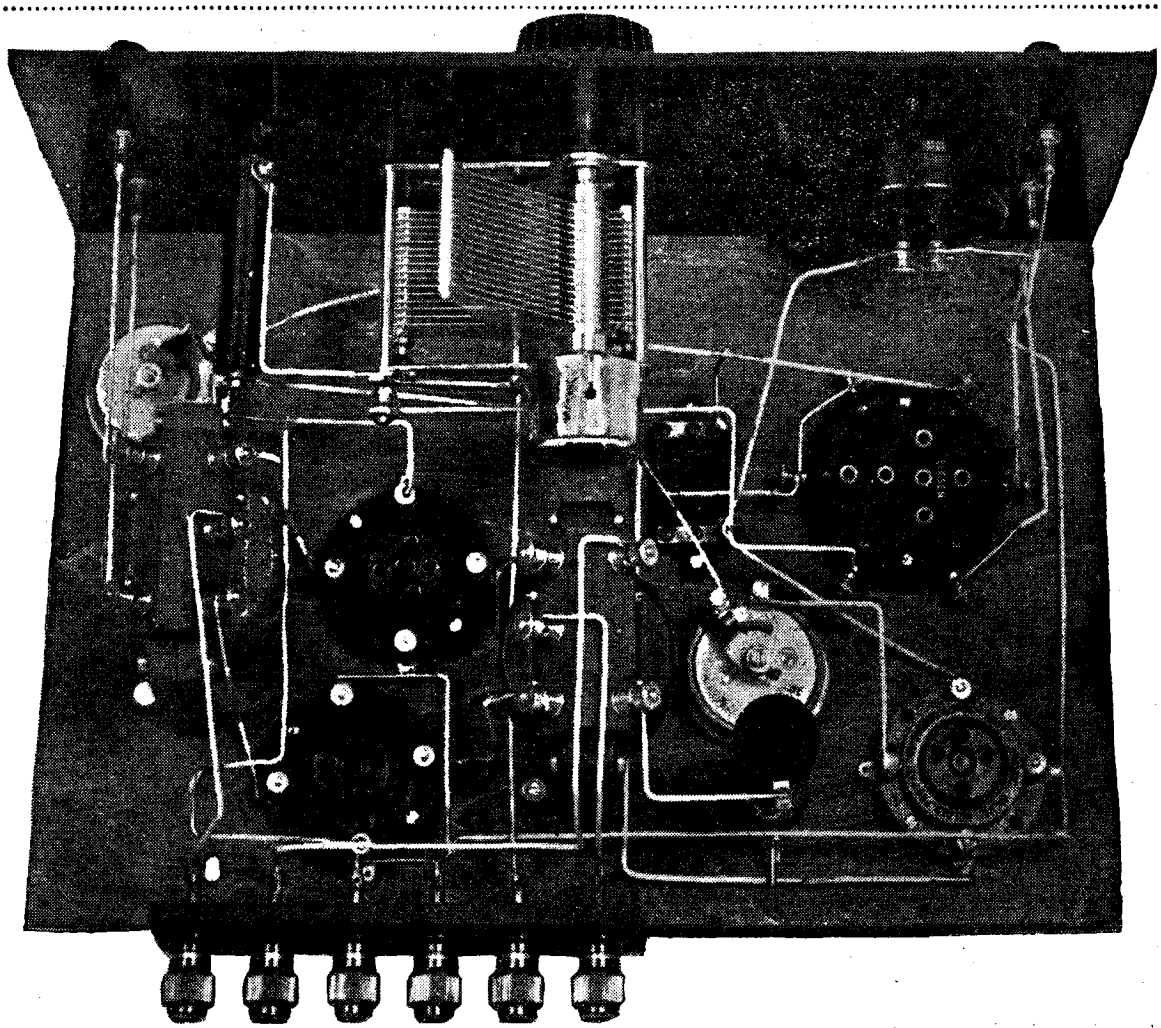
Connecting Up

The wiring up of the receiver in such a manner as to produce the theoretical circuit illustrated is but to copy the directions given in the wiring diagram. The connections to the "fieldless" coil base are numbered and the terminals 4 and 5 should be joined together and regarded as the centre tapping of the grid coil L_2. The layout is such that the grid terminals of valve holders come immediately opposite the ends of the secondary windings of the transformers, to which they are connected, while similarly the two anode terminals of the L.F. valves come immediately near to the ends of the primary winding with which they are connected.

The low-tension negative terminal is also used as the grid bias positive so the connection from the centre tapping of the "input" transformer secondary is taken to the only grid bias terminal so marked.

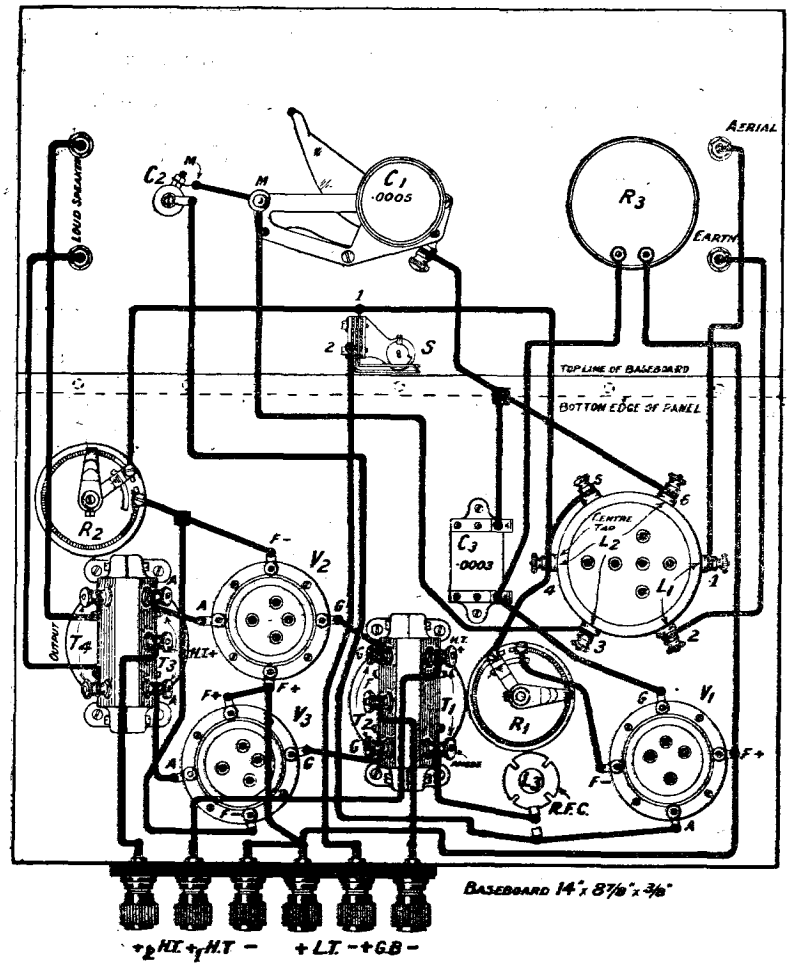
Care Needed

When actually connecting up every care must be taken to keep the wiring clear of the baseboard mounting rheostat, otherwise difficulty may arise when it is required to carry out any adjustment of these components; similarly the wiring to the base of the "fieldless" coil should also be done with care to ensure that the coil will not foul when it is inserted in its base.



This view of the components mounted on the baseboard will help the constructor in wiring up the set.

A "PUSH-PULL THREE"—(Continued)



The switch S controls the valve filaments. Blueprint No. 183b may be obtained free.

The wiring to the valve holders and transformers should also be done in such a way as to give clearance to the valves when they are inserted, and though these are obvious points which everyone knows, they are nevertheless points which one frequently forgets in one's haste and enthusiasm.

Testing the Receiver

After the wiring has been completed and checked against the practical wiring diagram the batteries may be connected and the receiver tested for working.

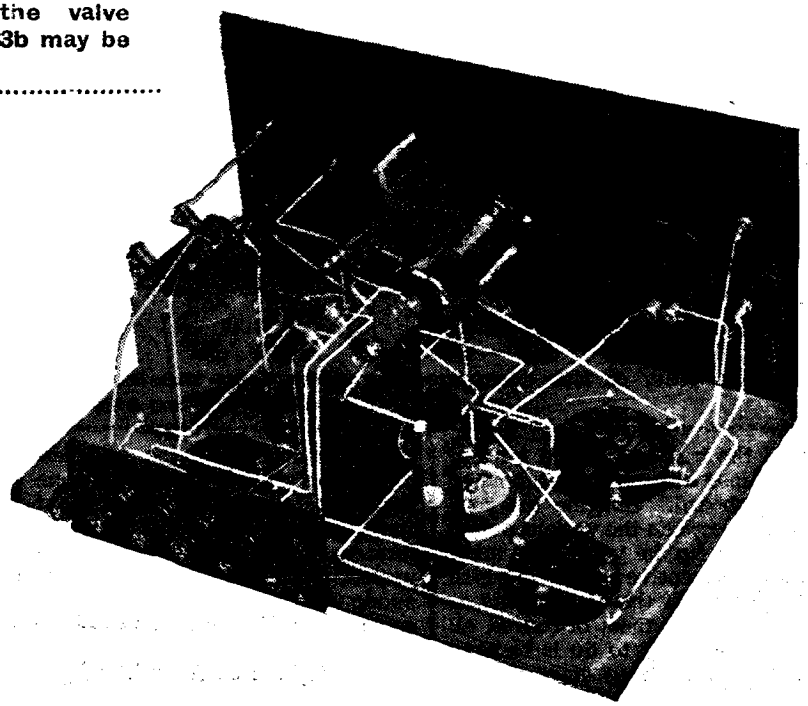
First place in position the "fieldless" coil, turn the switch to the off position and connect the low-tension battery across the appropriate terminals. Insert the valves in their sockets and ascertain that the filament resistances give adequate control of the brilliancy of the valves, not forgetting to turn the switch to the on position before doing so; in carrying out this test it should be remembered that the two low-frequency valves are controlled by a common rheostat.

Upon this part of the wiring proving correct, connect the two H.T. + terminals together and apply, say, 3 volts of the H.T. battery across the H.T. negative and either of the H.T. + terminals and note the valve as to any alteration in brilliancy; if there is any change, then the wiring must be incorrect and checked once more against the wiring diagram.

Assuming, however, that everything is satisfactory, remove the wire joining the two H.T. + terminals together and apply a voltage of about 60 to H.T. + 1 and 80 — 120 to H.T. + 2. Connect the positive of the grid battery to L.T. negative and the negative of the same battery to the G.B. — terminal, using as a start 4½ volts.

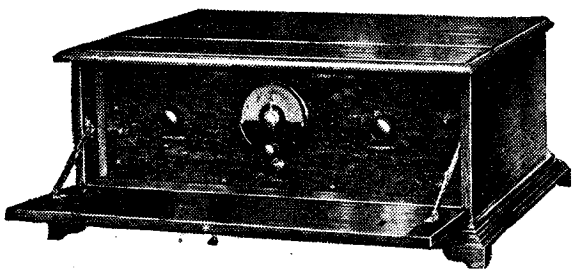
Turn the reaction condenser in an anti-clockwise direction as far as it will go, connect the aerial, earth and a pair of telephones to the appropriate terminals.

The photograph shown below will assist in following out the connections to the fieldless coil base.



HITCH YOUR AERIAL TO A "STAR"!

We supply all RADIO PRESS "STAR" SETS either as finished Receivers or in parts for home-assembly.



The "ELSTREE SOLODYNE"

"5 valves — 1 dial — 50 stations"—

Radio Press Test Report.

Every finished instrument bears the signature of Capt. W. R. TINGEY, A.M.I.R.E.

(late of Radio Press Research Laboratories), who is now in charge of our Test Department.

IF you want an efficient and handsome receiver ready built, you cannot do better than purchase one of these "Star" sets from us. They are designed by experts, made by skilled workmen and thoroughly tested on a large number of British and Foreign stations at full loud-speaker strength. These sets are installed free within 50 miles of any one of our branches.

SHOULD you prefer to assemble your own set—and there is no finer hobby for the long evenings—you can do so under our famous "Pilot" Service, with every assurance that your efforts will be successful. Write for details* of this service, and mention the type of set you want.

IN EITHER CASE WE GUARANTEE YOU GOOD RESULTS!

Prices of "STAR" Sets.

"Elstree Solodyne."	£ s. d.
Finished Instrument, royalty paid ...	27 7 6
Set of Copex Screened Coils, 250/550m ...	3 11 0
Other parts required	10 17 6
Black Ebonite Panel, matted and drilled	11 6
Mahoganite Panel, matted and drilled ...	18 6
Polished Mahogany Cabinet	4 5 0

"Mewflex Three."	£ s. d.
Finished Instrument, royalty paid ...	26 3 6
Set of Copex Screened Coils, 250/550 m	3 15 0
Other parts required	10 3 0
Panel, matted and drilled	14 6
Polished Mahogany Cabinet	4 5 0

"Distaflex Two."	£ s. d.
Finished Instrument, royalty paid ...	23 19 6
Set of Copex Screened Coils, 250/550m ...	3 15 0
Other parts required	9 18 0
Panel, matted and drilled	11 6
Polished Mahogany Cabinet	3 10 0

"Night Hawk."	£ s. d.
Finished Instrument, royalty paid ...	23 1 3
Set of Keystone Fieldless Coils and bases 250 to 500 m.	2 2 0
Other parts required	9 8 3
Panel, matted and drilled	8 6
Polished Mahogany Cabinet	3 0 0

The "All-British Six"

You will be delighted with the amazing results! This set built with our Copex "O/C" type coils recently secured the highest award for European sets in the International Amateur Competition held in conjunction with the New York Exhibition.

	£ s. d.
Finished Instrument, royalty paid ...	36 0 0
Set of Copex Screened Coils, 250/550 m, with diagram of connections... ...	5 0 0
Other parts required	16 5 6
Polished Mahogany Cabinet, with drilled panel and baseboard	6 0 0

¶ If a complete set of parts is ordered, Marconi Royalties at the rate of 12/6 per valve holder are payable.

* Send three penny stamps for the new edition of our booklet giving illustrated details of many of the latest Radio Press Receivers. Much useful information on assembling, soldering and testing is also included.

THE PILOT MANUAL

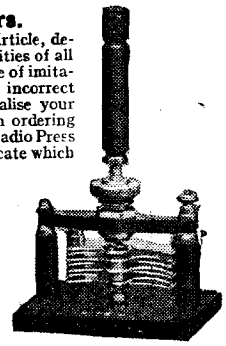
Improve your Set with KEYSTONE Components!

"Keystone" Neutralising Condensers.

A thoroughly efficient article, designed to suit the capacities of all types of valves. Beware of imitations which, owing to incorrect design, may not neutralise your valves properly. When ordering these condensers for a Radio Press "Star" set, please indicate which set you are building.

For board mounting **5/-**

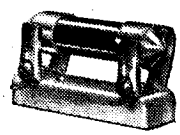
For panel mounting, **6/3**



Balancing Condensers

Similar in design to the above, but having two sets of fixed plates instead of one ... **7/6**

"Keystone" Fixed Resistors.



Our latest product. Recommended for all receivers which use fixed resistors. Available in the following types:—

No. 4 for '25 amp. valves with 6 V accumulator.
No. 17 for '06 amp. valves with 4 V accumulator.

Price, complete with base, **2/6** each.

"Red Triangle" Panels make Perfect Sets.

One of these famous panels, guaranteed free from surface leakage, will improve reception on *your* set—and it will also considerably enhance its appearance. Panels cut dead to size and sold in sealed wrappers:—

Black, matt both sides.
Black, polished one side, matt one side. Both ¼ in. thick. } **¾d.** per sq. in.

Mahogany, polished one side, 3/16 in. thick, **1d.** per sq. in.

N.B.—All Radio Press sizes kept in stock.

"Keystone" Connecting Wire.

The use of coloured insulated wires improves the appearance of a set and simplifies the wiring. Keystone wire is of the highest grade, well insulated, and supplied in the following colours: Red, Green, Black, White, Yellow.

10 ft. coils, any colour ... ... **9d.**
Packets of five 2 ft. lengths, assorted colours **10d.**

"Keystone" Super-Het. Constructional Portfolio.

Before you commence building a Super-Het. send for this portfolio, which contains full-size blue prints of the famous Keystone 7 Valve Super Het. With the portfolio we will send you, free of all cost, the Keystone Book, giving minute instructions for the assembly, wiring and operation of this superb receiver. 48 pp, fully illustrated. **3/-**

STOP PRESS

THIS MONTH'S SET.

The Drawing-Room Five, the Push-pull Three, and other receivers described in this issue are available as finished instruments or in parts for home assembly in the same manner as the other sets mentioned on this page. Write at once for detailed price list.

PETO-SCOTT CO., LTD.,

Head Office (Mail Order): 77, City Road, E.C.1.

Branches:

LONDON, 62, High Holborn, W.C.1
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P.S. 6081

DYNAMIC CURVES

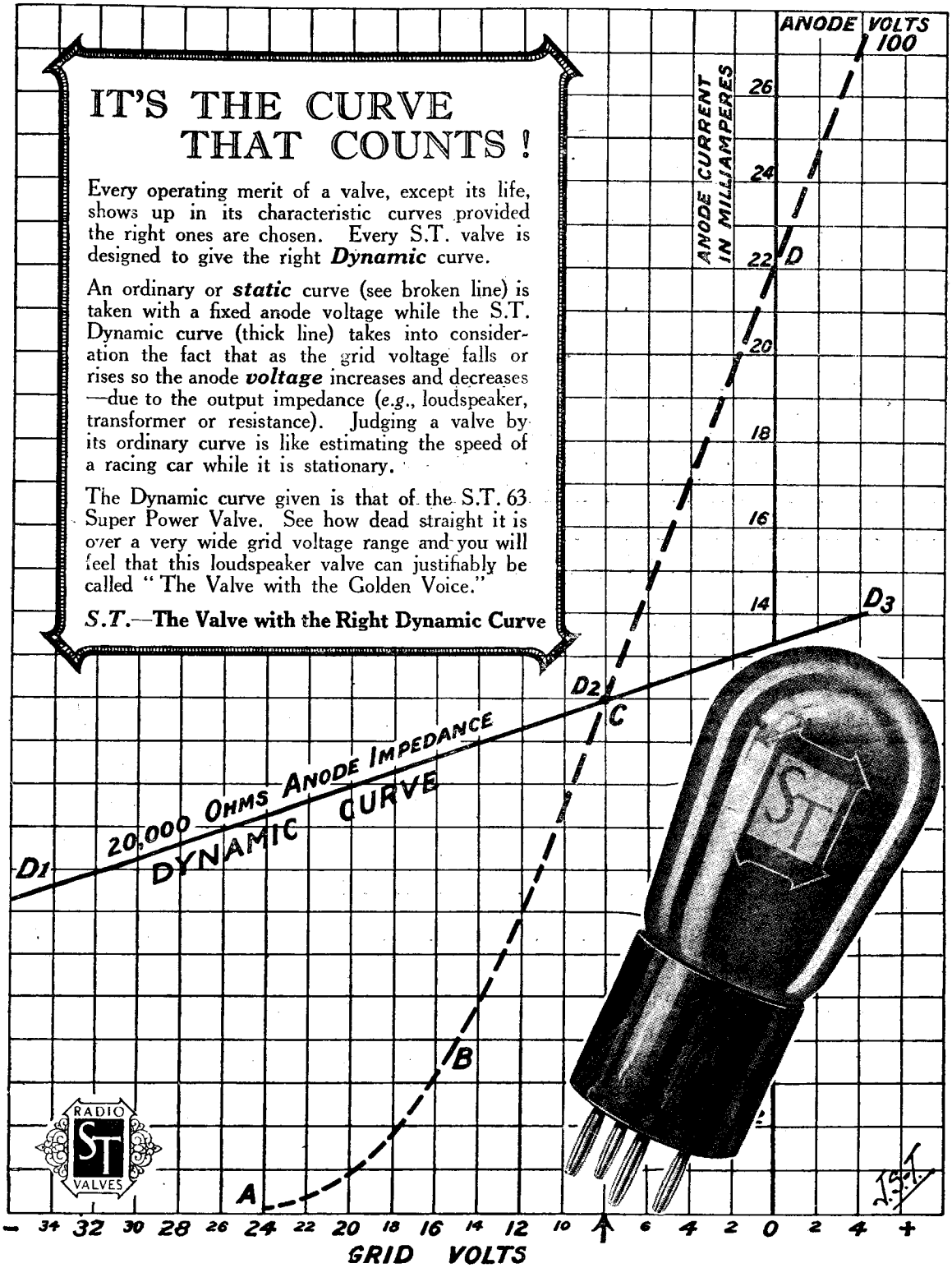
IT'S THE CURVE THAT COUNTS!

Every operating merit of a valve, except its life, shows up in its characteristic curves provided the right ones are chosen. Every S.T. valve is designed to give the right ***Dynamic*** curve.

An ordinary or ***static*** curve (see broken line) is taken with a fixed anode voltage while the S.T. Dynamic curve (thick line) takes into consideration the fact that as the grid voltage falls or rises so the anode ***voltage*** increases and decreases —due to the output impedance (*e.g.*, loudspeaker, transformer or resistance). Judging a valve by its ordinary curve is like estimating the speed of a racing car while it is stationary.

The Dynamic curve given is that of the S.T. 63 Super Power Valve. See how dead straight it is over a very wide grid voltage range and you will feel that this loudspeaker valve can justifiably be called "The Valve with the Golden Voice."

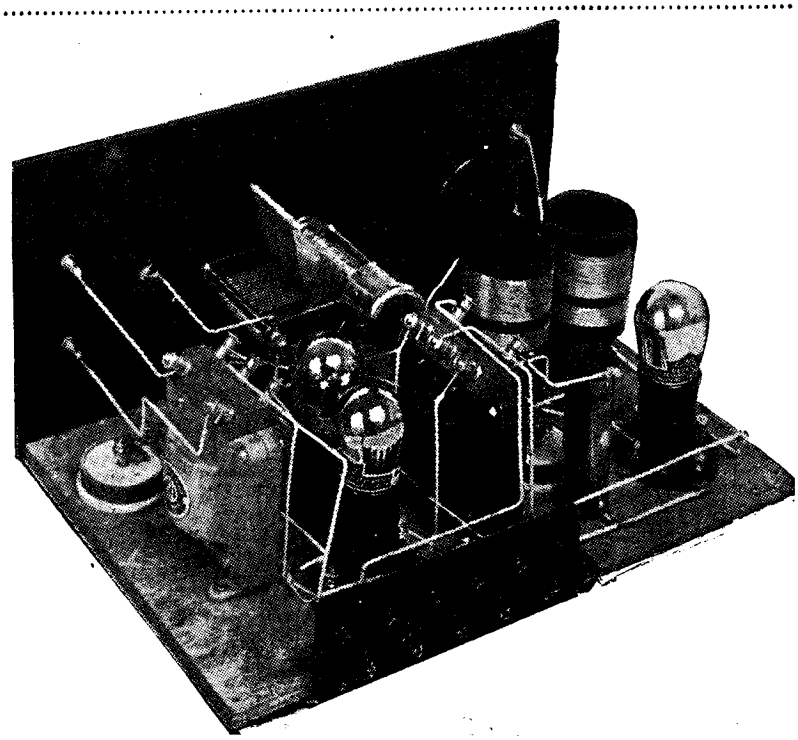
***S.T.*—The Valve with the Right Dynamic Curve**



A "PUSH-PULL THREE"—(Continued)

Adjusting the Voltages

By turning the variable condenser slowly throughout its range the local station will soon be tuned in at good strength, whereupon turn the reaction condenser ever so slowly in a clockwise direction until the receiver is just off oscillation. Should the set show no inclination to oscillate when the reaction condenser is turned, turn the grid leak knob either one way or the other until the desired effect is obtained. If, on the other hand, the receiver tends to oscillate too easily reduce the voltage connected to the H.T. + 1 terminal until a smooth control is given by the reaction condenser.



