

LARGEST RADIO CIRCULATION IN THE WORLD

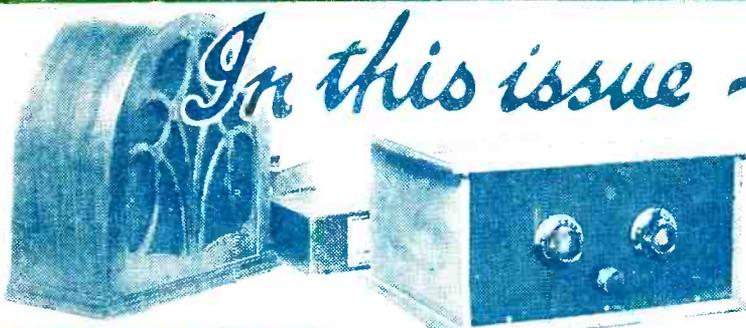
Popular Wireless

Every Thursday
PRICE
3d.

No. 495. Vol. XX.

INCORPORATING "WIRELESS"

November 28th, 1931.



In this issue - "S.Q."
STAR

Also This Week :

FURNACES
FOR FILAMENTS

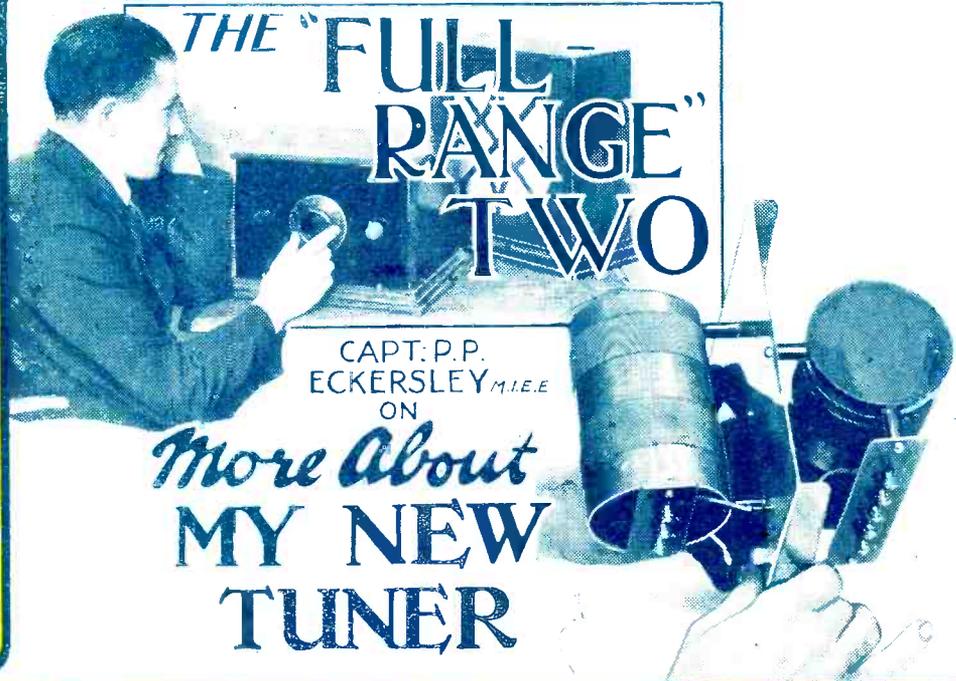
THE B.B.C.'s
UNKNOWN
STUDIOS

THIS "CLAUQUE"
BUSINESS

THE BOGEY VAN

MAKING YOUR
OWN RECORDS

THE SCOTTISH
EXHIBITION



THE "FULL
RANGE"
TWO

CAPT. P.P.
ECKERSLEY M.I.E.E.
ON

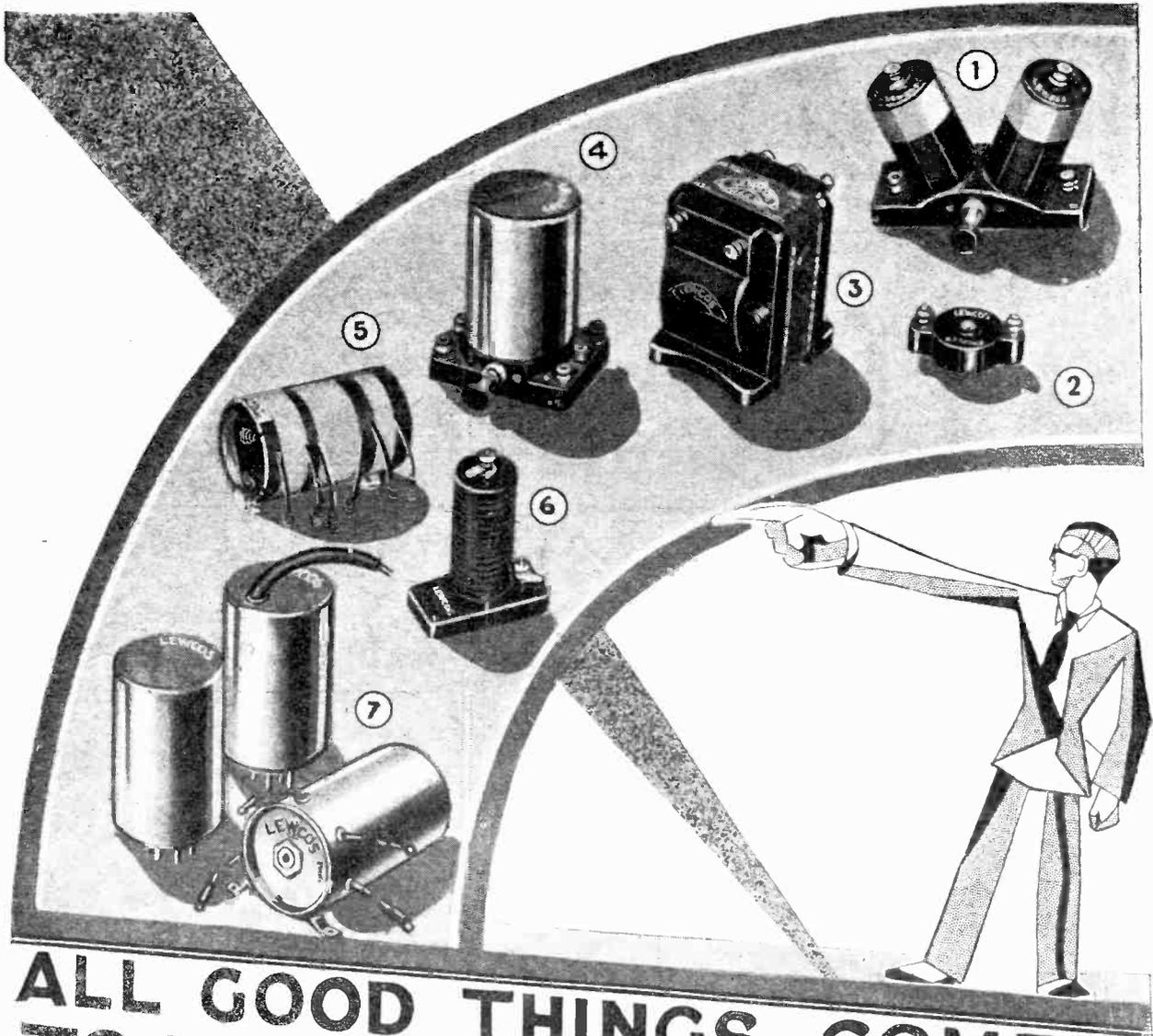
More About
MY NEW
TUNER

When Building
your set—use a

Ready Radio

TESTED
KIT

See page
745.



ALL GOOD THINGS COME TO THOSE WHO

use

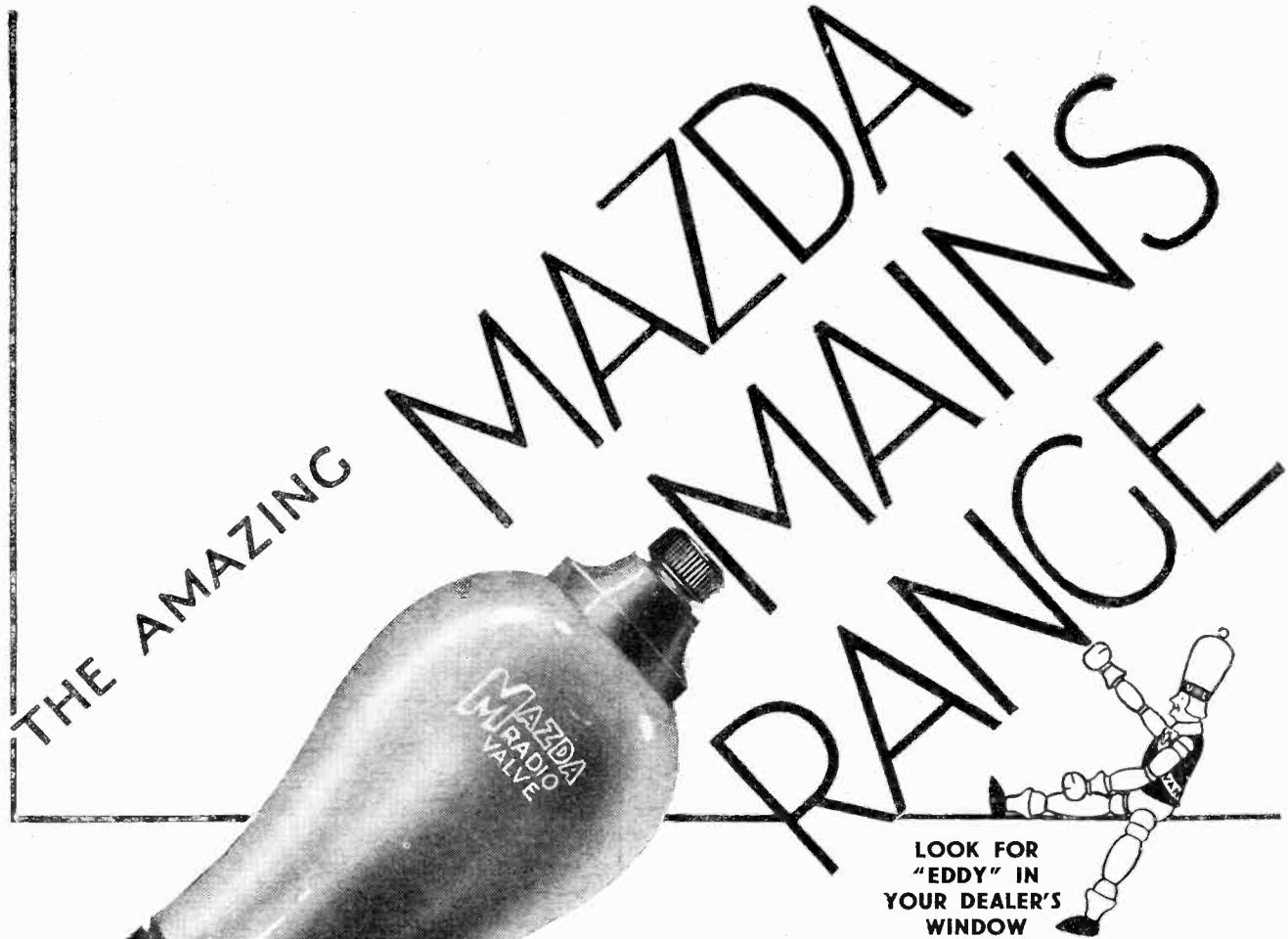
LEWCOS
Radio Products!

THE LEWCOS COMPONENTS ILLUSTRATED ABOVE ARE—

- 1. The Band Pass Filter. Price 12 -
 - 2. The H.F. Choke, Type M.C. Price 2 6
 - 3. The L.F. Transformer Reference L.F.T. 3, Price 12 6; I.F.T. 5, 17 6
 - 4. The A.T.G. Coil. Price 8 6
 - 5. The "P.J." Coil. Price 2 6
 - 6. The Super H.F. Choke. Price 6 -
 - 7. Extenser Oscillator. Price 12 6
- L.F. Transformer with pigtail, Price 10 6
- L.F. Transformer without pigtail, Price 10 6

The Lewcos Super-Het Kit (No. 7) is specified for the "S.Q. Star." The Super H.F. Choke and a "P.J." Coil are specified for the "Full Range 2," described in this issue.

LEWCOS RADIO PRODUCTS FOR BETTER RECEPTION



From the time when Mazda engineers introduced the first indirectly heated mains valve, every big development in mains valve practice has emanated from the Mazda factory. Now, when both Mazda A.C. and D.C. types are acknowledged to be the most efficient available, comes an even greater range of indirectly heated cathode valves.

Just look at this extraordinarily sensitive metalised valve, the AC/S2, a new screened grid Mazda: Amplification factor 3,000. Mutual Conductance 6.5.

Price **22/6**

MAZDA MAINS VALVES

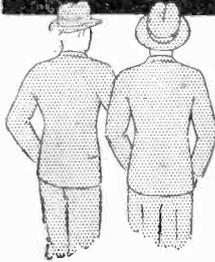
TYPE		PRICE
A.C. MAINS		
AC/HL ...	Clear ...	15/-
AC.2/HL ...	Metalised ...	15/-
AC/SG ...	Clear or Metalised ...	22/6
AC/S.2 ...	Metalised ...	22/6
AC/P ...	Clear ...	17/6
AC/P.1 ...	Clear ...	20/-
AC/PEN ...	Clear ...	25/-
D.C. MAINS		
DC/SG ...	Clear ...	22/6
DC/HL ...	Clear ...	15/-
DC/P ...	Clear ...	17/6
DC/PEN ...	Clear ...	25/-
DC.3/HL ...	Clear ...	15/-
DC.2/P ...	Clear ...	17/6
DC.2/PEN ...	Clear ...	25/-

MAZDA
THE
BRITISH
VALVES
EDISWAN RADIO



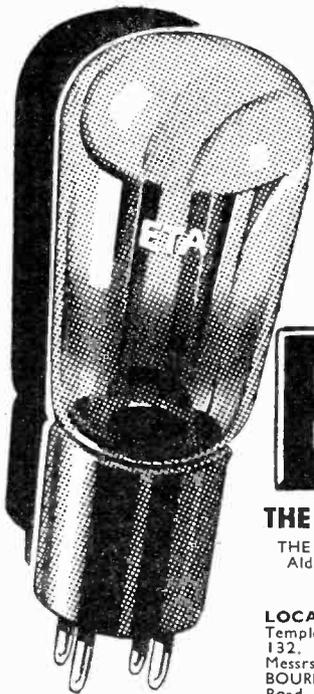
THE EDISON SWAN ELECTRIC CO. LTD.
 Radio Division: 155 Charing Cross Road, London, W.C.2 V.143

Are you getting your money's worth?



ETA Valves are just as good as the highest priced valves on the market. They give equal performance — often better performance. They last just as long — often longer. They are as economical on current — often more economical.

And yet they cost quite a decent bit less to buy. They give you *real value for money, real economy, real satisfaction.* ETA valves are in use all over the world. Nation listens to Nation with them. Next time you want a valve ask for ETA.



PRICES FROM

7/-

ETA

THE INTERNATIONAL VALVE

THE ELECTRICAL TRADING ASSOC. LTD.,
Aldwych House, Aldwych, London, W.C.2.
Telegrams: Eltradax, Estrand, London.
Telephone: Holborn 8139

LOCAL AGENTS: DUBLIN, W. J. Byrne, 21, Temple Lane. GLASGOW, R. G. Jackson-Nisbet, 132, Renfrew St. NEWCASTLE-ON-TYNE, Messrs. Black & Co., Prince's Buildings, King St. BOURNEMOUTH, L. G. Wray, 926, Christchurch Road, Pokesdown. BRIGHTON, Messrs. McEwan & Co., Ltd., 31 Crown St. WELLINGBOROUGH, A. J. Garrod, 9 George St.



Hutchinson



Have you had your copy of the 1932 "All-Metal Way"?

If you are going to build an all-mains receiver, or convert an existing battery-operated set, you need this booklet. It tells you how to construct high- and low-tension eliminators and trickle chargers, and contains full details for running moving-coil loud-speakers from A.C. mains. There are additional chapters on many all-mains radio problems; and questions which were not fully dealt with in our 1931 issue are now discussed in detail.

If you would like a copy of this new "All-Metal Way," fill in the coupon and send it to us with threepence in stamps.

WESTINGHOUSE **METAL RECTIFIERS**

THE WESTINGHOUSE BRAKE & SAXBY SIGNAL CO., LTD.
York Road, King's Cross, London, N.1. 'Phone: NORTH 2415

Many Westinghouse Metal Rectifiers have been in constant service for a period of 5 years or more and the most exhaustive tests show no ascertainable deterioration or falling off in output. Prices of the H.T. units are from 12/6.

COUPON

Westinghouse Publicity, 82 York Rd., King's Cross, London, N.1.
Please send me a copy of "The All-Metal Way, 1932," for which I enclose 3d. in stamps.

— PLEASE USE BLOCK LETTERS.

Name.....

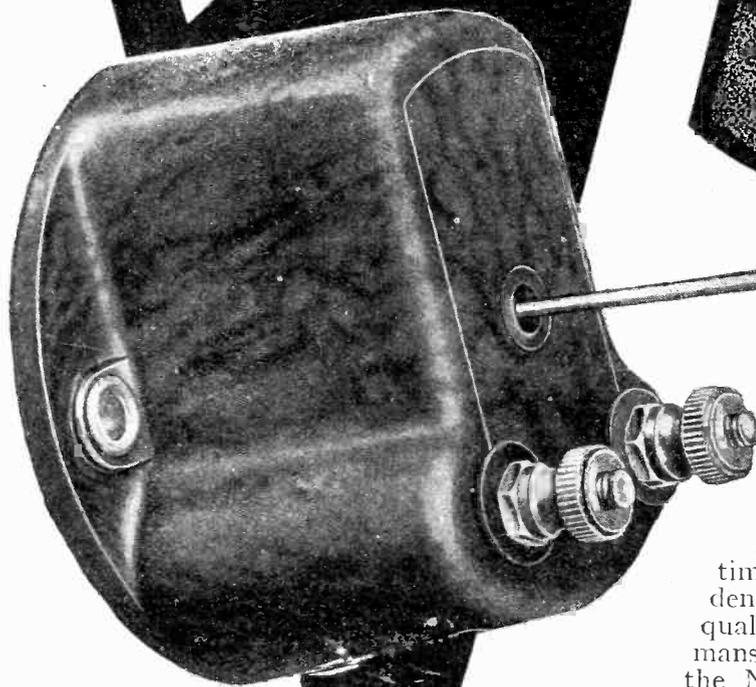
Address.....

P.W.28.11.

ORMOND

*The Greatest
of all modern
Values!*

5!



The **NEW No. 4 LOUDSPEAKER UNIT**

**for PUNCH
POWER & PURITY**

Again, Ormond break new ground, this time with a loudspeaker unit of unprecedented low price. Made from the finest quality materials, with the splendid workmanship that typifies all Ormond products, the New No. 4 Unit is designed for the listener who wants the best possible return for a modest outlay.

It is extremely sensitive, and is provided with an adjusting screw at the rear opposite the rod. The working parts are enclosed in a beautifully finished walnut moulded cover, secured to a circular base. Fitted with cobalt magnets to ensure long and reliable service.

Cat. No. R/474. Price 5/-

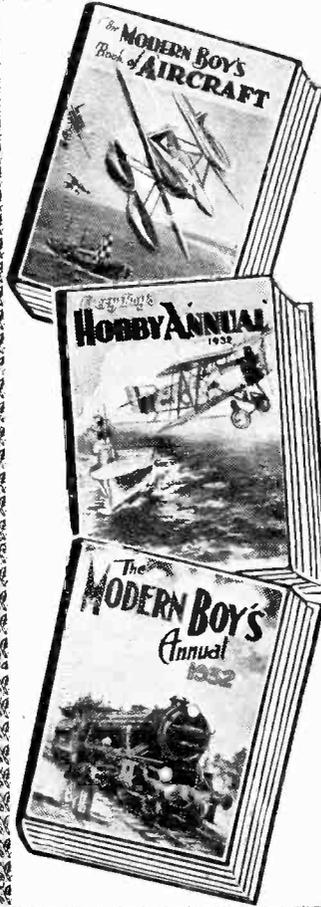
THE ORMOND ENGINEERING CO., LTD.,
Ormond House, Rosebery Ave., London, E.C.1

Telephone: Clerkenwell 5334/5/6 and 9314/5/6.
Telegrams: "Ormondengi, Isling."



IF IT'S — — IT'S QUALITY IS GUARANTEED

British Books for British Boys!



HOBBY ANNUAL
6/- net

Every Boy's HOBBY ANNUAL is the finest book of its kind ever published. It is packed with brightly written articles on practically every hobby and subject appealing to the boy of to-day. Every boy who is keen on making things and finding out how things work will want this wonderful book. It is profusely illustrated with photographs and drawings that show how in the simplest way. There are also two large folding photogravure plates.

The MODERN BOY'S ANNUAL 6/- net

The MODERN BOY'S ANNUAL is packed with up-to-date attractions for all bright boys of all ages. It deals in fascinating and chatty fashion with Aeroplanes, Ships, Railways, Speed-boats and Seaplanes, Motor-cars and Motor-bikes, and other items that every up-to-date fellow wants to know about. There are also hundreds of wonderful photographs and pictures, beautiful coloured plates and three complete adventure stories.

The MODERN BOY'S BOOK of AIRCRAFT 7/6 net

The MODERN BOY'S BOOK OF AIRCRAFT is a magnificent new volume which tells about the romance of man's Mastery of the Air in picture and story. It gives the story of Aviation from the earliest days, and contains four full-page Colour Plates, fifteen full-page pictures, and hundreds of photographs and drawings. There are articles dealing with "Aviation as a Career," "The World's Newest Aeroplanes," "The Schneider Trophy Race," and everything else the "air-minded" boy wants to know about. Make sure of a copy before it is too late.

On Sale at all Newsagents and Booksellers

6d

SELECTED
CIRCUITS

ALL THOROUGHLY PRACTICAL—ALL CAREFULLY TESTED

A wonderfully comprehensive collection of expertly chosen practical circuits covering all kinds of radio sets and other arrangements. Master circuits from one to five valves, with sets, valves, and special parts, etc., are included. Every arrangement described has been made up and given a carefully practical test, and comes up to the highest standard of efficiency. Never before has such a magnificent selection of up-to-date radio-circuit sets presented in one book.