Good results can be obtained with ordinary general purpose valves in the L.F. stages.

Keeping the H.T. + 2 terminal connected to a suitable tapping on the H.T. battery, tune in the local station to its loudest volume once more and adjust the grid voltage until signals are pure and clear, using as high a value of grid volts as possible without losing signal strength or spoiling in any way the results formerly obtained.

Operating the Set

Once the two filament resistances have been adjusted to suit the valves chosen the switch may be used as the only necessary means of switching off; similarly, after the correct high tension and grid voltage have been found these two need not be touched, subject to age and so on.

Tuning is performed by means of the variable condenser C_1, and stations should only be sought when the reaction condenser is set so that the receiver is well under control. In the event of the set being adjusted close to the oscillation point when it is desired to reduce the reading of C_1, then the reaction condenser should be turned a little in an anti-clockwise direction before doing so, otherwise it is conceivable that considerable interference will result from permitting the set to oscillate.

Valves

The receiver has been tried with valves of all types and makes, using 2, 4 and 6 volts as the low tension supply, and satisfactory results have been obtained with all of them.

For purposes of general listening the receiver has for a long time been fitted with ordinary general-purpose ·06 valves for reasons of economy in filament current, with the relatively low H.T. voltage of 80 applied to the anodes of the low frequency stages.

(*Concluded on page 622.*)

WIRING INSTRUCTIONS

Join one side of R2 to contact **1** of S: contact 1 of S to terminal 4 of L2; terminal 4 of L2 to one side of R1 and terminal 5 of L2.

Join contact 2 of S to LT –

Join G of V3 to one "Grid" terminal of T2.

Join remaining side of R2 to F – of V2 and F – of V3.

Join remaining side of R1 to F – of V1.

Join F+ of V3 to F+ of V2; F+ of V2 to LT +; LT + to HT – and F+ of V1; F+ of V1 to one side of R3.

Join earth to terminal 2 of L1.

Join aerial to terminal 1 of L1.

Join remaining side of R3 to one side of C3; same side of C3 to G of V1.

Join terminal 6 of L2 to remaining side of C3, and fixed plates of C1.

Join A of V1 to one side of L3; same side of L3 to fixed plates of C2.

Join terminal 3 of L2 to moving plates of C1; moving plates of C1 to moving plates of C2.

Join remaining terminal of L3 to "Anode" terminal of T1.

Join centre terminal of T2 to GB –.

Join "HT +" terminal of T1 to HT + 1.

Join remaining "Grid" terminal of T2 to G of V2.

Join A of V2 to one "Anode" terminal of T3.

Join A of V3 to other "Anode" terminal of T3.

Join one side of T4 to one loud-speaker terminal.

Join other loud-speaker terminal to remaining side of T4. Join HT + of T3 to HT + 2

HEAD OF RADIO PRESS RETIRES

Mr. Scott-Taggart's Decision to Enter Valve Business

Will Probably Continue to Write

IT will, no doubt, come as a great surprise to readers of MODERN WIRELESS to hear that Mr. John Scott Taggart, F.Inst.P. A.M.I.E.E., the founder and head of the great Radio Press organisation, has retired in order to enter the valve business.

To those who know him the step which he has now taken is not altogether surprising. His whole technical life has been devoted to a study of the manufacture and use of the valve. Behind the scenes he has done a great deal to assist the radio industry and valve industry, and it is only logical for him to market a series of valves bearing his name, which will carry with them a reputation which has always belonged to one who has devoted the whole of his interest to this section of radio.

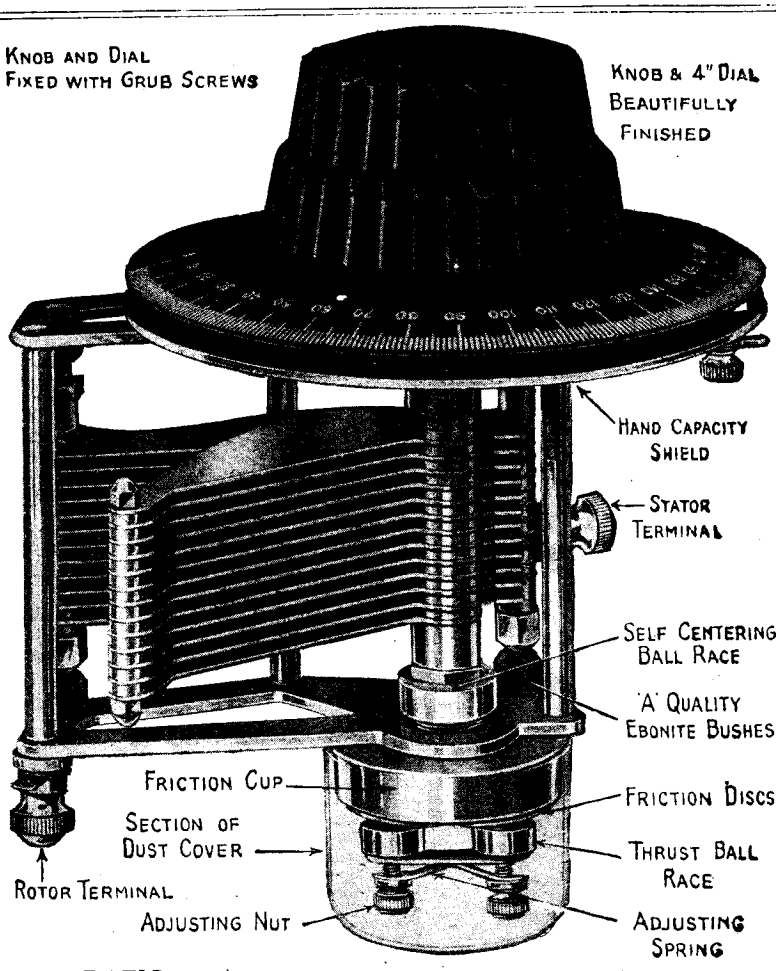
It is probably news to a large number of readers of MODERN WIRELESS that Mr. John Scott-Taggart has already been a valve manufacturer. The present time is an appropriate one to know what must be one of the most interesting and unusual careers.

Early Days

Before the war, Mr. Scott-Taggart was a keen amateur, and 13 years ago he was writing articles, although only at school. He had one of the relatively few transmitting stations in those days, and possessed the call sign LUX.

During the war, Mr. John Scott-Taggart served from 1914 to 1919, first in the Seaforth Highlanders, and later in the Royal Engineers. Enlisting as a private, he was rapidly promoted to Sergeant-Instructor of Signalling.

He was later promoted in the field to commissioned rank, and was first in the results of every examination on valves held at the General Headquarters in France.



(RATIO 55-1)

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EXTRAORDINARILY LOW PRICES

Prices: With 4 inch Bakelite Knob:

.0005 microfarad	-	20/-
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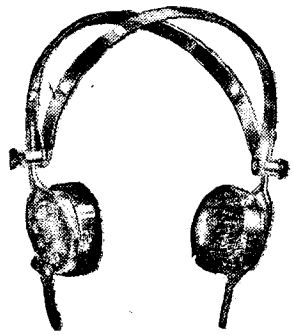
Ormond S.L.F. Condensers are obtainable from all dealers.

Orders can now be taken for the ORMOND TRI-GANG CONDENSER eminently suitable for the Elstree Solodyne Receiver. Price **£2,** complete with anti-capacity shield, knob and dial.

THE ORMOND S.L.F. ENABLES YOU TO PICK UP STATIONS WITHOUT CALCULATIONS



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Brown A 2 Headphones are famous for their astonishing sensitiveness, astounding responsiveness and superior tone. Many crystal users have obtained a large increase in volume by their use, while valve users in many countries prefer them for long distance reception. In resistance of 2,000 ohms. Price 30/-

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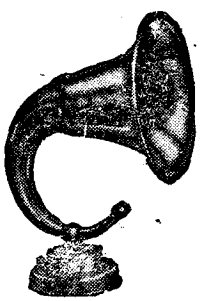
LONG before Broadcasting was ever thought of in England, the name **Brown** was indubitably bound up with Wireless Headphones. On the high seas, ships' operators relied upon them to receive vital messages; on the fields of war, when thousands of precious lives depended upon messages going through, the army put their faith in **Brown** A type 'phones; the Navy, many other Government services, and the World's Cable Companies—all have for long chosen the **Brown** as the supremely sensitive and utterly dependable Headphone.

What better recommendation could you desire than the faith so many vital Services have placed in the **Brown**? Whether you buy the famous original A-type, the new A2 (unequalled anywhere at thirty shillings) or the popular Featherweights, you know you are getting a headphone constructed on the same unique **Brown** principals, with the same **Brown** high standard of manufacture, and which, you can be sure, will give the same **Brown** incomparable service. Don't ask for Headphones—follow the experts' choice and say "**Brown.**"



Brown H.J. Loud Speaker —one of the range of nine, from 30/- to £15 15s.

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Gilbert Ad. 6055

HEAD OF RADIO PRESS RETIRES—(*Continued*)

Pioneer Work on Valves

As a wireless officer in the Royal Engineers, he took part in fighting on Vimy Ridge in April, 1917, and was one of the very first to use valve transmitters in warfare. Later in the year, he became an Instructor at the 1st Army Signal School, giving courses of lectures on the valve. Although he had been engaged in active service, Mr. Scott-Taggart had written articles for *The Wireless World* in 1917, and later in the year he wrote the first article dealing in a comprehensive manner with the characteristic curves of valves. This article was entitled, "On Characteristic Curves and their Use in Radio Telegraphy and Telephony," and was also published in *The Wireless World*.

The training of Army wireless operators is carried out on up-to-date valve apparatus

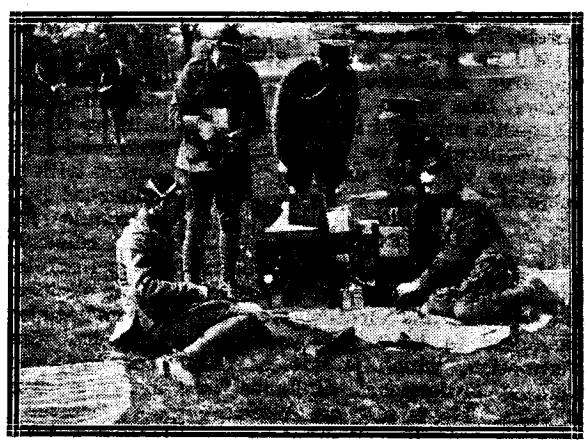
Although investigators in the services had, no doubt, similar information, Mr. Scott-Taggart had to investigate the whole question of characteristic curves from the beginning, and carried out a very laborious set of measurements, which formed the basis of what is one of the first real published analyses of "families" of valve curves.

Wireless Proves Its Worth

At the beginning of 1918, Mr. John Scott-Taggart joined the 55th Division, just before the battles of Festubert and Givenchy, in the La Bassée sector. On April 9, 1918, a fierce attack was made along the whole British front, and due to a flanking movement the original site of the 55th divisional headquarters was actually captured while the front remained substantially unaltered.

The whole of the communications of the division were broken by shell fire, and the direction of operations was carried out entirely by the wireless system, which extended to the front line trenches. For work on this occasion, Mr. John Scott-Taggart was mentioned in despatches.

The part played by wireless in this division may be judged from the fact that the wireless section under his command possessed the highest percentage of decorations for gallantry of any wireless section in the British Army. Later in the year, during the final fighting, Mr. John Scott-Taggart was awarded the Military Cross for "gallantry in maintaining wireless communications under fire."



Without valves the production of the compact transmitter and receiver shown would have been virtually impossible.

Continuous Experiment

Although not enjoying the advantages of a more sheltered technical post, Mr. John Scott-Taggart maintained the closest technical interest in valve work, and carried out much experimental work during rest periods. He also continued to write articles for the technical Press, which disclosed for the first time the great usefulness of the three-electrode valve. Professor Fleming, in his book on the valve, quoted large extracts from these articles, and in his Preface paid a very generous tribute to the original author.

During this period, Mr. Scott-Taggart developed a valve attachment for trench work which eliminated the high-tension battery, and at the time of the Armistice, according to the statement of Colonel Trew, who was the officer in charge of wireless of the B.E.F., this valve attachment was to be fitted to all trench sets.

A Standard Text Book

Immediately after the war, Mr. John Scott-Taggart completed a book entitled "Thermionic Tubes in Radio Telegraphy and Telephony." It is, to-day, the standard text-book on the valve, and is easily the largest book on the subject.

In 1919, Mr. Scott-Taggart took charge of valve manufacture at the lamp works of The Edison Swan Electric Company, Limited. His work was principally the manufacture of different types of valves for the Government, and in view of the very strict specifications and the fact that every valve was rigidly tested by the Government Departments concerned, it proved an excellent training in a particularly difficult process of manufacture. It is interesting to note that the first valves specifically designed for amateur use were designed by Mr.

HEAD OF RADIO PRESS RETIRES—(Concluded)

Scott-Taggart, and were called E.S.2 and E.S.4 valves. These were different from the standard service type of valve which was then the only one readily available to the British public.

Wide Experience

Mr. Scott-Taggart left the Edison Swan works to join the Radio Communication Co., Ltd., which, as readers may know, carries on a big business in ship wireless installations with activities in this country as regards general wireless work which are only second to the Marconi Co. Mr. Scott-Taggart became head of the department dealing with inventions and patents, and was second in seniority to the chief engineer.

He held this position for several years, and during this time acted as patent adviser to the Mullard Radio Valve Co., and in fact prepared the original defence in the patent law-suit which that company had with the Marconi Co., which finally resulted in the House of Lords' decision for the Mullard Co.

The Negatron

It was during his stay with the Radio Communication Co. that Mr. Scott-Taggart's invention, the Negatron valve, was adopted for use in continuous wave reception on dozens of liners, which to-day receive their news bulletins on this ingenious valve which gives a negative resistance effect. This valve, like many of Mr. Scott-Taggart's principal inventions, has no application to broadcasting, but has valuable uses in "commercial" wireless.

Distinctions

Mr. Scott-Taggart is a Fellow of the Institute of Physics, and at the time of his election was the youngest to have achieved that distinction, which is one of the highest professional diplomas in physics. He is also an Associate Member of the Institution of Electrical Engineers, besides holding similar membership in the French, Belgian and American Institutions of Electrical Engineers. Many of his writings, including text-books on the valve, have been published in foreign countries, and he is an honorary member of the German Radio Society.

Mr. Scott-Taggart has lectured

The development of short wave technique allows of the use of small portable aerials.

before the British Association, and at one time devoted considerable attention to the fostering of the Radio Society movement. He was a member of the Council of the Radio Society of Great Britain, and president of several Radio Societies.

Radio Press, Limited

In 1922, Mr. Scott-Taggart established Radio Press, Ltd., as a radio publishing organisation, and has built up the business to its present successful state. Those who have worked with him have been greatly influenced by his enthusiastic aim at technical accuracy in the articles and efficiency in the receiver designs published.

The slightest error in one of his papers has always been followed by what has almost amounted to a court of inquiry to see exactly how the error arose. With regard to the receiver designs, he leaves behind a tradition of seeing that every set is put to exhaustive test and reaches a very high standard before a description is published.

Founding Elstree

It is partly in this account that he conceived the idea, most unusual for a publishing firm, of establishing special laboratories, where apparatus could be put through exhaustive tests and new ideas and designs tried out. The result was the Elstree Laboratories. Mr. Scott-Taggart has amply justified his views on the sound design of receiving apparatus by the production of such receivers as the "Elstree Six," "Solodyne," "Elstreflex," "Magic Five," and other leading designs emanating from the Elstree Laboratories.

The New Company

It is not illogical that Mr. Scott-Taggart should desire to enter the valve business. He possesses all the necessary qualifications for success in this branch of work. We feel convinced that he would not have taken this step unless he were whole-heartedly confident of the product his company is to produce. He is probably the only person in this country who has acquired a wide reputation as an expert on the use of valves as well as their manufacture. The average valve maker is rather inclined to look upon a valve as a form of lamp, and rather to ignore the suiting of the valve to the circuit in which it is to be employed. The use of proper valves for certain purposes is a comparatively recent development, and no doubt Mr. Scott-Taggart's unique experience of modern receiver designs will be an important factor in his new activities.

The Future

On the technical side of Radio Press, Ltd., there are able engineers who will take Mr. Scott-Taggart's place, and the existing traditions will be carried on exactly as before. We have made arrangements whereby we shall from time to time publish articles from Mr. Scott-Taggart's pen, and we are sure that readers will join with us in wishing him every success in his new sphere of activities.

A New Appointment

Some twelve months ago Mr. Scott-Taggart resigned the managing directorship of Radio Press, Ltd., so the actual management of the business remains, as heretofore, in the hands of Mr. Robert A. Lodge, A.S.A.A. Mr. J. H. Reyner, B.Sc., A.M.I.E.E., has been appointed technical manager of the company—an appointment which, we feel sure, will meet with satisfaction in every quarter.

THE "ELSTREE SIX"

Further hints on operation together with some notes upon suitable alternative components which have been tried at Elstree.

A NUMBER of enquiries have been received from readers regarding the low-frequency side of the "Elstree Six" circuit. In some cases readers do not wish to utilise two low-frequency stages, but would be content with only one, or perhaps none. Others have enquired whether the use of low-frequency transformers specified is of any great moment.

As a matter of fact the low-frequency side of this receiver is absolutely straightforward and does not affect the operation of the high-frequency side to any extent. Those readers who wish to utilise other transformers in place of those specified may do so without any detriment to the operation of the receiver, provided that the transformers actually employed are of a reasonable standard of efficiency.

Alternative Transformers

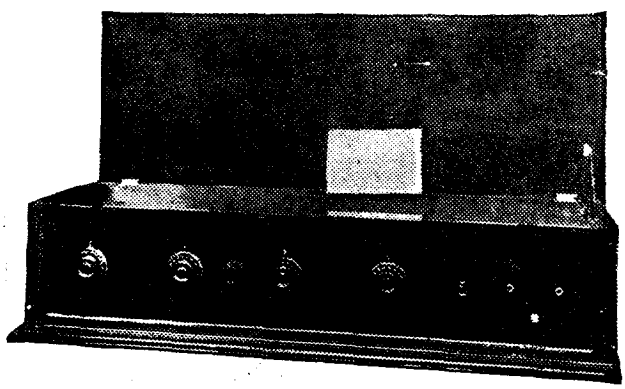
One or two alternative transformers have been tried in the circuit. Two Ferranti A.F.3 transformers operate very satisfactorily. It is sometimes found that there is a tendency to whistle, but if this is the case, a leak of .25 megohms placed across the secondary of the second transformer will overcome this difficulty. Eureka transformers have also been employed in the circuit quite as successfully, while the well-known multi-ratio transformers made by Messrs. Radio Instruments provide a very useful combination in that the suitable tapping for the particular valve in use may readily be chosen.

These transformers are only a few of the suitable alternatives, and the fact that any particular transformer is not mentioned in this list does not preclude its use in the "Elstree Six." As has been previously stated, provided the transformer is of a suitable ratio and of sufficiently high standard it can be used quite satisfactorily.

Wavelength Ranges

Many readers have queried the apparent discrepancy between the results obtainable on the lower wavelength range, and that of the Daventry waveband. On the lower range the axis of the Dimic coils and the plug-in primary are approximately the same. Using the long range Dimics, however, with a standard form of plug-in primary, this is no longer the case, and in fact coupling between the two is somewhat weaker than is desirable.

This results in a certain weakening in the signal strength on the higher range, but this may be overcome by either raising the long-wave Dimic coils on extension pieces, so that the axis of these coils come into line with the axis of the plug-in primaries. Alternatively a much smaller plug-in primary coil may be used. Again, the primary coil may be of a very much smaller diameter, wound if necessary with a much finer wire. Home-made hank-wound coils may be utilised, such coils having about 300 turns wound on a 1 in. diameter former. If these coils are then fitted with standard two-pin plugs they will be found to constitute quite satisfactory primaries for the longer range. Care should be taken to keep the direction of the windings of the primary coils all the same, and they should be so connected that the direction is the same as on the standard plug-in coils.



The "Elstree Six" receiver was described in the June issue of this journal.

The "Unimic" Coil

Messrs. McMichael have recently produced an interesting coupling unit specially designed to replace the plug-in primary which was used in the original model. These coils, which are known as "Unimic" coils, consist of a small coil arranged to fit into a special form of rocking holder. By this means the actual degree of coupling between primary and secondary may to some extent be varied if it is found desirable.

For the shorter waves these coils consist of a short length of flanged tube similar to that on which the Dimic coils themselves are wound, carrying a single layer winding, while for the longer range the Unimic coil is similar to one-half of the Dimic coil for the particular range specified. By means of the mountings provided it is possible to maintain the axis of the primary and secondary coils the same both for short wave and the long wave coils.

Actually the winding is so designed that there is no danger of resonance between the primary and one-half of the secondary winding, the numbers of turns being suitably proportioned to avoid any effect of this at all. Unless this is done there is a danger of trouble due to unexpected oscillation in the circuit.

Dual Condensers

We have received other makes of dual condensers which may be used satisfactorily in the "Elstree Six" circuit. Messrs. Ormond Eng. Co. have produced a dual model of their well-known instrument which is quite suitable in this circuit, and Messrs. Burne-Jones have also submitted a dual condenser which has given satisfactory results.

The use of the specified H.F.

FURTHER HINTS ON THE "ELSTREE SIX"—*(Concluded)*

choke is not essential, and any of the various makes of high-frequency chokes now on the market may be employed in the circuit provided they are of adequate quality. The same remarks apply to the potentiometer, for which any well-made component will suffice.

Resistances

We have recently tried a set of four Mullard wire-wound resistances in the "Elstree Six" with entirely satisfactory results. The same remarks apply to the Dubilier wire-wound resistance, so that either of these two components may be used as suitable alternatives to the Varley resistances which were originally specified.

Filament Switching

Several readers have enquired as to whether it would not be possible to incorporate a filament switching jack in the last stage, so that the last valve may be cut out of circuit when not in use. This course is quite feasible, and in fact has been done in many cases with entirely satisfactory results. Since the last valve is provided with a separate filament resistor, no difficulty is experienced when this valve is cut in or out of circuit.

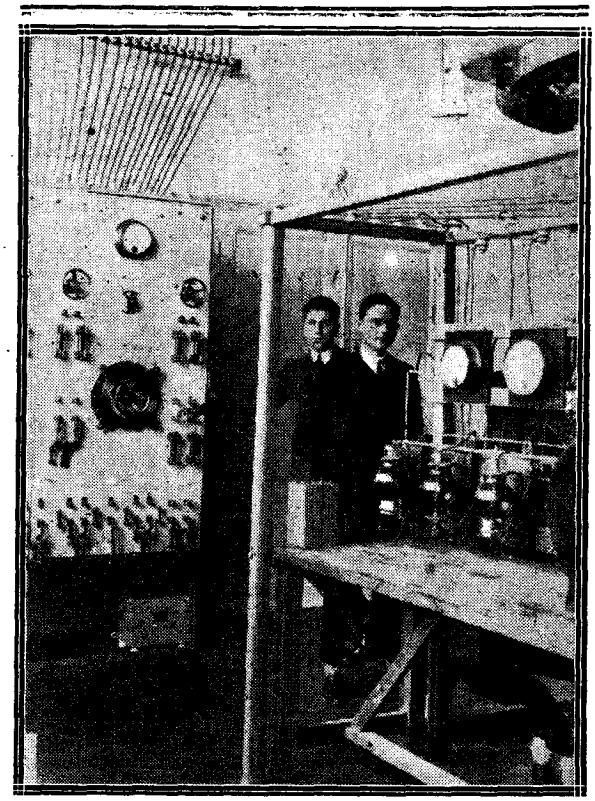
Fixed Resistors

In this connection the use of fixed resistances in the "Elstree Six" may be discussed. The original circuit included Amperites, which are a form of automatic resistance. They pass substantially the same current irrespective of any variation in the voltage of the accumulator within certain limits. The valve therefore passes its true current irrespective of the condition of the accumulator.

If fixed resistors are used then the adjustment of the filament current is automatic, only as long as the voltage of the accumulator remains at 2 volts per cell, when the valve will carry its correct current. The voltage of an accumulator, however, does not vary considerably in use, and for most practical purposes a fixed resistor is perfectly satisfactory. The modern valve is sufficiently flexible to give quite satisfactory results over a fairly wide range of filament currents. The use of fixed resistors, therefore, in the majority of cases is quite permissible, and no loss of efficiency will be occasioned by their use.

H.F. Transformers

There is one point which has perhaps not been sufficiently emphasised in connection with the "Elstree Six" circuit, and that is the flexibility which is obtained owing to the fact that the coupling between the primary and secondary of the high-frequency transformers is variable. If the size of the primary winding is increased then the signal strength will also be increased, but at the same time the selectivity will be cut down. Conversely, if an increased selectivity is required, then the size of the coil in the primary may be reduced, and the required selectivity can be obtained at the expense of a certain degree of signal strength.



A portion of the television laboratories at Maimaison, which are under the direction of Henri Fenal. Some of the transmitting valves may be seen above.

Primary Coils

The arrangement therefore is very flexible, and the reader can suit himself as to the particular combination he uses. When endeavouring to receive stations operating very close in wavelength to the local station the coils in the primaries should be reduced in size until the requisite selectivity is obtained. If, on the other hand, it is desired to increase the strength of a distant station which is not coming through as well as is desired, then the size of the primary coils should be somewhat increased.

When receiving stations close to the local station in wavelength something must be sacrificed, either signal strength or selectivity, but once a little experience is gained in the handling of the receiver, the flexibility obtained by this interchangeability will then become appreciated. It is often found, for example, that the changing of one of the primaries only will make all the difference between satisfactory reception and doubtful signal strength or selectivity.

A Station for nearly Every Degree

SIR,—The results obtained with the "Elstree Six" are far beyond my expectations. For selectivity, distance and pure volume I do not think it will ever be improved upon. As an example of selectivity, Madrid, Manchester, Bournemouth, Hamburg, Newcastle and Dublin are easily separated, and, for distance, Rome and Berne are a fair test. The neutralising, and tuning are quite simple compared with several smaller sets I have used.

Thanking you for your work in turning out such a fine set.—Yours truly,

W. N. BATES

Congleton.

P.S.—I have logged a station for nearly every condenser degree between 38 and 118.

Distortion—visible or audible?

WHEN little Willie takes photographs you must have noticed how the buildings often look as if they are falling down. Frequently this is due to the distortion caused by the use of an inferior and uncorrected lens. It is distortion made visible to the eye. But every wireless enthusiast knows the distortion which comes from the use of uncorrected L.F. Transformers. Just as an anastigmatic lens is scientifically corrected against distortion of every kind and is guaranteed to give a faithful image, so a Eureka Transformer is scientifically corrected and guaranteed to give faithful reproduction. It is a matter of precise mathematics and expert knowledge. The Eureka stands in a class by itself. It has no laminated core and its improved method of "stratum-winding" ensures greater volume with an even amplification of all frequencies. Again and again has it been proved to be the one L.F. Transformer which really "re-creates the living Artiste."

Eureka Concert Grand

A superb L.F. Transformer hermetically enclosed in a coppered steel case proof against atmospheric influences. For second stage use there is the No. 2 which is designed for work in perfect partnership with the Concert Grand. Designed under identical principles.

Concert Grand 25/- No. 2 21/-

Eureka Reflex

For reflex work a special Eureka is available. Gives an exceptional volume of mellow clear tone.

Fully guaranteed 15/-

Eureka Baby Grand

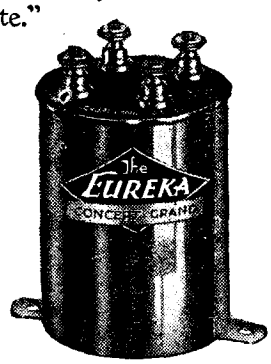
For those who cannot afford the necessary higher price of the larger Concert Grand we have introduced the Baby Grand. Fully up to the same high standards of workmanship and carrying the same generous guarantee. Chosen by many manufacturers of Broadcast Receivers,

No. 1 15/- No. 2 15/-

Eureka L.F. Choke Unit

The L.F. Choke method of amplification is gaining in popular favour among seasoned experimenters. The Eureka Choke Unit, incorporating grid leak and condenser is the finest instrument of its type.

Fully guaranteed 25/-



Portable Utilities Co., Ltd., Fisher St., W.C.1.

Sole Manufacturers of Eureka Radio Products

Re-creates the EUREKA Living Artiste

Gilbert Ad. 6966

"SOLODYNE" SUCCESSES

Appreciations from readers who have built the well-known Elstree "Solodyne" receiver. Two of them are willing to demonstrate its capabilities to any interested enthusiasts.

Will Demonstrate

SIR,—I am sending you a report on the Elstree "Solodyne," which I have just completed.

The set is certainly all you claim it to be, and I find the dial readings are practically identical to those published by you, and this has been a great advantage in identifying the numerous stations received. I will not enumerate them all as they correspond to the principal stations in your list.

Everything is quite straightforward, and anyone who can use a soldering iron could make it successfully. I find that by removing the fixed resistors of the H.F. valves, and connecting the aerial to F.3 of the triple condenser, the set works as D. and 2LF with reaction, and gives tremendous volume on the local station, and is capable of receiving such stations as Hamburg, Frankfurt and many others on L.S.

I am using Cossor .1 valves for the first three and P.M.2s for the last two, and am using R.I. multi-ratio transformers. I am limited to an indoor aerial and also have to take the earth wire out of the window and 20 ft. down to the garden, which is not exactly ideal.

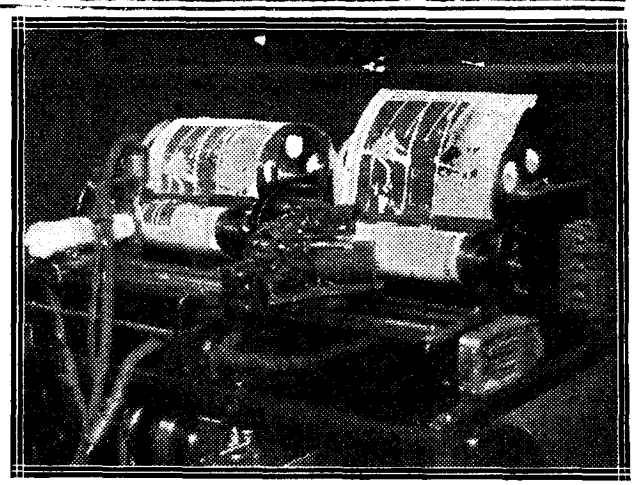
Needless to say I am highly delighted with the results obtained both as regards range and volume and great simplicity, and shall be pleased to let anyone interested try it for themselves, if they care to make an appointment. — Yours truly, F. M. SEARS.

627, *Barking Road, E.13.*

"Tone Wonderful"

SIR,—I have now got the "Solodyne" working well and I am entirely satisfied with the results I am getting, in fact I consider it is better than the super-het I was using before, although that was very good. I only got it working last Saturday, October 2nd, and I have already logged at least 46 stations, all (most of them good strength) on the loud-speaker. Of course, some fading badly at times. A lot of other stations are heterodyned, and I am sure it is possible to get the 50 or even more.

The selectivity is very good, and on a good night I can cut out Cardiff (our local station) and get London very loud indeed by using a good deal of reaction and bringing the tone control nearly down to it.



Some of the "Photo-radiogram" receiving apparatus at Radio House. This instrument was employed in the reception of the photographs of the Dempsey-Tunney fight.

minimum. The volume is excellent and the tone is absolutely wonderful.

I enclose a list of stations I have received, and where I have put a query it means I have not absolutely identified the station, but have gone by the dial in MODERN WIRELESS, and they are different from any other stations in the list.

If anyone likes to come and hear the set at the address below they are very welcome.—Yours truly,

W. MAURICE BROWN.

8, *Trewartha Park,*
Weston-super-Mare.

[The list of stations has been omitted owing to the pressure upon our space.—Ed.]

"Uncanny"

SIR,—I am sending you my opinion of the "Solodyne." It was tested out within a mile of 6 LV, who was tuned out *absolutely* when any other station was being received. I cannot speak too highly of the "Solodyne"; the perfect ease of control, and the way one station after another comes rolling in, is nothing short of uncanny. To sum the receiver up, it is the most wonderful I have ever heard, seen, or handled. Please make whatever use you wish of this testimonial. To my mind, it is a receiver everyone should know about.—Yours truly,

Liverpool. D. MELLOR.

LECTURE AT CROYDON.

On the evening of the 18th October, a short lecture and demonstration of the Elstree "Solodyne" were given before the Croydon Wireless Society, under the chairmanship of Mr. Elsden, at 128A, George Street, Croydon. There was a good attendance and the members present showed great interest in the set. Some of the members had themselves built the "Solodyne" and were glad of the opportunity of obtaining first-hand advice on the handling and adjustment of the set.

TRIUMPH FOR ELSTREE DESIGN

Thirteen-Year-Old Boy's Success at New York Radio Exhibition

"MEWFLEX" WINS SPECIAL CUP

A specially interesting feature of the Great Annual Radio World's Fair at New Madison Square Garden, New York, was the international competition for home constructed sets of all types. The principal class and the only one in which Radio Press readers entered was the multi-valve category (3 or more valves).

Entries were invited from all over the globe, and many sets were sent in by British amateurs, a truly international contest of set builders resulting. The awards were made on a basis of "workmanship, appearance, volume, distance, selectivity and tone," a body of leading American experts, headed by Dr. Alfred Goldsmith, being the judges.

The result has proved to be a triumph for Elstree, and has once again shown the outstanding excellence of Radio Press Star designs. The second prize in the class for competitors under sixteen years of age was won with a "Mewflex" receiver entered by J. A. E. Black, of Mill Hill School, a thirteen-year-old British competitor. This set also won a special cup for general fine workmanship. Below the young prizewinner tells why he decided to make the "Mewflex."

WHEN I decided to make up a set for the International Competition the first question that naturally presented itself was, what set should I construct? Should I build a three-, four-, five-or six-valver? At the time there was the "Elstree Six" or the "Solodyne," "Magic Five," or some other Star set.

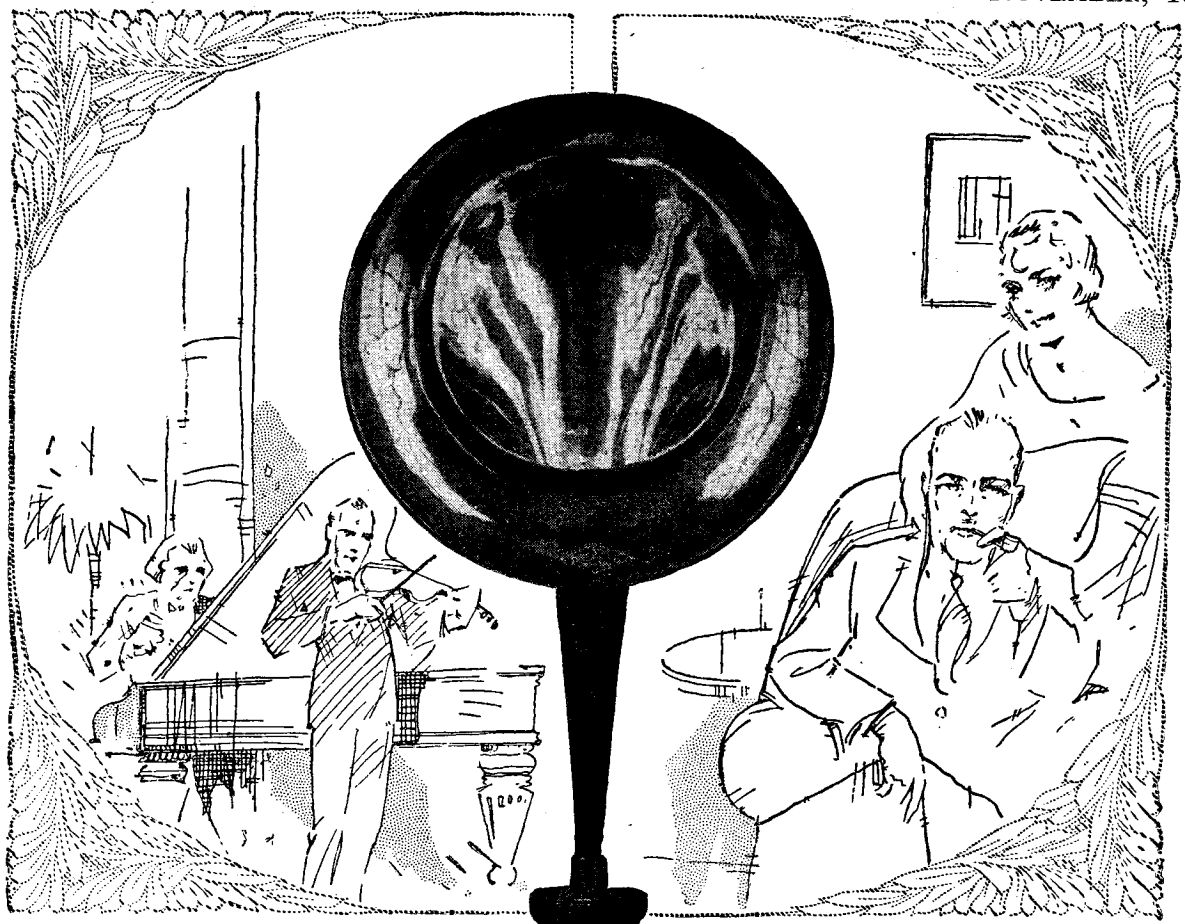
For a three-valve set the "Mewflex" is the best I have ever heard. Prague came in at full loud-speaker strength when London was on. London of course, was faintly audible, but only interfered in the intervals. Over forty stations were logged on this Radio Press set, all coming in at loud-speaker strength. The volume which the set gives on all stations is remarkable for three valves, and London (the local station) is much too loud, but this is beautifully controlled by the volume control, which enables one to bring the local station in with a purity and clarity of tone that speaks well for the design of the receiver.

On the right, Master J. A. E. Black, and, left, a "photo-radiogram" as it was received in New York. It was transmitted in response to a cable from the Exhibition authorities.

The lay-out is extremely compact and neat. Although it is a small receiver as regards valves, the circuit makes the number of components necessarily fairly large, but four tuning dials, a filament switch and the volume control are all the knobs on the panel, and this makes for a very neat appearance.

These are the main reasons for which I chose the "Mewflex." It took me about a week to complete it and test it. All the tests were most satisfactory, and I am firmly of the belief that when conditions for wireless reception become better in the winter the set will give really great results. Selectivity combined with ease of control make the receiver a pleasure to operate and its economy in valves a boon to all who have to carry their accumulators far to be charged. At first when I tested it I had no reaction, as one of the coils was dud. However, I logged Oslo, Frankfurt (loud-speaker strength), San Sebastian, Milan, Hamburg, London, Birmingham and others, even with that handicap. On the whole the "Mewflex" is a three-valve set of remarkable capabilities, selective, and gives the utmost volume for the number of valves. When it returns from America I am discarding an efficient five-valve receiver which I now use for the "Mewflex" thus using half the current for H.T. and L.T. and getting better and purer results.

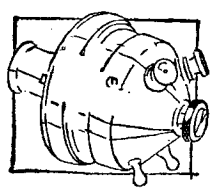
J. A. E. BLACK.



GOLDEN HARMONY

CLEAR at a whisper—clear at the heavy volume of a brass band . . . the T.M.C. "Concert Grand" brings a wealth of mellowness, and faithfully reproduces the sounds originated in the broadcasting studio.

The instrument is unequalled for its freedom from "throaty" noises, because the copper used in the construction of the horn is in a natural, unstressed state and its frequency of vibration is out of range of that of any note which the loud speaker may be called upon to reproduce. It gives that full richness which only copper can give.



The magnetic system—a vitally important part of every loud speaker—is the result of much study and experimental work. Your dealer will supply you. **Price - £5 : 10 : 0**

THE "GRAMO-SPEAKER."

The "Gramo-speaker" is a little brother to the "Concert Grand." In a moment it will turn your Gramophone into a splendid loud speaker, or it can be fitted to home made or purchased horns of ordinary design. It makes a most useful extra loud speaker at a nominal price, for your nursery or for entertaining your domestic staff. It is not an adapted "Earpiece" with the diaphragm held in place by a screw-on cap, ready to loosen through its own vibration. It is a real loud speaker unit with an adjustable magnetic system (loud speaker size) fitted with permanent magnets of cobalt steel and a diaphragm firmly clamped between ground metal surfaces. For performance, finish and price it is the best of its kind. Ask your dealer to show it to you. Its price is only **13/6.**

OTHER T.M.C. RADIO SPECIALITIES.

LOUD SPEAKERS.

"Standard" £4 5 0
"Junior" ... £1 17 6
"Minor" ... 17 6

CRYSTAL SETS.

From 12s. 6d. to £2 7s. 6d.

OTHER T.M.C. RADIO SPECIALITIES.

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No. 3. (Lig tweight) in cardboard box 17/6
No 2s. Heavier Model 15/-
Plush lined cases, 2/6 extra.

LOW-CAPACITY KEYS.

No. 1. 12 point, 3 position 7/-
No. 2. 6 ,, 2 ,, 6/-
No. 3. 24 ,, 3 ,, 15/3

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HOLLINGSWORTH WORKS. WEST DULWICH. S.E. 21.

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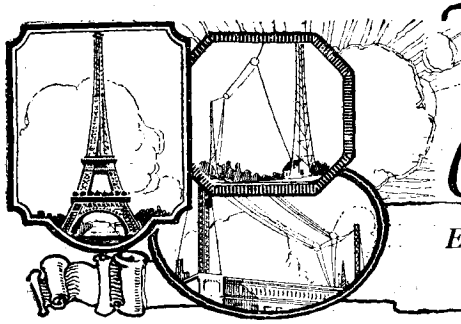


Regular Programmes from Continental Broadcast Stations

Edited by CAPTAIN L. F. PLUGGE, B.Sc., F.R.Ae.S., F.R.Met.S.

Times reduced to Greenwich Mean Time.

Corrected up to October 11th, 1926.

WEEKDAYS.