PREPARED BY THE TECHNICAL STAFF OF
"THE WIRELESS CONSTRUCTOR"

FREE!

If you are looking for a good circuit, now's your chance. Get the great Gift Book presented to every reader of the **DECEMBER**

WIRELESS CONSTRUCTOR

(On Sale Everywhere—Sixpence)

A CIRCUIT FOR EVERY PURPOSE—
with explanatory notes to help the constructor.

—AND EVERY CIRCUIT TESTED BY EXPERTS.
You can rely on every single circuit in this comprehensive selection.

SECURE YOURS NOW

The Wireless Constructor

December

Sixpence

good news for constructors



New LOTUS anti-microphonic valveholder at amazingly low price!

Now you can buy *sprung* valve holders of the renowned LOTUS quality at a price that defies competition.

There is nothing sacrificed to price about this new LOTUS Valve holder Type VHK. It comprises two highly finished bakelite mouldings of excellent dielectric quality. These are assembled together by means of four resilient, phosphor-bronze combined sockets, springs and tags.

Special attention has been given to provide ample current carrying capacity and the nickel-plated terminal nuts are accessibly placed.

Also the LOTUS 4 pin Anti-Microphonic Valve Holders Type VH/27 with Terminals, Type VH/28 without Terminals. Price 1/- each. Rigid Valve Holders for 4 or 5 pin valves. Type VH/30 without Terminals, 9d. Type VH/31 with Terminals, 10d.

FREE COUPON
LOTUS RADIO LTD.,
Mill Lane, Liverpool.

Please send me a free copy of the LOTUS Component Catalogue describing the complete range of LOTUS Guaranteed Components.

Name.....
 Address.....

P. W. 28/11.



RADIO COMPONENTS

LOTUS RADIO LTD., MILL LANE, LIVERPOOL

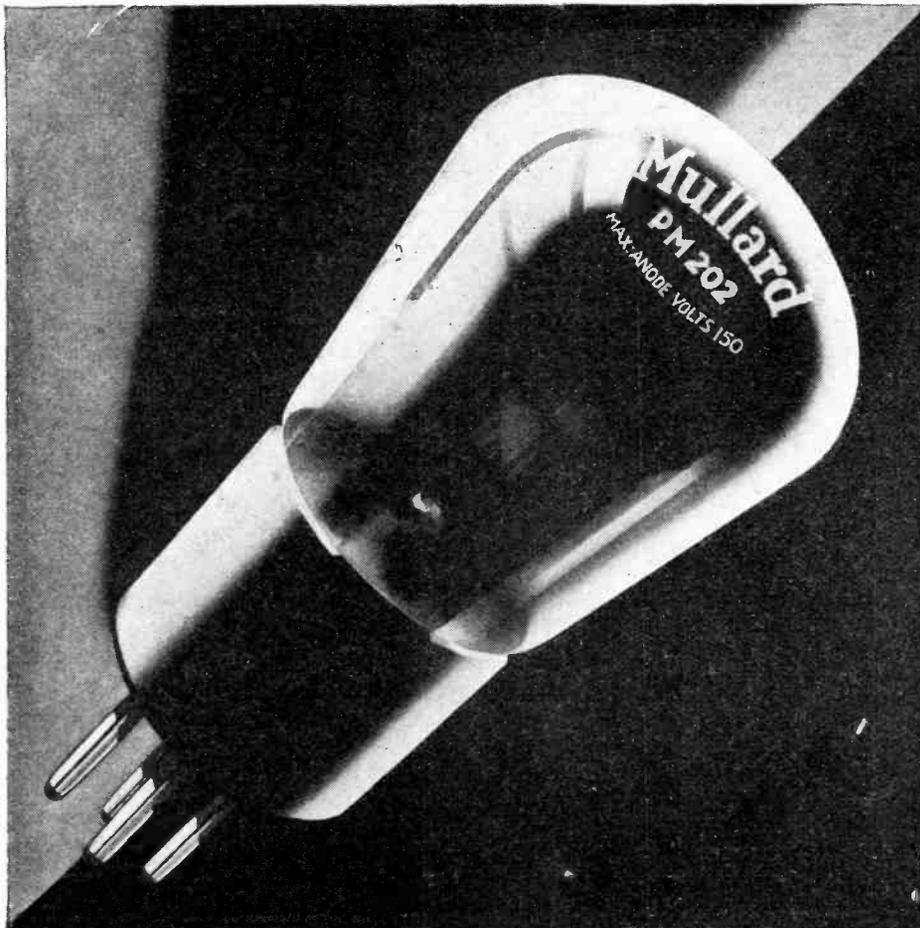
Mullard

THE · MASTER · VALVE

The Mullard 2-volt range, already supreme in performance, now includes the P.M.202, a super-power valve specially designed to economise in low tension current consumption. With its low filament consumption of only 0.2 amp.—no more than that of an ordinary power valve—it gives large volume and high quality reproduction. It is thus particularly suitable for use in the output stage of portables and small battery-operated sets. Take advantage of the efficiency, and fit one in your receiver to-day.

Price **13/6**

P M · · 2 0 2



SUPER POWER OUTPUT

MADE IN ENGLAND

Is your
Wireless
spoiled by
Station

Overlap*

★ Selectivity is
to-day's great
Radio problem



CRISP, clear-cut programmes—free from irritating background noises and overlapping transmissions from other stations—are what everyone wants to-day. But you can't expect your Set to be selective if its Screened Grid Valve (or Valves) is inefficient. The Screened Grid Valve has a very great influence upon selectivity.

Due to its design and unique Mica Bridge Construction the Cossor Screened Grid Valve is exceptionally efficient. Its record low grid-anode capacity (of the order of .001 micro-microfarads) is not approached by any other valve. Its high stage gain enables it to give a big all-round improvement to any Screened Grid Receiver. Every Cossor S. G. Valve is available with a metallised glass bulb which improves selectivity still further at no extra cost.



COSSOR
ALL-BRITISH
SCREENED GRID
VALVES

A copy of the 72-page Cossor Wireless Book B11 will be sent you free on application to A. C. Cossor Ltd., Melody Dept., Highbury Grove, London, N. 5.

THE VALVES WITH THE MICA BRIDGE CONSTRUCTION

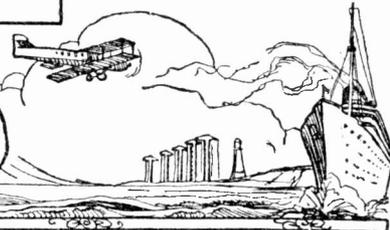
Popular Wireless

LARGEST NET SALES



Scientific Adviser:
Sir OLIVER LODGE, F.R.S.
Chief Radio Consultant:
CAPT. P. P. ECKERSLEY, M.I.E.E.
Editor: NORMAN EDWARDS.

Technical Editor: G. V. DOWDING, Associate I.E.E.
Assistant Technical Editors:
K. D. ROGERS, P. R. BIRD,
A. JOHNSON RANDALL.



**CHRISTMAS IN SIGHT
DALLYING
TIP ON TONE
EMPIRE SERVICE**

RADIO NOTES & NEWS

**SOCIETY PAR
"ALF-SENIOR"
"P.W." ANSWERS
THE NICK OF TIME**

Christmas in Sight.

WITH November on the point of expiring one realises with a jolt that one is within spending distance of Christmas. Ah, now I see!—Oh, fool and blind!—why, that boy of mine has been asking questions about amateur transmitting apparatus for weeks past, and "showing willing" by trying to make one out of a buzzer. I explained how hard it would be for him to get a licence, but if, as I now fear, we are thinking of a Christmas present, why, it'll be a clever P.M.G. who will stop that lad with excuses about a mere bit of paper!

Dallying at the Desk.

UNDER the pretence of listening to Fat Stock Prices and other market reports, American men are conspiring, with the aid of makers of radio sets, to have receivers installed in their office desks—in the lower right-hand drawer. The loudspeaker is put at the front of the drawer, so that Hiram has only to open the drawer very little in order to hear it. Think of all the 100 per cent "sugar daddies" lapping up jazz whilst pretending to work out mergers! This new idea will be a Blow at Big Business and a Menace to Much Money!

Standardised Car Radio.

BEFORE we leave the U.S.A., let us notice the threat of American car manufacturers to make radio equipment on most odder models within the next two years. Already the sets are being designed, and special sparking-plugs are being developed. Golly, what a country! But will the notion "pan out" profitably? I myself should deem it just plain heck to have a loudspeaker shouting in any car I might occupy. But then, I don't have to live in America!

Another Prophecy Comes True.

A REPORT from Indiana, U.S.A., tells of a demonstration of ploughing a field by means of a tractor operated by wireless. The wireless apparatus was in a car thirty feet away from the tractor.

In Kipling's story, "As Easy as A B C" written in 1912, he says: "There was a rattle and a rush, and a five-plough cultivator, blades in air like so many teeth, trundled itself at us round the edge of the timber, fuming and sparkling furiously." This plough was operated by a girl from a house half a mile away. That is as good as any of Wells' forecasts.

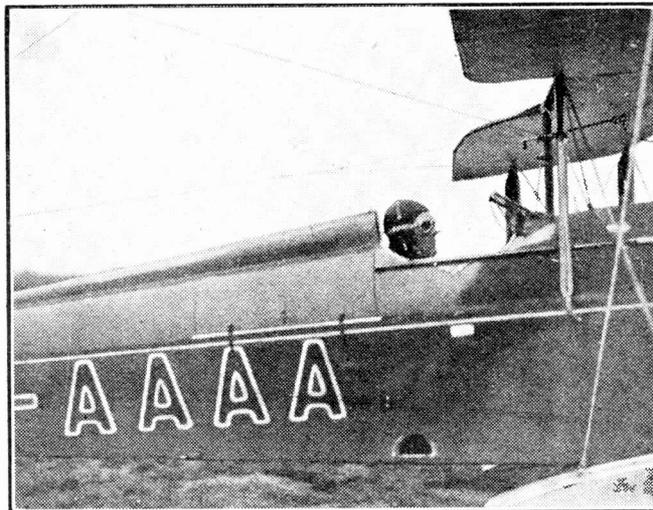
A "Tip" About Tone.

AN old reader, G. W. (Kensington), tells us that with his set, a "straight" three, det. and 2 L.F. (transformer-

Note for Exporters and Radio Clubs.

MR. J. ASHER, 28a, Waverley Road, Bloemfontein, S. Africa, wants to get into touch with a Radio Club, though he doesn't say where the club is to be situated. I expect he will receive replies from most parts of the world. Further, he asserts that he cannot find in South Africa a British-built set, at a reasonable price, which will give L.S. results on "most of the high-powered overseas broadcasting stations." He uses an American six-valve A.C. mains set which, with aerial and licence fee (£1 5s.) cost him £25. Now, British exporters, what about it?

THE A.A. TAKES TO THE AIR!



The Automobile Association has established an Air Service Station at Heston Aerodrome, from which light aircraft can receive weather reports and other helpful information by radio. Apparently this machine, equipped for the service, succeeded in getting very appropriate registration letters!

coupled), and a "Blue Spot" 66 K., he found speech and music a little too "bright and crisp," which he altered by connecting a .001-mfd. fixed condenser between the grid of the first L.F. valve and "earth." This, he says, rounded the tone and gave a "better introduction of bass notes." Our technical people, in passing on his letter, point out that he merely cuts down the amplification of the high notes; they would prefer to leave 'em alone and increase the bass, if possible. Many thanks to G. W.

Radio Society Note.

MR. G. RATCLIFF, Secretary of the Hackney and District Radio Society, who is domiciled at 10, Balfour Road, Highbury New Park, N 5, has sent me the society's programme for the coming season, and it is a top-notch. S.W. super-hets, home recorders, interference, club supper, valves, wave-lengths and frequencies, the "mike," anode-bend detection, wave-meters, debates, ten-minute lectures, gramophones, sales of spare parts—a real all-round, general utility layout of a syllabus. All welcome. Ten bob per annum.

"Notes From the North."

I LEARN from one of our regular correspondents that Mr. M. R. Kelsall, formerly of the Scottish National Theatre, has been appointed the Aberdeen representative of the B.B.C. vice Mr. Ian Whyte, who is now Scottish Musical Director. By the way, the latest information goes to show that the separation between the North Regional and Prague is to be increased to 11 kilocycles, and that between the North Regional and Langenberg to 10 kilocycles.

An Empire Service at Last.

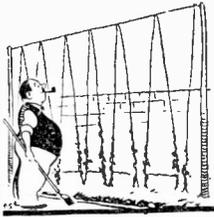
I REJOICE that the B.B.C. has decided to build a short-wave transmitter at Daventry to give an all-round-the-clock service to the Empire, various wave- (Continued on next page.)

NEWS—VIEWS—AND INTERVIEWS (Continued)

lengths being used to suit the different territories. Better late than never! According to my information no less than £40,000 is to be spent on the maintenance of the station and the provision of its programmes. Well, there you are, you people all over the place! Don't forget to build the very best "P.W." short-wave receiver you can, and when in the sweet bye-and-bye you hear the new station—let us know how you get on with it. You will probably need the 20-30-metres band.

"Good-bye to All That."

THIS book title exactly fits the case of the writer of a letter which was recently received at a certain suburban post office. The missive referred to a notice



about the renewal of a receiving licence and it continued: "In consequence of the installation of Brookmans Park, which renders my set useless, I discontinued using it in January, 1931, and converted the case into a workbox; took down my aerial and used it for stringing runner beans, and stowed the loudspeaker in the loft as the sole relic of an inglorious episode." I think he was right about those beans. They need a lot of care!

Society Par.

THE Rochdale Radio and Television Society, which at a recent local Trades Exhibition gave thousands of people their first opportunity of "looking in," is now flourishing, but extends a hearty welcome to new members. The Society has a well-equipped workshop and a complete apparatus for television transmission (by line). For details apply to either of the Joint Hon. Secs., Mr. A. Kershaw, 2, Exeter Street, Rochdale, or Mr. A. E. Sutton, 53, George Street, Rochdale.

Licence Figures.

BY the end of this year the number of licences will be biting well into five millions! At the end of October the total was more than 4,000,000! But it is stated that during September more than 180,000 licences lapsed, and I am curious to know the reason, because that is a mighty big figure, even for these hard times. The aerials, of course, may do service as clothes lines, but what happens to all the receivers which become unlicensed? Do they just stay "put"—objects of suspicion to the Post Office—or are they used illicitly?



Radio Research.

RADIOISTS, not only those who pursue the light and genial path of harkening and home construction, but also those who have a bent for the more serious

study of radio and allied subjects, should beg, borrow, or buy the Report of the Radio Research Board for the period ended December 31st, 1930, price 2s. at the Stationery Office. Therein are recorded the results of the labours of a veritable galaxy of scientific stars on such subjects as "Propagation of Waves," "Atmospherics," "Study of Aerials for Transmission and Reception," and so forth. All very learned, but tempered, in parts, to that shorn lamb—the ordinary reader.

"Alf—Senior."

I THANK Mr. A. J. Mann (Middlesboro) for his letter in which he explains that his son, Alf Mann, o' Middlesboro', having been called to London for some time, is unable to reply to the shoal of letters asking him for copies of "International Short-Wave Radio News" (see "P.W.,"

SHORT WAVES.

POT AND KETTLE?

"Obvious ythe B.B.C. standard list of pronunciations is far from complete," says the "Glasgow News." Their own spelling doesn't seem to comply with dictionary standards, either!

THE SOUL'S AWAKENING.

Mr. Dillwater: "I wonder if there is anything on the wireless worth listening to—Professor Yapp will give a talk on 'Kindness to Dumb Animals—'"

Mrs. D.: "Don't shut him off, dear—I'd love to hear him."

Mr. D.: "This sob stuff seems to appeal to you."

Mrs. D.: "I was just thinking, darling—perhaps I haven't always been as kind to you as I might have been."

"Answers."

"The doom of the cat's-whisker is sealed, and two valve sets are now brought within the reach of a million-and-a-half crystal-set users."—Daily Paper.

Hardly enough to go round, surely?

According to the B.B.C.: "The best way to give the public what it wants is to reject the express policy of giving it what it wants. In other words, if you set out to give the public what it wants you will not do it."

Ses they!

An American professor declares that "the border of the earth's atmosphere is enclosed in a crystal globe, and that this globe is responsible for some of the queer things that happen."

That doesn't explain away some of the queer professors.

October 24th, page 406). Alf had time only to despatch the copies which he had in hand; the other applications have been sent by Pa Mann to the headquarters of the club at Southport. Pa Mann quotes several chunks from letters received, which show that Alf's efforts on behalf of short-wavers are greatly appreciated. I sincerely hope that Alf has "clicked" for a job.

"P.W." Answers Up.

A GOOD friend of ours, G. W. D. (Dundee), in trying to convert two non-readers into readers, was asked whether we publish lists of old "P.W." sets. The reply is that we supply a sheet giving a

list of all our blue prints, on application. Secondly, there is a complaint that we do not continually give details of how our back numbers can be obtained. Such numbers should be applied for from Back Number Dept., POPULAR WIRELESS, Amalgamated Press, Ltd., Bear Alley, Farringdon Street, London, E.C.4; post free, 4d. each. (This information is repeated from time to time under "Radiatorial.")

In the Nick of Time.

WHO says that there isn't a wee cherub wot sits up aloft to watch over the poor struggling penny-a-liner?

Why, bless me soul, this very week, as ever was, after me climbing into a brand new kit of winter "undies," down I goes, as you might say, into the werry deevile of a code *id der doze*, plus a coff wot 'ud be worth a forchin artside of a theater. (And I've still got it! Wittles, drink and baccy arn't no manner o' good to pore ole Hariel at the moment!)



Still in the Nick.

LO! Behold Ariel, recumbent on a bed shaken by sneezes and coughs, sucking a tasteless pipe, when, *tut-tut*, comes the postman, bearing a small parcel containing *one lemon* and the best wishes of C. S. P. (Wembley) in answer to some question which, so I gather, I propounded in "Notes and News" aeons ago, in the days before I caught this cold. Did ever a lemon arrive so opportunely? For it seemed that all the world was telling me to "take hot lemon juice and sweat it out." Since I had malaria nothing has made me perspire except physical work in the sun. And that I avoid. (*A-chew!*)

What We Are Spared.

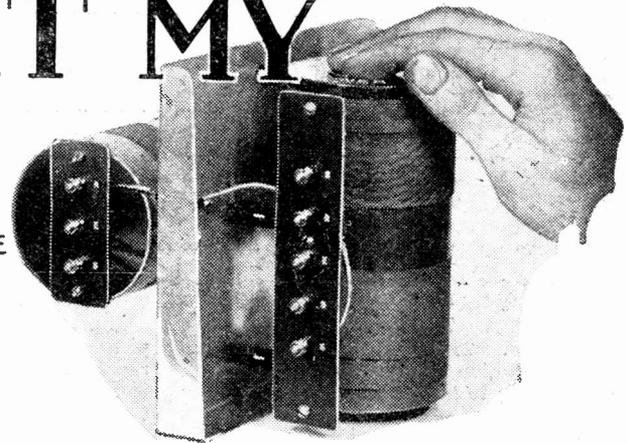
WHENEVER you feel annoyed at the "unco guid" attitude of Grandma B.B.C., just think of this and be thankful that men of good taste stand between the "mike" and broadcasters like Messrs. Fields and Hall of the U.S.A. These two appear to make a speciality of composing jingles about crime, the "eternal triangle," the wandering boy "mush," and so forth, but their crowning achievement is the song which they made about the hanging of Mrs. Eva Dugan, the first woman to be executed in Arizona. As a chorus, they were kind enough to use a nine-line verse which the unfortunate woman left behind her. The "New York Sun" refers to this sort of thing as "sheer fun."



ARIEL.

MORE ABOUT MY NEW TUNER

BY CAPT. P. P. ECKERSLEY M.I.E.E.



Our Radio Consultant-in-Chief discloses some further details concerning his new invention, and describes some interesting features found in its practical form. Readers should note that practically any Det.-L.F. or Det. 2 L.F. set can be modified to include this wonderful new component, so long as there is sufficient space for its accommodation—it is rather larger than most coil units.

A LITTLE more about the famous coil! Let's go over it again in some quick way to revise its advantages.

Thus: selectivity, in its general sense, is a paramount consideration in modern wireless technique. This is because the Prague plan imposes a 9-kilocycle separation and because the power of stations has been in the past few years greatly increased.

Selectivity.

Selectivity is achieved in two ways: firstly by the design of the high-frequency circuits; secondly, by the design of the low-frequency circuits.

So far the ordinary technique has imposed a single-tuned circuit in front of a high-frequency valve and a single-tuned circuit after the high-frequency valve. The selectivity so obtained is not sufficient for modern needs.

It is proposed in the new technique, for which R. E. H. Carpenter and myself claim to be the pioneers, to have a "tuner" so that all selection or high-frequency filtering is done before the first valve. It is further proposed to interpose a low-frequency filter after the detector and before the loudspeaker.

The tuner which has been described is the very simplest form in which the new technique can be presented; price has been a primary consideration.

The filter to go after the detector has been designed to be simple and inexpensive. It is not a criticism of the underlying principle that in its simplest form it does not give perfection of quality.

No set gives perfection, anyhow; you will find that the quality given by this set is very pleasing. It lacks "top," but the Prague plan has denied us top. It's better to have too little top than mush, side-band jamming, and so on, mixed in.

The Circuit.

I will now describe the diagram of connections which you will see on this page.

I gave you a diagram which was designed to illustrate the principle. Now I give you a further diagram to define the practice.

It is necessary with most tuners to arrange

that one inductance is tuned by a variable condenser. I am not sure that this is necessarily right, but it's convenient because component manufacturers have marketed for this new standard method of designing high-frequency tuners.

Covers Both Bands.

Thus *force majeure* we use this principle. But one condenser would have to have a variation of 100 to 1 to "tune" a coil from 1,500 kilocycles per second to 150 kilocycles per second.

Thus it is usual to have two coils—a "long" wave and a "medium" wave. The user selects which coil he will have by a switch. In better, but slightly more expensive designs, notably the Extenser, the condenser dial timed through 180 degs. automatically changes the coils to give the long- or medium-wave range of tuning. In this design, always remembering price was

absorption effects, as in some designs.

The reaction windings are different for medium-wave and long-wave tuning. This is a very great advantage, since it is difficult, if not impossible, to arrange for one coil to have the same order of coupling either to the long- or medium-wave windings.

It is a further advantage of the design that these reaction windings, being at low potential, form a partial screen which minimises the strength of stray fields, and hence prevents serious electro-magnetic couplings between the aerial and the coupled circuit.

If it had been possible, I should have greatly preferred to arrange the whole of the screened circuit to be in a screening box.

Stray Coupling.

It was proved, however, that the coupling between the coils, placed carefully at right angles, was slight, but it does exist. With very strong signals there is, in fact, direct pick-up by the coil, but in very strong signals there is no need for great selectivity. When other stations are picked up this effect is eliminated, thanks to the existence of the novel method of tuning.

The methods for wave-change, etc., are not particularly novel. The reaction connections with their screening effect and, of course, above all the resistance coupling, are the salient features of the device.

Let it be insisted that simplicity of design and construction are the keynotes of the tuner. Performance is really very extraordinary, one might be using a five-gang high-frequency "popopodyne," so far as selectivity is concerned!

And, with the simple Det. and 2 L.F., there is the added advantage over the super-set that you can only pick up what is worth picking. I never did enjoy noise as such, and mush is more succinctly described as muck. So highbrows beware, if you start drawing curves they will shock you, but if you start listening to a clean signal you will realise that curves are meant to be bent if signals overlap!

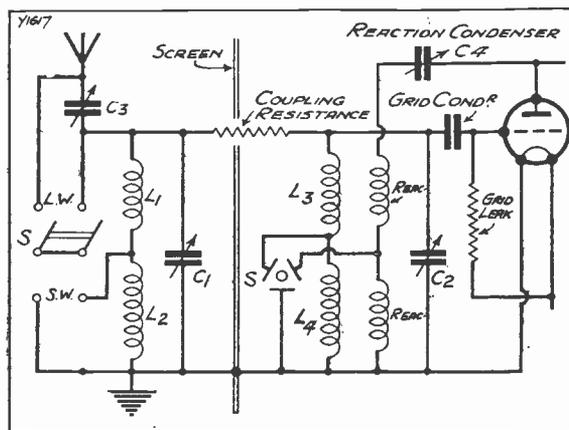
I wish all of you who go in for this tuner a most interesting time, and I can confidently do so because I know you'll have it, and I know the device is an advance on existing technique.

MAKE SURE OF YOUR XMAS "P.W."

ON SALE DEC. 3RD.

PRICE 3d. ORDER NOW!

CONNECTED TO A DETECTOR



This diagram shows, in theoretical form, how the Eckersley Tuner can be connected up to an ordinary detector valve. The tuner itself includes six coil windings, the coupling resistance, and the screen. The condenser C3 is shorted out on the long waves by the double-pole switch.

a prime consideration, we use a switch.

Thus S, S, are the switches. It will be seen that these switches besides cutting out or in the long-wave coil (by short-circuiting it) also cut out or in the aerial series tuning condenser. This condenser is not required for long waves.

L₁ and L₂ are the medium-wave, and L₃ and L₄ the long-wave windings. They are wound on the same former. The shorting of the long-wave coil does not produce

THE SCOTTISH RADIO EXHIBITION

DESCRIBED BY OUR NORTHERN CORRESPONDENT.

Who gives you his impressions of this "Northern Olympia," gained during his recent visit.

SCOTLAND is soon to receive a big shock. The Scottish National Radio Exhibition at Edinburgh gave me an opportunity to have a chat with a number of Scottish radio business men, and almost unanimously they told me that the public does not realise the full significance of the new Scottish Regional high-power station at Falkirk.

The Opening Speeches

In opening the exhibition on November 11th, Sir Gordon Nairne, a Governor of the B.B.C. (and himself a Scot) mentioned the new station, and so did Mr. Cleghorn Thomson, the Scottish Regional Director, but their references were as studiously vague as we have come to expect of the B.B.C. at such times.

"However," said an exhibitor, "the speeches to-day will perhaps waken the Scottish public up to what is going to happen." Alas! the opening of the exhibition was all but ignored by the Edinburgh evening newspapers that day.

Evidently the Press in Scotland is also unaware that the biggest broadcasting event since broadcasting first started in Scotland is drawing near. In fact, Falkirk will be in full swing long before the next Scottish Radio Exhibition takes place.

Most certainly there will be a next. They are talking about it in Edinburgh already. In 1930 the first was held; there were 43 stands. In 1931 the Radio Manufacturers' Association gave the show its support and there were over 70 more stands.

In 1932, with Falkirk working and Scotland awake to what high-power and alternative programmes mean, the Scottish Exhibition will undoubtedly be larger still.

Plenty of Business

Don't imagine that enthusiasm for radio is lacking in Scotland. Forty thousand people attended last year's exhibition, and on the opening day of this year's show several exhibitors told me that they were already doing splendid business.

But as I mingled with the exhibition visitors I noted that their inquiries most rarely referred to this forthcoming event and to the new demands it will make of receiving sets—(1) high selectivity, (2) ability to handle powerful signals.

The Scottish show was smaller than Olympia and Manchester, but it was no hole-in-the-corner affair. Held in the Waverley Market, a spacious hall below street level, it had a cheerful and go-ahead appearance.

The organiser, Mr. T. Percy Bentley (to whose foresight and energy the exhibition owes its existence), believes in uniform stands, and so each exhibitor had a cream-and-blue stand similar to his neighbour's.

GIVING IT A GOOD SEND-OFF!



On November 11th the biggest Radio Exhibition Scotland has ever known was declared open by Sir Gordon Nairne, a Governor of the B.B.C. It should give a tremendous boost to the Scottish Radio trade, and is a fitting preliminary to the opening of the Falkirk station next year.

A great attraction to the public was the B.B.C.'s model studio. Concerts were broadcast from this studio every day.

The Edison Swan Company had a second microphone in the studio, alongside the B.B.C. "mike," and the concerts were relayed to the loudspeakers in the exhibition by this company, who were responsible for feeding all loudspeakers in the hall. When no concert was available gramophone records were used.

A bank of nine 20-watt amplifiers was used, nine to feed the 180 loudspeakers on exhibitors' stands, and one to supply the

four R.K. permanent-magnet loudspeakers flooding the hall with music.

Glass windows in the model studio permitted exhibition-goers to see broadcasters in the flesh. A more human and attractive effort, this, than the B.B.C.'s highly statistical show of maps and graphs at Olympia and Manchester—but the studio sadly needed a coat of paint.

All "At Sea"!

On the opening day, too, there were no numbers on the exhibition stands, and the public roamed about like lost sheep. I understand this was rectified later.

Many of the chief radio manufacturers were exhibiting. Most of them had sets stripped of their cabinets and other attention-catching stunts—such as G.E.C.'s 100-kilowatt transmitting valve, Mullard's 1½-kilowatt ship's transmitter (loaned by the liner "Cameronia"), and Ekco's huge model of the ingenious tuning dial calibrated with the names of stations, which are tuned in by moving a pointer to the name of the station required.

It has been objected that such arrangements will be upset by future wave-length shuffles. I was told however, that new calibration discs will be published when that happens.

Scottish traders had taken a large number of stands and some of them made a jolly good show. On the whole, however, the manufacturers had the best of it as far as showmanship was concerned.

Marconiphone had a particularly bright and spacious show, and Ferranti's stand, though not utilising the colour appeal (and even sex-appeal!) of some competitors, was one of the largest and most interesting.

Mains Sets

I will not go into detail about exhibits. They have already been described in POPULAR WIRELESS'S full reports of the Olympia and Manchester Exhibitions. All-electric sets were again predominant, and the three or four-valve type of cabinet set was the vogue. Components

and constructors' kits were not featured so strongly as at Manchester.

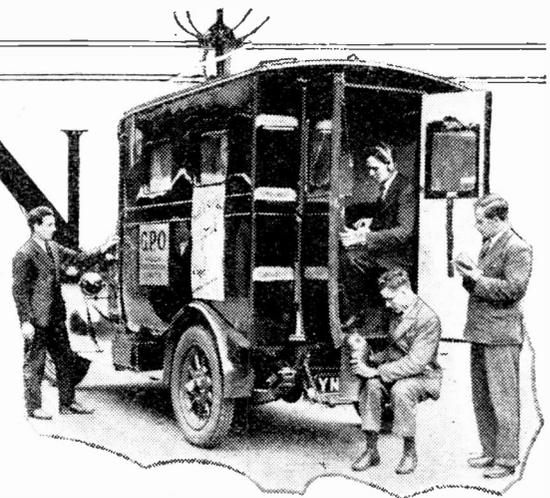
The enormous value of such an exhibition as this, is that it enables people in distant parts of Great Britain to examine the very latest apparatus, "direct from Olympia, London," as theatrical folk would say.

And, as Mr. Cleghorn Thomson pointed out at the opening ceremony, it is important that Scottish listeners should have the opportunity to see the new sets, for, he said, it is not much use the B.B.C. putting out good programmes unless the public has good apparatus to reproduce them.

The BOGEY VAN

BY A SPECIAL CORRESPONDENT.

The Bogey Van is so spook-like that our contributor never managed to get on board it, but nevertheless he manages to make some surprising disclosures!



THROUGH half-lit streets glides a black, sinister-looking van in which two or three hooded figures crouch over a contraption of bulbs and knobs, muttering "It's 'The Laurels,'" or "It's No. 17 again! We've got them at last!"

Such is one of my visions of the special cars used by officialdom to drive a couple of wireless licence-dodgers to the police-court and a couple of thousand to the grille of the nearest post-office.

Has Anyone Seen Them?

I ought to explain that I have never seen such a van, even though I once used a set for two months without a licence. And I have never met anyone who *has* seen such a van.

Perhaps there aren't any; they may be like the Russian army which landed in Scotland in 1914. I believe there have been pictures in the newspapers of them but that may be just G.P.O. playfulness.

I have to rely on my imagination for real details. Sometimes I think these vans (the plural is used in spite of a conviction that there can have been only one van for eight years for a population of 40,000,000) are cheery affairs with lots of visible wireless apparatus outside such as frame aerials and with blood-curdling warnings painted on the sides.

The driver simply cruises through the streets, stopping now and again to light a pipe. Inside, the engineers play cards—giving the wheel of the frame aerial a twiddle now and again with their elbows. The result—20,000 listeners in Aberdeen (or whatever the locality) suddenly take up wireless.

On The Right Track.

After all, it's the moral effect that counts. Whether I am right or wrong in my idea of a "blood-hound" van, the Post Office are on the right track.

There is to be a new drive against wireless pirates. There are to be bigger and better vans and more of them. But they are "on the Secret List," say the Post Office.

They cannot be photographed, but it is suggested that they look like "luxurious limousines—the sort a millionaire would use." Leaving aside the propriety in these times of crisis of such lavishness, are such vehicles the best for the purpose?

Some More Suitable Vehicles.

I doubt it. Unless the psychological element is to outweigh all technical considerations, surely a coal-cart or a hearse would be more useful. Slow movement to enable tests to be made would be seemly and natural in such vehicles.

In London a taxi might even be used. Personally, I am all for variety; there is room for a new technique in making the

find" the pirate, eagerly waiting for him to oscillate.

They wait without success. Meanwhile Bach has come on and the pirate has gone off. The whole job must be very trying for the engineers.

But suppose the pirate never oscillates? My suggestion is—*make* him. If the P.O. van had a special oscillator, the engineers could swish their condensers and the pirate might retaliate.

Even When Not Working.

However, the P.O. seem to have thought of all this. The new and better vans have, they say, "equipment which can detect a set which is not even working" and "their instruments are so delicate that any piece of metal more than 6 in. long has a definite effect on them." A crow-bar, perhaps.

But does all this mean that to avoid the privacy of our homes being invaded we must have only wooden bedsteads, that we must reduce the length of our poker to five and a half inches.

Although I fear the Post Office engineers are going to discover a large number of drain-

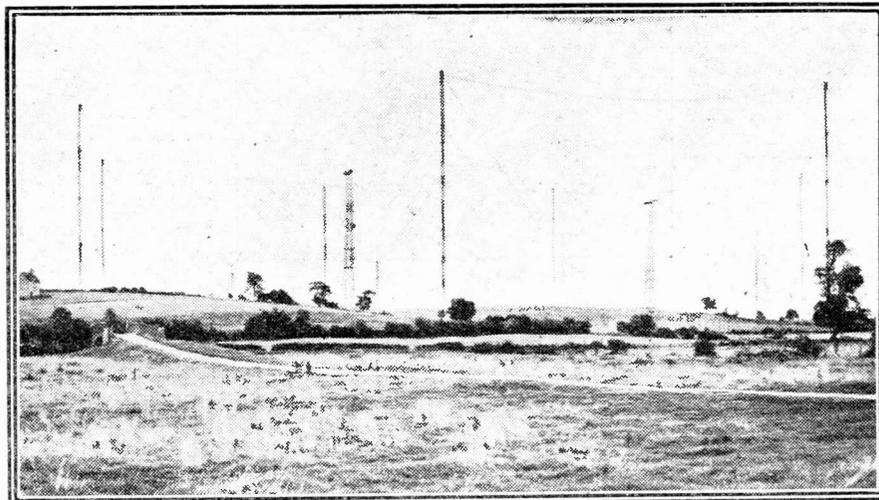
pipes, rain gutters, hospital beds, fire-irons and other domestic metalwork, I have not the slightest doubt but that licence figures will shoot up as pirates are tracked down.

Something Up Their Sleeve.

But there is no doubt that the Post Office have something up their sleeve. If you who read this are a pirate, trouble is certainly coming to you in a plain van, if you don't look out.

Personally, I should like to see the penalty for what, after all, is a very mean sort of evasion, raised to £1,000 or ten years' imprisonment—or both!

ALSO IN THE VAN—OF RADIO PROGRESS!



This is a view of the Rugby radio station, which handles most of Europe's trans-Atlantic telephony. It is the largest wireless station in the world.

pirate walk the plank. Ex-Q-boat commanders could be called in to advise on camouflaging.

Technically-curious readers will want to know "how they do it." Judging by the frame-aerial on top of the van seen in pictures, apparently the P.O. engineers wait till the pirate oscillates and thereby sends out feeble wireless waves.

A Very Trying Job.

The house is thus indicated (or the house behind or three houses behind). The van passes a few doors up the road, and again the process is repeated to get a cross-bearing.

The engineers again try to "direction-

THE MIRROR OF THE B.B.C.

By O.H.M.

ULTRA-SHORT WAVES

THE B.B.C. BOARD—SEQUEL TO T.U.C. ATTACK—MORE
XMAS PROGRAMME DETAILS.

I UNDERSTAND the B.B.C. is seriously concerning itself about the possibilities of ultra-short wave development.

Special research has been put in hand, and experiments extending over many months will be undertaken.

The B.B.C. engineers are naturally conservative, but I gather that they are not without definite hope that many of their problems will be solved by the use of the very short waves.

Chiefly, of course, it would put an end to the international muddle because then there would be enough and to spare of channels for all comers. But no definite working conclusions can be expected until 1933.

The B.B.C. Board

Sir E. Grigg is the latest quotation for possible additions to the B.B.C. Board of Governors in January. He was one of those who stood aside in the General Election to avoid vote-splitting, and this taken in conjunction with his previous distinguished record of public service gives him a definite claim on the gratitude of the National Government. So he takes the place of Captain Ian Fraser in the lists.

Sequel to T.U.C. Attack.

I hear that certain members of the B.B.C. staff share the views of the Trade Union Congress about the alleged partiality of the B.B.C. to the National Government in the General Election. There is some talk about resignations.

More Christmas Programme Details.

Here are some further details about the Christmas programmes upon which I have written several paragraphs in previous issues.

There are still gaps which it is expected will be filled with interesting items not only for Christmas Day, but also in the week—upon the Friday of which we shall, I hope, all be as happy with our eats and drinks and radio as befits the jolliest day of the year—and of these I shall probably be in a better position to say more next week.

Meanwhile, it is good to learn there will be the usual relays of carols on Christmas Eve—first in the afternoon from King's College Chapel, Cambridge, and during the evening from St. Mary's Church, White-chapel, from where for some years we have become accustomed to hearing Mr. Stanford Robinson's well-trained Wireless Choir.

Canterbury Cathedral has again been chosen to supply the morning service on Christmas Day, which will be broadcast on the National wave-length.

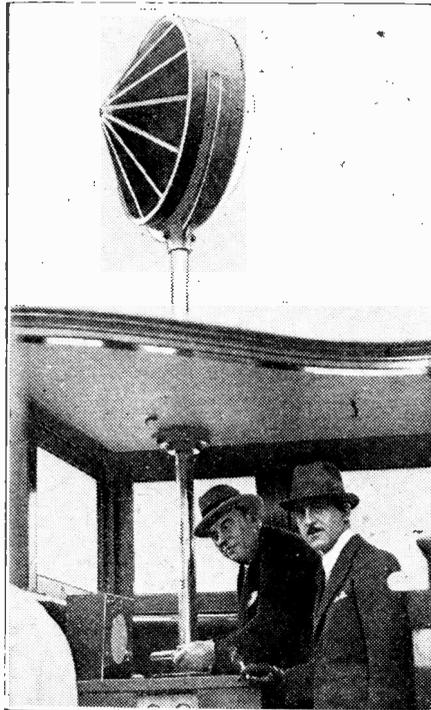
Selections by Christopher Stone.

An hour's recital of seasonable gramophone records selected by Christopher Stone—who, although, as he admits himself, is somewhat inclined to be talkative, knows all that is worth while about such programmes and how to get them over—follows the Cathedral relay, after which

there is an hour of cinema organ music played by Reginald Foort which will carry us until after lunch at 2.30 p.m.

Ernest Longstaffe's pantomime, with which I have already dealt, is down to begin at 7.30 and this goes on until 9 p.m., when such news as we usually get on Christmas Day will be broadcast.

IT'S FINE FOR FOG!



The assistant harbour-master of the Port of London (at the wheel) with a novel sound-indicator that enables ships to steer safely in fog. He got the idea from talkie technique.

The usual appeal on behalf of the Wireless for the Blind Fund has been given a quarter of an hour and twenty-five minutes is allocated to the singing of Christmas songs by John Coates (tenor).

The tit-bit of the evening, the special Christmas Day programme in which the B.B.C. will broadcast conversations between the studio and people throughout the British Isles and the Empire, to which I referred at some length last week, fills the remainder of the time until 10.30, when Dance Music from the Savoy Hotel will be relayed until midnight. Jack Payne and his "Boys" have heroically "offered" to carry on from midnight until 1 a.m.

The London Regional programme on Christmas Day includes many of the usual features, beginning at noon with three items each of an hour's duration—Organ Music from Lozells Picture House, Birmingham; Orchestral Music from the Trocadero Cinema at the Elephant and Castle, and a Feature Programme by the Orchestra at the Regal Cinema, Handsworth, Birmingham.

At 4 p.m. most stations will be linked up with the Dorchester Hotel for a programme by Moschetto and his Orchestra, and special Christmas Day programmes for the children are also being arranged.

During Xmas Week.

The Studio Service at 6.30 will also be common to most stations, but at 7.15 London Regional listeners will hear a concert by Reginald King's Orchestra, followed by a violin recital by Albert Sammons.

At 9 p.m. Mr. Percy Pitt is conducting a concert version of Massenet's "Cinderella," after which, dance music.

Other Christmas Week programmes upon which I can give brief details are those on Monday, December 21st, when the well-known Nativity Play will be relayed from St. Hilary, Marazion; Tuesday, December 22nd, a vaudeville entertainment; Thursday, December 24th, a musical comedy programme by the B.B.C. Theatre Orchestra and Saturday, December 26th, a running commentary on the Rugby Football Match between London and South Africa, and another vaudeville entertainment.

(Continued on page 764.)

FOR THE LISTENER

By "PHILEMON."

A note on what the stay-at-home feels about the B.B.C.'s promised
Empire Broadcasting Station.

THE idea of having an Empire broadcasting station, capable of transmitting home news and Empire news to the four corners of the earth is a fine Imperial gesture. It quickens the patriotic and Imperial imagination. One wonders why it was not carried out before.

When I was in South Africa a few years ago, I was astonished at the welcome which Britishers there accorded to me because I had just come from England, and at the greediness with which they devoured any news I could give them. The news itself was perhaps not the chief thing, for they had their morning papers with paragraphs regularly supplied by the familiar "Reuter,

Exchange Telegraph, Central News": but it was the living link which counted for most with them, an English voice actually speaking to them about England.

They Never Forget.

I confess, too, to being surprised that the home-hunger was so acute with so many of them. My idea had been that, with their adopted country to think of, with their own life to live there, and with little expectation of ever seeing the homeland again, they would soon have forgotten.

No doubt in many ways they had forgotten, had become weaned (as it were)

(Continued on page 766.)



A two-valve receiver which compares favourably with many "threes," and not very old ones at that. It will give you good "loudspeaking" from quite a number of stations, and is just the set for the "household," as it is so simple to handle.

THE recent great improvements in 2-volt valves and the general raising of the standard of component efficiencies make a two-valve set of the nature of the "Full-Range" something much more than a mere "junior" type of instrument. Actually, it is capable of giving a very great many listeners everything they want

to bring in distant stations on the "Full-Range" Two that would have been quite beyond the capabilities of the earlier "threes" and "fours." And the "Full-Range" is, as you can plainly see by glancing at the component list and photos, a particularly easy set to build. There are but few parts, and these are readily obtainable at competitive prices. We strongly recommend their purchase in the form of a complete kit from one of the established kit suppliers. By obtaining the components in

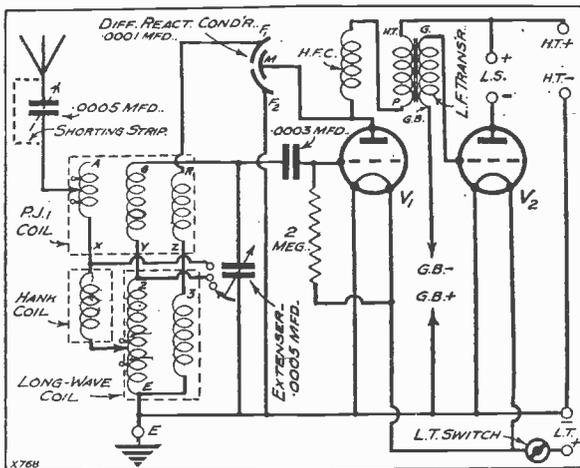
and the advantages of this device will be very well known to all regular readers. But we recognise that in these hard times there are many people who must perforce negative certain things on grounds of economy, however desirable they may be.

An Extenser Preferable.

If you happen already to have an ordinary variable condenser in your possession, you may be satisfied to use this in conjunction with a wave-change switch.