G.M.T.	Name of Station.	Call Sign and Wavelength.	Closing Time or Approx. Duration.
a.m.			
6.30	Eiffel Tower ..	FL 2650 m.	10 mins.
7.55	Amsterdam ..	—— 1950 m.	10 mins.
7.56	Eiffel Tower ..	FL 2650 m.	5 mins. Sp.
8.10	Eiffel Tower ..	FL 2650 m.	15 mins.
8.10	Ecole Supérieure	FPTT 458 m.	15 mins.
9.25	Eiffel Tower ..	FL 2650 m.	5 mins. Sp.
10.25	De Bilt	KNMI 1100 m.	5 mins.
11.0	Eiffel Tower ..	FL 2650 m.	11.30.
11.40	Hilversum ..	NSF 1050 m.	10 mins.
11.57	Nauen	POZ 3100 m.	8 mins. Sp.
p.m.			
12.30	Eiffel Tower ..	FL 2650 m.	10 mins.
12.30	Radio-Paris ..	CFR 1750 m.	2 p.m.
12.35	De Bilt ..	KNMI 1100 m.	5 mins.
2.0	Zurich	—— 513 m.	5 p.m.
2.30	Union-Radio ..	EAJ7 373 m.	3.30 p.m.
3.0	Eiffel Tower ..	FL 2650 m.	3.30 p.m.
3.0	Königswusterhausen	AFT 1300 m.	5.30 p.m.
3.30	Milan	IMI 320 m.	5.0 p.m.
3.30	Breslau ..	—— 418 m.	4.0 p.m.
3.40	Kiev	—— 900 m.	5 p.m.
4.0	Voxhaus ..	b 504 m. and 571 m.	6.30 p.m.
4.10	Amsterdam ..	—— 1950 m.	10 mins.
4.30	Radio-Paris ..	CFR 1750 m.	5.40 p.m.
4.40	Hilversum ..	NSF 1050 m.	5.40 p.m.
4.45	Eiffel Tower ..	FL 2650 m.	15 mins.
5.0	Breslau	—— 418 m.	7 p.m.
5.0	Salamanca ..	EAJ22 405 m.	6.0 p.m.
5.0	San Sebastian ..	EAJ8 343 m.	7 p.m.
5.0	Munster ..	ms 410 m.	6.30 p.m.
5.15	Stuttgart ..	—— 446 m.	6.30 p.m.
5.15	Eiffel Tower ..	FL 2650 m.	10 mins.
5.30	Rome	—— 425 m.	7 p.m.
5.30	Frankfurt ..	—— 470 m.	6.30 p.m.
5.30	Leipzig	—— 452 m.	6.30 p.m.
6.0	Leningrad ..	—— 940 m.	9 p.m.
6.0	Hamburg ..	ha 392.5 m.	7.30 p.m.
6.0	Radio-Barcelona	EAJ1 325 m.	7 p.m.
6.0	Brunn	—— 521 m.	8.0 p.m.
6.0	Eiffel Tower ..	FL 2650 m.	7.0 p.m.
6.0	Moscow ..	—— 450 m.	8 p.m.
6.30	Zurich	—— 513 m.	9 p.m.
6.40	Hilversum ..	NSF 1050 m.	10 p.m.
7.0	Union-Radio ..	EAJ7 373 m.	8 p.m.
7.0	Konigsberg ..	—— 463 m.	8 p.m.
7.0	Radio-Cadiz ..	EAJ3 357 m.	9 p.m.
7.0	Voxhaus ..	b 504 m. and 571 m.	Midnight.
7.0	Munich	—— 485 m.	11 p.m.
7.0	Stockholm ..	SASA 430 m.	10 to 11 p.m.
7.0	Oslo	—— 382 m.	9 or 11 p.m.
7.0	Munster ..	ms 410 m.	10.0 p.m.
p.m.			
7.0	Berne	—— 435 m.	9.30 p.m.
7.0	Leipzig	—— 452 m.	2 to 3 hrs.
7.0	Königswusterhausen	AFT 1300 m.	Midnight.
7.0	Stuttgart ..	—— 446 m.	11 p.m.
7.0	Goteberg ..	SASB 287 m.	10 or 11 p.m.
7.0	Malmo	SASC 270 m.	10 or 11 p.m.
7.0	Sundsvall ..	SASD 545 m.	10 or 11 p.m.
7.0	Boden	SASE 1200 m.	10 or 11 p.m.
7.0	Lausanne ..	HB2 850 m.	8.30 p.m.
7.0	Copenhagen ..	—— 347.5 m.	9.30 or 11.
7.0	Radio-Wien ..	—— 531 m. and 582.5 m.	9.30
7.0	Prague	—— 368 m.	9.0 p.m.
7.0	Eiffel Tower ..	FL 2650 m.	10.30 p.m.
7.0	Bratislava ..	—— 300 m.	9 p.m.
7.0	Bilbao	EAJ9 415 m.	9.30 p.m.
7.0	Radio-Cartagena	EAJ16 335 m.	9 p.m.
7.15	Frankfurt ..	—— 470 m.	10 or 11 p.m.
7.15	Geneva	—— 760 m.	9 p.m.
7.15	Breslau ..	—— 418 m.	9 or 11 p.m.
7.30	Hamburg ..	ha 392.5 m.	10 p.m.
7.55	Eiffel Tower ..	FL 2650 m.	5 mins. Sp.
8.0	Königsberg ..	—— 463 m.	10 p.m.
8.0	Radio-Bruxelles	SBR 487 m.	10.10 p.m.
8.0	Ecole Supérieure	FPTT 458 m.	11 p.m.
8.0	Rome	IRO 425 m.	11 p.m.
8.12	Milan	IMI 320 m.	11 p.m.
8.30	Radio-Toulouse	—— 430 m.	11 p.m.
8.30	Budapest ..	—— 560 m.	11 p.m.
8.30	Radio-Paris ..	CFR 1750 m.	10 or 11 p.m.
9.0	Radio-Béziers ..	—— 95 m.	1 hour.
9.0	Radio-Viscaya	EAJ11 418 m.	11.30 p.m.
9.0	Radio-Barcelona	EAJ1 325 m.	2 to 3 hrs.
9.0	San-Sebastian ..	EAJ8 343 m.	11 p.m.
9.0	Radio-Catalana	EAJ13 460 m.	Midnight.
9.0	Salamanca ..	EAJ22 405 m.	11 p.m.
10.0	Union-Radio ..	EAJ7 373 m.	Midnight.
10.20	Eiffel Tower ..	FL 2650 m.	5 mins.
10.44	Eiffel Tower ..	FL 2650 m.	3 mins. Sp.
11.57	Nauen	POZ 3100 m.	8 mins. Sp.

SUNDAYS.

G.M.T.	Name of Station.	Call Sign and Wavelength.	Closing Time or Approx. Duration.
a.m.			
7.56	Eiffel Tower ..	FL 2650 m.	5 mins. Sp.
9.25	Eiffel Tower ..	FL 2650 m.	5 mins. Sp.
10.0	Hilversum ..	NSF 1050 m.	11 a.m.
11.30	Königswusterhausen	AFT 1300 m.	12.30 p.m.
11.30	Union-Radio ..	EAJ7 373 m.	12.30 p.m.
11.57	Nauen	POZ 3100 m.	8 mins. Sp.
p.m.			
12.14	Eiffel Tower ..	FL 2650 m.	10 mins.
12.45	Radio-Paris ..	CFR 1750 m.	1.45 p.m.
2.10	Hilversum ..	NSF 1050 m.	4 p.m.

G. M. T.	Name of Station.	Call Sign and Wavelength.	Closing Time or Approx. Duration.
	SUNDAYS (Contd.)		
p.m.			
2.30	Union-Radio ..	EAJ7 373 m.	3.30 p.m.
2.30	Zurich	—— 513 m.	5 p.m.
4.0	Munster ..	ms 410 m.	7.30 p.m.
4.30	Milan	IMI 320 m.	6 p.m.
4.40	Bloemendaal ..	—— 315 m.	2 hrs.
5.30	Leningrad ..	—— 940 m.	7 p.m.
6.0	Brunn	—— 521 m.	9 p.m.
6.0	Leipzig	—— 452 m.	Midnight.
6.0	Radio-Castilla ..	EAJ4 340 m.	8 p.m.
6.0	Radio-Barcelona	EAJ1 325 m.	8.50 p.m.
6.15	Goteborg ..	SASB 287 m.	9.15 p.m.
6.15	Stockholm ..	SASA 430 m.	9.15 p.m.
6.15	Sundsvall ..	SASD 545 m.	9.15 p.m.
6.15	Boden	SASE 1200 m.	9.15 p.m.
6.15	Malmo	SASC 270 m.	9.15 p.m.
6.30	Eiffel Tower ..	FL 2650 m.	7.55 p.m.
7.0	Munich	—— 485 m.	10.30 p.m.
7.0	Berne	—— 435 m.	9.30 p.m.
7.0	Prague	—— 368 m.	8.30 p.m.
7.0	Radio-Wien ..	—— 531 m. and 582.5 m.	9.30 p.m.
7.0	Lausanne ..	HB2 850 m.	8 p.m.
7.0	Stuttgart ..	—— 446 m.	10 p.m.
7.0	Zurich	—— 513 m.	9 p.m.
7.0	Hamburg ..	ha 392.5 m.	8 p.m.
7.0	Breslau	—— 251 m. and 418 m.	8 p.m.
7.0	Helsingfors ..	—— 522 m.	9.30 p.m.
7.0	Warsaw	—— 480 m.	10 p.m.
7.0	Radio-Cadiz ..	EAJ3 357 m.	9 p.m.
7.0	Barcelona ..	—— 325 m.	9 p.m.
7.30	Bilbao	EAJ9 415 m.	9.30 p.m.
p.m.			
7.30	Voxhaus ..	b 504 m. and 571 m.	Midnight.
7.40	Hilversum ..	NSF 1050 m.	10.40 p.m.
8.0	Milan	IMI 320 m.	11 p.m.
8.0	Oslo	—— 382 m.	11 p.m.
8.0	Radio-Cartagena	EAJ16 335 m.	10 p.m.
8.0	Hamburg ..	ha 392.5 m.	11 p.m.
8.0	Budapest ..	—— 560 m.	Midnight.
8.0	Eiffel Tower ..	FL 2650 m.	10 mins.
8.0	Königswusterhausen	AFT 1300 m.	Midnight.
8.0	Munster ..	—— 410 m.	10 p.m.
8.0	Rome	IRO 425 m.	9.30 p.m.
8.10	Radio-Agen ..	—— 318 m.	15 mins.
8.10	Königsberg ..	—— 463 m.	10 p.m.
8.15	Copenhagen ..	—— 347.5 m.	11.30 p.m.
8.15	Geneva	—— 760 m.	1 hour.
8.15	Radio-Bruxelles	SBR 487 m.	10 p.m.
8.25	Breslau ..	—— 251 m. and 418 m.	Midnight.
8.30	Marseilles ..	PTT 351 m.	9.30 p.m.
8.30	Ecole Supérieure	FPTT 458 m.	11 p.m.
8.30	Radio-Toulouse	—— 430 m.	11 p.m.
8.30	Frankfurt ..	—— 470 m.	Midnight.
8.30	Radio-Paris ..	CFR 1750 m.	10.45 p.m.
9.0	Radio-Viscaya	EAJ11 418 m.	11.30 p.m.
9.0	San Sebastian ..	EAJ8 343 m.	11 p.m.
9.0	Salamanca ..	—— 405 m.	11 p.m.
9.10	Eiffel Tower ..	FL 2650 m.	11 p.m.
9.15	Petit Parisien ..	—— 333 m.	10.30 p.m.
9.30	Radio-Catalana	EAJ13 462 m.	Midnight.
10.0	Union-Radio ..	EAJ7 373 m.	1 a.m.
10.44	Eiffel Tower ..	FL 2650 m.	3 mins. Sp.
11.57	Nauen	POZ 3100 m.	8 mins. Sp.

DAY and NIGHT EFFECTS

By G. P. Kendall, B.Sc.

In this interesting article the author explains in a simple manner the wide variation between the daylight and night ranges of a given receiver. The big difference which does exist is not always fully appreciated by the wireless enthusiast.

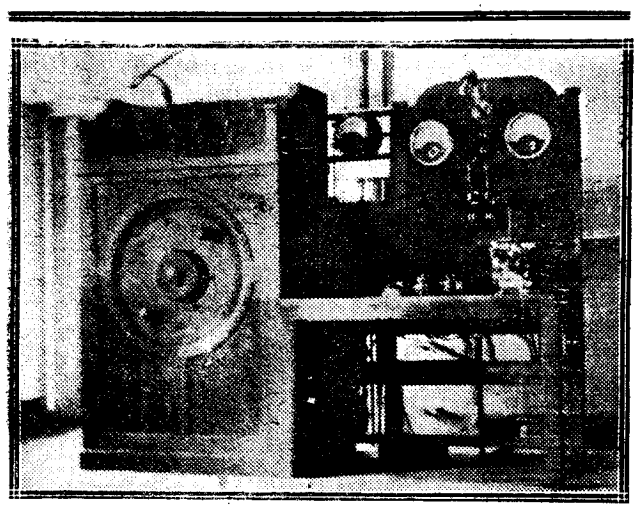
"WELL, that is very good, but what will it do in daylight?" The beginner is apt to find such remarks as this rather disconcerting when made by an experienced friend to whom he is relating stories of the powers of his latest receiver, such as bringing in Aberdeen on the loud-speaker with only three valves, and so on, for he does not always feel that they are quite justified.

A Misconception

At first, one finds that a set will bring in such and such results on a certain occasion, and one is apt to assume that that is the standard of reception of that particular receiver, and that one can claim such results to one's friends without mentioning anything about conditions. As a matter of fact, the pertinent question above relates to an aspect of reception which has a most powerful influence upon the behaviour of any given set, and since it is one to which many people do not attach sufficient importance, it is intended in these notes to give some idea of the allowances which should be made for varying conditions of darkness and daylight and so on.

A Wide Variation

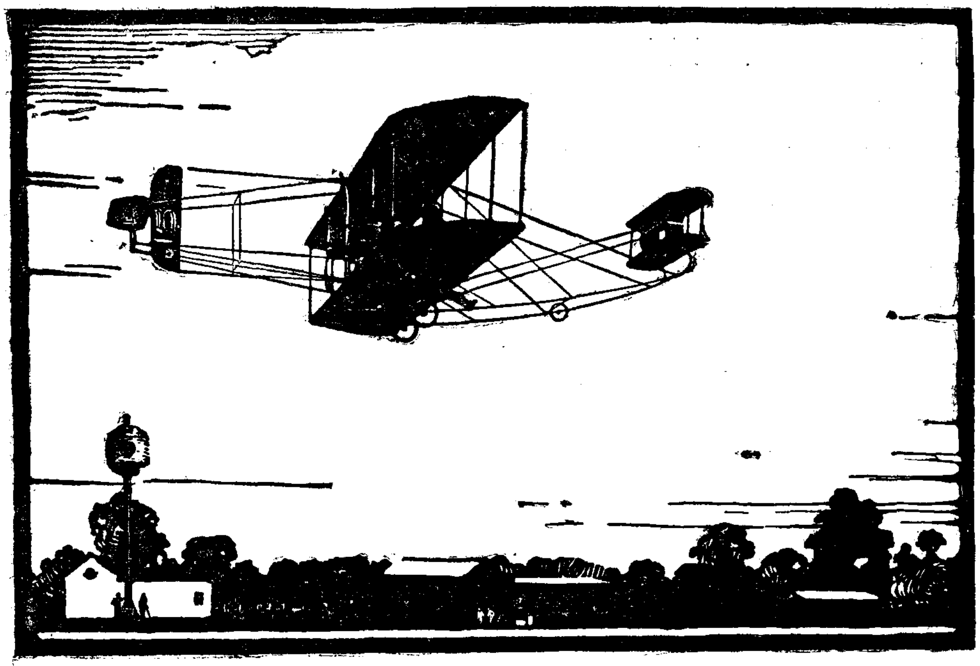
Now, it must be realised at the very outset that there is a most enormous difference between the behaviour of any given set by day and after darkness has fallen, the difference in the case of quite simple sets being such as to make it seem an altogether different instrument during the day time. In the case of, say, a receiver employing no high-frequency amplification, but having some good form of reaction circuit for the detector and perhaps one or two stages of low-frequency amplification, it is no uncommon thing to find that quite a large number of main stations can be received after dark, with a good sprinkling of Continentals, some even coming up to loud-speaker strength. During the day time, however, it is a most unusually good receiver of this type which will bring in anything except perhaps one or two of the nearer stations.



Part of the spark transmitting gear at the Helsingfors station. The broadcasting equipment is housed in the same building.

An Example

This effect was, perhaps, better appreciated in the days when crystal receivers were our main stand-by, and as an example I would quote the figure of 200 miles which used to be given as a standard range of a 1½-kilowatt ship's spark transmitter, when used with a standard receiver. This was regarded as the definite guaranteed range of the installation, but plenty of sea-going operators will remember occasions on which they covered distances of the order of 1,000 miles with this equipment, but practically always during the night. By day, signals from the more distant stations faded away com-



In 1910

In 1910 arose the problem of designing condensers for aircraft wireless sets.

The glass Leyden jars of those days were too bulky and too fragile, and there was no other suitable condenser made.

Thus it was that William Dubilier turned his attention to the subject and commenced his pioneer experiments. He immediately realised that to design a condenser which should be compact, unbreakable, and at the same time efficient under the high frequencies and voltages of wireless circuits would call for much specialised research.

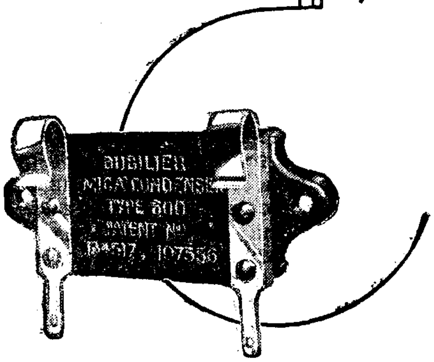
He was successful in that same year in producing the first condenser to meet these requirements. Its dielectric was Mica.

Three years later, encouraged by the War Office, he commenced upon the manufacture of condensers on a large scale, and the Dubilier Condenser Company at once assumed the leadership which it holds to this day.

For sixteen years we have specialized in the manufacture of wireless condensers, and for all products bearing our name we have continuously insisted upon that high standard of efficiency which we as Radio Engineers know to be so essential.

Naturally this high standard implies a slightly increased selling price, but it undoubtedly results in the production of condensers in which you *can* have complete confidence.

And the possession of such condensers is essential to good results whether you build a crystal set or conduct laboratory research.



Specify—

DUBILIER

ADVERT. OF THE DUBILIER CONDENSER CO. (1925) LTD., DUCON WORKS, VICTORIA ROAD, NORTH ACTON, W.3. TELEPHONE: CHISWICK 2241-2-3.

E.P.S. 220

DAY AND NIGHT EFFECTS—*(Concluded)*

pletely, and the range came down to something in the neighbourhood of the standard figure of 200 miles.

Using a simple crystal receiver for the reception of ship stations the effect is most marked, and would probably surprise many of those who regard a crystal set as merely something for receiving a broadcasting station at distances of the order of, perhaps, 20 miles.

Try It

This is quite an interesting thing to try for those who have crystal receivers which will tune to the standard ship wave of 600 metres, and they will find that during the day they only hear ships' signals at intervals, perhaps, from only two or three stations during quite a considerable period. This, of course, depends to some extent upon where the set is used, but in general you will find that as darkness falls, signals begin to increase in volume and in number in quite a surprising fashion, until finally, when night has fallen, there is quite a lively amount of traffic going on, and the headphones are rarely silent for long.

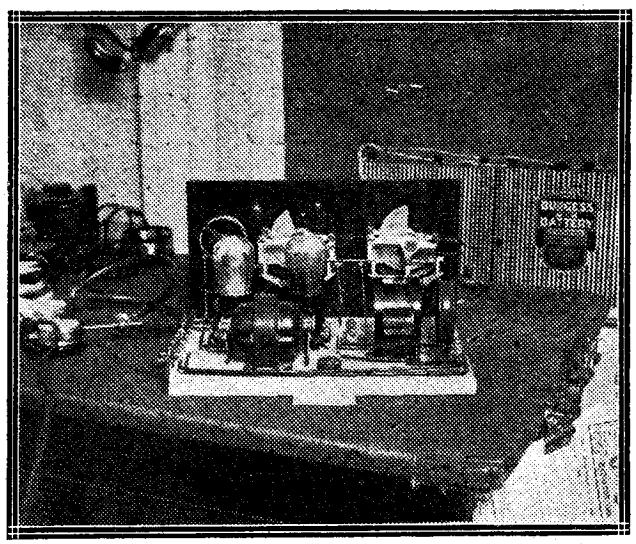
With a Single-Valve Set

With such a set as a single-valve reaction receiver, one can demonstrate these effects almost as strikingly, using the various broadcasting stations as the sources of test signals. For example, in my locality if I listened in with an average single-valve reaction receiver, with finely controlled reaction operated at a safe distance below the oscillation point, it would be found that the only stations which can be heard with any degree of reliability (other than the local one) during daylight, are Birmingham and Bournemouth, limiting one's search, of course, to the shorter waveband.

As darkness falls, the German stations begin to come in, as a rule somewhat ahead of the other British stations. Soon afterwards, the northern British stations, such as Newcastle and Glasgow, begin to be heard, and when once darkness has fully set in, it is generally possible to pick up Aberdeen.

We begin to see, then, that the really severe test of capabilities of a receiver is to be found in its use in daylight, and it must be regarded as a rule that the simpler types of sets will not do very much during the day. To obtain really long distance results with them is usually a matter of reception during the hours of darkness.

To bring in plenty of distant stations in daylight with any degree of certainty, we must realise that we need something more than a simple type of set, but, on the contrary, we require something with really efficient high-frequency amplification, like one of the more modern types of sets, or a super-heterodyne.



The apparatus owned by Mr. E. S. Strout, Junr., an American amateur, with which he successfully communicated with the Byrd Polar Expedition after the historic flight across the North Pole.

An Interesting Field

Although the beginner is often a little incredulous as to differences in reception during day and night until he has gained a little experience, as a matter of fact these differences are so great and so erratic that they form a very interesting subject for observation.

Probably the most striking example of such a field of observation open to the average listener is to be found in the reception of the American broadcasting stations, which, as is now well known, can often be picked up with quite simple sets during the winter months, at favourable hours. It will be noted that I have qualified the statement just made in two ways; first, "during the winter months" and secondly, "at favourable hours."

Although, of course, I should not like to say that American stations are never heard during the summer, it is very unusual for them to come in during the period of long days and short nights, and it is chiefly in the winter that they can be picked up.

Conditions

Then, as to favourable hours, I do not recollect ever having heard of an American station on the normal broadcast band between 200 and 600 metres ever having been heard during the hours of daylight, and the study of the conditions and times under which various American stations are heard in this country forms a really quite interesting subject for observation, by anyone possessing the necessary moderately sensitive receiver and time for listening.

An Interesting Study

It is quite an interesting study to note the exact readings upon the dials for a few of the more commonly received American stations, and to listen for them carefully one evening as darkness is spreading across the Atlantic, and note when the carrier waves begin to be perceptible, observing how they grow in strength as darkness falls all the way across the ocean, till finally some of them become of quite passable strength, with, of course, the usual spells of fading.

At last an Accumulator which can be charged quickly but discharged slowly

AFTER successfully solving the problem of the H.T. Accumulator, Oldham now presents in the new O.V.D. a slow discharge Accumulator incorporating entirely new principles of construction. With the growing popularity of Dull Emitter Valves there has been an incessant demand for a small accumulator suitable for use with two- and three-valve sets, capable of holding its charge over long periods without sulphation. Read below and see how, in the new O.V.D., Oldham has now overcome every previous obstacle.

ON the introduction of the Dull Emitter Valve, a new problem began to loom on the horizon for the accumulator manufacturer. With the valve-maker producing valves of almost negligible consumption it became increasingly obvious that old ideas had to be swept overboard. The old idea was that an accumulator should last the average valve set anything from a week to a fortnight and should then be recharged. That was alright with bright emitters consuming ·75 amp. each, but when consumption was dropped to one tenth of an ampere at 2 volts, a new kind of accumulator became necessary. An accumulator which would hold its charge for weeks on end without the necessity of recharging.

Oldham solves the problem of re-charging

Here, then, was the problem — how should it be solved? One way would be to increase the thickness of the plates. But this introduces another difficulty — the difficulty of recharging. Obviously a thick plate will hold its charge for many weeks. It won't buckle and it is reasonably free from the risk of sulphation. But it cannot easily be recharged. It must be charged slowly and for a long period on end. Compare the thick plate if you like to a thick mass of absorbent material dipped in liquid. It will take a long time for moisture to penetrate to its inmost recesses, but cut it in strips and the liquid can take effect at once. That was exactly what Oldham did. The new Oldham O.V.D. plate is the equivalent of a thick plate made up of laminations. Electrolyte can penetrate completely through the plate and get to work upon its several surfaces. So the new O.V.D., therefore, incorporates every advantage of a thick plate with none of its disadvantages. It can be charged quickly—that is to say, at the normal accumulator charging rate. There is no fear that it can be damaged during charging. And it will readily take up its charge.