Therefore, in a future article we propose to show how an ordinary variable can be (Continued on next page.)

A HIGH-EFFICIENCY CIRCUIT



The circuit includes our very effective "P.J." system of wave-changing, which is automatically controlled by the extenser.

in the way of programmes. Using a fairly good outdoor aerial, or even an indoor aerial of extended wire construction, sufficient volume results from the local stations and from the more powerful foreigners to operate the largest loudspeaker at excellent quality.

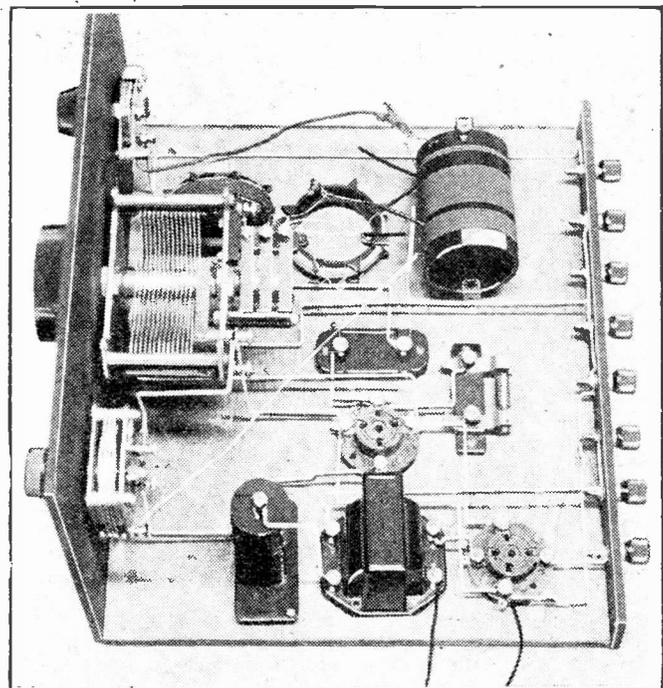
Easy to Handle.

Indeed, for these a second L.F. amplifying valve, were it used, would have to be volume-controlled to some considerable extent. And because of its up-to-the-minute inductance and reaction arrangements it is no difficult matter for the tyro

this way you are saved all the trouble of collecting together the small items such as screws, etc., and, moreover, the panel is already drilled for you.

In this particular model of the "Full-Range" Two that we are dealing with this week an Extenser is included.

NO CROWDING—NO COMPLICATIONS



There is heaps of room for all the components, even if some which you use are larger than those which figure in the original model.

THE "FULL-RANGE" TWO

(Continued from previous page.)

used, although we assure those new readers who have had no personal contact with the Extenser that it has many points of advantage over and above that of mere tuning facility.

You will notice that a "Brookmans"

condenser is specified as one of the front panel controls. This is a variable condenser of compact construction that serves to give an aerial-balancing effort and added selectivity on the ordinary broadcast waves.

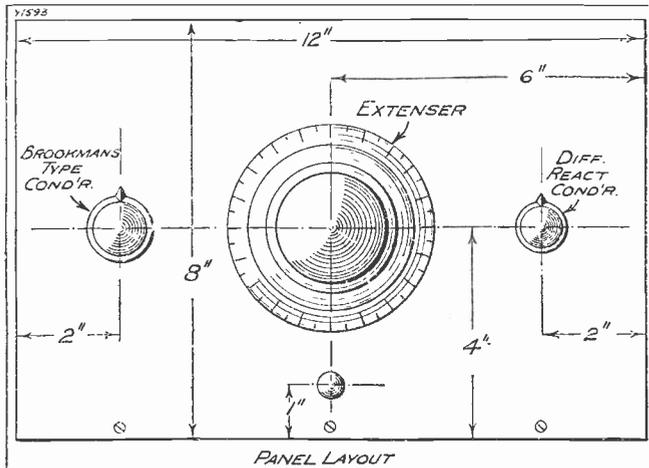
It is not needed on the long waves, and is provided with a shorting device so that it can, if desired, be thrown right out of circuit.

Messrs. Ferranti supply a "variable" that is suitable for the job which actually has such a shorting

so equipped and modify it yourself in the simplest possible manner.

All you have to do is to cut a small piece of copper foil or tin, pierce a hole through it, and secure it under the fixed vanes securing screw; this is clearly shown in the wiring diagram. You then bend the metal over so that the moving vanes come into contact with it when they are turned right round in their "fully out" position.

VERY FLEXIBLE CONTROLS



After a little experience you will be surprised at the extent to which this wily little set can be "pushed" when searching for distant stations.

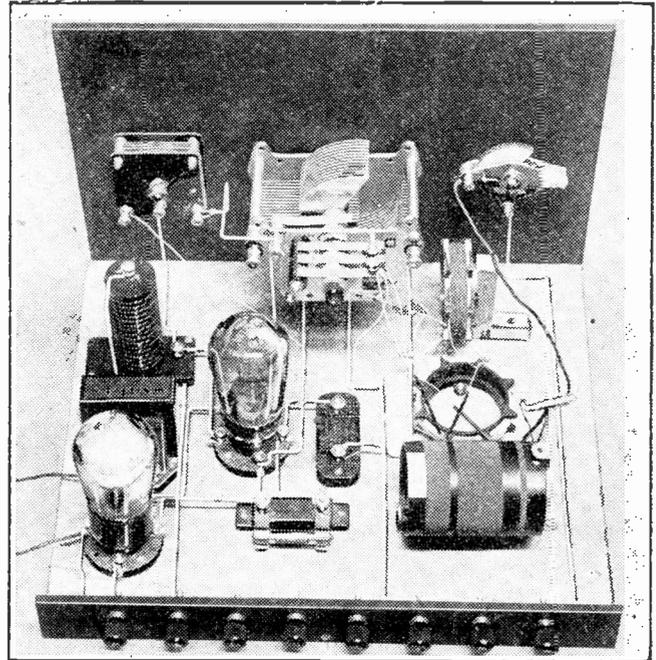
LIST OF COMPONENTS for the "FULL-RANGE" TWO.

- | | |
|--|---|
| 1 Panel, 12 x 8 in. (Permeol, or Becol, Wearite, Red Seal, Goltone). | 1 H.F. choke (Lewcos, or Ready Radio, Telsen, R.I., Lotus, Varley, Dubilier, Wearite, Sovereign, Lissen, Atlas, Tunewell, Graham Farish). |
| 1 Cabinet, with baseboard 10 in. deep to fit (Camco, or Pickett, Gilbert, Ready Radio, Osborn). | 1 L.F. transformer (Lotus, or Telsen, R.I., Igranic, Lewcos, Varley, Ferranti, Lissen, Graham Farish). |
| 1 '0005-mfd. Extenser (Cylton, or J.B., Formo, Wavemaster). | 2 Coil quitois (Peto-Scott, or Wearite, Sovereign, Melbourne, Parex, Ready Radio). |
| 1 '0001-, '00012-, or '00015-mfd. differential reaction condenser (J.B., or Ready Radio, Telsen, Cylton, Wavemaster, Lotus, Polar). | 1 P.J.1 coil (Lewcos, or Ready Radio, Parex, R.I., Melbourne, Formo, Goltone, Wearite, Ferranti, Peto-Scott). |
| 1 '0005-mfd. solid di-electric condenser Ready Radio, or Telsen, Wavemaster, Lotus, Polar, Graham Farish, Parex). | 2 ozs. of No. 24 D.S.C. wire. |
| 1 P.J.1 coil. | 2 ozs. of No. 30 D.S.C. wire. |
| 1 L.T. switch (Ready Radio, or Colvern, Telsen, Goltone, Lissen, Igranic, Lotus, Graham Farish, Bulgin, Peto-Scott, Wearite). | 1 Terminal strip, 12 x 2 in. |
| 2 Valve holders (Telsen, or W.B., Lotus, Graham Farish, Igranic, Bulgin, Burton, Clix, Wearite, Formo, Junit). | 8 Indicating terminals (Belling & Lee), or Eelex, Igranic, Clix, Goltone). |
| 1 '0003 mfd. fixed condenser (Dubilier, or T.C.C., Mullard, Ediswan, Goltone, Telsen, Lissen, Igranic, Graham Farish, Ferranti, Watmel). | Glazite or Lacoline, Quickwire, Jiffilinx. |
| 1 2-meg. grid leak and holder | 2 Crocodile clips (Goltone, Bul-Screws, flex). |

ACCESSORIES

- Loudspeakers.—(Amplion, B.T.-H., H.M.V., Mullard, Celestion, W.B., R. & A., Graham Farish, Blue Spot, Undy).
- Valves.—1 Det., 1 L.F. or small power valve. (Mazda, Osram, Mullard, Six Sixty, Cossor, Tungstram, Eta, Fotos, Dario, Lissen).
Using H.L. (Mazda) and P2 (Osram) H.T. consumption at 120 volts with 9 volts bias, is 10.5 milliamps (4- or 6-volt valves of similar characteristics can be used).
- Batteries.—H.T. 99-120 volts (double capacity) (Ever Ready, Lissen, Drydex, Ediswan, Magnet, Petrix, Columbia).
G.B., 9 volts (as above).
- Accumulators.—Voltage to suit valves (Exide, Ediswan, Lissen, Petrix, G.E.C.).
- Mains Units.—(Regentone, Heayberd, Ekco, Tannoy, Lotus, R.L., Atlas, Tunewell).
State voltage and type of mains and also milliamperage and description of set when ordering.

STRAIGHTFORWARD WIRING



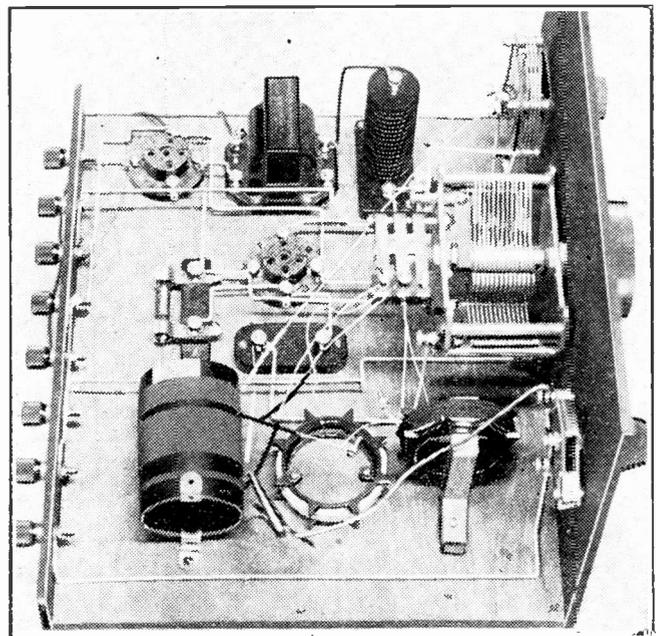
The extenser, together with a careful disposition of the components, makes the wiring particularly simple.

scheme included. But you can use another make not

Alternatively, you could short the condenser out of circuit by joining a short wire across its ordinary terminals; but

(Continued on next page.)

FIXING THE "L.W." COIL QUIT



You fix the long-wave coil quit by screwing it to a piece of wood, which in turn is held to the baseboard by another piece of wood, as shown above.

THE "FULL-RANGE" TWO

(Continued from previous page.)

that is a clumsy alternative. (If you buy a kit of parts, ask for a Brookmans condenser with shorting device fitted; the extra charge for this should only be two or three pence. if, indeed, any charge at all is made.)

The Coils.

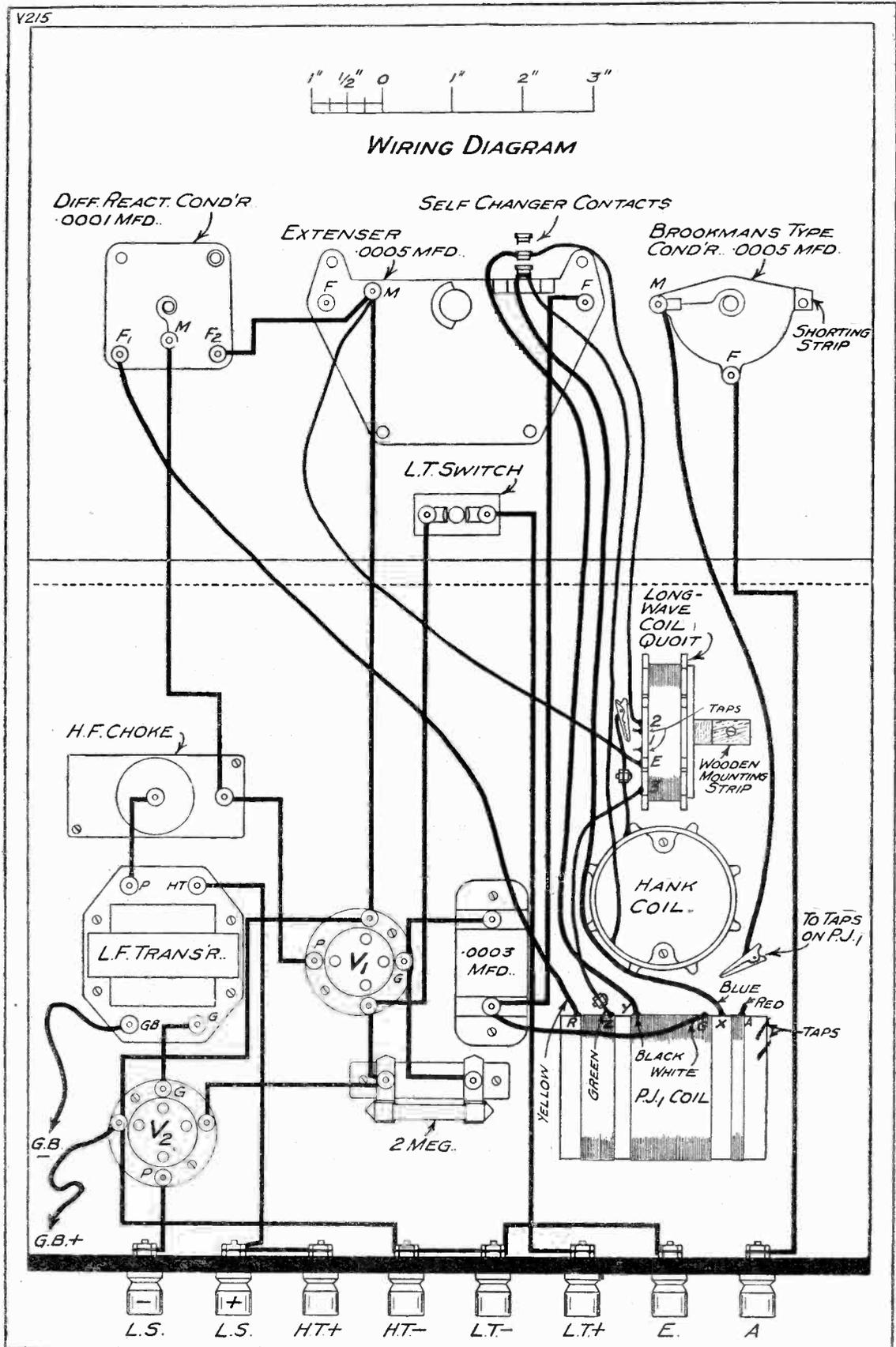
We would advise you to purchase the P.J.1 coil for it is an inexpensive component, and the "ready made" version is fitted with coloured connecting wires agreeing with the colour indication given in our diagram. However, if you do desire to wind your own P.J.1 coil you will not discover the job to be anything but quite easy. The required details are given in our Radiatorial columns. The P.J.1 coil is a standard unit and has been used in other sets, and will appear in future designs.

The long-wave and bank coils must be accommodated on "P.W." Coil Quoits; these cost 6d. each. The hank coil comprises 60 turns of No. 24 gauge double silk-covered wire, and this should be wound on fairly loosely. You need not take any particular precautions, but just don't pull the wire on tightly; wrap it on as you would wind up string on your fingers.

Long-Waves.

Much the same applies to the long-wave winding, only for this you will need 30 gauge double silk-covered wire. You will find the instructions for making and using this coil, too, in our Radiatorial columns this week.

THIS IS A "SCALE" DRAWING OF THE SET



As with all "P.W." wiring diagrams, the above is drawn exactly to scale, so that you are able to place your components in exactly the same way as in the original model. The long-wave coil quoit is mounted edgewise, and is held in position by a wooden bracket (see also the photos).

HAVE you heard the Americans yet on the medium band? If not, now is the time to think about adding some of them to your list of captures. It is no good going for them until after mid-night since until that time there are too many Euro-

pean stations at work on the band. Naturally, you don't want to sit up long past your usual bed-time unless there is some chance of success. Here is a tip worth noting. One of the most fruitful patches in the medium wave-band for Americans is that between 230 and 290 metres.

Some Useful "Yanks."

When bed-time comes along try Lille, Turin, Heilsberg, Bratislava, Nurnberg and Trieste and see how these stations are coming in. If there are no atmospherics, if strength is good and if fading is not severe, then it is well worth while sitting up and you can feel pretty sure that you will bag your first American.

The stations best worth going for are W I O D on 230.18 metres, K O B on 254.1 metres, W H A M on 260.7 metres, W P G on 272.6 metres and W T I C on 282.8 metres. If you don't find the lower part of the band good try between 300 and 400



Some practical distant-programme notes compiled by a special contributor who nightly searches the ether in order to obtain really up-to-the-minute information for "P.W." readers.

metres, going for W B Z on 302.8 metres, K D K A on 305.9 metres, W E N R on 344.6 metres, W G Y on 379.5 metres, W B B M on 389.4 metres and W J Z on 394.5 metres.

Conditions for long-distance listening to European stations are now very fine indeed. I mentioned in my last notes that a surprising number of foreign stations could be heard before dusk. Since writing that report I have found more and more stations coming in as early as three o'clock in the afternoon.

If you haven't tried daylight reception on the medium band for a time, set your tuning condensers at or near zero and use just enough reaction to bring the set into a sensitive condition. Then advance the readings steadily without pausing when a station is heard, so that you turn from end to end of the dials in a minute or so. I think that you will be amazed to find how lively the set is and how many stations are there.

The long waves are now superb, all of

strength varies a little.

Between the top of the band and 400 metres there are now at least a dozen stations which can be relied upon for loud-speaker reception. In addition to the two already mentioned we have Brussels No. 1, Milan, Prague, Langenberg, Rome, Stockholm, Beromunster, Witzleben, Katowice and Sottens. Not a bad lot, eh?

Can You Get Them?

Between 300 and 400 metres the number of stations that will provide first-rate loud-speaker reproduction depends rather upon how much you suffer from the wipe-out of the Midland Regional, the London Regional and the North National stations. The stations actually "there" are Frankfurt, Toulouse, Lwów, Hamburg, Stuttgart, Barcelona, Strasbourg, Brno, Brussels No. 2, Breslau, Goteborg and Bordeaux.

In addition, Belgrade, Bucharest, Munich, Sundsvall, Madrid, Algiers, Naples, Grenoble and Marseilles are all worth attention.

THE select circle of we who confide in each other, and argue with each other, through the medium of these weekly notes, seems to be growing. In fact, no sooner do I settle someone's inquiries about a "mystery station" than a third party comes along and says we are both wrong.

As an example in point, F. J. F., of Raynes Park, steps in now and says that there is a Spanish "mystery station" on about 32 metres, and that the Spanish talks that have been mentioned probably come from him, and not from W 2 X A F. As a matter of fact, the "mystery" is dispelled, for the station is none other than our wandering friend E A Q.

Another "Lost Soul"!

He is scheduled as working on 30.4 metres, but he seems to move about between 29 and 32 metres. I think several of the Spanish stations are offenders in this respect, for one of them, E A K by name, has just settled down right inside the amateur 20-metre band, after moving to five or six different wave-lengths. How long it will be before the authorities tell him to move I cannot say, but he certainly is a decided nuisance at the moment.

To return to F. J. F., he really does seem to be in an unfortunate situation, for he tells me that his self-same receiver, moved to a friend's house quite a short distance away, does surprising things. In spite of this, he successfully enters the "H.A.C. Club."

SHORT-WAVE NOTES



News and views regarding an exciting and fascinating wave-band.

By W. L. S.

Talking of that august collection of enthusiasts, we must have a roll-call one day, in the form of a receiving competition for "H.A.C. Club" members only. With so many hot-stuff receivers absorbing signals from the ether, things should be quite dull for those that are left!

Can anyone help to trace yet another unknown station below 20 metres, with a programme consisting mostly of tangos, and announcements in a little-known language? It has caused a lot of bother to D. P., from Chesterfield.

Metal Screening.

Some time ago I suggested the use of aluminium on baseboards or panels as a rough kind of emergency screen. Since then I have had several letters on the subject. Most of those readers who have not tried it say that they don't believe it would do a

thing. On the other hand, all those who have tried it report it quite effective.

One suggestion forthcoming as a result of the note is that it might be an effective way of "metallising" a favourite old valve instead of buying a new one!

An interesting epistle from F. N. B. (Hale) condemns all kinds of screening. F.N.B. says that he builds sets with a sufficiently good layout to give absence of hand capacity, etc., without having to resort to metal panels and baseboards. And, furthermore, that they beat any other receiver in the district, particularly the "armour-plated" variety.

Renewed Enthusiasm.

He has returned to the short-wave fold after a long absence (being quite an old stager) and thinks conditions are terrible. I don't know, F. N. B., that I should go so far as that. I have logged as many Australians during the past month as I have ever heard before during a similar period.

Likewise, I have heard amateur stations in all continents and all U.S. and Canadian districts in a single afternoon and evening. What's wrong with that? Suppose you do try a metal panel?

Seriously, though, I think our receivers have improved so vastly since two or three years ago that those of us who have been active all the time have not noticed the dropping-off in conditions very much. The improvement in transmitters has also done something to prevent an absolutely blank period.



*No excuse for buying foreign
batteries for your wireless set*

**BRITISH BATTERIES
ARE PROVED THE BEST**

*No excuse for having any but
the best British battery... **GET AN***

**Exide
BATTERY**

and have clear, constant reception!

N.60

MADE ENTIRELY IN ENGLAND, EMPLOYING BRITISH LABOUR AND BRITISH CAPITAL

Obtainable from Exide Service Stations or any reputable dealer.

Exide Service Stations give service on every make of battery.

Exide Batteries, Exide Works, Clifton Junction, near Manchester.