Type O.V.D.

2 volts—for use with Dull Emitter Valves. Fitted with the new Laminode Plate. Dimensions 6 ins. by 3 ins. by 2½ ins 10 amp. hours.

5/6

A plate that cannot buckle or sulphate

The new O.V.D. plate, owing to its exceptionally rigid girder-like construction, cannot buckle. Nor can it sulphate even if left for months without being recharged. Owing to the internal construction of the stout glass cell no separators are necessary.

The new O.V.D. supplied charged ready for use

This new Accumulator is supplied "dry charged." This means that it has already been charged at the factory. Merely add acid and wait for a short while for the cell to get active and it can be used at once. Think how this will benefit you. No long first charge to delay you. The O.V.D can come straight off the dealer's shelf to your home and within an hour can be delivering its stored-up energy.

Every O.V.D. made under the Special Activation Process

The famous Special Activation Process which has made the name Oldham a household word for reliable accumulators is used in the O.V.D. Its Laminode Plates are manufactured under the same conditions as other Oldham plates. As a result the same high standard of efficiency is available At the low price of 5/6 the new O.V.D. offers remarkable value. Its stout clear-glass container—rugged enough to withstand even the hardest knocks—its coloured terminals of generous size—and its non-splash vent cap bespeak the quality product. Ask your Dealer about it to-day.

Oldham & Son, Ltd., Denton, Manchester

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Special Activation Process Batteries

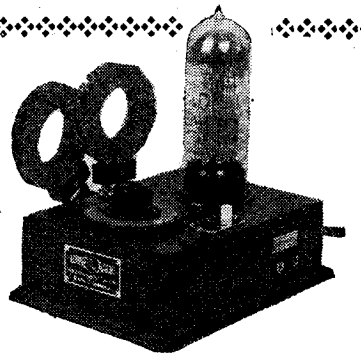
OLDHAM

Makers of the Oldham H.T. Accumulator, famous for its expanding bookcase principles of construction.

Gilbert Ad. 6069

THE LOEWE VALVE

An Interesting Demonstration at Elstree



AT the Radio Press Laboratories on the evening of September 20, an interesting demonstration of a remarkable new German valve was given by the inventor, Dr. Loewe, in the presence of Mr. John Scott-Taggart and members of the staff. The main feature of this valve is that the one evacuated bulb may contain the necessary components for a complete amplifier of two stages. In the case of the two valves demonstrated, for instance, one was arranged internally to give the equivalent of the ordinary detector and two resistance coupled note magnifier circuit, while the other consisted of two high-frequency valves in one, coupled on the well-known T.A.T. principle.

Compact Sets

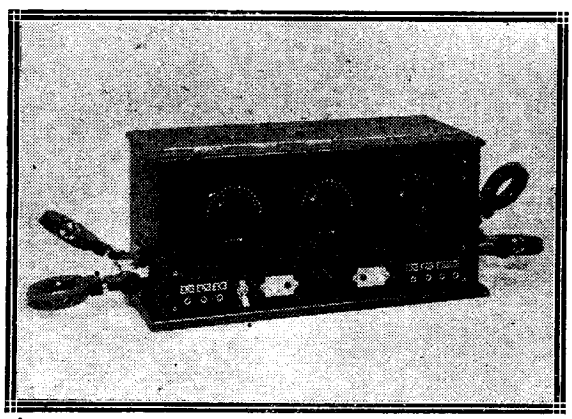
It naturally follows that when valves of this type are incorporated in a receiver there will be practically no additional components to include, and it be comes possible to build extremely compact sets.

Receivers Demonstrated

Two receivers employing these valves were shown by Dr. Loewe, the smallest of which employed one valve to give a detector and two low-frequency stages. A photograph of this set is given, from which an impression of the remarkable compactness may be gathered. A simple form of reaction circuit is used, and very powerful results are obtained from the local station, with excellent quality of reproduction.

The Circuit

The receiver upon which the main demonstration was performed is equivalent to a five-valve receiver, two of the special valves being used in this case. The first of these is a two-stage high-frequency amplifier on the T.A.T. principle while the other is similar to the valve just described. The circuit is given on page 619, and is quite straightforward, except for the positively biased extra grids of the H.F. amplifier. Two tuned circuits are incorporated, these being separated by an "aperiodic" coupling in the form of a resistance. This latter is found to give good results even on the lower broadcast waves, and the explanation may be found in the very short wiring existing in the valve.



A close up view of the larger set. It embodies a two-stage H.F. Amplifier coupled by means of the T.A.T. principle.

Below: Dr. Loewe is seen explaining the arrangement of his larger set to Mr. G. P. Kendall (standing.)

Long Wave Efficiency

When working on the longer waves, however, such as that used by Daventry, a distinct increase in efficiency was noticeable, as is generally the case with resistance-coupled H.F. amplifiers.

The receiver gave very interesting results, ten foreign stations as well as several B.B.C.

(*Concluded on page* 619.)

WHAT JACK SHALL I NEED?

By A. V. D. HORT, B.A.

All constructors of wireless receivers should have some knowledge of the construction and operation of that useful switching device—the plug and jack. The following article will tell you all about the more commonly used types.

THE use of jacks as a means of carrying out one or more switching operations is finding an increasing popularity with set designers. Jacks have, among others, these points to recommend them to the constructor: they give a neat appearance to the panel, they form a convenient means of switching, and they cannot be tampered with without the plug employed with them.

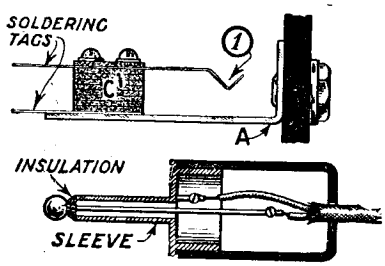


Fig. 1.—The construction of plugs and jacks is simple to understand.

Jacks are used not only in wireless apparatus: they find a very extensive application in telephone switchboards, either with plugs and cords for making the connections, or in the form of "key" switches, which are really only key-operated jacks.

The constructor who is making up a wireless receiver, and who wishes to use jacks, may well be puzzled by the different types available. Each jack has its own special function, the insertion or withdrawal of the plug switching circuits in or out, as required. Thus, there are "Single Circuit Closed," "Single Open Circuit," and "Single Open Circuit Filament Control" jacks, to quote examples. Perhaps these terms convey little to the reader if he is not well acquainted with jacks, and some explanation of them may be helpful.

A Simple Form

Before passing on to discuss individual types of jacks, it may assist the reader to grasp the principles of the jack if Fig. 1 is considered. Here we have a "Single Open Circuit" jack, the simplest form which is used.

L.F. Switching

Now jacks are not to be recommended for use in the high-frequency stages of a receiver, since the method of their construction almost inevitably introduces considerable unwanted capacities in the circuit. In practice, jacks are almost invariably employed in the low-frequency circuits, usually for placing the telephones or loud-speaker in circuit.

Explanatory Details

The jack shown in Fig. 1 has two essential parts—the "body" A and the springy contact blade (1). C is an insulating block separating A from (1). When a plug, shown in section in Fig. 1, is inserted through the hole in the body of the jack, the sleeve of the plug makes contact with the body, while the tip of the plug, which is insulated from the sleeve, connects with the contact blade. The "V" shaped end of the blade drops into the nick behind the tip of the plug, making a firm contact and locking the plug in position.

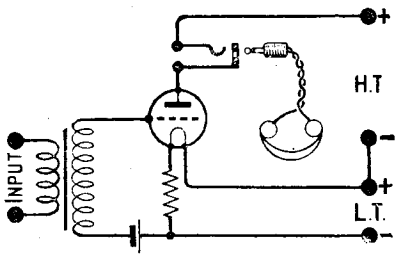


Fig. 2.—The plug and jack of Fig. 1 are commonly employed as shown above.

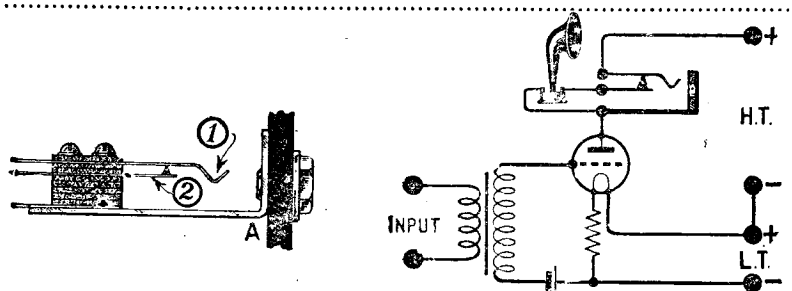


Fig. 3.—The Single Circuit Closed jack possesses an additional contact (2), and may be used as seen in the theoretical diagram.

Announcing A GREAT

John Scott-Taggart, F.Inst.P., A.M.I.E.E.

IN this, the first announcement of the new S.T. series of valves, I would, as the designer, like to make some preliminary remarks.

I have for several years watched valve development very closely, noticing the advantages and disadvantages of every type and every process. When I decided to enter the manufacturing field myself, I resolved to combine the best features of existing valves with my own ideas. The Company of which I am now managing director has acquired a licence under all the leading patents which have contributed to valve development in order that we shall not be hampered in any way in producing the best. Although this has added to the manufacturing cost and minimises the profit, I was not prepared to place a valve bearing my name on the market unless it represented the highest technique in valve manufacture and design.

While head of the Elstree Laboratories, my duties included the technical criticism of existing valves and acquiring an intimate knowledge of their respective advantages and limitations, and I would not have produced a series of valves unless I believed they would stand out above others.

THE S

FOR STRENGTH

NEW VALVE

IT is because I feel acutely that my technical reputation is staked on these valves, that I propose—having satisfactorily established the design and manufacture—to satisfy myself that *each* valve is within the necessary specification, and then to initial every carton to certify that the valve is fully up to standard.

In launching a new valve, no risks can be taken. The valve you buy will have been tested under my personal supervision—a laborious task—but then the whole business of S.T. valves will be run on personal lines. I do not believe in treating valves as a species of electric lamp or as so much merchandise. Every valve I sell, every valve you buy, is a valve in which I shall retain a personal interest. Each valve is designed for a specific purpose, although the series have many merits in common. I have aimed at a high mutual conductance, a large filament operating at a very low temperature, and taking a minimum of current, a long life for the valve, a high vacuum, a big factor of safety in every direction, robustness, and absolute uniformity. The S.T. valve is strong, entirely non-microphonic and foolproof, but is built like a chronometer.

For types and prices see page 595.

John Scott-Taggart

T VALVE

AND TONE

S.T. LIMITED
2, MELBOURNE PLACE,
ALDWYCH——————W.C.2

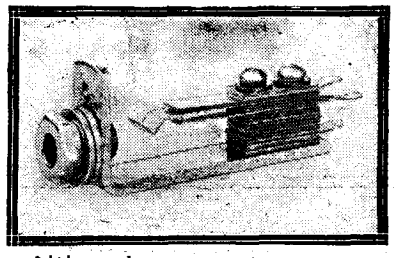
WHAT JACK SHALL I NEED? — *(Continued)*

A " Single Open Circuit " jack is normally used to place the telephones or loud-speaker in circuit, as shown in Fig. 2. The telephones are connected to the terminals of the plug, H.T. positive and the anode of the valve being connected to the contact blade and body of the jack respectively.

Simultaneous Control

This simplest form of jack may be taken as a guide to other types, illustrating a rule which applies to them all. The telephones, or similar apparatus to be connected in the anode circuit, are connected to the plug. The body and " V " shaped contact in the jack, or in " Double Circuit " jacks the two " V " shaped contacts, are connected in the anode circuit. Any other contacts there may be are used for filament control or other switching, these operations being controlled simultaneously with the insertion of the plug—*i.e.*, putting the telephones in circuit.

Having now dealt with the " Single Open Circuit " jack, we may proceed to develop this by adding other contact blades. The same type of plug is, of course, used throughout.



Although possessing many advantages for L.F. work, jacks should not be used on the H.F. side.

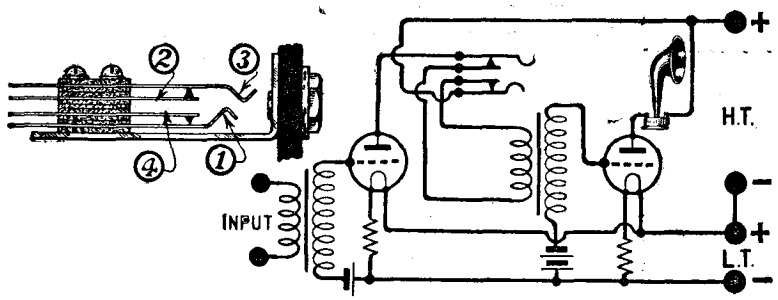
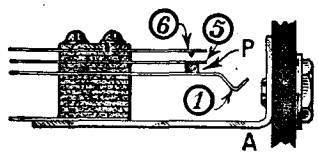


Fig. 4.—The Double Circuit Closed jack is frequently used for cutting out a note magnifying valve.



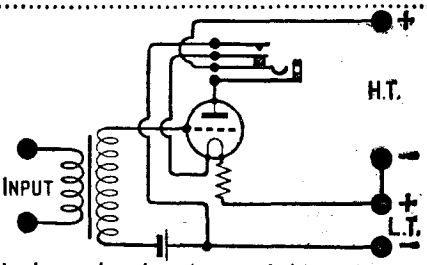


Fig. 5.—The jack depicted above is simply an elaboration of that shown in Fig. 1—two further contacts being added for filament control.

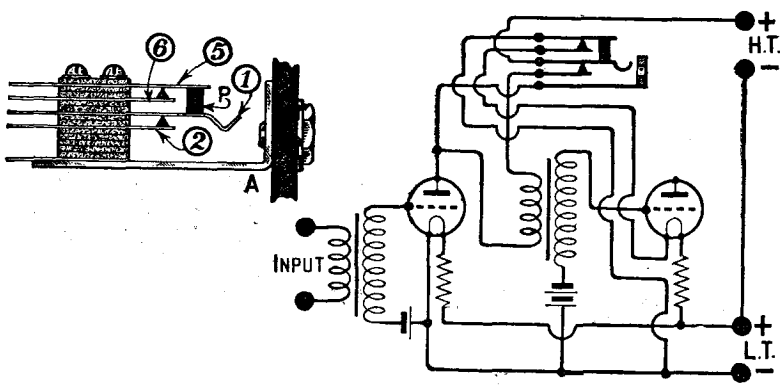


Fig. 6.—This type of jack switches out the filament of the last valve and places the telephones or loud-speaker in the anode circuit of the first L.F. valve.

Closed Types

If one contact is added to the jack, we have the " Single Circuit Closed " type, shown in Fig. 3, in which a suitable circuit for employing the extra contact is also given. In the normal state, the blade (2) is in contact with blade (1). When the plug is inserted, it makes contact with (A) and (1) in the usual way, and at the same time lifts (1) away from (2). In the circuit shown the loud-speaker is permanently wired in circuit. The insertion of a plug connected to the telephones puts them in circuit, disconnecting the loud-speaker. It will be noted that one side of the loud-speaker is still connected to the " live " circuit.

The Double Circuit Jack

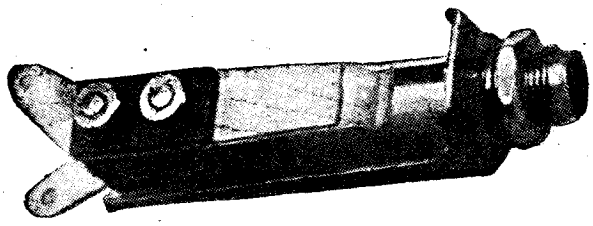
When it is desired, by inserting the plug, to cut out altogether the apparatus normally connected in circuit, a " Double Circuit Closed " jack may be used, as shown with a suitable circuit in Fig. 4. In this jack no electrical use is made of the body (A). Two contact blades (1) and (3) are used, (3) taking the place of the body and making contact with the sleeve of the plug.

The blades (2) and (4) are here normally in contact with blades (1) and (3), the insertion of the plug pushing the latter pair apart and breaking both contacts.

Filament Control

So far the jacks discussed have been those dealing with anode circuit connections only. If the filament of the valve could be switched on by the act of connecting the telephones in circuit, the utility of the system would be greatly enhanced. This is made possible by the addition of further contacts, as shown in Fig. 5, illustrating the " Single Open Circuit Filament Control " jack. Here the blade (1) and the body

WHAT JACK SHALL I NEED?—(Concluded)



A photograph of the simplest jack used—the Single Open Circuit type.

perform the same functions as in the "Single Open Circuit" jack of Fig. 1. Two additional blades (5) and (6) are added above blade (1), these two being normally separated by a small gap. P is a pin of insulating material attached to blade (5) and resting on blade (1). Insulation is necessary here, since blade (1) is in the anode circuit and (5) in the filament circuit. The insertion of the plug pushes (5) into contact with (6), thereby completing the filament circuit.

A further development results in the "Single Closed Circuit Filament Control" (Fig. 6), which is the "Single Circuit Closed" jack (Fig. 3) with filament control added. In this case, the filament circuit also is normally "closed," blades (5) and (6) being in contact, to be separated by the insertion of the plug.

Obviously, the last two jacks described may be obtained with the filament control either "open" or "closed," so that the insertion of the plug switches a valve on or off as required.

Other Uses

Further, by combining the two arrangements, we can have double filament control (Fig. 7), the plug switching on one valve and switching off another. The types described above, however, are those which are most commonly met with, more elaborate jacks being developments on the same general principles.

It should be noted that it is not essential to use the plug for the anode circuit of the set. It may be preferred to plug in, for example, the low-tension battery, completing the anode circuit with the subsidiary contact blades. The method of use which has been described is, however, the conventional one, and the one which is generally accepted as the most convenient.

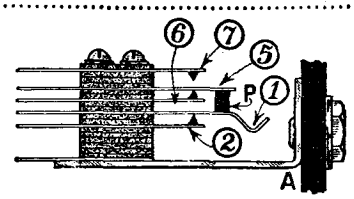


Fig. 7.—Double Filament Control is featured in some of the larger specimens.

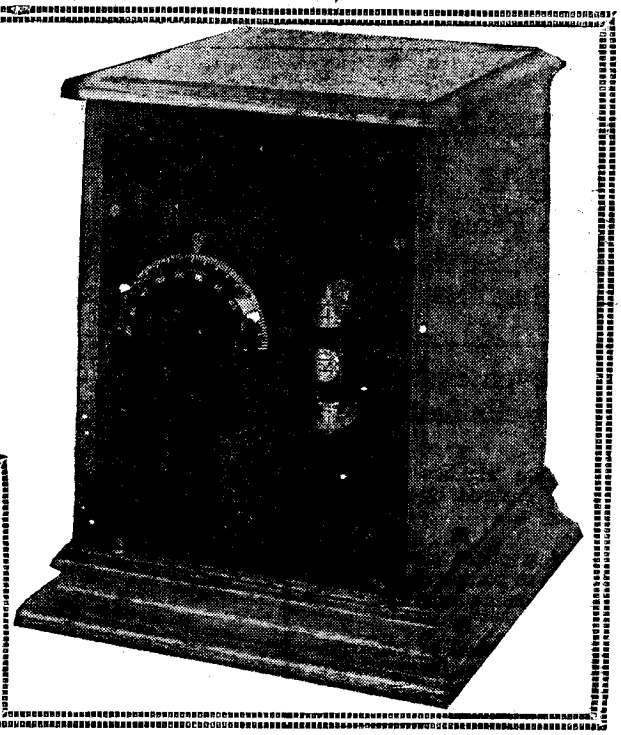
A point worth noting is that jacks should always be connected so that the H.T. + contact goes to the same side of the telephones when the plug is inserted. It is common practice to arrange for the tip of the plug to be connected to H.T. positive, but this is not essential.

NEATNESS AND EFFICIENCY

A crystal set with aerial and detector taps

By H. BRAMFORD

This little set employs a tapped home-wound inductance which permits the use of "auto-coupling" and a variable crystal tap, both resulting in increased selectivity without loss of signal strength.



A DESIRABLE feature at the present time is selectivity, not only in valve receivers but also in crystal receivers. At the same time, a crystal receiver should fundamentally be of simple design and construction. Simplicity helps to make for efficiency as regards signal strength, and selectivity is desirable in order to be able to comply with the present conditions. The receiver about to be described in this article embodies these two features, inasmuch as it is simple to construct, simple to operate, and gives efficient results. Further, it is not an expensive set to make, while at the same time it presents a neat and pleasing appearance when completed. A list of the components required to build this set is given on another page.

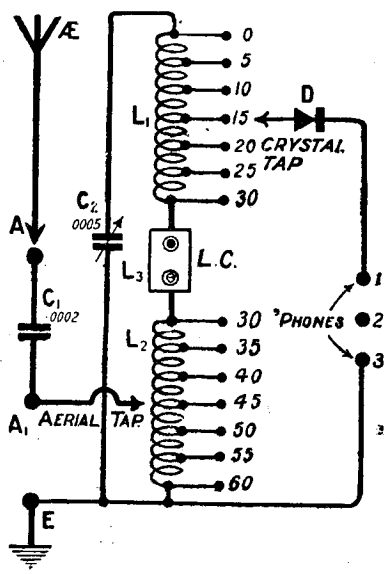


Fig. 1.—Complete details of the circuit employed are given in this theoretical diagram.

Details of Construction

To carry out the construction of the receiver, first proceed to drill the panel in accordance with the details and dimensions given in the front of panel diagram. Having done this, proceed to secure the panel to the wood baseboard and side brackets by means of the four countersunk wood screws, as indicated. Next mount upon the panel the six terminals, and the crystal detector, leaving the assembly of the variable condenser to a later stage to facilitate the ease of the process of wiring up. Before proceeding any further, it is advisable to construct the tapped coil.

The Tapped Coil

First cut off a length of cylindrical former having an external diameter of 2 in. The former should be approximately $3\frac{1}{2}$ in. long. Commence from the right-hand side of the former, the winding being made with the wire specified in the list of materials. First secure the beginning of the winding by

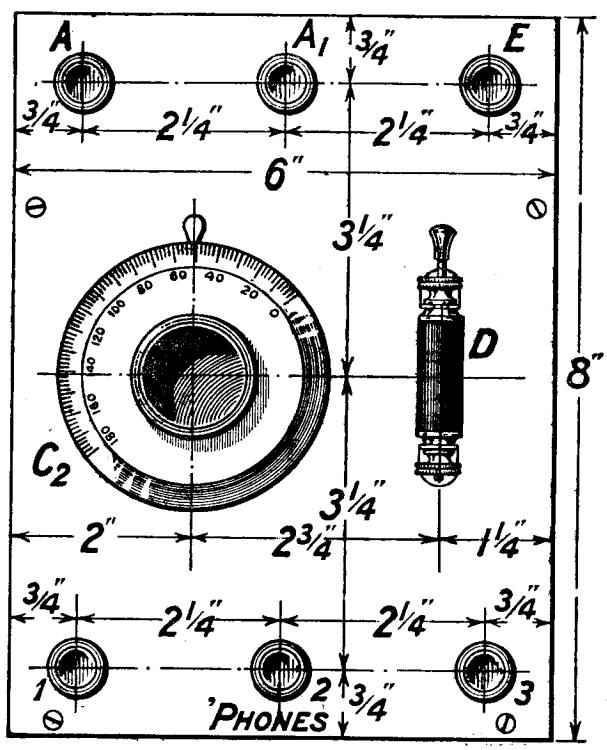


Fig. 2.—The three 'phone terminals permit two pairs of telephones to be used in series.

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The Grid Leak is not discernible, being totally enclosed in Bakelite Valve Holder Base.

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Guaranteed efficient in construction and design.

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Combination Grid Leak and Terminal Valve Holder	**3/9**
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All Anti-Microphonic Type.

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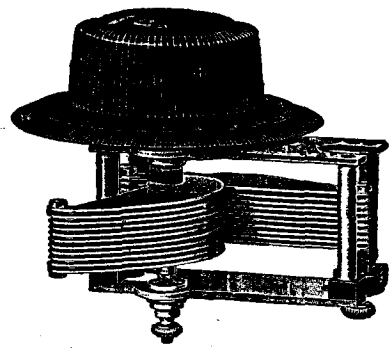
The New J.B., S.L.F. Condenser is made on lines similar to our Low Loss Type (Pat. No. 241805). In addition, its many excellent new features include Special Bearings Top and Bottom which eliminate springs. Side and End play in the centre spindle is impossible. The Top Bearing is of large diameter and friction-lined, which ensures an absolutely smooth movement. The brass vanes are supported at tips to ensure accurate spacing. End plates are highly polished and all fittings are heavily nickel-plated.



Fitted with ¼" shaft, sold complete with 4" Dial and is more compact than most S.L.F. Condensers.

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.0005 mfd.	11/6
.00035 mfd.	10/6
.00025 mfd.	10/-

Two of our new .0005 mfd. Straight Line Frequency Condensers, and one .00025 of the same type have been specified for the 5-valve Receiver described in this issue of *Modern Wireless*,—another proof of the remarkable efficiency and perfect workmanship of our instruments. Our extensive range includes types suitable for all the big sets recently published, and we guarantee that J.B. Condensers—the skilled product of experienced specialists—are unsurpassed by any on the market to-day, either for quality, efficiency, or price.

Particulars of the new J.B. Gang Control Dual Condenser on application.

THE LOWEST LOSSES YET!

THAT'S the claim we make for the new J.B. Condenser. The losses are, in fact, absolutely negligible. For instance, with the .0005 model the total losses measured at a million cycles are .02 ohms.
This is a fact established by an N.P.L. Test, and gives an added point of superiority to the J.B. which, while combining features of mechanical excellence, is logically an instrument for the radio man seeking a precision condenser.

PRICES:

.001 mfd.	17/6
.00075 ,, ...	16/3
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.00025 ,, ...	13/3
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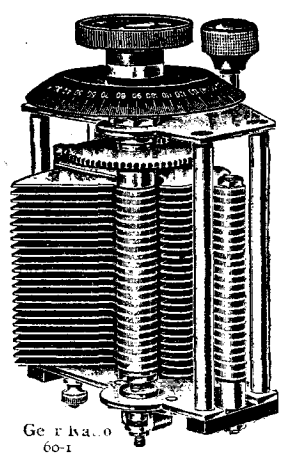
.0001 ,, ...	12/9

.0005 mfd. Twin Low Loss Condenser, complete with 4in. Bakelite Dial, for the Elstree Six, Distallex, Mewflex and Elstreflex, 21/- each.

GEARED MODEL.



Pat. Nos. 241805 & 246009.

.0005 mfd. Triple Gang Control Condenser for the Solodyne. Complete unit, less dial, £2 : 7 : 6.

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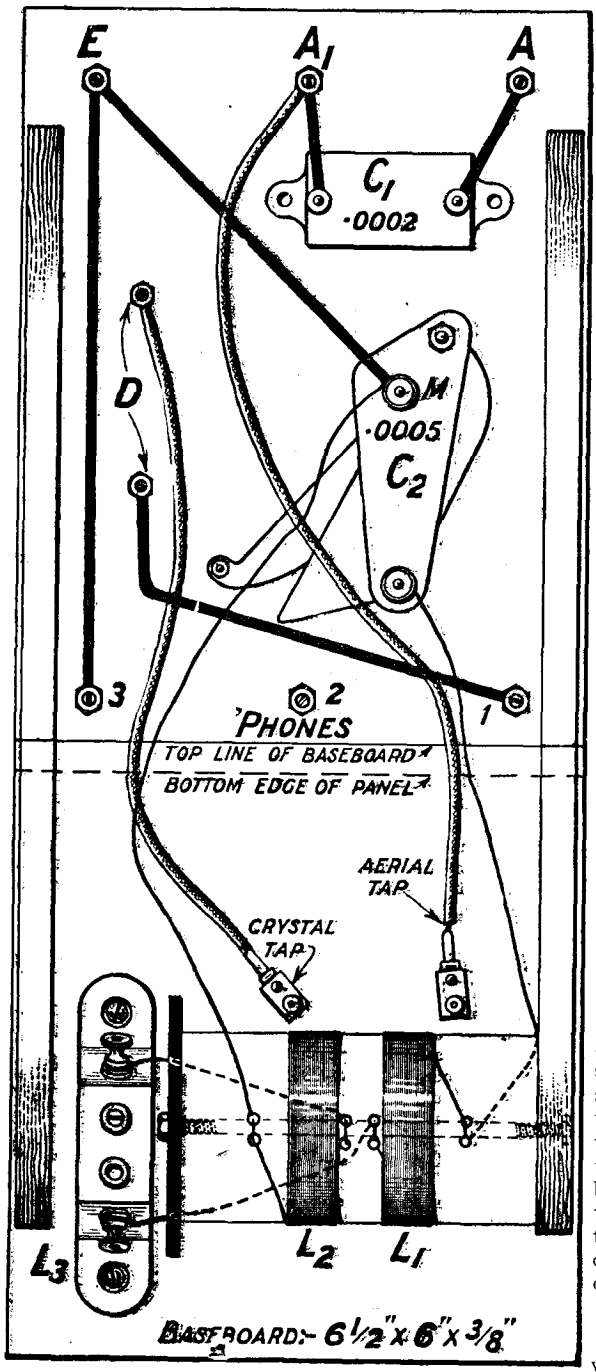


A SELECTIVE CRYSTAL SET
(Continued)

passing through two small holes previously made in the former, as shown in the back of panel diagram. At the first turn make a tapping; the method of doing this will be described later. Make a further tapping at the 5th, 10th, 15th, 20th, 25th and 30th turn. At this point secure the wire by means of two further holes made in the former, and finish by taking end through the inside of the former and cutting off. If the winding is close wound it will occupy a distance of approximately 7/16th of an inch. Commence a second winding in a similar manner, 7/16 in. away from the previous winding. This winding should be in a similar direction, that is to say, clockwise. Secure the beginning of the winding as before, making a tap at the first turn, and further taps at the 5th, 10th, 15th, 20th, 25th and 30th turn. At the 30th turn, finish off the winding by securing as before and passing the end of the wire through to the inside of the former and cutting off. Thus we have at present two separate windings upon the ebonite former.

Fig. 3.—This practical wiring diagram will be found simple to follow. Note how the cylindrical coil is mounted, the threaded rod shown dotted, passing along the axis of the coil.

Making the Tappings

Care should be taken in making the tappings, as the wire is of a somewhat fine gauge, and due consideration should be given to this fact. The simplest way of making such tappings, which incidentally occasions the least possible amount of trouble, is as follows: At each tapping point make a small loop with the wire, and twist it closely with the fingers. Pliers should in no case be used, as this might easily result in over twisting and breaking the wire. Each tapping is twisted thus and made as the winding is proceeded with, and they should be spaced somewhat apart from each other, as shown in the drawing. When the winding is completed, the problem presents itself of removing in the best possible way the silk covering from the wire of the twisted tappings. This is quickly and easily done by placing a lighted match under each tapping until the silk covering is burnt away. The tappings should then be lightly scraped with a sharp knife in order to clean them, after which they may be bent over in order to strengthen them and make them more rigid.

Assembly

The coil thus made may now be assembled upon the wood side support, as shown in the back of panel

COMPONENTS REQUIRED

One panel measuring 8 by 6 by 3/16 in. (any good make).

One cabinet with baseboard 6½ in. deep, and wooden side pieces (Pickett's).

One S.L.F. variable condenser ·0005 (K. Raymond).

One fixed condenser, ·0002 (Efesca).

One automatic loading coil socket for baseboard mounting (Athol or any other good make).

One permanent crystal detector (Radio Instruments).

A piece of ebonite former 2 in. external diameter by 3½ in. long.

Small quantity of No. 28 D.S.C. copper wire (40 ft.) (London Electric Wire Co.).

Glazite for wiring.

Two short lengths of insulated flex.

Two spring clips. (Peto Scott).

Six terminals. (Belling and Lee).

One Decko dial indicator (A. F. Bulgin).

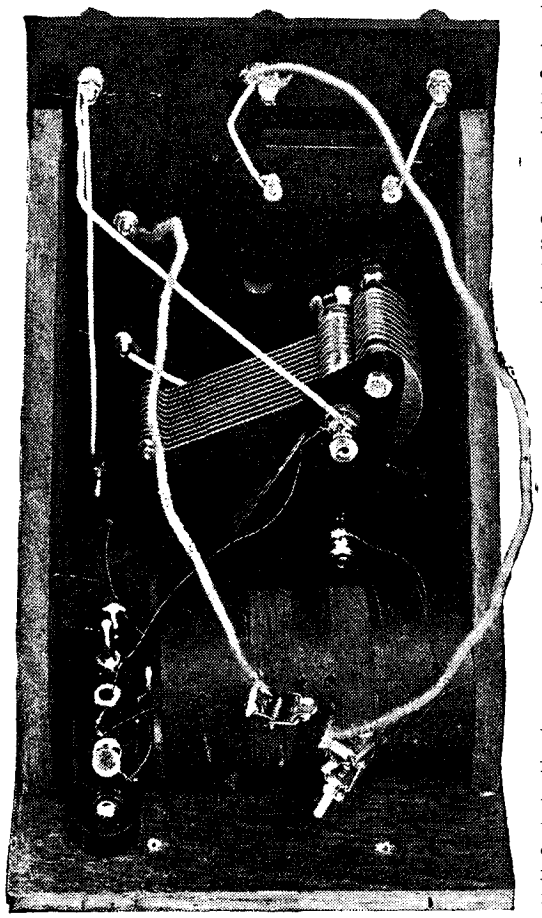
Four ¾ in. counter-sunk wood screws.

A SELECTIVE CRYSTAL SET—*(Concluded)*

WIRING INSTRUCTIONS

Join terminal A to one side of C1.
Join other side of C1 to A1, and connect flex wire with spring clip on end to A1.
Join flex wire with spring clip on end to one side of detector.
Join other side of detector to 'phone terminal 1.
Join 'phone terminal 3 to E; E to moving plates of C2; moving plates of C2 to end of L2.
Join fixed plates of C2 to beginning of L1.
Join end of L1 to socket of holder for L3.
Join beginning of L2 to pin of holder for L3.

diagram. This is simply done by securing by means of a brass rod, two nuts, and a piece of ebonite strip. It should be remembered that before the former is thus secured the four loose ends of the windings, which pass from the inside of the former, should be arranged conveniently for the connections to be made. When the former is secured, the loading coil socket may next be screwed on to the baseboard itself. Before assembling the variable condenser, proceed with the necessary wiring, which is tabulated. When we come to the point where it is necessary to make the connections to the variable condenser, this component may be mounted upon the panel.



The small amount of wiring necessary may be gathered from this back-of-panel view.

The Circuit

From the theoretical circuit shown, it will be seen that constant aerial tuning may be employed by connecting the aerial to terminal A, and ordinary tuning by connecting the aerial to A_1. The value of the C.A.T. condenser chosen is .0002 microfarads. The aerial tap is used principally between tappings 30 to 60, which represent L_2. L_3 represents the loading coil. The earth in every case is connected to terminal E. Three telephone terminals are provided, thus enabling one or two pairs of 'phones to be used.

Operation

The operation is simple and easy. For reception from the local station no loading coil is necessary. The loading-coil holder chosen is designed in such a way that when the loading coil is pulled out it automatically short-circuits the holder. No shorting plug is therefore necessary when employing this particular holder. To tune in the local station, connect the aerial to terminal A or A_1, as may be desired, place the aerial tap somewhere between 30 and 60 of L_2, and the crystal tap between 0 and 30 of L_1. The best positions should be obtained by experiment. The crystal tap should not be taken below the 30th turn, as this would result in an appreciable difference in signal strength. On the other hand, the aerial tap may be taken, if desired, to almost any tapping, but the best results will probably be obtained when used as specified. With the crystal detector adjusted, it is only necessary to tune in the local station by means of the variable condenser, C_2. When 5XX is to be received it will be necessary to plug in a loading coil in the region of 200 or 250.

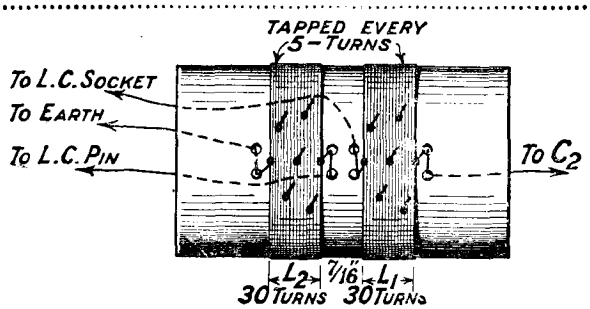


Fig. 4.—This diagram shows the method of winding the coil, and also its correct connections when completed.

Test Report

The set was tried out some ten miles north-east of 2LO on a moderate out-door aerial. Both the local and high-power stations were received with ease at excellent signal strength, also Morse and one or two amateurs below 360 metres. Using two pairs of 'phones no drop in signal strength was noticeable.

THE WINNER'S STORY

(Concluded from page 541)

visit a success, including arranging visits to valve works, high-power stations, and other points of interest, and for the way they studied my personal comfort. As a final paragraph, I was given a message to deliver to Radio Press readers to the effect that should they be in Amsterdam, if they will call at the office at Achterburgwae, 75, they will receive a cordial welcome.

R. Waldo Emerson

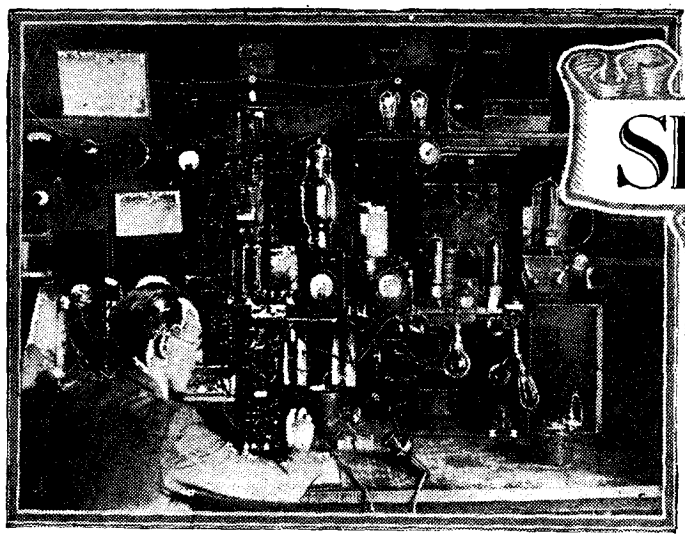
St. John's Wood,
London, N.W.8.

AN INEXPENSIVE RADIO PRESS STAR SET

A FURTHER addition to the series of Radio Press Star Sets is the "Spanspace Three," a set with which it is possible to obtain high selectivity combined with complete stability. These desirable features are incorporated in a set which is by no means expensive to construct, the total cost of the components required, including the cabinet, being in the neighbourhood of £8.

The "Spanspace Three" is described by G. P. Kendall, B.Sc., in the November issue of the *Wireless Constructor*, which is now on sale.

A further attraction of this issue of the *Wireless Constructor*, and one which makes it all the more vital that you should secure your copy at once, is the inclusion of a Free Gift Constructional Envelope describing how to make the "Midget Reflex" receiver. This envelope is similar in style to the Radio Press envelopes, normally sold at 2s. 6d., and contains photographs and full-size blue prints. The Free Gift of the "Midget Reflex" constructional envelope will create an enormous demand for the November issue of the *Wireless Constructor*, and you should make sure of your copy at once. The price is 6d., as usual.



For the Short-Wave Novice

By L. H. THOMAS (6QB)

AS the writer hinted in a previous article on the subject of short-wave reception, the novice to this branch of wireless will quickly find out that the only way in which a short-wave receiver differs from an ordinary broadcast set is that the coils have fewer turns, the condensers are smaller, and the spacing of the components must be planned rather more carefully, in order to eliminate any slight losses which might prove troublesome on these short waves.

A Difficulty

The chief difficulty which besets the beginner, however, is usually that he does not know what to listen for, or even, in some cases, on what wavelength he is listening. Although there are many commercial stations working on the shorter waves which might serve admirably as "landmarks," several of them work simultaneously on three or four wavelengths, and are thus apt to cause trouble.

45 Metres

If the reader is familiar with the Morse code, he will at once be able to identify the wavelengths of 45 metres or thereabouts, since this is the wave allotted for use by British amateurs. At most times of day or night at least twenty or thirty of them can usually be heard, so that there will be little doubt about that particular wavelength!

The procedure adopted by amateur stations when calling one another is very well known, but for the benefit of the absolute newcomer to this type of work a few words on the subject will not be out of place.

Intermediates

Each country in which amateur stations are licensed is allotted an "intermediate" letter or letters, which are sent immediately before the call-sign of the station, and serve to identify him. A list of these letters appears on this page.

These "intermediates" serve as a very useful and clear indication of the location of any trans-

NATIONALITY PREFIXES OR "INTERMEDIATES"

A:	Australia	EG:	Egypt	MF:	Morocco	SS:	Straits Settlements
AI:	Tripoli, Africa	F:	France	N:	Holland	T:	Poland
AU:	Alaska	FI:	French Indo-China	O:	South Africa	TJ:	Trans-Jordania
B:	Belgium	G:	Great Britain	OE:	Austria	TU:	Tunis
BE:	Bermuda	GI:	Northern Ireland	P:	Portugal and Madeira	U:	United States
BO:	Bolivia	GW:	Irish Free State	PE:	Palestine	W:	Hungary
BZ:	Brazil	H:	Switzerland	PI:	Philippine Islands	X:	Portable Stations
C:	Canada	HU:	Hawaii	PR:	Porto Rico	Y:	Uruguay and India
CH:	Chile	I:	Italy	Q:	Cuba	YS:	Yugo Slavia
CO:	Colombia	IC:	Iceland	R:	Argentine and Russia	Z:	New Zealand
CR:	Costa Rica	J:	Japan	S:	Finland		
CS:	Czecho-Slovakia	K:	Germany	SM:	Sweden		
CZ:	Canal Zone, Panama	KY:	Kenya Colony	SR:	Salvador		
D:	Denmark	L:	Luxembourg				
E:	Spain	LA:	Norway				
		M:	Mexico				

FOR THE SHORT-WAVE NOVICE—*(Concluded)*

mitting station that may be heard on short waves, and are used as follows :—

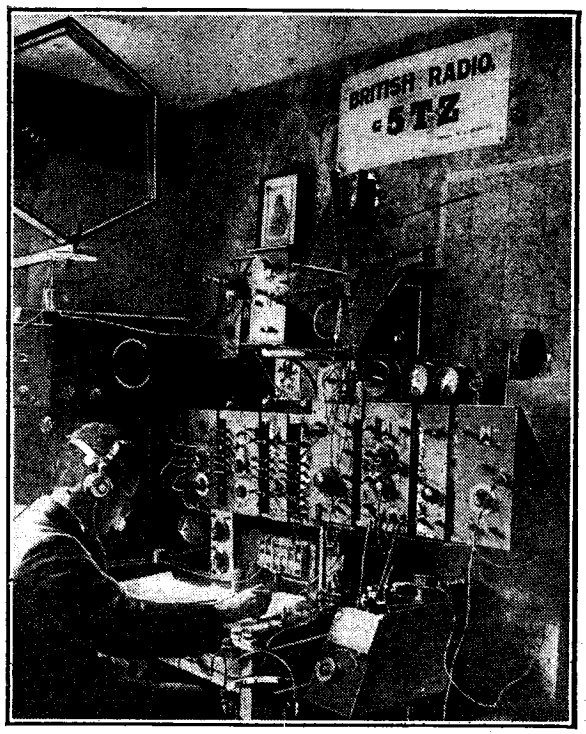
Australian (A) 3BQ, calling British (G) 2SZ, would transmit—2SZ 2SZ 2SZ *ga* 3BQ 3BQ, etc., and 2SZ would reply—3BQ 3BQ 3BQ *ag* 2SZ 2SZ, etc. Similarly, French (F) 8BV would call United States (U) 1CH as follows : 1CH 1CH 1CH *uf* 8BV 8BV 8BV. The letter nearest to the actual call-sign of the station being received indicates his nationality.

Times to Listen

During the day, on wavelengths between 30 and 50 metres, signals come in well from practically every country in Europe. Those from the more distant countries, generally speaking, become stronger towards the evening, and die out as darkness approaches. After dark the American signals, as well as those from various countries more than 3,000 miles distant, commence to come through. Brazilian stations are particularly strong between about 10.30 p.m. and midnight, and after midnight the United States stations reach a good strength, and may be well received until the early hours of the morning.

At about 6.30 a.m. New Zealand and Australia may usually be heard, and the former country may also be received on occasions at 6.30 p.m.

The chief point to remember is that the distant signals are often stronger than those from the nearer countries, so that it is not good practice to pick out weak signals in the hope that they are "DX." It is, in fact, best to listen to *everything* that you hear.



The transmitting station owned by Mr. W.G. Sherratt, who was one of the first amateurs to establish two-way communication with Mosul, Mesopotamia.

Modifying a Broadcast Receiver

It is often somewhat of a problem to the newcomer to short-wave work whether to build a special receiver for the purpose, or to modify the design of his broadcast receiver in such a way that it will work efficiently down to about 20 metres. This is, of course, much more easily done to-day, with the numerous makes of improved components upon the market, than it could have been done a few years ago. In the issue of *Wireless* published on July 31, the writer described an "All-Wave Single-Valve Set," in which "Dimic" coils were used. These are quite suitable for short-wave reception on account of the low-capacity mounting employed in conjunction with them. Short-wave low-loss coils with the standard plug-and-socket base are marketed by at least one firm, and there is no reason why a receiver should not be used in conjunction with plug-in coils to cover all ranges from 15 to 20,000 metres.