Branches: London, Manchester, Birmingham, Bristol, Glasgow, Dublin, Belfast

A really new home entertainment

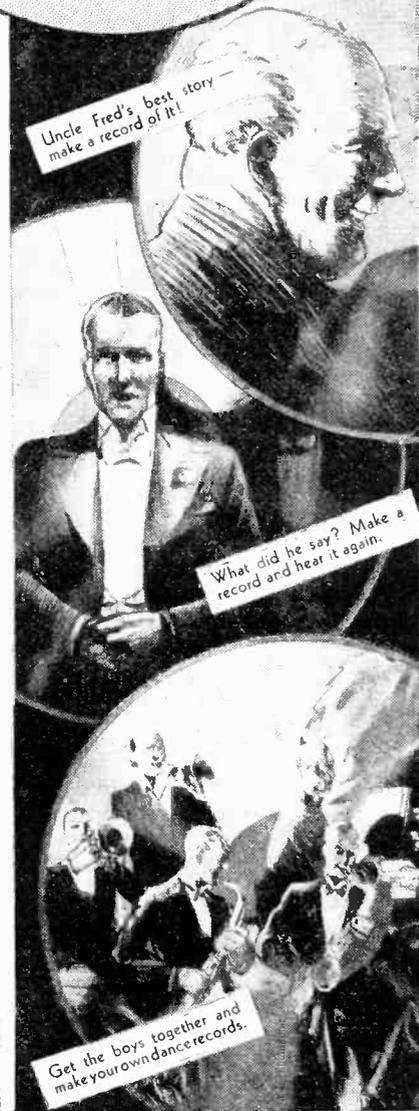


As a source of infinite variety of home entertainment the new and improved EKCO Radiocorder is unequalled. It enables you to make in your own home, in your own words and style, *unbreakable* gramophone records as easily as playing an ordinary record.



Recorder, Cutting Arm, Mounting Socket, Record Carrier and Record—
all shown in position during process of cutting.

Imagine a Christmas greeting to your friends which will actually speak your own words in your own voice. Imagine capturing radio items, your friends' voices, anecdotes, musical accomplishments and thereby providing a store of golden memories for your leisure hours. What could be more novel or acceptable! The EKCO Radiocorder does all these things simply and quickly. At a remarkably low cost you can build up a library of records such as money can never buy.



Your dealer will willingly give you a demonstration.

Price £5:5:0 complete.
(Microphone £2.2.0 extra)

EKCO RADIOCORDER

To: E. K. Cole Ltd., Dept. A.18.
EKCO Works, Southend-on-Sea.

Please forward me your new fully illustrated EKCO Radiocorder literature.

Name.....

Address.....

NOW THEN, "ARIEL!"

An amusing letter received from an American reader.

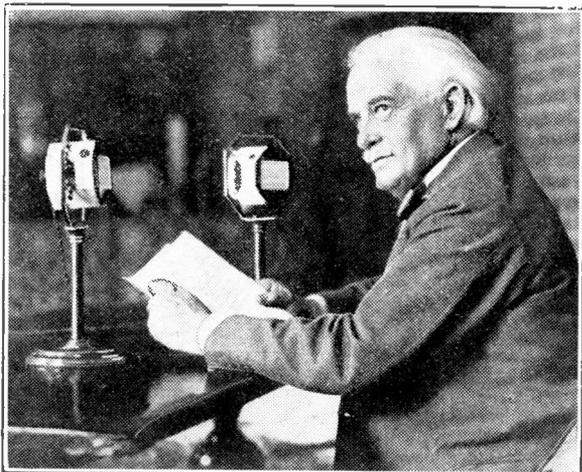
The Editor, POPULAR WIRELESS.

Dear Sir,—“ARIEL'S” comments in POPULAR WIRELESS give me more amusement, I believe, than any other radio column which I have read. It is with great interest that I read them whenever a copy of the magazine comes into my hands.

One thing about ARIEL which vastly amuses me is that he never misses the opportunity to take a crack at things American. Perhaps I should rejoin with irate comments, but I feel moved to laughter rather than to anger. It sounds like sour grapes to me. Maybe I am wrong, but the impression is that overwhelmed by the bewildering immensity of American radio, he tries to belittle it to suit his insular standards. As I say, maybe I am wrong—I hope I am.

I know that we Americans are regarded as about the next thing to nothing. That amuses me, too.

APPEALING TO THE PUBLIC



Mr. Lloyd George giving his election broadcast before the microphones at his home in Churt.

Well, maybe we are crazy, but we get what we demand in radio entertainment, and don't pay a licence fee to listen to whatever the Director-General deems is fit for us to hear. And what about those Sunday Programmes??????

And while ARIEL and others point their fingers and shake their heads we dial our radios and listen to the voices of England's great men who are more international minded and have taken the trouble to speak to us in transatlantic relays. We hear at least one talk per week from London, and are familiar with the voices of King George, Ramsay MacDonald, and many others. Our daily papers keep us as well informed on the political situation in England as of our own country, and the day the gold standard was abandoned a coast-to-coast programme was interrupted to broadcast the flash. Meanwhile, from what I can gather through reading English publications, we are regarded as spending the days machine-gunning with gangsters.

Amusement.

Yes, ARIEL amuses me. Some time ago he made the rash assertion that advertising by radio doesn't pay. I took him up on it and he came right back at me with another challenge, to which I failed to respond. In the issue of August 29th he says: "An interesting sidelight on the small controversy I had about the value of radio advertising in the States." I wonder if he can be

referring to our set-to? His paragraph concludes with: "I pause for a reply." O.K.!

When ARIEL tilted back at me in the May 23rd issue, I determined to secure statistical proof to back my statements. We spoke of Amos and Andy, so I wrote to the Pepsodent Company. A prompt and courteous reply informed me that they did not reveal such statistics as I required, pointing out the obvious fact that if radio advertising did not pay, it certainly wouldn't be so extensively utilized.

Next I tried a radio station. The matter was taken up with the board of directors, and the answer was that while the argument amused them it was of no importance what ARIEL or anyone else thought about it—it did not matter, and they couldn't spare the time to go into the intricate business of compiling statistics for such a purpose.

Money and Broadcast Advertising.

In other words, ARIEL got the Bronx cheer. But I can see him smiling and answering: "No proof, eh? What did I say?"

Yes, I will have to grant that this plays into ARIEL'S hands, on the surface. But I let him grasp this straw, for perhaps he really believes that the hundreds of firms advertising by radio are expending huge sums merely to pass the time.

As I recall, ARIEL'S chief argument against the sponsored programme is that he would not buy a certain tooth-paste because its makers broadcast divine music.

This brings up an interesting point. ARIEL no doubt, would buy a certain brand of tooth-paste because his father bought it and his grandfather bought it.

An American doesn't do things that way. He is always looking for something new. Nor is the American listener so cold as ARIEL. In common with many others, I use Pepsodent tooth-paste because I appreciate that nightly dose of good fun they give us through Amos and Andy. In an aside I might add that while I see reports in English magazines to the effect that Amos and Andy are dead, I noticed, walking home the other evening, that I could practically follow that night's skit along the route.

"The D.G. in America."

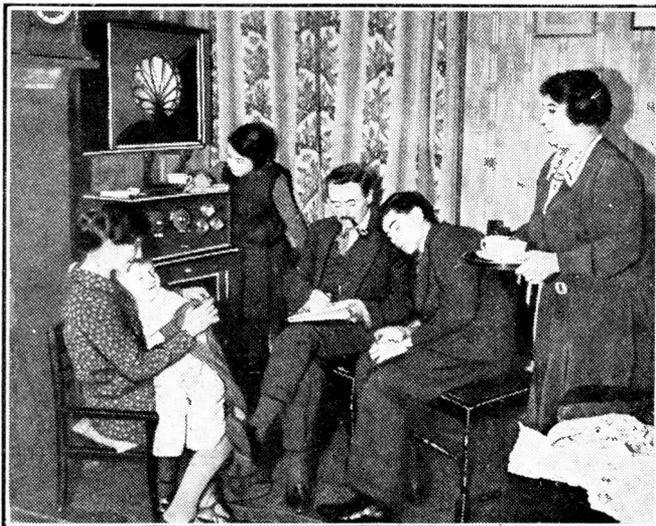
Returning to the sponsored programme situation, another thing that amuses me is a story in the June 20th issue of "P.W." on "The D.G. in America." Because the nation listened while he spoke and the newspapers gave him a break, the opinion seems to be that we humbly bowed before the great mind of radio—witness these remarks on Page 470 of the June 20th issue:

"Sir John seems to have made it pretty clear to the Americans how and why it is we in this country have a far, far better broadcasting system.

"Whether the Americans will take Sir John's hint and change their broadcasting methods is open to doubt—but the fact remains that they have heard our 'Radio Czar' and have his word for it that the B.B.C. organization is the best thing of its kind in the world."

Such conceit! Again, I am amused! But seriously, such a spirit is not the true radio

WHEN THE FIGHT IS OVER



A domestic scene typical of many thousands, taken on Election night.

HOW YOUR SET WORKS

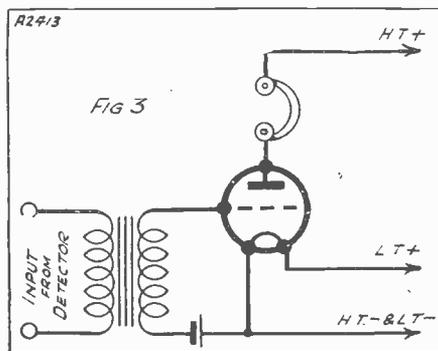
(Continued from previous page.)

in the secondary, thus inducing in this winding five times the voltage. It is known as a step-up low-frequency transformer. (And in this case it would be described as having a ratio of one-to-five.)

The secondary of this transformer is then connected to the grid and filament (via the grid bias) of the low-frequency amplifying valve. Magnification is then obtained in the plate circuit in the same way as for high-frequency amplification.

There are several other methods of obtaining low-frequency amplification, but there is not space to deal with them fully here. The method I have given above is that which is most commonly used; in fact, it is almost universal. There is another scheme, however, which was much in vogue

GETTING MORE "MAG"



If really large outputs are required from a radio receiver, it is essential to use L.F. amplification. Part of the step-up is provided by an intervalve transformer, and the remainder by the valve.

some years ago, and that is resistance-capacity coupling.

It consists of a valve connected up in the usual way, but having a high resistance of about 100,000 ohms instead of the primary of the transformer in series with the plate. The voltage variations developed across it by the changing current are then passed on to the next valve through a fairly large grid condenser.

The great advantage claimed for this system was that it gave practically equal amplification to all the notes in the musical scale but, unfortunately, it could not provide the step-up given by the transformer.

In the days when transformers were none too good from a quality point of view this loss was gladly put up with for the sake of good reproduction, but nowadays when transformers are greatly improved there is often no advantage in resorting to this method.

NOW THEN, "ARIEL!"

(Continued from previous column.)

spirit. Radio is international and a true radio fan does not devote his time to ignoring the other fellow's good points and sneering at his alleged bad ones.

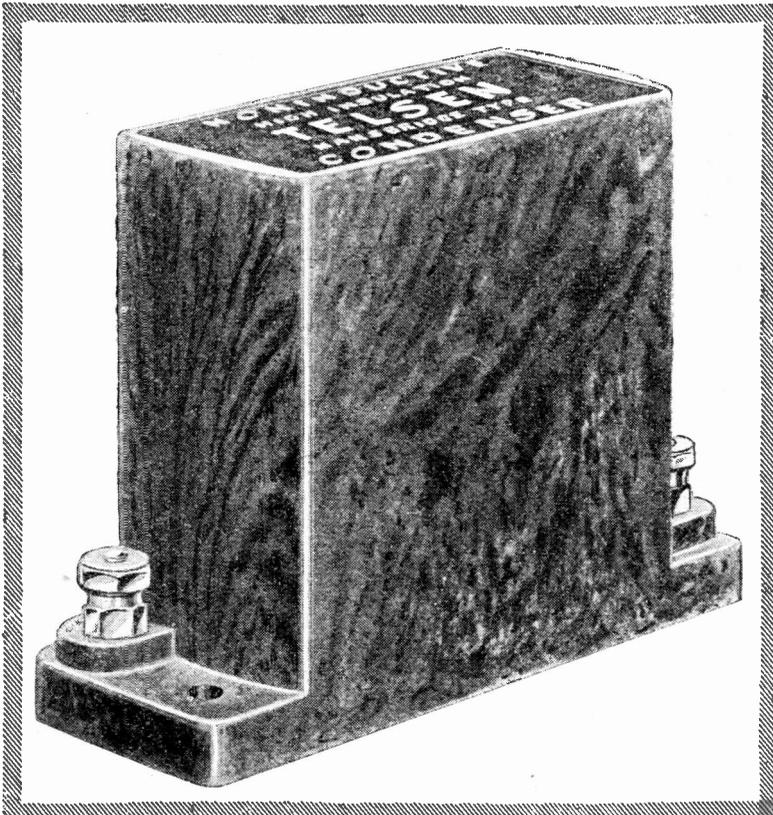
In my humble opinion ARIEL, as a devotee of the greatest potential good-will factor, radio, should devote his efforts to creating a better international understanding rather than belittling the efforts of his fellow "fans."

All right, ARIEL, it's your turn.

Respectfully yours,
W. WERNER,

1468, Seventh Avenue, San Diego,
California, U.S.A.

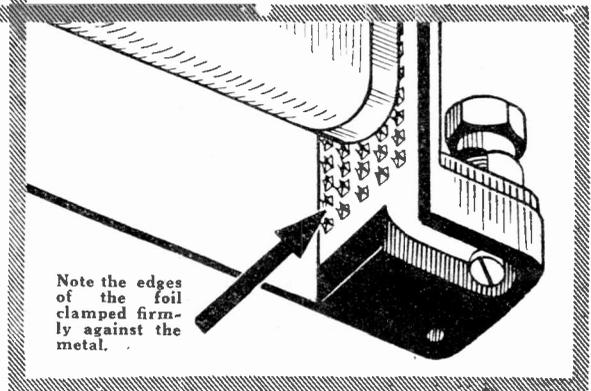
ABSOLUTELY NON-INDUCTIVE



TELSEN MANSBRIDGE TYPE CONDENSERS

It is essential for condensers used in radio work to be non-inductive to ensure negligible resistance to H.F. currents. Telsen Condensers are made by a special process which ensures *hundreds* of points of contact along the edge of each foil, thus preventing the possibility of any inductive effect.

The illustration below shows the base of a Telsen Condenser stripped to show the method of "Nutmeg-grater" contact.



EVERY

Telsen Condenser is completely non-inductive.

EVERY

Telsen Condenser is of the true Mansbridge self-sealing type, dehydrated in vacuo, impregnated and hermetically sealed.

EVERY

Telsen Condenser undergoes five laboratory tests before it is packed.

EVERY

Telsen Condenser is tested to the high insulation standards of the G.P.O.

EVERY

Telsen Condenser is 100% British.

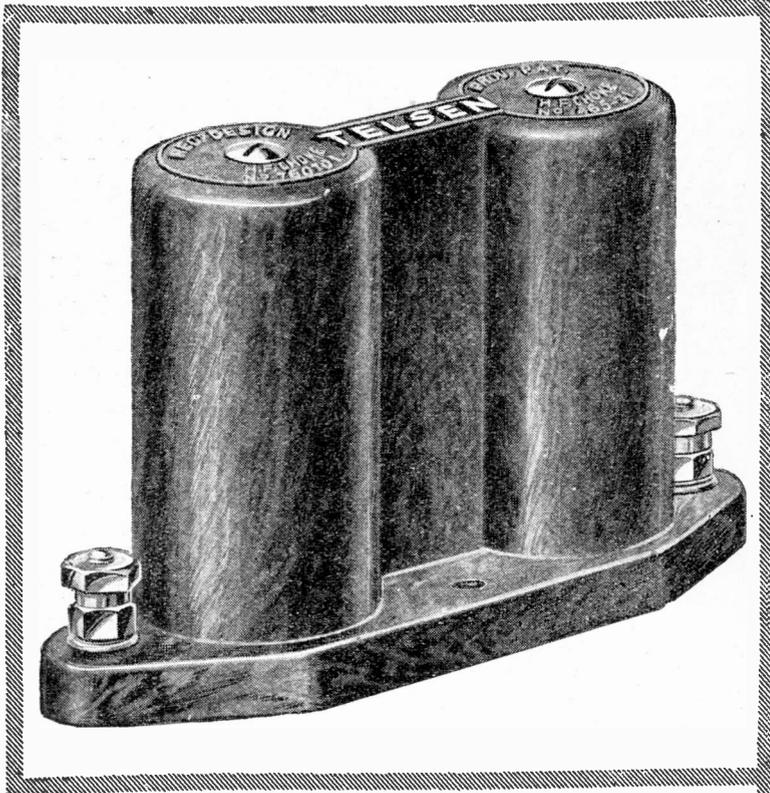
Telsen Mansbridge Type Condensers, made in capacities from .01 to 2.0 microfarad from 1/6.

Send for the "Telsen Radio Catalogue" and book of "All-Telsen Circuits" to The Telsen Electric Co., Ltd., Aston, Birmingham.

TELSEN

THE SECRET OF PERFECT RADIO RECEPTION

IMPEDANCE . . .



TELSEN BINOCULAR H.F. CHOKES

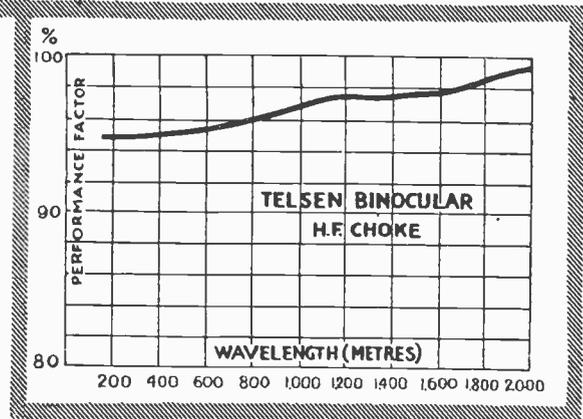
It is the function of an H.F. Choke to present the highest possible impedance to H.F. currents at all wavelengths. Particularly does this apply to the popular tuned grid arrangement of screened-grid amplification, where the performance of the whole set is limited by the value of the impedance in the anode circuit of the screened-grid valve. It is equally important that this high efficiency should be maintained over the whole broadcast band.

Telsen Binocular H.F. Choke - Price 5/-
Telsen Standard H.F. Choke - Price 2/-

The Curve adjoining (published by courtesy of AMATEUR WIRELESS) represents the efficiency over the Broadcast Band, as measured at the Furzehill Laboratories by J. H. Reyner, B.Sc., A.C.G.I., D.I.C., A.M.I.E.E., M.I.R.E., who says: "This curve shows the fine performance of the new Telsen Binocular H.F. Choke . . . the performance factor exceeds 95 per cent. at all points, and there is a distinct freedom from subsidiary resonances. . . . This Choke must be considered as taking its place as the best on the market."

Combined with its "fieldless" properties these figures show that where superlative performance is called for the choice must be the TELSEN Binocular H.F. Choke.

Send for the "Telsen Radio Catalogue" and book of "All-Telsen Circuits" to The Telsen Electric Co., Ltd., Aston, Birmingham.



TELSEN

ALL-BRITISH
RADIO COMPONENTS



NOT one listener in a thousand knows that there is a tiny talks studio in Bristol, and that an "unknown" studio centre is springing into being at Leeds. The Bristol studio serves the West Region, and when I went down to see developments at the Watchet site (for the new West Regional station) last month I took the opportunity of getting acquainted with the Bristol centre.

A So-called "Little" Studio.

At Savoy Hill they had referred to it as a "little" talks studio, and I expected to find one solitary room with a microphone and reading desk. But, no! Bristol is rapidly becoming a local headquarters, and the office and studio accommodation is truly generous.

The local studio at Bristol is very useful, because on many occasions it has saved an artiste crossing the Severn to go to the Cardiff headquarters. For residents on the south side of the channel this is not always a convenient journey.

The studio has now been opened long enough to show the Western Regional officials how useful it is to have studio centres in order to pick up local talent. I chatted with one of the West Regional officials, and he told me that the studio was opened on Saturday, April 25th, and a talk at 7.15 in the evening was given after the unofficial opening ceremony.

Saving Time.

This was a good example of the way in which time can be saved, because had the speaker gone to Cardiff to give his talk on that particular opening evening of the Bristol

Our Special Correspondent here describes the studios at Bristol and Leeds, unknown to the general public, but of the greatest importance to the B.B.C. in programme building.

studio he would have had to leave the city at 5 o'clock, and would have returned to Bristol at 10.45. As it was, he just went down to Queen's Road and said his part.

The B.B.C. has a liking for banks, the Manchester headquarters being partly over a bank, and down at Bristol the premises consist of five rooms on the second floor of the Midland Bank Chambers, in Queen's Road, Clifton.

You might wonder why five rooms are needed, but I should explain that these are taken up, not only by the talks studio and

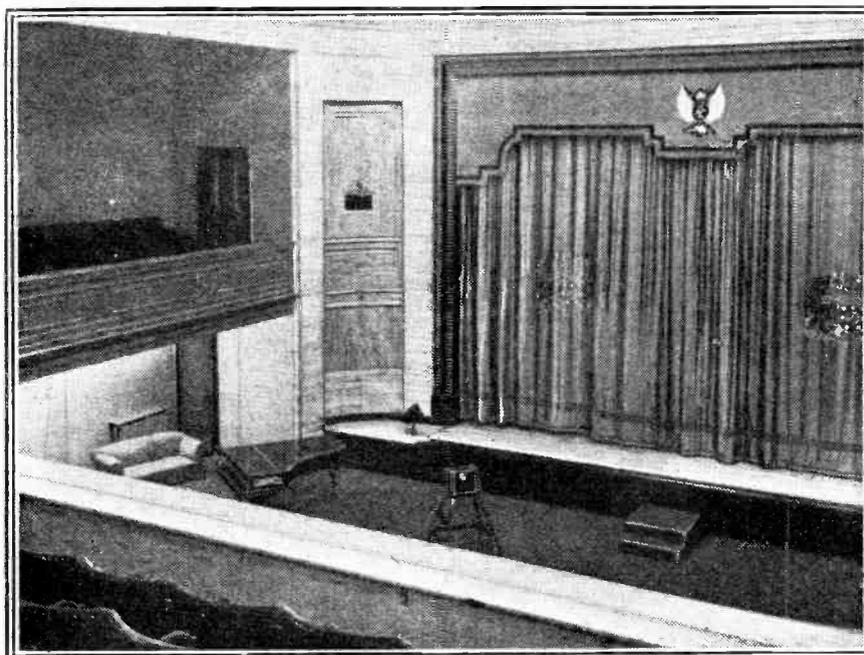
the control-room, which houses the "A" and "B" amplifiers at the Bristol end of the 'phone line to Cardiff, but by a small board room and office accommodation for Mr. E. F. H. Mills, who is the Education Officer of the West Region.