Size of Condensers

The condensers, however, are apt to be rather troublesome in this case, since .0002 is quite a large value when we are concerned with waves between, say, 30 and 50 metres; anything larger may be unmanageable. Normally, a broadcast set would employ variable condensers with a capacity higher than this, generally about .0005. An easy way out of the difficulty is to make some arrangement whereby a small fixed condenser can be connected in series with the variable. The effective capacity of the latter may thus be reduced to a convenient value.

Layout

As far as the lay-out of an "all-wave" receiver is concerned, the chief point is, of course, to keep the coils in such positions that their fields will be quite clear of any large metal objects, such as L.F. transformers, variable condenser end plates, etc.

Aerial Coupling

The method of coupling the aerial to the set also needs a little alteration; it will certainly not do to take it direct on to the grid condenser—the receiver will not oscillate in these circumstances. It may, however, be connected to this point in series with a very small condenser, such as one of the many makes of neutralising condensers now on the market. Alternatively, it may be coupled inductively to the set, or may be tapped on to the grid coil at a point near the filament end.

THE "SOLODYNE"

A READER'S OPINION

SIR,—It is with very great pleasure that I give you herewith my results with the "Solodyne."

May I say, first of all, that I was doubtful that "one knob control" would be efficient, and so I left out the L.F. circuit and also used an old panel.

The wiring was finished on Sunday at 2.30 p.m., when I had a try out. As, judging by the state of the ether, several hundred others were also trying out, I switched off and waited for 3.30.

By 3.50 p.m. (*i.e.*, within 20 minutes) I had neutralised, adjusted the variable condensers and received eight stations. In the evening I made a "tour" of the dial, but was much too interested to log anything. It was astonishing to hear station after station come in as the dial was rotated.

On Monday night I added a stage of L.F. Please note.—One stage L.F. Result: 32 stations on the loud-speaker.

A number of others were heard, but not logged as they were not loud-speaker strength. A further stage of L.F. would no doubt have brought these up, and the volume control would certainly have been needed to reduce the strength of a number of the 32.

Last night I went round the stations again and had the same excellent results. Need I say that I am highly satisfied? As the set is so ridiculously easy to operate, why not call it a family set?

In conclusion, may I congratulate you on the production of such a wonderfully efficient circuit?—Yours truly,

D. F. HOGAN.

Sheffield.

SCREENED COILS

The design of the screened coils used in Radio Press sets is the result of a careful combination of high efficiency and compactness. After experiments at Elstree certain standards have been found necessary and unless these are adhered to loss of efficiency may result.

At the time of going to press the following have been examined by Elstree and found to conform to the standard specification:—Bowyer-Lowe, Collinson, Copex, Efesca, Lewcos, Magnum.

News in Advertisements

A special high voltage blocking condenser for use in battery eliminators, working off the electric light mains, has been placed on the market by the Telegraph Condenser Company.

* * *

A loud-speaker on the easy payment system is advertised by W. Bullen.

* * *

A three-valve set, tunable from 40 to 2,500 metres, with silver oxydised metal panel and cabinet to match, is advertised for £17 10s. complete with all accessories, including loud-speaker by Beard and Fitch, Ltd.

* * *

The Duvarileak, a new variable grid leak, is announced by the Dubilier Condenser Co., Ltd.

* * *

Messrs. Gent and Co. advertise an H.T. battery eliminator working off A.C. mains.

* * *

A new accumulator for use with dull emitter valves is being advertised by Oldham and Sons, Ltd., of Manchester.

A Reader's Results with The "Elstree Six"

SIR,—I have built an "Elstree Six," and have had it in use during the last three weeks. I can get all the B.B.C. main stations on the loud-speaker during daylight or dark, and a large number of the Continental stations in daylight or dark, all tuned in on the loud-speaker, without any use of 'phones.

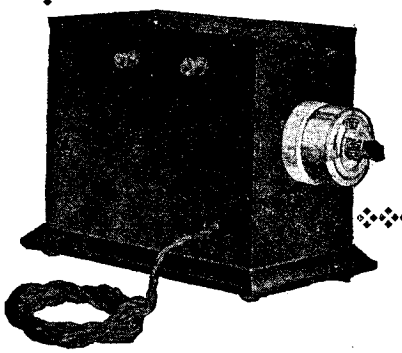
On an indoor aerial of insulated wire, about 40 feet long, strung four times across the room from the picture moulding, starting with Aberdeen, which is our local station, I can put the following stations on the loud-speaker: Aberdeen, Leipzig, Radio-Toulouse, Rome, Glasgow, Newcastle, Dublin, Hamburg, Bournemouth, Union Radio Madrid, Prague and London.

With best wishes for your continued success on the road to further improvements.—Yours truly,

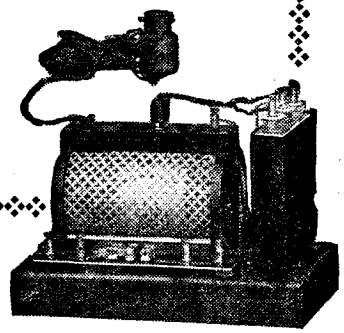
A. W. CARDNO.

Peterhead.

POINTS ABOUT BATTERY ELIMINATORS



By J. H. REYNER,
B.Sc. (Hons), A.M.I.E.E.



THE use of alternating current mains for a variety of wireless purposes is becoming increasingly popular. We have on the one hand a fair number of devices for charging low-tension accumulators from the alternating current mains. Such devices usually consist of a transformer which reduces the voltage of the mains to something of the same order as that of the battery. (Actually, of course, the secondary voltage is a little higher than the voltage of the batteries being charged, so that it can pass a current against the back E.M.F. of the battery itself.) The low-voltage alternating current is then rectified either by means of a mechanical arrangement such as a vibrating reed, or by some other form of rectifier such as the Nodon valve, or some arrangement of this nature.

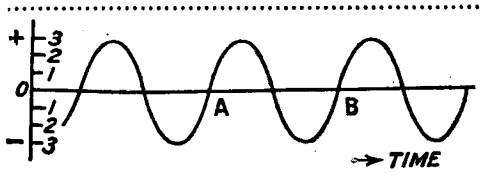


Fig. 1.—One complete cycle is denoted by the distance A B.

Charging H.T. Batteries

Another application of the alternating current mains is to the charging of high-tension accumulators. In such cases the step-down transformer may usually be dispensed with, and it is then only necessary to connect the mains direct on to the accumulator to be charged through a suitable rectifying device. If the rectifier is of a saturating type, such as, for example, an ordinary two-electrode valve, then this is all that is required, because the valve will not pass more than a certain current, and in this way the charge is more or less self-regulating somewhat as in the charging set which appeared in last month's issue.

If, on the other hand, the rectifier is not limiting, then it is necessary to see that the voltages are in the correct relation. For example, it would not be possible to charge a 60-volt accumulator direct from a 240-volt main with a rectifier which was not limiting, and it would be necessary in this case to utilise a step-down transformer to reduce the voltage of the mains to something like 80 to 100 volts.

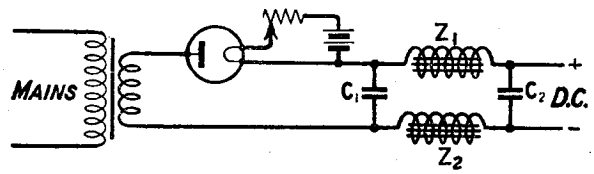


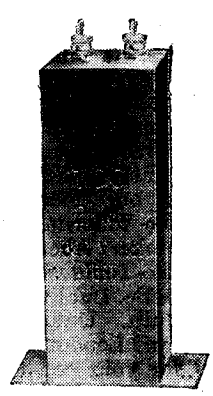
Fig. 2.—A simple rectifying arrangement. C_1 and C_2 are smoothing condensers.

Battery Eliminators

Apart from the charging of H.T. accumulators, we have an increasing number of battery eliminators, the purpose of which is to supply high-tension voltage for the receiver direct from the mains without the use of any accumulator or any other battery. Such arrangements comprise—firstly, a rectifying system which converts the alternating current into uni-directional current; secondly, a smoothing system is necessary in order to smooth out the variation and fluctuation on the rectified A.C., and so convert it into more or less unvarying direct current, and finally there is usually some arrangement to enable different values of high-tension voltage to be tapped off the units, so obtaining different anode potentials suitable for the different stages in the receiver.

Underlying Principles

Now there is no doubt that arrangements such as these will be used in increasing quantities in the future, and it is desirable, therefore, that the user or prospective user should have some idea of the underlying principles upon which their operation is based. The average man has some idea that alternating current mains produce current which goes backwards and forwards, and by the use of these various devices one half of the current is



The smoothing condensers used in A. C. work should have an adequate factor of safety against breakdown.

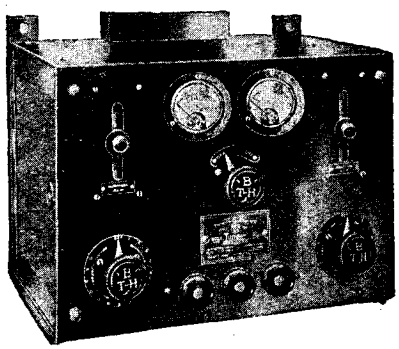
POINTS ABOUT BATTERY ELIMINATORS.—*(Cont'd.)*

wiped out, leaving only the currents in the same direction.

While this theory is correct in its essentials, there are one or two points upon which further information is desirable, and I propose in this article to dwell upon the theory of rectified alternating currents in a little greater detail. The subject is one of considerable interest and is also quite simple if tackled from common-sense principles. It is necessary, however, to go into the subject more or less from the beginning in order to obtain a clear idea of what is actually happening.

A.C. Waveform

Now the alternating voltage supplied by the ordinary house wiring mains is of the form shown



Battery charging units effect a considerable saving in cases where both H.T. and L.T. accumulators are used.

in Fig. 1. In one instant the voltage is zero. It then commences to grow in strength until it reaches a maximum, after which it dies away again to zero. It now commences to grow to a maximum again, but this time in the opposite direction, after which it once more falls to zero.

Thus the actual value of the voltage across the mains is continually varying, and this periodic change takes place many times per second. The actual number of complete changes per second—that is to say, between the points A and B in Fig. 1—is known as the periodicity or frequency of the system.

Frequency Values

In this country there is a diversity of frequencies. In the early days when alternating current was

POINTS ABOUT BATTERY ELIMINATORS—*(Contd.)*

first introduced, there was a tendency to design the electrical side of the plant to suit the steam-engine or other prime mover which was provided, and which in the majority of cases was already in existence. This led to the adoption of all sorts of freak values of frequency.

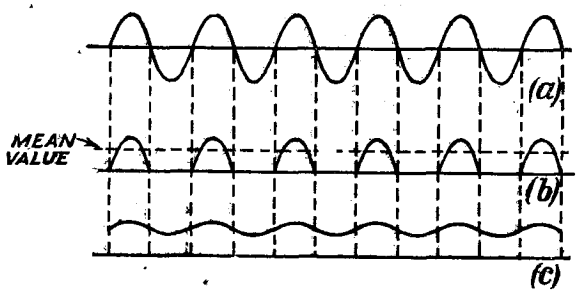


Fig. 3.—Showing how the A.C. wave form finally becomes a simple D.C. ripple after rectification and smoothing.

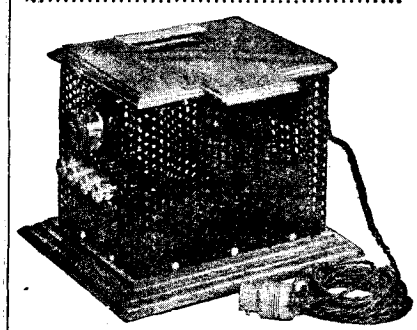
Standardisation

There is a distinct tendency nowadays, however, to the adoption of a single frequency of 50 cycles per second, although for power work the frequency of 25 cycles per second is also used to a considerable extent. In America, on the other hand, everything is standard 60-cycle frequency, and this naturally considerably simplifies the design of apparatus, not only in the wireless field, but throughout the whole electrical industry.

Voltage Rating

Now with a direct current mains we specify the actual voltage between two mains, and this is fixed and definite in value. What are we to specify, however, in the case of alternating current mains, where the value of the voltage is continually fluctuating? The same difficulty arises in the case of an alternating current which fluctuates in a similar manner to that of the voltage, and whatever arrangement of specification is adopted it must be suitable for both voltage and current.

Now there is one property of current which is always the same, and that is the heating effect which is produced. If a current is passed through a wire, then a certain heating effect is obtained depending upon the resistance of the conductor and the amount of current flowing through it. If an alternating current is passed through the same wire, the heating effect is still produced, and this gives the clue, as it were, to the method of defining the value of an alternating current. The value is so chosen that the current shall produce the same heating effect as a direct current.



H.T. units of this type may be plugged into any existing lamp socket.

If, therefore, we pass an alternating current through a wire and obtain a certain increase in temperature, we can then pass a direct current through the wire and obtain the same temperature rise. If the value of the direct current, as measured by an ordinary ammeter, is 3 amperes, then the value of the

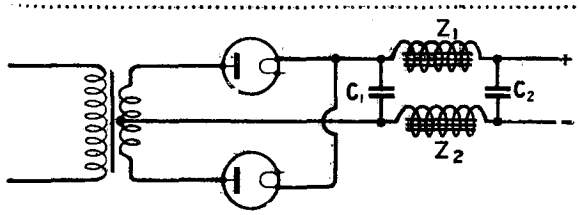


Fig. 4.—The theoretical circuit of a double wave rectifier. To retain simplicity the filament connections to the valves are not shown.

POINTS ABOUT BATTERY ELIMINATORS—*(Contd.)*

alternating current is said to be 3 amperes as well.

Root-Mean-Square Value

Now, obviously, the actual heating effect will vary from instant to instant. When the current is zero there is no heating effect at all, and when the current is at a maximum we have a much larger heating effect. The temperature which the wire will attain if an alternating current is passed through it, therefore, is the result of a mean heating effect which will be something less than the maximum.

Actually the heating effect in a wire can be shown to depend upon the square of the current at any instant. Therefore the mean heating effect is proportional to the mean value of the square of the current at each instant. The equivalent mean value of the current, therefore, is the square root of this *mean-square* value, and this has given rise to the expression *root-mean-square* value of the current or voltage.

This somewhat complicated way of choosing a mean value is necessary owing to the fact that the heating effect (and in general the power produced in any electrical circuit) is proportional to the square of the current, or what is the equivalent, the product of the voltage and the current. The actual average value of the current itself is a different value altogether, and

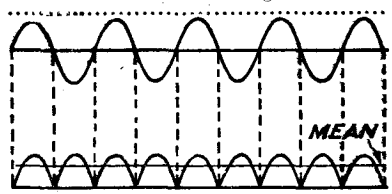


Fig. 5—The rectified voltage after two-wave rectification is as shown above.

is actually somewhat less than the root-mean-square or R.M.S. value. In the case of an ordinary alternating current of sine wave form, the R.M.S. value is 1.1 times the mean value.

Maximum Voltage

The point which should be noted is that the rated value of any alternating current mains is considerably less than the maximum voltage, which may be nearly 50 per cent. higher than the R.M.S. or rated value. This fact was mentioned last month in discussing the H.T. charging unit, and it is a point which is often overlooked. It has an important bearing upon the design of apparatus for operation of alternating current mains, since the various components have to be designed to withstand a higher voltage than appears to be the case at first sight.

Smoothing Condensers

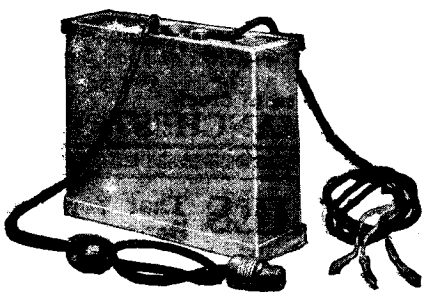
This particularly refers to the use of condensers in smoothing units and similar devices. It is necessary in such to employ fairly large condensers to act as reservoirs or smoothing condensers in such circuits and so to reduce the fluctuation to a small value. The circuit shown in Fig. 2 is a representative case. Here the alternating voltage from the mains is stepped down to a suitable value by means of the transformer. The output from the

POINTS ABOUT BATTERY ELIMINATORS — *(Contd.)*

secondary of the transformer is then rectified by means of an ordinary two-electrode valve, and this gives us pulsating current of the form shown in Fig. 3 (*b*).

These pulsating currents may be considered as being made up of a mean value, and a ripple or fluctuation on top. Now we have to eliminate this ripple as far as possible, and leave ourselves with the steady component of the rectified voltage, and this is done by a combination of choke coils and condensers.

The condensers take a little time to charge up, and this tends to resist the rise in voltage above the mean value, while they also take a certain time to discharge and thus



An H.T. Battery eliminator is quite a simple and compact device.

oppose any fall in the voltage on the other hand.

Choke Coils

The choke coils, while offering very little opposition to the direct current, tend to oppose any change in the current, and thus further assist in reducing the actual value of the fluctuation. The final result, therefore, is that the voltage output appears somewhat as shown in Fig. 3 (*c*), which will be seen to be a constant value with only comparatively small fluctuations.

Double-Wave Rectifiers

In Fig. 4 we have a double-wave rectifier in which both halves of the alternating current have been rectified. This arrangement demands the use of a split transformer, so that one half of the wave can go through one rectifying valve and the other half through the other one. The two rectified outputs are arranged to be both in the same direction, and the

"4 Point" Newey Condenser

An Unsolicited Testimonial

60, MELBURY GARDENS,
COTTENHAM PARK,
LONDON, S.W.20.

Dear Sirs,

I recently purchased three of your Four Point Newey Condensers for test. I had them so wired up in my receiver that on pushing down a switch I had another set of condensers made by —— in circuit.

On the 24th of September, at 2.34 a.m., I was able to tune in the whole of the Dempsey-Tunney fight, from both K.D.K.A. and Station 2X.H.F., each about R.5. On pushing over the switch and tuning round I could receive nil except X's and morse.

They are the finest piece of workmanship I know of.

Yours faithfully,
(Signed) M. F. W.

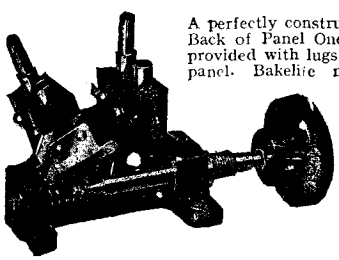
6/10/26.

The original of the above letter can be seen at our offices, Phonos House, Bucknall Street, W.C.2.

The Newey Four Point Condenser is perfectly designed and constructed, and is made by All-British Labour in All-British Factories from the finest available materials.

PRICE complete with knob and dial: .0005 mfd., **17/6**
.0003 mfd., **15/-**

THE NEWEY VERNIER COIL HOLDER



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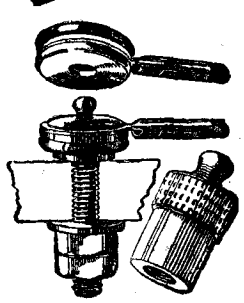

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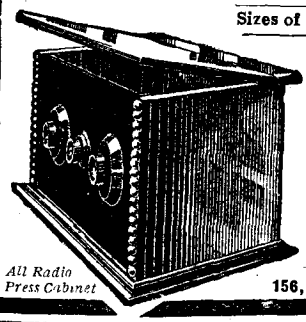

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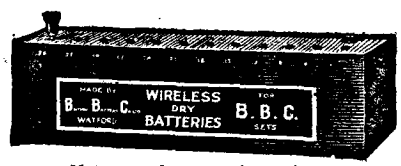

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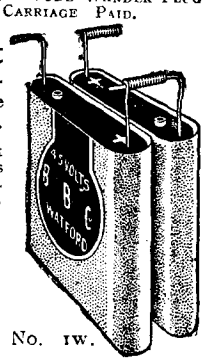

No. 1w.

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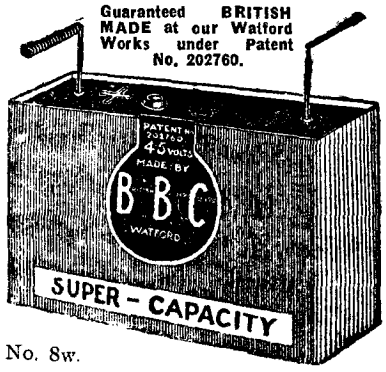

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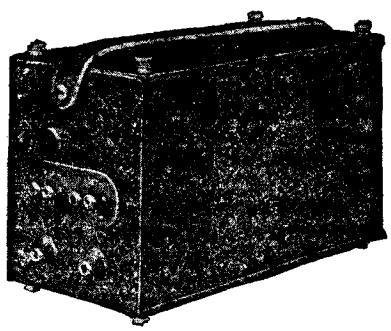
POINTS ABOUT BATTERY ELIMINATORS — *(Contd.)*

resultant rectified voltage before smoothing is as shown in Fig. 5. It will be seen here that the ripples are of twice the frequency and are also not so serious in character. The higher the frequency of the fluctuations the more readily can they be smoothed out, since the size of the condensers and choke coils necessary is considerably smaller. For this reason it is customary to use double-wave rectification where possible, since this considerably simplifies the smoothing operation.

An Important Point

The particular point to notice is that the smoothing condensers connected across the output circuits have to withstand the full value of the alternating voltage. The rectified output before smoothing rises from zero to the full value of the alternating current, and consequently the condenser must be able to withstand this voltage, which, as we have seen, is considerably in excess of the average value.

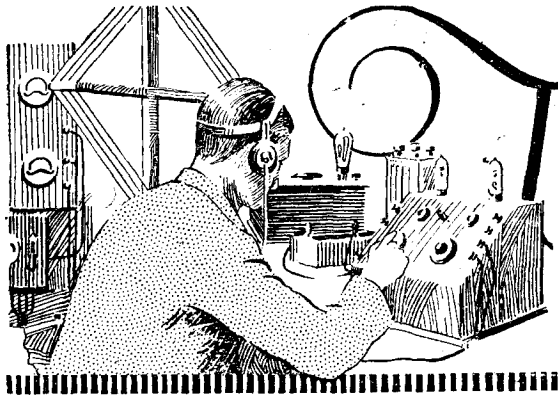


This battery eliminator is no larger than a medium sized hand camera.

Shunting Values

Owing to the size of the condensers required, which are of the order of 2 to 4 microfarads or more, it is customary to employ paper-insulated condensers of the Mansbridge pattern. These condensers are constructed with a specially prepared paper having a metal deposit on one side which forms the plates of the condenser itself, while the paper constitutes the insulation. The material is actually a specially prepared form of the ordinary paper often used for wrapping up

(Concluded on page 616).

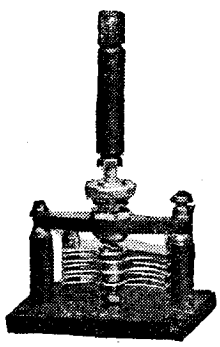


Tested by Ourselves

Neutralising Condenser

MESSRS. Peto Scott Co., Ltd. have sent us one of their new pattern of neutralising condensers for test.

In this component the spindle which carries the moving plates passes through a bush located in the centre of a bridge piece of insulating material, which is carried at the top of two pillars of similar substance fixed to the base. This forms the main bearing of the spindle, the bottom bearing being



The Peto Scott Neutralising Condenser

carried in a small metal bush screwed into the base. The fixed plates are placed well away from the moving plates, so as to obtain a low minimum, which is further provided for by the special curved shape of the opposing edges of the plates. The spindle is provided with a lock nut, so that the condenser may be locked, after the correct setting is obtained. Terminals or soldering tags may be employed when making connections.

It should be noted that two terminals are provided, one at either end of the bridge piece which carries the spindle for the moving vanes, but only one of these is in actual contact with the spindle. Care should should, therefore, be taken to ensure that the terminal to which connection is made is the right one.

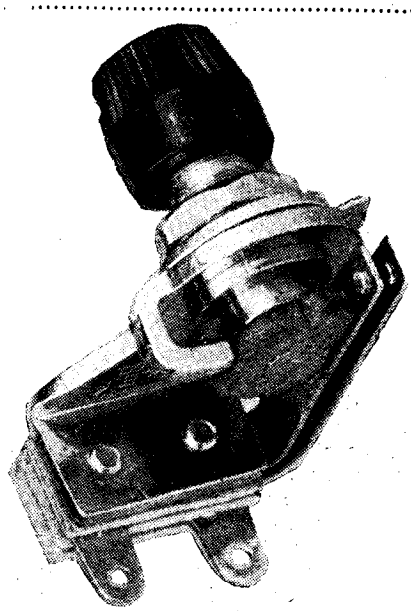
On test the component showed a minimum capacity of 2 micro-micro-farads, the maximum being 19. This is quite satisfactory for all practical purposes, and can be considered as complying with the standard specification.

Battery Switch

MESSRS. Rothermel Radio Corporation of Great Britain Ltd. have submitted to us for test one of their "Yaxley" battery switches.

As the name implies, this component is intended for insertion in one of the battery leads for use as an "on-and-off" switch. A small lever actuates a cam made of insulating material, which presses against a spring contact as the knob is rotated, thus closing the circuit.

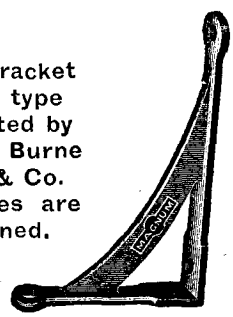
Connections may be made by means of two soldering tags, and a positive stop is provided for "on" and "off" positions, which are indicated by means of a small engraved plate placed in position on the panel under the fixing nut.



The "Yaxley" battery switch.

The lever on the switch knob also serves to lock the knob on the spindle, and it is provided with a knurled end for easy withdrawal.

We can recommend this component as being a workmanlike job, and it provides a satisfactory means of making or breaking the low-tension circuit.



A panel bracket of the type submitted by Messrs. Burne Jones & Co. The faces are machined.

Panel Brackets

MESSRS. Burne-Jones and Co., Ltd., have sent us samples of their "Magnum" Panel Brackets for test. These brackets, which appear to be constructed of cast aluminium, though light in weight, are solid and robust in construction, while both faces have been machined so that when in use the panel will be held at true right angles to the baseboard.

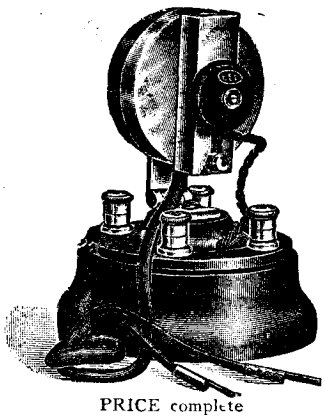
Each arm of the brackets is provided with two holes for fixing purposes, and this accessory can specially be recommended in cases where heavy components are mounted on the panel.

Filament Rheostat

WE have received samples of baseboard mounting Filament Rheostats from Messrs. Lissen, Ltd.

These rheostats are similar in construction to their well-known panel mounting type in that the winding is carried on a strip of insulating material which is bent round a

THE NEW MAGNETIC MICROPHONE BAR AMPLIFIER



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Six pairs of Wireless Headphones, or any 2,000-ohms Loud Speaker may be operated from a single 3-volt Dry Battery.

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The Magnetic Microphone Bar Amplifier uses less than ¼ of an ampere, one 3-volt dry cell, at a cost of 3/-, lasting upwards of 300 working hours.

No Diaphragms. No Distortion. No Fragile Parts. Nothing to get out of order. No microphonic noises. Unaffected by vibration. Compact and easily portable. ANYONE CAN ADJUST IT.

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Swan-neck pattern, 1/- extra.

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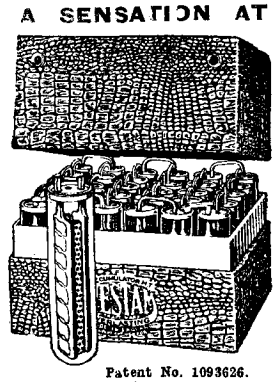

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Recharge twice a year only

6D a Volt. 2 Amps.
Entirely British. Fully Guaranteed.

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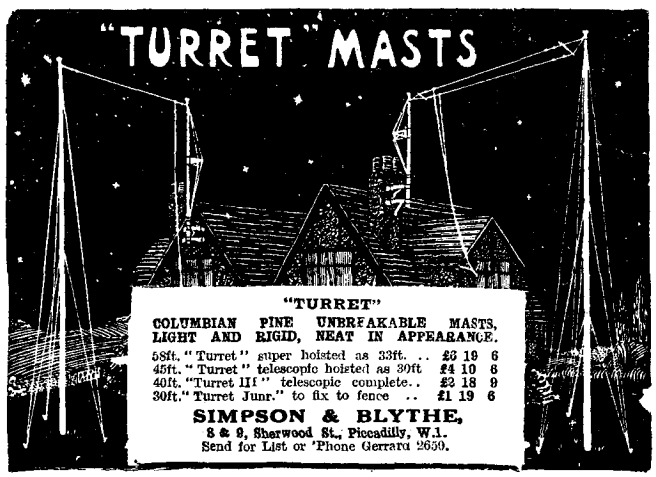

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The Variable Grid Leak that *remains* variable

No Dubilier product is placed on the market until we can be absolutely certain of its giving perfectly satisfactory results in use.

The Duvarileak has been in the experimental stage for three years.

The final result is that this Grid Leak will show a smooth and uniform variation of resistance from zero to five million ohms. More important still, by successfully discovering a resistance element of extremely hard surface and by arranging a ball-bearing contact (see inset) we have assured that the wear in operation will be negligible.

This means that the Duvarileak will, throughout its life, give a ***constant resistance value for any given setting of the dial.***

Like all Dubilier products, the Duvarileak can be relied upon to give the utmost efficiency in service—it is, in fact, the perfect variable Grid Leak at last.

As seen in the illustration, it has one-hole fixing and a dial scale by which the resistance may be set.

The Duvolcon for Loud Speaker Volume control is the same in appearance and price as the Duvarileak, and is suitable for use with any Loud Speaker.

Price **7/6** of all Dealers.

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TESTED BY OURSELVES—(Contd.)

moulded insulating former. Terminals or soldering tags are provided for making connections, while a special short spindle is employed so that the rheostat may be mounted flat on the baseboard. The resistance can be set to any required value within its limits, and so long as an "on" and "off" switch is included in circuit need not be altered again.

The rheostats received were of the bright emitter type, and when placed on test it was found that they all had a resistance of 7 ohms, which is the figure given by the makers. The maximum position gives less than one-tenth of an ohm, while the wire employed is of a heavy gauge, so that several amperes can be passed through this resistance without overheating.

This component is robust in construction, and can be recommended for use.

Duros High-tension Unit

MESSRS. A.F.A. Accumulators Ltd. have sent us for test one of their Duros high-tension units.

This unit is of monoblock construction, compact in size and light in weight. When discharged at a rate of 60 milliamperes its capacity is stated to be 1,800 milliampere hours.

The plates are separated from each other by a strip moulded into the glass container, while the top of the cell is filled in with pitch, tappings being provided at every 2 volts. The vent plugs are held together on a common strip of india-rubber, this being an excellent idea, since the single vent plugs do not get lost.

Several of these units have been in use for some months as a 60-volt high-tension battery, and when originally charged their voltage was found to be in the neighbourhood of 66 volts. After two months' use the voltage still registers above 60, and the cells appear to be in excellent condition in every way; the battery is silent in action.

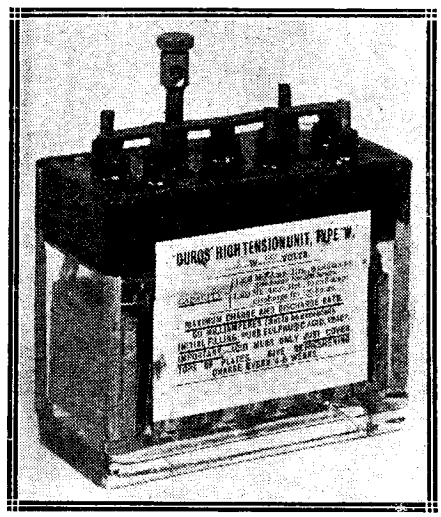
The makers advise giving this cell a slight boosting charge every four to five weeks, but this has not been found necessary in the case of the unit under test.

Although we have not as yet been able to give this cell a very stringent test, the results so far obtained are very favourable, and we have no hesitation in recommending this high-tension unit.

Velvet Contact Rheostat

MESSRS. M. and A. Wolff have sent us one of their "Etherplus" velvet rheostats for test.

The resistance element of this component is carried on a strip of fibre round which it is wound, the fibre being bent in a circle, and the two ends being fixed to a small metal bracket. The spindle which carries the moving contact to the resistance passes through a bush fixed in the centre of the metal bracket, this bush also serving to fix the component to the panel. A small moulded knob provided with a pointer serves to control the amount of resistance in the circuit, while a clearly marked scale is provided with the instrument.



The Duros high-tension unit.

When placed on test it was found that the value of the resistance was exactly 30 ohms, which is the maker's rating. The moving contact was extremely light and amply bears out the maker's claim of velvet contact.

The component is neat and compact in construction, and its general finish is satisfactory. We can recommend it for all purposes where a 30-ohm resistance capable of carrying about half an ampere is required.

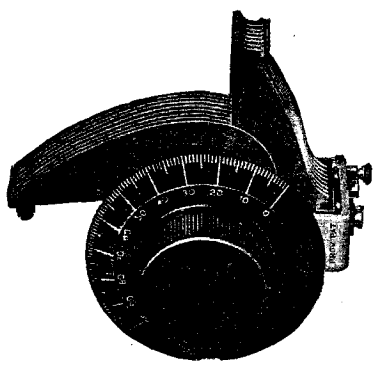
TESTED BY OURSELVES
(*Concluded*)

"Formo" Variable Condenser

WE have received a Straight-Line-Frequency Condenser for test from Messrs. Formo, Ltd.

The construction of this component incorporates several novel features. Only a single bearing is employed, and this is of the cone type, arrangements being made for adjustments in the case of wearing. The stator plates are supported at one place only, the insulation being arranged so as to be out of the main field of the condenser.

As in most S.L.F. condensers, the vanes are somewhat long, and in order to eliminate any possibility of irregular spacing at the tip, small supports to both the rotor and stator vanes have been fitted. The component is of the one-hole fixing type, and is provided with a standard quarter-spindle for the dial. Connections may be made to it either by terminals or soldering tags, as desired, while, as an additional means for connecting to the rotor plates, a copper pigtail is provided.



The Formo S.L.F. variable condenser.

The capacity of the condenser is rated at .0003 by the makers and when placed on test its actual value was found to be .0003. Its minimum value was .00002 while at broadcast frequencies its losses were negligible.

The instrument is robustly constructed and well finished, and can be fully recommended.

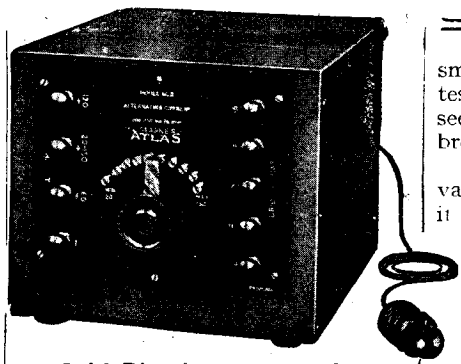
POINTS ABOUT BATTERY ELIMINATORS—(Concluded from p. 611)

packets of tea. Such condensers are quite satisfactory in use, provided they are suitably chosen for the particular circuit in which they are to be employed.

Factor of Safety

Obviously, these condensers will not stand up to such a high voltage as a mica or oil-insulated condenser, but to obtain the requisite capacity with mica insulation would not only be extremely expensive, but would also be excessively bulky. Moreover, with suitable precautions the paper-insulated condenser is perfectly satisfactory and there is no need to go to the extra expense. In many cases, however, this heavy strain on the condensers is not sufficiently appreciated, and condensers are employed having an inadequate factor of safety.

The usual type of paper-insulated condenser is tested at a D.C. voltage of 300 volts. This gives an adequate factor of safety where the condenser is used as a by-pass condenser in a receiver, where the maximum H.T. voltage is 120 or 150 volts. In the case of a smoothing unit, however,



Grid Bias is provided for on this H.T. unit.

it is quite possible that this factor of safety would not be sufficient.

Breakdown Possible

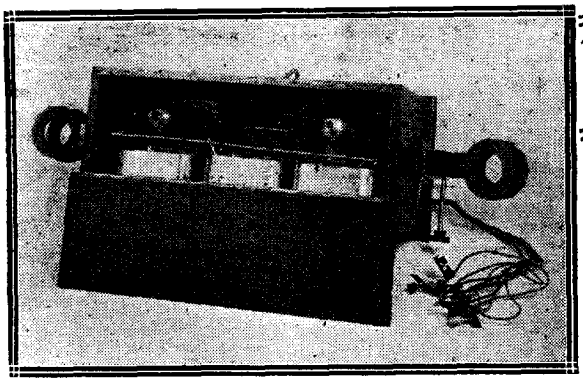
Let us consider the case of a battery eliminator or similar device designed to operate off 240 volt mains. Now 240 volts as we have seen is the rated or R.M.S. value of the mains, and the peak value is considerably higher. With the usual type of sinusoidal wave form, the actual peak value is 1.41 times the R.M.S. value, and in this case works out at 340 volts approximately. Now, if the condensers used in the smoothing unit have only been tested up to 300 volts, it will be seen that there is a possibility of a breakdown occurring.

With a 200 volts supply the peak value would be 280 volts, so that if this were all that had to be contended with, the ordinary type of condenser would be satisfactory. There is always, however, the possibility of a sudden surge on the line which may cause a momentary rise in the voltage which would put a strain on the condenser considerably over the rated 300 volts.

High Voltage Condensers

There are on the market condensers of this paper-insulated type which are provided with special insulation, and are actually tested on 600 volts D.C.

This, therefore, is a case where the first trouble is the least, and if a mains unit is being designed to operate off a fairly high voltage of over 150 volts, then it is preferable to use the 600 volts type of condenser and so avoid risk of possible breakdown in service.



The inside of the five-valve set (above) presents a very compact appearance. Below is seen the theoretical diagram of the circuit employed.

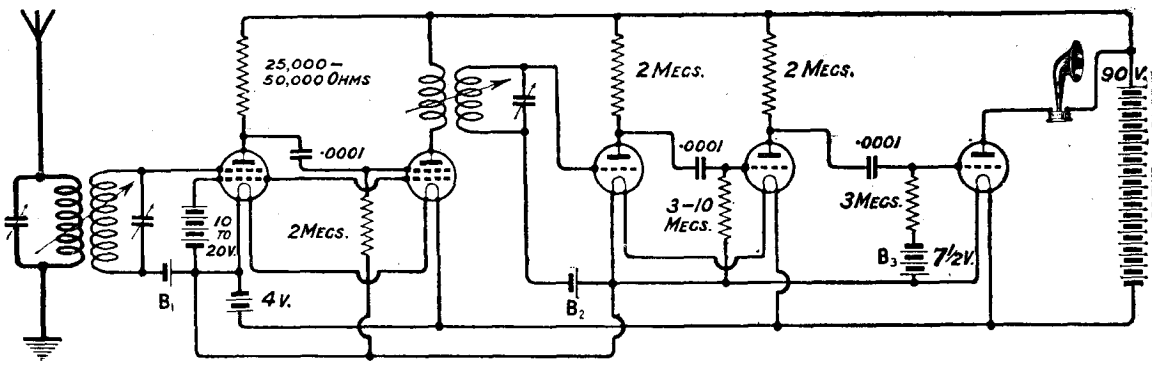
THE LOEWE VALVE

(Concluded from page 580.)

stations being tuned in at really good loud-speaker strength, the quality being also very good. Good loud-speaking was obtained from the local station with the H.F. stages cut out of circuit.

From the point of view of selectivity it was found that there was room for improvement. This deficiency in the matter of selectivity may be understood if the high-frequency portion of the circuit be compared with the neutralised tuned amplifiers now coming into general use.

Receivers built upon these amazingly compact lines present a strong appeal in view of the range and power obtainable from them, combined with simplicity of control.



THE "DRAWING ROOM FIVE"—(Concluded from page 535)

serve for the connections to be made here (looking at front).

Valves, H.T. and Grid Bias

For use in a set of this type resistance-coupling valves should be employed for the detector and first two note magnifiers, whilst in the last valve socket a power valve of similar filament voltage rating to the others must be used. It will be found, in most cases, that for the H.F. valve socket a further resistance - coupling type or alternatively an H.F. type will prove satisfactory. On the note magnifiers the maximum H.T. permitted by the maker's rating is to be advised, and generally 100 to 120 volts will prove satsifactory here, in conjunction with 1½ or 3 volts grid bias for G.B., −1 and 6 or 7½ for G.B. −2. For the detector valve, this being of resistance-coupling type, 70 to 90 volts proves satisfactory in conjunction with a single dry cell of 1½ volts for G.B.1. On the H.F. valve 60 to 80 volts proves satisfactory with a resistance-coupling type.

Aerial Connection

A suitable aerial coil should be inserted into the L_1 coil base and in the other a split-primary transformer, for the same wavelength range, should be used. With the valves plugged in, first connect the L.T. battery, and if the valves appear to light correctly connect the H.T. negative lead from the set, into the H.T. battery, join all positive leads together and tap into a low voltage socket, of the order of 4 or 6 volts, noting whether the valves light more brilliantly. If they do not do so it is probable that all is correct and the voltages previously indicated should be employed for the various valves or groups of valves.

The Radio Choke

On the lower broadcast range a No. 250 or 300 plug-in coil will serve for the radio frequency choke, but if coils for the 1,000-2,000 metre range are obtained a large choke will be required, Nos. 400 or 500 proving satisfactory.

Neutralising

The neutralising of the H.F. valve is usually by no means critical, and the procedure I generally adopt is to tune in the local station with the first valve extinguished, by placing the first baseboard mounting rheostat to the off position, when upon adjusting the neutralising condenser it will be found that a point occurs where signals are reduced to minimum strength or disappear entirely.

Preliminary Testing

For a preliminary test place the reaction condenser, that is, the right-hand condenser at zero setting, and advance the two other tuning condensers by two or three degrees each at a time, when the local station should be heard. The tuning is sharp but throughout the whole lower broadcast range, with the coils which I used, the variation between the two readings was not more than five degrees, so that searching is very easy.

A "PUSH-PULL THREE"

(*Concluded from page 557.*)

Long Wave Reception

Should it be desired to receive upon the long wavelengths, the "fieldless" coil should be changed for one of long wave design; beyond this, however, the operation of the receiver is the same in every detail as that obtaining when receiving upon the ordinary broadcast band of wavelengths.

In the Crystal Palace district, where the reception of Daventry is not generally good, the present receiver gives quite good loud-speaker results without forcing the set to the limit of reaction adjustment, while Radio-Paris can also be received at much the same strength, the iron building of the Crystal Palace having some weakening effect upon the Daventry signals.

Results

Though the receiver is not intended for distance work, and it is not suggested that it be used for that class of listening, it is nevertheless possible to tune in a number of stations other than the local one; and as a matter of interest, when using the receiver with telephones as the means of hearing, such stations as Birmingham, Newcastle, Hamburg, Radio-Belgique, Cadiz, Leipzig and Frankfurt have been received at good strength.

Though some of these stations could be heard on the loud-speaker their volume does not justify, in my opinion, their being regarded as being received "on the loud-speaker"; nevertheless, they can be received at quite good telephone strength so long as the receiver is handled with due care and patience.

A LECTURE AND DEMONSTRATION

On November 9th a lecture and demonstration of the Elstree "Solodyne" will be given by Mr. J. H. Reyner, B.Sc. (Hons.), A.M.I.E.E., to the Bournville Radio Society, by whose courtesy we are enabled to offer a limited number of tickets to readers residing in the Birmingham district. Applications should be made at once to the Editor, MODERN WIRELESS, Bush House, W.C.2. Envelopes should be marked "Lecture."

OVER 70 STATIONS on the "SOLODYNE"

SIR,—May I offer my most respectful congratulations to the Radio Press on your latest and most astounding Star Set. I have only one objection to raise: modesty, in moderation, is an admirable quality; but do not overdo it.

I only completed my "Solodyne" four days ago, and my bag already is not 50 but well over 70 stations! I must frankly confess that I am astounded at the results; and I should also like to add that I have never handled a set so delightfully easy to manipulate. It took me only two minutes to adjust the neutralising and the gang condensers, and in the next 50 minutes I had identified and logged 35 stations. I have since asked one or two friends of mine, who have never handled a set before, to sit down and tune in; they have done so with very nearly the same ease as I myself have experienced. My own frank opinion is that this set will to a very large extent knock the Super-Het. clean out of the market.

In conclusion I can only tender my very real gratitude to all who have contributed to put this set "into circulation," and to wish for it the success it so richly deserves.—Yours truly,

M. G. FERGUSON.

Holm Leigh, Buxton.

"WIRELESS," *The One-Word Weekly.*

A New Radio Press Star Receiver

—⊗—

"WIRELESS," the one-word weekly, is now running a series of articles describing the latest Radio Press Star Receiver—the "Monodial": four valves and only one dial.

—⊗—

Why not place a standing order with your newsagent? 2d. Every Tuesday 2d.

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