Rather Futuristic Finish.

I was taken all over the place, and was rather impressed. The studio is a very bright room; the colouring has been obtained without much effort, for the walls are simply panelled with Insulite. In contrast to the panels, the woodwork is painted fawn colour, and the appearance is rather futuristic. For the rest the place is simply furnished, there being the usual reading desk and standard lamp.

After my visit to Bristol I made inquiries about other "unknown" studios, and was told about Leeds. In great contrast with the Bristol studio centre is this new centre at Leeds.

EDINBURGH'S "THEATRE" FOR BROADCASTING



Strictly speaking, we should call it a studio, it being the largest one at Edinburgh, but the layout is just the same as a proper theatre, with stage, circles, etc. Theatre artistes should certainly feel at home when broadcasting from here.

This was started because the need was felt for bigger premises on that side of the Pennines, and the Leeds officials set about looking for a likely place. They found it in Woodhouse Lane, which is in a fairly central part of Leeds, and it was formerly a Friends' Meeting House.

Conversion Started.

After it had been given up by the Quakers it was taken up by a well-known cloth concern, and it is from this that the B.B.C. is renting the premises. Rent was paid from the beginning of August last, and now the work of conversion is well in hand. The house was taken over because the programme people

(Continued on next page.)

THERE must have been many of you who, like myself, came away from the Radio Exhibition this year with an attack of mental indigestion after having partaken deeply of that exhilarating feast of new developments and bewildering exhibits.

To me the most striking feature of the show was the development of "canned" radio, which was noticeable in almost every receiver of merit. This "canning" of coils, valves, and condensers seems to have been developed rapidly by all manufacturers since last year's exhibition, when only a few examples of this new idea were to be seen.

Last year we had the first real development of metal partition screening, which, in the case of some of the foremost designs, resulted in rather complicated chassis constructions.

Simplification of Chassis Design.

This year, however, the simplification of chassis design was particularly noticeable. If you examined closely any number of the receivers on view you will have observed a wide-spread use of coils, band-pass and intervalve, in aluminium cans with built-in and ganged wave-change switches. Also totally enclosed ganged condensers were much in evidence with H.F. valves also in cans or of the metallised type.

Taking a general view of the receiver exhibits one could not help but be struck by the remarkable standardisation of both circuit and chassis design. In many cases the chassis was virtually a set built round a screened ganged condenser assembly. This results in a general compactness of

"CANNED" COMPONENTS.

A review of how the use of metal is increasing both in set and component design.

layout very striking when compared with multi-valve receivers of even only a year or two back.

Wooden Baseboards Being Ousted.

From our impressions of the Radio Show each year we get a good idea of the future trend of receiver design. This year, for example, you will have noticed that the one-time wooden baseboard is being ousted by a metal platform, hollow underneath, on which are mounted the ganged condenser assembly, and the "canned" coils and valves.

The general scheme is to have the H.F. stages upstairs and the L.F. and output stages at the back or below. Underneath we find all the de-coupling components, H.F. chokes, voltage controlling resistances, etc. This type of layout is particularly compact and reduces wiring to a minimum.

Ebonite Panels Disappearing.

As for the once universal ebonite panel, you perhaps noticed that in very many designs there is now nothing left but the escutcheon plate of the tuning condenser!

There is no doubt that a study of these modern tendencies in receiver design is of practical use to the home constructor,

especially those of you who plan your own receivers.

When these ideas have been placed upon a simplified and economised basis, a practical design of the near future for home construction might well include a simple metal chassis with "canned" coils and a ganged condenser assembly; subsidiary controls will, of course, be side-operated as in the "P.V. Star" receiver. Metallised H.F. and detector valves will probably be favoured in place of metal valve-cans, while all de-coupling components will be grouped beneath the chassis.

As regards the tuning circuits, the increasing congestion of the ether makes band-pass tuning particularly attractive, especially in conjunction with a ganged Extenser assembly.

Band-Pass Tuning a Feature.

As regards this band-pass tuning, which was such a prominent feature of this year's exhibits, we must not forget the new development of post-detector tone control, using sharp-tuning single circuits. Of this we shall hear more in the near future.

One other feature of the show which interested me particularly was the diversity and number of components of new and improved types on view. This will certainly confound the pessimists who prophesied a decline in the amateur constructor game!

Here again, the "canning" process, applied to all manner of coils, band-pass, intervalve, super-ict, etc., was very much in evidence. Some of these units were certainly very attractive both in appearance and technical performance.

THE B.B.C.'s "UNKNOWN" STUDIOS

(Continued from previous page.)

demanding three studios, the largest of which should be able to accommodate a fair-sized band.

The radio play people wanted space, and not only did this mean extra studio accommodation, but it meant the fitting of a dramatic control panel and a whole lot of extra wiring in connection with the faders and effects. Of course, there is also to be a talks studio.

This will mean that when the new Leeds premises are in full swing there will be more work for the control engineers, and it is planned to have quite a deal of apparatus at Woodhouse Lane, so that this studio centre will be self-supporting.

P.O. Lines Always Available.

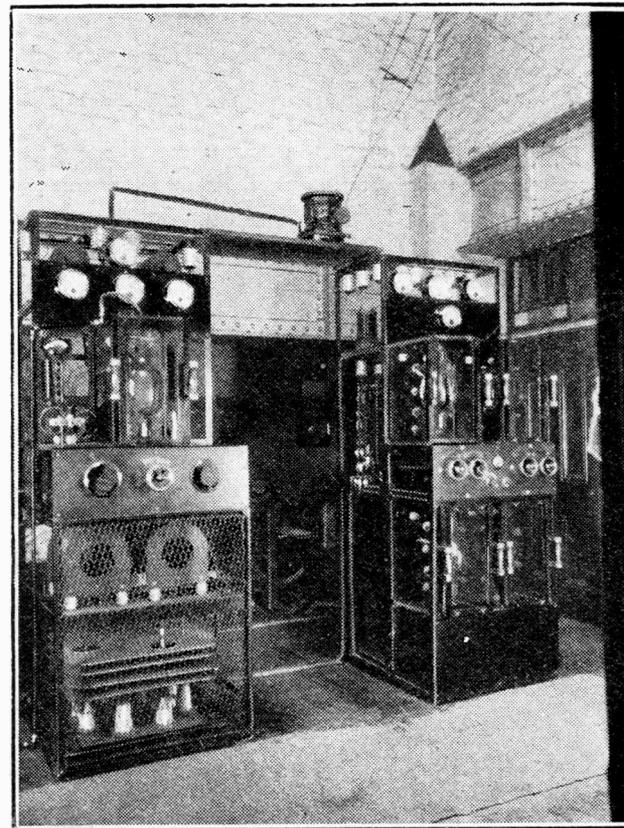
It will link up with the existing B.B.C. landline scheme in any way made necessary by the programme arrangements of the moment, and the "O.B." section at Savoy Hill have made plans for taking over the P.O. lines whenever the studios are needed.

The third of our "unknown" studios is at Glasgow, and is the old studio site vacated in favour of Edinburgh's palatial studios. Not all Scotsmen, and certainly few Englishmen, know that Glasgow is still maintained as a studio centre.

Everybody knows it is an important landline junction for the B.B.C. Because the studios are used on an average only once a week, they come in the ranks of the "unknown."

The studio accommodation at Glasgow is

IT WAS ONCE A KITCHEN!



"Bottles" of a different type are now housed in the one-time kitchen, now transmitting room, of the old house which is the B.B.C. premises at Glasgow. The cellar forms an echo room, and upstairs are two studios which are still used, in spite of the new ones at Edinburgh.

likely to be maintained indefinitely in spite of the fine studios at Edinburgh, and the reason is the same as that for the opening up of Bristol's local studio in the south, namely that it saves artists making unnecessarily long journeys.

Old Headquarters.

There are two studios at Glasgow, and although these now seem small, it must be borne in mind that until the old Queen's Hall was taken over at Edinburgh, this was the B.B.C.'s Scottish headquarters. At the time of writing the engineers are fitting up a dramatic control panel, as for a long time they have made use of ordinary volume control faders to switch in the echo room, which is a converted cellar of the old house.

In the room which used to be the kitchen are the three-valve low-frequency amplifiers used on the lines which link up Glasgow and Edinburgh. I think we are likely to hear more of Glasgow's studios in the future.

TELSEN TRANSFORMERS & CHOKES

TELSEN L.F. & OUTPUT TRANSFORMERS

Telsen transformers have achieved fame in the radio world on account of the high standard of their quality and performance. Designed and built on the soundest engineering principles, these robust, full-size transformers will not only give efficient but enduring service.

TELSEN L.F. TRANSFORMERS

Telsen "Ace" Transformer, Ratios 3-1, 5-1	Price 5/6
Telsen "Radiogrand" Transformer, Ratios 3-1, 5-1	Price 8/6
Telsen "Radiogrand" 7-1 Transformer	Price 12/6
Telsen "Radiogrand" 1.75-1 Transformer	Price 12/6

TELSEN OUTPUT TRANSFORMERS

Telsen Multi-Ratio Output Transformer, giving three Ratios of 9-1, 15-1, 22.5-1 Price 12/6

Telsen Output Transformer, Ratio 1-1 Price 12/6

Telsen Pentode Output Transformer Price 12/6

TELSEN L.F. CHOKES

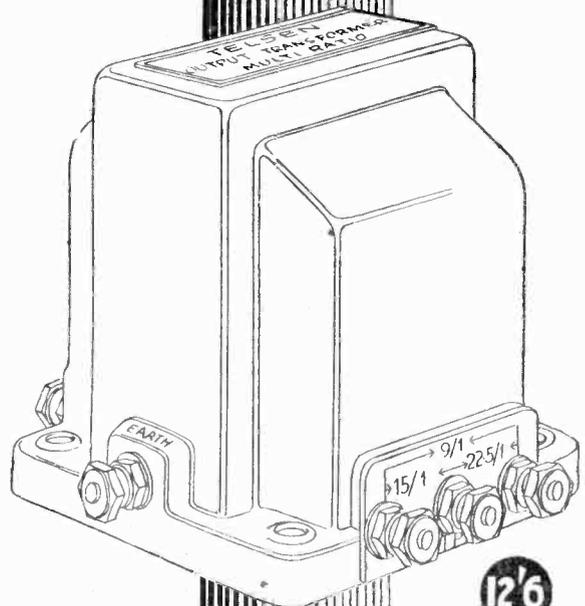
Telsen L.F. Intervalve Coupling Choke, 40 and 100 henrys Price 5/-

Telsen Heavy Duty Power Grid L.F. Choke, 40 henrys Price 8/-

TELSEN OUTPUT CHOKES

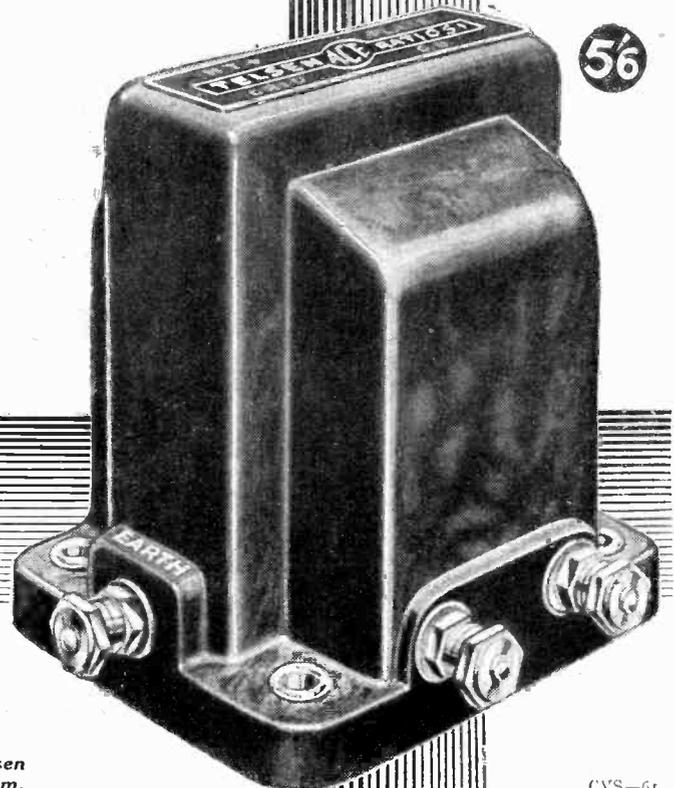
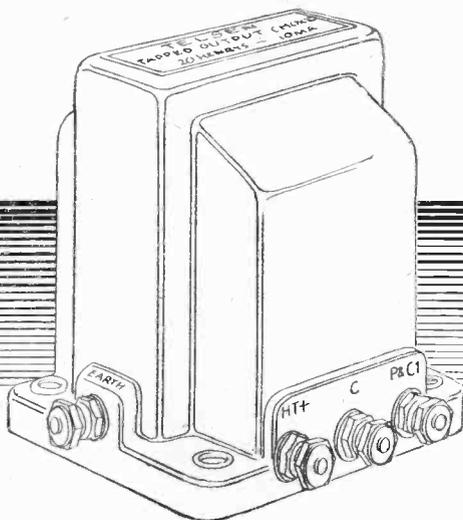
Telsen Output Choke (Plain), 20 henrys Price 8/-

Telsen Output Choke (Tapped), 20 henrys Price 8/6



TELSEN

THE SECRET OF PERFECT RADIO RECEPTION



Send for the "Telsen Radio Catalogue" and book of "All-Telsen Circuits" to—The Telsen Electric Co., Ltd., Aston, Birmingham.

FROM THE TECHNICAL EDITOR'S NOTE BOOK.

Tested and Found—?



A HIGH-CLASS SPEAKER.

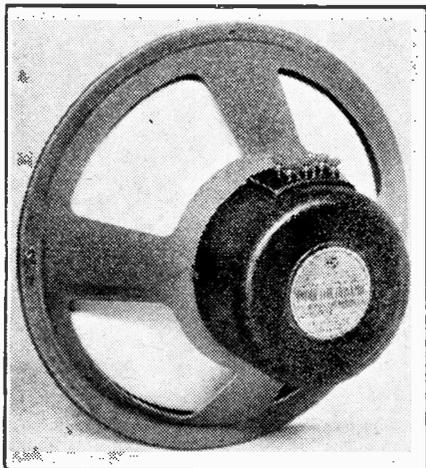
IF I have one outstanding technical weakness, it is a decided prejudice in favour of the "inductor" loudspeaker principle. But in my loudspeaker testing I endeavour to avoid allowing any partiality to creep in.

And that, unless one is very careful, is just the sort of thing to make one *over-critical!*

These observations are a direct result of my examinations of the latest Lamplugh Inductor loudspeaker.

I have been particularly meticulous in checking its response characteristics, and I

THE LAMPLUGH "INDUCTOR"



Note the range of terminals which enable the speaker to be adapted to varying set output conditions.

find these are as good as those of a high-class moving-coil loudspeaker of modern design providing a good "baffle" or cabinet is used.

So far so good, but here's the snag. The Lamplugh Inductor seems to give *better* results than the average high-class moving-coil loudspeaker, and I find it difficult to see why that should be so, and why ordinary frequency tests do not reveal the discrepancy.

You might suggest that my ears react better to the one than the other. I do not accept that suggestion, for the differences are of the nature keenly appreciable by one with a knowledge of acoustics and music.

I have definite ideas as to the whys and wherefores of this curious business, and I believe I have happened across something

new in the way of moving member effects in loudspeakers.

But I am not sure enough of my ground to place them on record—yet. In the meantime I will say this: If you are thinking of spending your money on a moving-coil loudspeaker, don't forget the Lamplugh "Inductor." As its name suggests, it isn't a moving-coil loudspeaker, but, believe me, it will take a good moving-coil instrument to give equal, let alone superior, results.

RADIO CABINETS.

The new W. & T. Lock, Ltd., catalogue has the phrase "Put your Radio in Dress Clothes" on its cover—a very striking way of conveying the idea of high-class cabinet work. It is an interesting list and illustrates some attractive cabinets of all kinds.

FERRANTI PRICE REDUCTIONS.

The new prices of the Ferranti A.C. mains Console Receivers are: Inductor Console, in blue or brown rexine, 15 guineas; Moving-Coil Console, in similar finishes, 18 guineas. Either is available in walnut at 1 guinea extra. Amateurs will also welcome the news that the price of the Ferranti Multi-Range Test Set is reduced from £9 13s. 6d. to £8 5s. 0d., and the price of the Ferranti Valve Tester from £7 5s. 0d. to £6 10s. 0d.

The name of the latter is to be changed to the Ferranti Set Tester in view of its application to the general testing and servicing of radio receivers. Also it should be noted that there is an adaptor available for the instrument which enables it to take measurements in A.C. sets.

A STRIKING COVER.

The cover of the new Cyldon catalogue is of a gold material and is unlike anything I have seen before. It is most striking and is a fitting accompaniment for the interesting and attractive components which are described in the list itself. Of course, Extenders occupy a leading position, and a fine range there are of these unique components, too.

THE NEW "VARLEY" SETS.

The catalogue describing the Varley "Square Peak" sets, which comprise first-class mains receivers and radio-gramophones, is a very well produced publication. And all those desirous of noting what high-grade instruments the British Radio industry is producing this season should send for it at once.

A SHORT-WAVE FRAME.

Super-het owners will be interested in the Goltone Short-Wave Miniature Frame Aerial.

This is not much larger than a plug-in coil, but is fitted with a neat base, as you can see in the photo.

It is wound with silk-covered stranded wire on an air-spaced former fashioned from high-grade ebonite.

There is a centre tap, making the device suitable for direct connection to many popular frame-aerial super-hets.

The cost of this little frame is but 5s. 6d., at which figure I think it very cheap, for it

Manufacturers and traders are invited to submit radio apparatus of any kind for review purposes. All examinations and tests are carried out in the "P.W." Technical Department, with the strictest of impartiality, under the personal supervision of the Technical Editor.

We should like to point out that we prefer to receive production samples picked from stock, and that we cannot in any circumstances undertake to return them, as it is our practice thoroughly to dissect much of the gear in the course of our investigations!

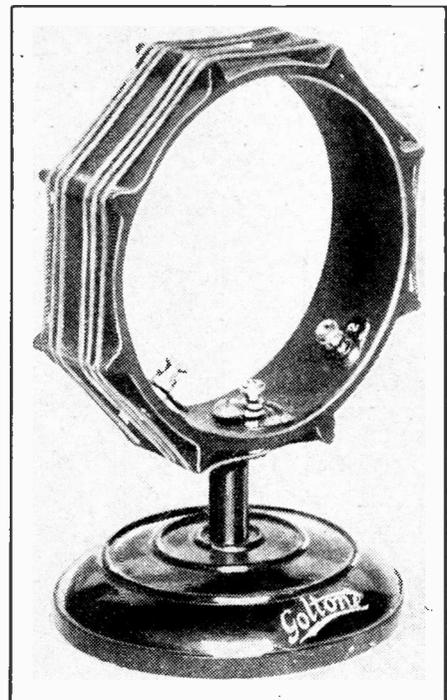
And readers should note that the subsequent reports appearing on this page are intended as guides to buyers, and are, therefore, framed up in a readily readable manner free from technicalities unnecessary for that immediate purpose.

is excellently constructed and has a high-class finish imparted to it.

Readers who are unacquainted with the effectiveness of supers may wonder how such a tiny frame can pick up anything.

But they need have no doubts—the Goltone Miniature Frame brings in the "Yanks" and other distant stations with a "pick-up" reminiscent of a lofty vertical aerial of the K.D.K.A. type!

FOR SUPER-HETS



The "Goltone" Short-Wave Miniature Frame Aerial.

TELSEN SWITCHES AND DIALS

TELSEN PUSH-PULL SWITCHES

(Prov. Pat. No. 14125/31) From 1/-

The Telsen Push-Pull Switches employ a proper electrical knife switch contact and are soundly constructed on engineering principles. The centre plunger is wedge-shaped, so that as it is pulled out it forces the inner fixed contacts outwards, tightly gripping the moving contacts. There is no fear of crackling with Telsen Push-Pull Switches. Their low self-capacity makes them suitable for use in H.F. circuits.

Telsen Push-Pull Switches—

Two-point	Price 1/-
Three-point	Price 1/3
Four-Point (2-pole)	Price 1/6

TELSEN SLOW-MOTION DIAL

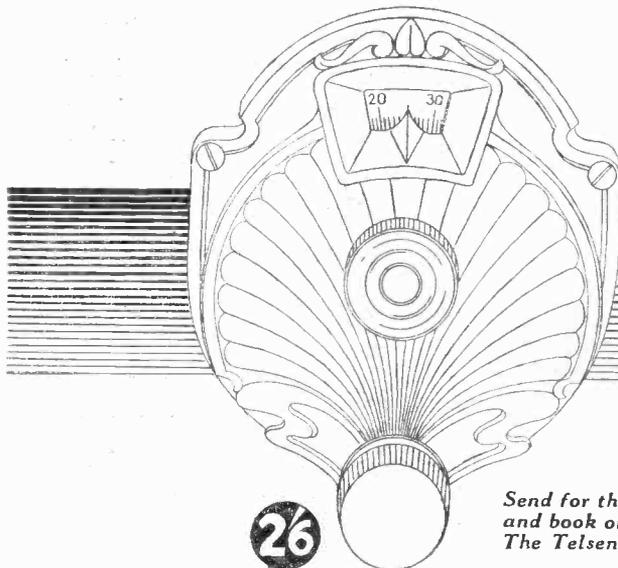
The Telsen Slow-motion Dial has an exceptionally smooth action with an approximate ratio of 8-1. There is no toothed gearing, so that it is impossible to strip the dial. The figures are clear and arranged to provide for right and left-hand condensers.

Telsen Slow-motion Dial Price 2/6

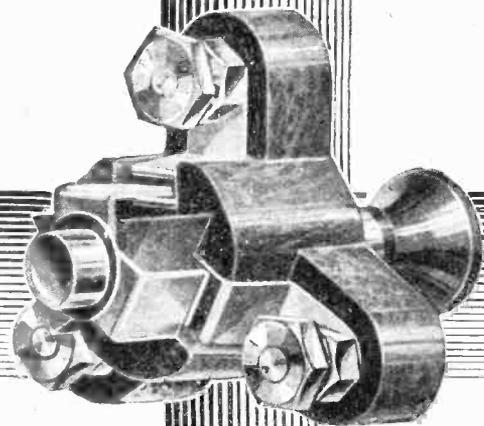
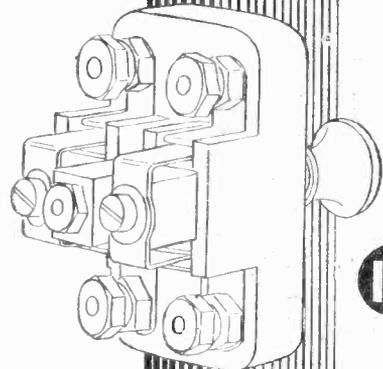
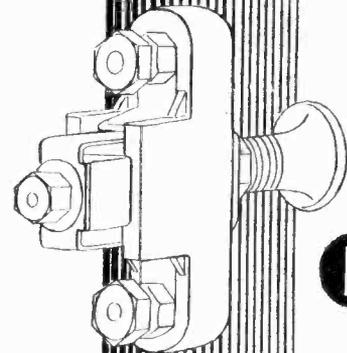
Supplied in Black or Brown Bakelite

TELSEN

ALL-BRITISH
RADIO COMPONENTS



Send for the "Telsen Radio Catalogue" and book of "All-Telsen Circuits" to—
The Telsen Electric Co., Ltd., Aston, Birmingham.



CAPT. ECKERSLEY'S QUERY CORNER



Under the above title, week by week, our Chief Radio Consultant comments upon radio queries submitted by "P.W." readers.

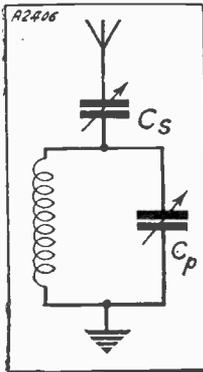
Don't address your questions direct to Capt. Eckersley; a selection of those received by the Query Department in the ordinary way will be answered by him.

Selectivity with a Long Aerial.

B. R. S. (Ballock).—"I have had in use since the early days of broadcasting a large outdoor aerial, which I have had to gradually reduce in length so as to obtain satisfactory results, until now it is only a fraction of its original length and height. Do you think that it would be wise at this point to scrap the existing large masts entirely, or is there a possibility of my requiring them at some future date, due to a change in broadcasting conditions?"

A large aerial gives poor selectivity for reasons we need not go into here and now. But a large aerial does not give poor selectivity if it is series "tuned." Have you tried that?

FOR SHARP TUNING



The Condenser C_s in series with a big aerial, removes the tendency to flat tuning.

C_s in my sketch is a very small condenser indeed—four-noughts something, in fact. C_p is the ordinary sort of condenser. By making C_s very small you have what is in effect a series-tuned circuit.

By making C_s very, very small you have the aerial pick-up sensitivity under control, and can make it so much less to give the required volume from the local powerful Brookmans Park station, but with those distant stations C_s can be increased a bit. C_p must vary with C_s , of course, to get

the same station.

No; keep a fair-sized aerial, but use the series-tuning condenser

Can You "Beat" It?

J. O'B. (Cork).—"In a super-heterodyne receiver a change of frequency is effected by allowing an oscillation generated at the receiver to 'beat' with oscillations set up in the receiver's aerial by the transmitter.

"Is there any limit to the magnitude of this new frequency relative to the frequency of the received signals? Could it not, for instance, be arranged to 'change' a received 'radio' frequency into the frequency of light and thereby obtain a solution of the television problem?"

You've beaten me with your beat frequency. In common practice the frequency received is greater than the frequency derived (beat frequency) by intro-

ONLY IN "P.W."

can you read Captain Eckersley's replies to listeners' own problems.

AND REMEMBER—

Captain Eckersley's technical articles appear only in the "Big Three."

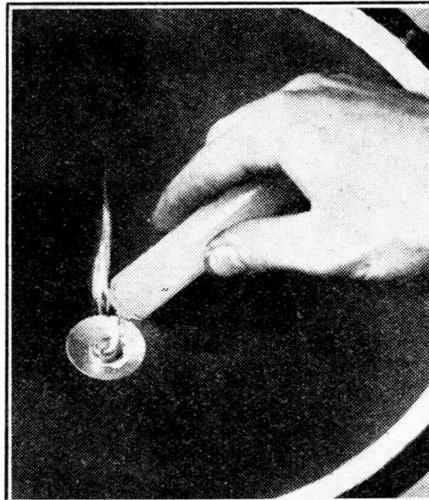
"POPULAR WIRELESS,"
"MODERN WIRELESS," AND
"THE WIRELESS CONSTRUCTOR."

ducing the third frequency (oscillator). Thus a frequency received of a million, one hundred thousand introduced to it and, after rectification, we have a (lower) frequency of 100,000. But you can do it the other way round when the beat frequency is the sum of the received and the oscillator frequency.

It cannot be done.

If you could make the oscillator frequency equal to the frequency of light-waves you'd get light frequencies I suppose. But how could this help to solve television? And, if you could produce light frequencies with a valve, well—at any rate, you can't!

STOP THAT RATTLE!



A good dodge for preventing the lock-nut of a cone loudspeaker from working loose is to seal it in its place with a single spot of grease from a candle.

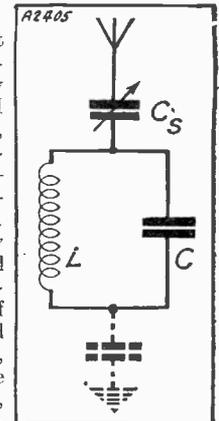
I may have missed your point. I think you have some ingenious idea somewhere, but it'll have to wait, won't it, until we can, in fact, produce light frequencies. This we cannot do by taking the sum of two wireless frequencies which is the only way two frequencies can be made to make a third greater frequency.

Without an Earth.

A. B. S. (Leeds).—"I have always understood that a good earth is essential for radio reception. Judge my surprise when I recently removed the earth wire from the set and, by slightly detuning, received the local station as good as ever. As this seems to point to just the opposite, may I ask:—

"Is this due to some peculiar conditions in my own particular set, or could this be done with any set. If so, then why use an earth connection at all?"

THE CONNECTING CAPACITY

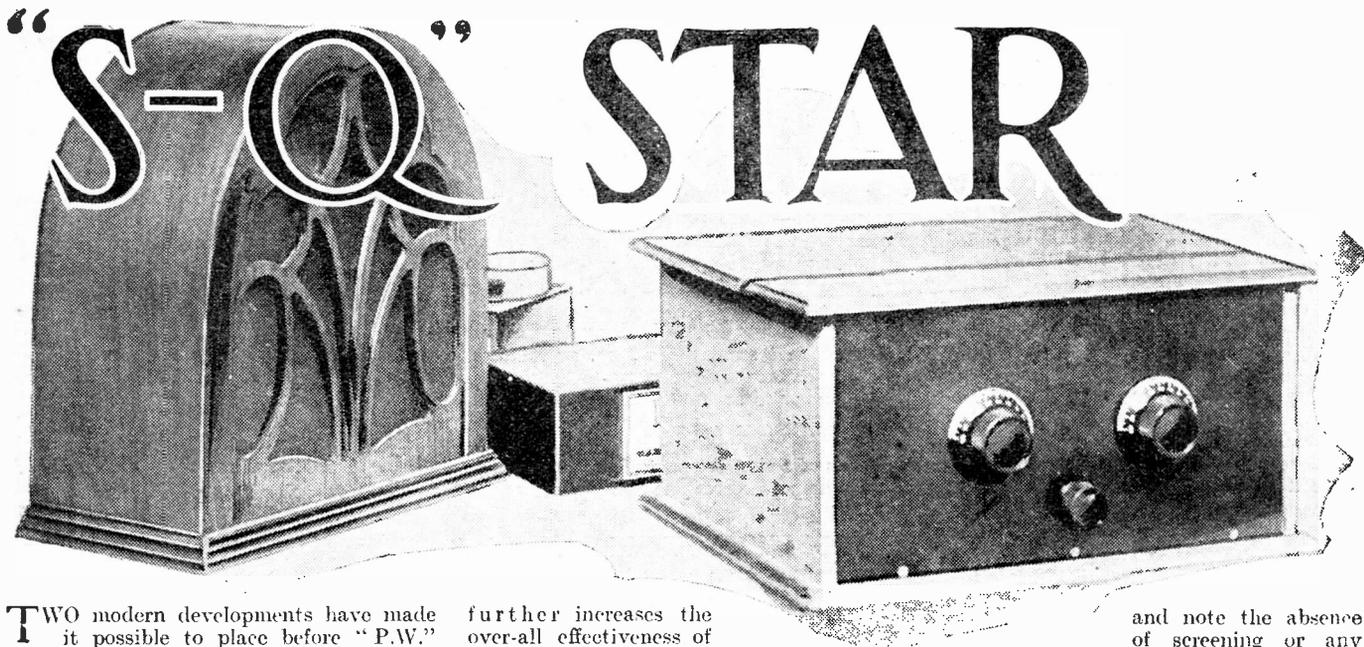


Sometimes a direct connection to earth seems detrimental, the better connection being via the sets "natural" capacity, as shown by the dotted condenser.

I have used a set without an earth connection for a very long time, because I find, living in flats, that an earth is frequently even detrimental to performance. It's this way. If you consider my diagram you will realise that the bottom, non-aerial end of the coil is connected to valve filaments, valve filaments are connected to mains, or batteries, to screening case, to a whole heap of stuff which has a capacity to earth.

A capacity to earth, with the kind of circuit shown, will have much less impedance than the closed circuit L.C., and a less impedance probably than C_s . So you are really connected to earth, but through a capacity.

Sometimes, however, the lack of an earth connection introduces bad mains hum. Thus it is better, taking it all in all, to have an earth, or tie things down, but it's not always absolutely necessary. When the "earth" as in a flat, is 50 ft. above the earth it's sometimes better not to connect it at all.



TWO modern developments have made it possible to place before "P.W." readers a super-heterodyne receiver of the highest possible efficiency which is almost fantastically simple in construction when compared with the intricate and unreliable "super" of the past.

These are greatly improved components for this class of set, and remarkably improved valves. But before I particularise, I must tell you exactly what "S-Q" Star is and what it does.

It is a four-valver into which an H.F. stage, necessitating the addition of but three or four normal, inexpensive parts, can be built in almost a matter of minutes.

Thus once again we meet the "P.W." Progressive principle which is rapidly becoming one of the most popular phases of home-construction.

The "foundation" of "S-Q" Star comprises a combined oscillator and first detector, a screened grid intermediate H.F. valve, a second detector and an L.F. valve.

THE "S-Q" STAR IS UNDOUBTEDLY THE MOST INEXPENSIVE AND SNAG-FREE SUPER EVER EVOLVED.

In this form it closely resembles the original "P.W." "Super-Quad" set, but it does not include the more or less expensive band-pass coil and two-gang condenser. There is an ordinary aerial tuning circuit controlled by a normal variable condenser.

Nevertheless, all the selectivity needed is obtained by the very excellent tuner employed. But the "foundation" complete though it is, should not be used permanently without the easily added H.F. stage.

Easy Tuning and No Screens.

Without this it will certainly give you a hundred or so stations at loudspeaker strength, and will cut through interference in an astonishing manner, but it will tend to re-radiate.

Re-radiation is prevented by the addition of an aperiodic H.F. stage. This also contributes a degree of amplification which still

further increases the over-all effectiveness of the set.

The H.F. stage occupies only two or three square inches on the baseboard, and it in no way complicates the control of the set. The tuning with or without the H.F. stage is exactly the same.

Glance at the accompanying photographs

A few years ago the mere mention of the term "super-heterodyne" was sufficient to conjure up visions of costly, complicated apparatus right out of the reach of ordinary home-construction.

Just as "crystal" was synonymous with simplicity in set assembly, so "super" was regarded by constructors as implying something that was indeed super in construction and operation.

The "P.W." "Super-Quad" succeeded in re-installing the term in its proper place as a prefix indicating a "super" principle giving super results.

And thousands of constructors have learnt to their advantage that a "super-heterodyne" designed with economy and simplicity as the guiding watchwords, can also be an immensely powerful collector of programmes. But that is only if various modern innovations are adopted and the circuit is prepared by technicians able to ignore useless precedents and apply original thought and ideas to the problem.

It is our firm belief that the "P.W." "Super-Quad" instituted a "milestone" in the progress of reception technique, and that it set entirely new standards—standards which render it difficult to maintain in other designs the same competitive individuality which hitherto existed.

However, we are able to record one further step forward along "Super-Quad" lines, and in many ways it is a big step forward in view of the reduced number and cost of parts required.

"S-Q" Star, as our new "feature" receiver has been called, is, in its way, as unique and as original as the "Super-Quad" and— But read about it in our Technical Editor's article which appears on this page. Even if you do not feel the immediate urge to construct a new set, we feel sure you will enjoy reading this important contribution.

and note the absence of screening or any other kind of con-

structional intricacy. I think you will have to agree that in this regard the "S-Q" Star has more in common with a crystal set than with a multi-valver of the usual form!

Indeed, the assembly of "S-Q" Star is merely a matter of screwing a few components down on a wooden baseboard, fixing one or two more on a straightforward panel and wiring them all up. Even this last operation calls for no skill whatever, since there is no soldering to be done, and the circuit does not demand meticulously placed wires.

A failure to obtain results, even on the part of a constructor who has never before tackled a valve set of any kind, could only be due to a faulty component, providing the wiring diagram (which will appear next week) is followed.

And you are not likely to come across a

IT IS AN EASY TO BUILD SUPER-HET SET EMBODYING THE FAMOUS "P.W." PRINCIPLE OF "PROGRESSIVE" HOME CONSTRUCTION.

faulty component if you choose your makes from the list we are publishing.

In view of the unusually large number of circuit innovations which we have encountered this progressive season, there may be many of you who feel you would like to tackle "S-Q" Star but are hesitant because you think there may quickly follow something else that will put "S-Q" Star in the shade.

Outstanding Simplicity.

I do not believe there is any possibility of that. It is most improbable that you will be able to build an equivalent "super-heterodyne" receiver at a lower cost for components, for a very long time to come—certainly not this year.

"S-Q" Star seems to have brought the "super-heterodyne" principle, as applied
(Continued on next page.)

"S-Q" STAR.

(Continued from previous page.)

properly, right "down to the bone"—in the financial sense.

During the next few months there may be (I say "may" for there is little in sight at the moment) a few new "super-het" improvements disclosed, but it is practically certain that these would be of an expensive, de-luxe nature.

Star Value for Money.

You see what I mean? At this very moment it is possible to design a "super-heterodyne" receiver giving, perhaps, as good results as "S-Q" Star, and having certain attractions of a subsidiary nature

not found in that set. But it will cost more both to build and to operate.

For instance, there is in existence a "Modern Wireless" "Super-Quad" design for A.C. mains having Extenser tuning—a magnificent set, that—but it costs two or three times as much as "S-Q" Star, even with all its five valves.

"S-Q" Star is the receiver for the economist—the man who wants to get every pennyworth of full value for his money, and who is prepared to waive a few of these refinements which do not effect the power of the set.

And in thus going right down to the root of modern "super" practice, as it were, taking advantage of every up-to-the-minute improvement in fundamental technique, you must obviously have a receiver which is capable of holding its own against all-comers of a similar calibre for a long time.

The super-heterodyne principle is about

as old as broadcasting itself, and the essential advances it has made have really been remarkably few. It is quite possible that another decade will pass before it progresses another trifling step.

Very Easy to Handle.

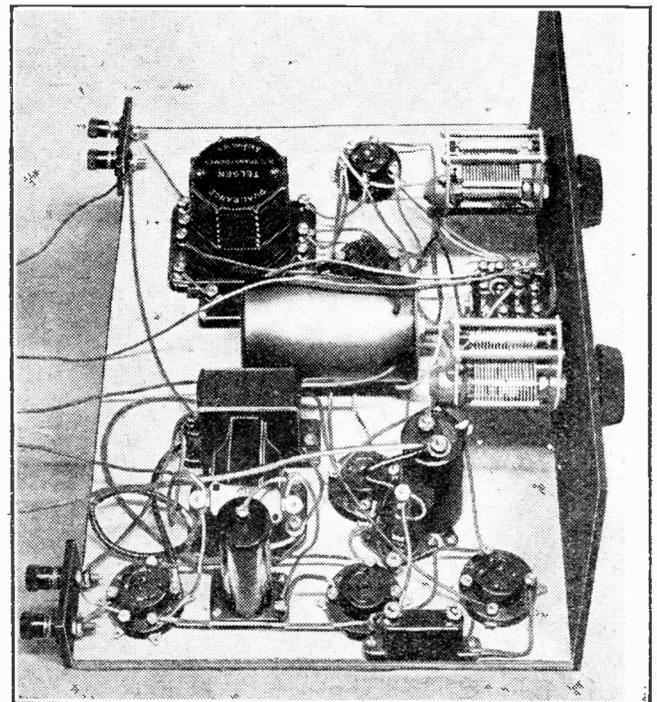
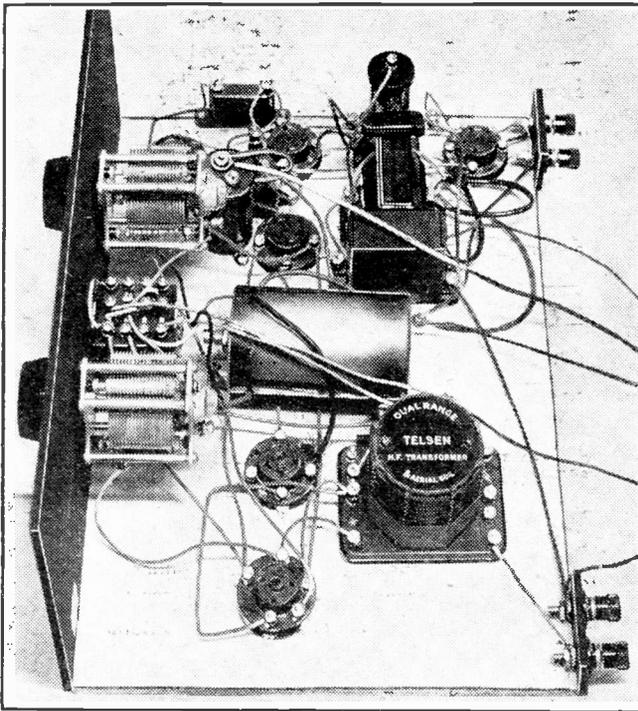
I am inclined to believe, as I have said before, that already we have practically reached rock-bottom in regard to this particular principle of radio reception, and that any further developments will be little more than minor improvements in practical application.

Anyway that, on all the evidence at our disposal, is what seems to be the probability, although I must warn you that it does not do to be too dogmatic about anything scientific!

But let us look at this modern example of the "super-heterodyne," the "P.W."

(Continued on page 746.)

A FIRST-CLASS PROPOSITION FROM EVERY POINT OF VIEW



Two views of "S-Q" Star, showing its remarkable simplicity of assembly, which was enhanced still further in the final model (shown on the next page) by the omission of the tubular condenser near the oscillator condenser.

THIS IS A VERY SMALL SHOPPING LIST FOR A FULL-POWER "SUPER"

- | | | |
|--|--|--|
| <p>1 Panel, 14 in. × 7 in. (Permeol, Becol, Peto-Scott, Wearite, Goltone, Parex).</p> <p>1 Cabinet with baseboard, 10 in. deep (Peto-Scott, Camco, Ready Radio, Pickett, Osborn, Gilbert).</p> <p>2 0005-mfd. tuning condensers (Polar No. 2, Telsen, Dubilier, Lotus, Igranic, Ormond, J.B., Cyldon, Wavemaster, Astra).</p> <p>1 4-pole double-throw switch with terminals (Wearite).</p> <p>4 4-pin valve holders (Graham Farish, Lotus, Telsen, W.B., Igranic, Wearite, Clix, Bulgin, Formo, Dario).</p> <p>2 5-pin valve holders (Graham Farish, etc.).</p> <p>1 1-meg. grid leak and holder (Dubilier, Telsen, Igranic, Graham Farish, Ready Radio, Peto-Scott, Ferranti, Ediswan, Loewe).</p> | <p>1 100,000-ohm spaghetti resistance (Lewcos, Varley, Telsen, Bulgin, Graham Farish, Igranic, Sovereign, Peto-Scott, Ready Radio, Goltone, Lissen).</p> <p>1 25,000-ohm spaghetti resistance (Varley, etc.).</p> <p>1 H.F. choke (Ready Radio Superhet, Lewcos, Telsen, Atlas, Climax, Igranic, Graham Farish, Varley, Parex, Lotus, Sovereign, R.I., Wearite, Dubilier, Tunewell).</p> <p>1 0002-mfd. grid condenser (T.C.C., Telsen, Mullard, Ediswan, Dubilier, Graham Farish, Ferranti, Lissen, Formo).</p> <p>1 0003-mfd. fixed condenser (Lissen, etc.).</p> <p>1 001-mfd. fixed condenser (Dubilier type 670, etc.).</p> | <p>1 2-mfd. fixed condenser (Telsen, Igranic, T.C.C., Lissen, Dubilier, Helsby, Hydra, Ferranti).</p> <p>1 L.F. transformer (Lotus, R.I., Telsen, Varley, Climax, Lissen, Formo, Ferranti, A.W., Graham Farish, Igranic).</p> <p>1 H.F. transformer (Telsen).</p> <p>1 Oscillator unit (Lewcos Ext. Osc. 123, Wearite, Colvern).</p> <p>2 Intermediate frequency transformers (one with pigtail). (Lewcos, IFT and IFT P, Wearite, Colvern.)</p> <p>2 Ebonite strips, 2 in. × 2 in.</p> <p>4 Terminals (Igranic, Eelex, Belling & Lee, Clix, Goltone).</p> <p>Battery plugs, etc. (Belling & Lee, Clix, Igranic, Eelex).</p> <p>Flex, screws, wire (Jiffilix, Glazite, Quickwire, etc.).</p> |
|--|--|--|



MATCHED KITS for the "S-Q" STAR

APPROVED LIST

	£	s.	d.
1 Ebonite Panel, 14 x 7 in., drilled to specification	4	6	
1 Polished oak cabinet, 14 x 7 in., with 10 in. baseboard	15	0	
2 Lotus 0005 variable condensers with dials	7	0	
1 Wearite 4-pole double-throw switch	5	0	
4 Junit 4-pin valve holders	2	8	
2 Junit 5-pin valve holders	1	8	
1 Readirad r-mog. grid leak and holder	1	4	
1 Leweos 100,000-ohm spaghetti resistance	1	6	
1 Leweos 25,000-ohm spaghetti resistance	1	6	
1 Readirad super-het. choke	5	6	
1 T.C.C. 0002-mfd. fixed condenser, type 34	1	6	
1 T.C.C. 0003-mfd. fixed condenser, type 34	1	6	
1 T.C.C. 001-mfd. fixed condenser, type S	1	6	
1 T.C.C. 2-mfd. fixed condenser, type 50	3	0	
1 Lotus L.F. transformer	5	6	
1 Telsen H.F. transformer	5	6	
1 Leweos oscillator unit, type Ext. 126	12	6	
2 Leweos intermediate frequency transformers	1	1	0
2 Sovereign terminal blocks	1	0	
4 Belling & Lee terminals, type R	1	0	
1 packet Jiffilix for wiring	2	6	
4 Valves as specified	2	19	0
5 Belling & Lee wander plugs			10
Flex, screws, etc.			8
Total	£8	3	6

Any component can be purchased separately.

TO INLAND CUSTOMERS.—Your goods are despatched Post Free or Carriage Paid.
TO OVERSEAS CUSTOMERS.—Everything Radio can be supplied against cash. In case of doubt regarding the value of your order, a deposit of one-third of the approximate value will be accepted and the balance collected by our Agent upon the delivery of the goods. All goods are very carefully packed for export and insured. All charges forward.

KIT "A" (Less Valves and Cabinet) **£4-9-6**

OR BY EASY PAYMENTS

8/3 down and 11 monthly payments of 8/3.

KIT "B" (With Valves, Less Cabinet) **£7-8-6**

OR BY EASY PAYMENTS

13/6 down and 11 monthly payments of 13/6.

KIT "C" (With Valves and Cabinet) **£8-3-6**

OR BY EASY PAYMENTS

15/- down and 11 monthly payments of 15/-.

Be sure to read Kendall's book entitled "10 Hows for Modern Radio Constructors." Send four 1d. stamps now.

A READY REFERENCE TO RADIO

Our new 100-page fully illustrated Catalogue contains details of all modern radio products. You need a copy. Price 1/- post free.

ESSENTIAL IN THE "S-Q" STAR



The **READIRAD**
SUPERHET CHOKE

PRICE **5/6**

Specially designed for use in the modern type of superheterodyne. Excludes the intermediate frequency currents from the low-frequency circuits. Will effectively block H.F. currents of wavelengths even as high as 3,500 metres. Can be used wherever a choke of extra high inductance is required. Special features:—

- (1) Highly efficient sectionalised windings, almost entirely air-spaced. Completely enclosed in a protective case.
- (2) Self capacity and losses exceptionally low for a choke of such high inductance.
- (3) Low D.C. resistance, 500 ohms.

CASH or C.O.D. ORDER FORM

To: **READY RADIO LTD.,**
Eastnor House,
Blackheath, S.E.3.

Please dispatch to me at once the following goods:

for which (a) I enclose (cross out line) (b) I will pay on delivery (not applicable) £.....

Name.....

Address.....

P.W. 28/11/31.....

To: **READY RADIO LTD.,**
Eastnor House,
Blackheath, S.E.3.

Please dispatch to me the following goods:

for which I enclose first deposit of £.....

Name.....

Address.....

P.W. 28/11/31.....

EASY PAYMENT ORDER FORM

"S-Q" STAR.

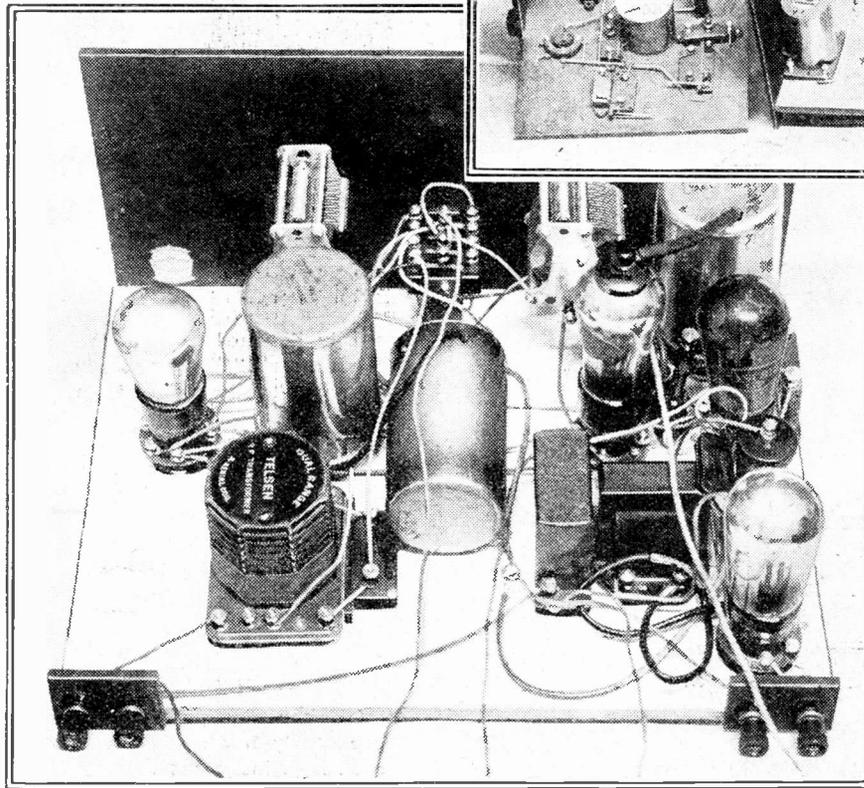
(Continued from page 744.)

"S-Q" Star, in detail, and try and visualise where it could possibly be improved. In operation there are only two tuning controls to manipulate and these can be compared, in a way, with the wave-length adjustment and reaction control of an ordinary "single dial tuning" set, except that it is advisable to calibrate, or at least note the readings on both dials of our super.

These two dials could certainly be merged into one control, but that would mean a special condenser costing a bit more than the price of both the ordinary tuning condensers at present used. There are many constructors who would rather pay less and have two dials, particularly in view of their ease in handling!

No Frame Aerial Needed.

The wave-changing could be done away



The "S-Q" Star enables anyone to tune-in those usually extremely weak stations at full loudspeaker strength.

with by using a couple of extensers. Now there may be many who would like that, but most of these have been satisfied already by the overwhelmingly popular "M.W." "Super-Quad."

Turning to the efficiency of the set as a programme collector, the issue is even clearer. An ordinary extended wire indoor or outdoor aerial has to be used. But most of us have such a thing already, and those who have not will not find it difficult to run a piece of wire up the side of the window frame and around the picture-railing—that is all "S-Q" really needs.

To get similar results on a frame aerial would necessitate two more valves above the "foundation" four. Would the extra

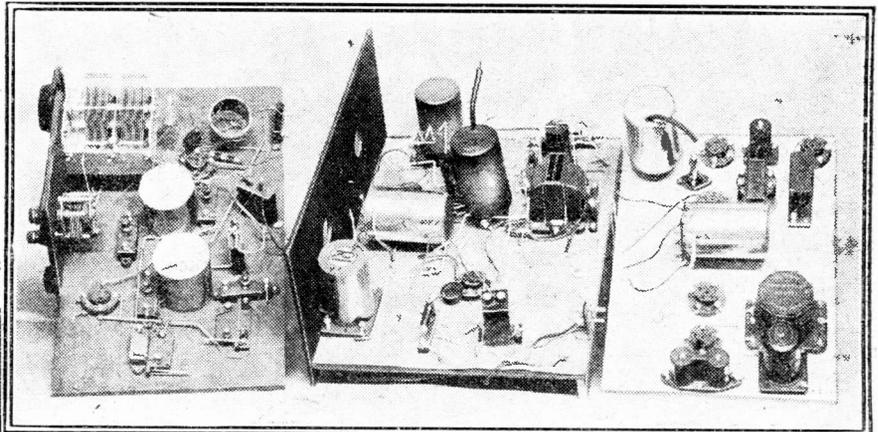
initial and running costs be worth it? A few of you may be richer than most of us, and the same, or a further few, may not object to the sight of a frame aerial poking up into the room—personally, I can't stand the things and can see little justification for their existence, remembering the simple and inexpensive alternative of a hidden, cotton-covered wire around one or two walls of the room. Of course, a frame is directional, but this quality is not generally in demand with supers!

justification for any other kind of circuit? That question I have dealt with in previous articles and I do not propose to go through it again. I can but refer you to the introductory article which announced the arrival of the first "P.W." "Super-Quad" design.

Superb Performance.

Suffice it to say that we have now been able to iron out many of the disadvantages that pushed earlier super-hets into oblivion

FINDING THE "STAR" THAT SHONE BRIGHTEST!



Here are three of the many experimental models that were tried out by the Research Department in their efforts to find an "S-Q" Star of the first magnitude. It is to the preliminary work on these sets that much of the super-efficiency of the final "S-Q" Star is due; and it is by virtue of its unequalled facilities for such investigation and practical test that our Research Department finally combs out the complete winner from a batch of promising possibilities.

in face of straight circuit competition.

And now we have "S-Q" Star—but I must not dwell on the merits of this "star" set too long, or I too, will begin seriously, very seriously, to wonder if there really is any justification at all for the existence of any other kind of circuit!

Undoubtedly, "S-Q" Star is a proposition which should provide a great stimulus to home-construction, for it gives you a performance equal, if not superior, to that given by the most expensive of all commercial sets.

And the extreme simplicity of its construction brings it within the reach of all set-builders. It is no exaggeration to say that it is as easy to make as most ordinary two valves, while it is definitely superior in its selectivity and power to any normal outfit employing an equivalent number of valves.

We are convinced that all who construct this latest "feature" set of ours will consider that the comparatively little time and money they spent on it brings them a more than ample return.

In the photograph at the heading of this article the loudspeaker shown with the "S-Q" Star is "His Masters Voice" L.S. 7.

NEXT WEEK.

Full constructional details of "S-Q" Star will appear in our special, enlarged Christmas Number, which will be on sale next Thursday, Dec. 3rd. Price Threepence.

On anything at all in the way of an extended wire aerial, the "S-Q" Star will give anyone anywhere thirty, forty, fifty, etc., up to one hundred or so alternative programmes at loudspeaker strength, depending upon one's experience of its controls. You can say that its receptivity is limited only by atmospheric conditions. Could you have more than that?

Piercing Through the Mush.

In regard to selectivity—well, "S-Q" Star has the full super-heterodyne power to pierce through mush, and your powerful local station is lost in a degree or so on the dials.

Where then, you may well ask, is the

TELSEN RADIO COMPONENTS

TELSEN VALVE HOLDERS (Prov. Pat. No. 20286/30)

The Telsen four and five-pin valve holders embody patent metal spring contacts which are designed to provide the most efficient contacts with split and non-split valve legs, and are extended in one piece to form soldering tags. Low capacity and self-locating.

- Telsen 4-pin Valve Holder Price 6d.
- Telsen 5-pin Valve Holder Price 8d.

TELSEN FIXED MICA CONDENSERS (Prov. Pat. No. 20287/30)

Telsen Fixed Mica Condensers are made in capacities from .0001 microfarad to .002 microfarad. They can be mounted upright or flat and the .0003-microfarad Telsen fixed mica condenser is supplied complete with patent grid-leak clips to facilitate series or parallel connections.

- Telsen Fixed Mica Condensers Price 6d.

TELSEN GRID-LEAK HOLDER

The Telsen Grid Leak Holder will hold firmly any standard size or type of grid leak. Ample clearance is provided between the terminal screw leads and the baseboard (underneath), preventing any surface leakage upsetting the value of the grid leak. The terminals and fixing holes are accessible without removing the grid leak.

- Telsen Grid-Leak Holder Price 6d.

TELSEN SPAGHETTI FLEXIBLE RESISTANCES

These are made in a range of values from 300—200,000 ohms with a maximum current varying from 42 m/a to 1 1/2 m/a. The terminal tags are firmly fixed to the wire and clearly marked with their respective resistance values; they are impregnated with special insulating compound which renders them proof against corrosion.

- Telsen Spaghetti Flexible Resistances from 6d.

TELSEN FUSE HOLDER

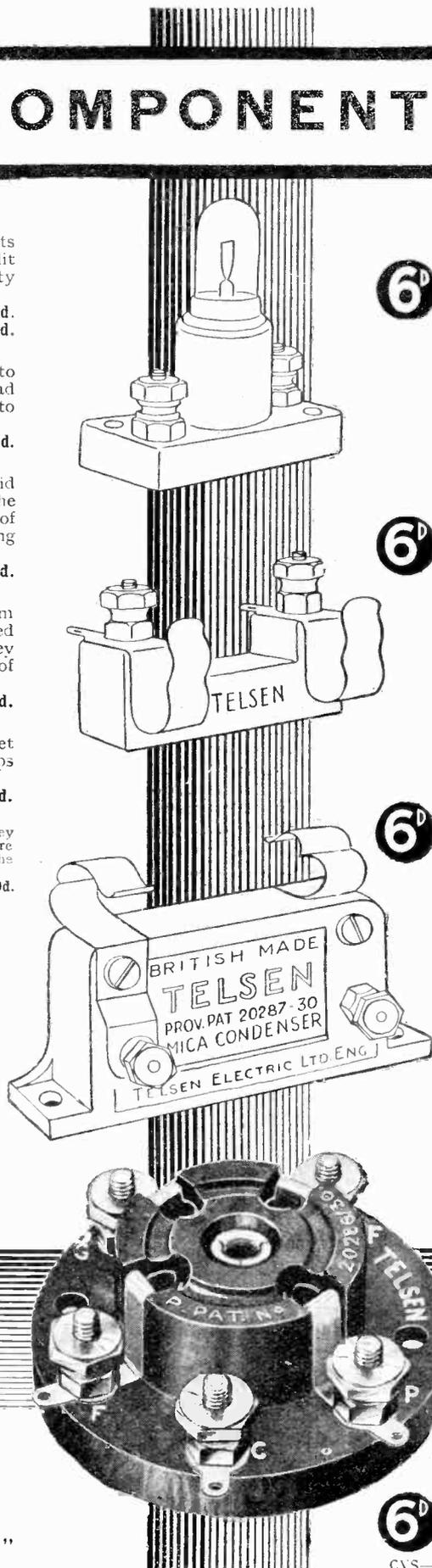
This is a neat and inexpensive device which should be incorporated in every set as a precaution against burnt-out valves. The Telsen Fuse Holder firmly grips the standard radio fuse, giving a perfect contact.

- Telsen Radio Fuse Holder Price 6d.

TELSEN GRID LEAKS

Telsen Grid Leaks are absolutely silent and non-microphonic, and practically unbreakable. They cannot be burnt out, and are unaffected by atmospheric changes. Telsen Grid Leaks are not wire wound, and therefore there are no capacity effects. Their value is not affected by variation in the applied voltage. Made in values from 1/4—5 megohms.

- Telsen Grid Leak Price 9d.

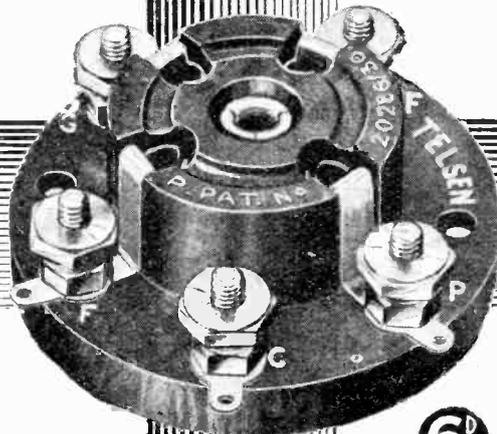


TELSEN

THE SECRET OF PERFECT RADIO RECEPTION



9^d



6^d

Send for the "Telsen Radio Catalogue" and book of "All-Telsen Circuits" to The Telsen Electric Co., Ltd., Aston, Birmingham.

FURNACES FOR FILAMENTS

A surprising title, isn't it? And there are also some surprising facts in this article!

BY R. E. BLAKEY.

THE discovery of a means by which a continuous current could be generated was made by Volta and Galvani a few years before the dawn of the 19th century, and from that discovery have sprung into existence our present-day enormous electrical industries.

Little more than a score of years had passed when Seebeck announced in 1821 a second and purely independent means by which the same object could be accomplished.

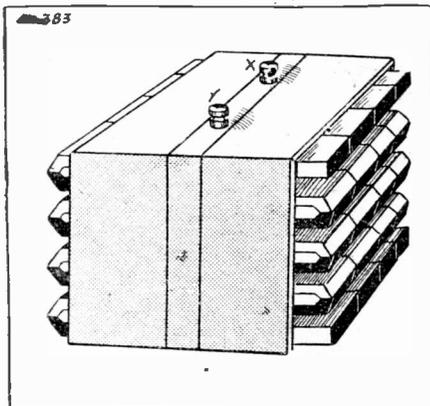
Producing a Current.

He found that by applying heat to the junction of two dissimilar metals a current was generated which flowed through the junction in a definite direction, depending upon the nature of the metals. He obtained the strongest effects when using the metals bismuth and antimony.

A combination of two such metals is called a thermo-electric couple, and the current generated by them—though they differ in no way from "ordinary" currents—are called thermo-electric currents.

If I give a few examples of the primitive apparatus, you will be able to form an idea of the underlying principles.

A SINGLE "CELL"



In practice a "thermopile" is made up into units, the one illustrated here being a typical arrangement.

For practical purposes it matters little from what place or places the E.M.F. is derived in a thermo-electric couple; it is sufficient to know that the application of heat to one junction generates a certain E.M.F. in the circuit, the amount of which we can determine when we know the difference of temperature between the heated junction and the remainder of the circuit.

For a single couple of any but the rare metals, the E.M.F. that can be obtained, even with a large difference of temperature, is extremely small when compared with an

ordinary dry cell or accumulator, and to this cause alone must be attributed the fact that thermo-electric batteries have not come into popular use.

Useful for Radio.

Everything else appears to be in their favour: they contain no liquids, nor do they require any renewals of any materials like ordinary batteries: they contain no moving parts, nor are they liable to break down like dynamos, for example, not to mention batteries of all sorts; they have a fairly small resistance, and when once fixed in position, it is only necessary to light a jet of gas or some other such heating force in order to start and maintain them working, whilst their E.M.F. can be easily controlled by raising or lowering the flame.

It would, therefore, appear that if this form of supply could be successfully applied to radio receivers, people residing in remote districts would for the first time be amply catered for, since we must remember many have neither gas nor electric supply.

The first really useful thermo-electric battery was constructed by Melloni, who called it a thermopile. (Fig. 1 illustrates it.)

The metals consist of bismuth and antimony, each metal being square and substantial in section. These metals are laid alternately side by side, so as to build up a cube, and each piece is carefully insulated from its neighbour by a layer of gypsum or similar substance.

The alternate ends are then soldered together so as to convert the whole into a battery containing as many couples as there are pieces of bismuth or antimony in the cube. Four sides of the cube are then covered by a brass case, leaving the soldered junctions exposed as shown, and a pair of insulated terminals, *x* and *y*, are fixed to the last bismuth of the series and the other to the last antimony.

As a current generator, the Melloni Pile is very expensive to make, and very inefficient, but as it was never intended for this purpose we must pass over this. It was intended for measuring small differences of temperature, and for this purpose it is very useful.

A Commercial Unit.

As a current generator for use on a commercial scale Clamond constructed his thermo-electric battery. This battery contains 50 couples joined up in series: the couples are arranged in rings of ten, and five of these rings are placed one above the other. The plan on the right shows this apparatus.

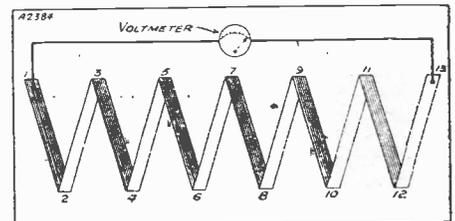
The thermo-positive element consists of an alloy of bismuth and antimony: they are solid substantial blocks marked "A," and are arranged in a circle. The thermo-negative elements consist of sheet iron,

and are marked "F" in the diagram. The junctions to be heated are made on the interior portions of the blocks, and are marked 1, 3, 5, 7, 9, 11, 13, 15, 17, and 19, whilst the junctions to be cooled are marked 2, 4, 6, 8, 10, 12, 14, 16, 18, and 20. These, you will note, are external. The inner junctions are packed with asbestos cement, and in the circular space which is shown, an earthenware tube containing a number of holes is fixed vertically.

Economical to Run.

Ordinary gas or flame from a spirit lamp, or other such method of heating is passed into this tube, and when the jets are lighted, they heat the inner junctions 1 to 19 to the desired temperature. The projecting sheets of iron marked "F" present a large radiating surface, and thus help to keep the exterior junctions moderately cool. The five rings of ten couples are insulated from each other, but are all joined up in series by means of a clamp by means of which

THE HEATED JUNCTIONS



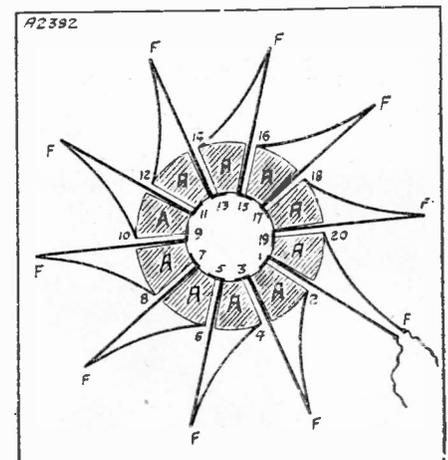
The heat is applied at alternate points where the different metals touch, and results in a small voltage being generated there.

the rings can be joined up in series or parallel as desired.

The E.M.F. of this battery is 2.5 volts and the internal resistance $\frac{1}{4}$ ohm, and the battery consumes about 6 cubic ft. of gas per hour. If any of you attempt the construction of such a battery, I suggest a Bunsen burner is used in preference to ordinary jet flames.

Considering the enormous strides that have been made in electricity during the last hundred years it is singular that this subject has so little advanced. It would appear well worth consideration, and the primitive batteries would be very interesting to procure in order to enable tests to be made upon them.

IN THE RING



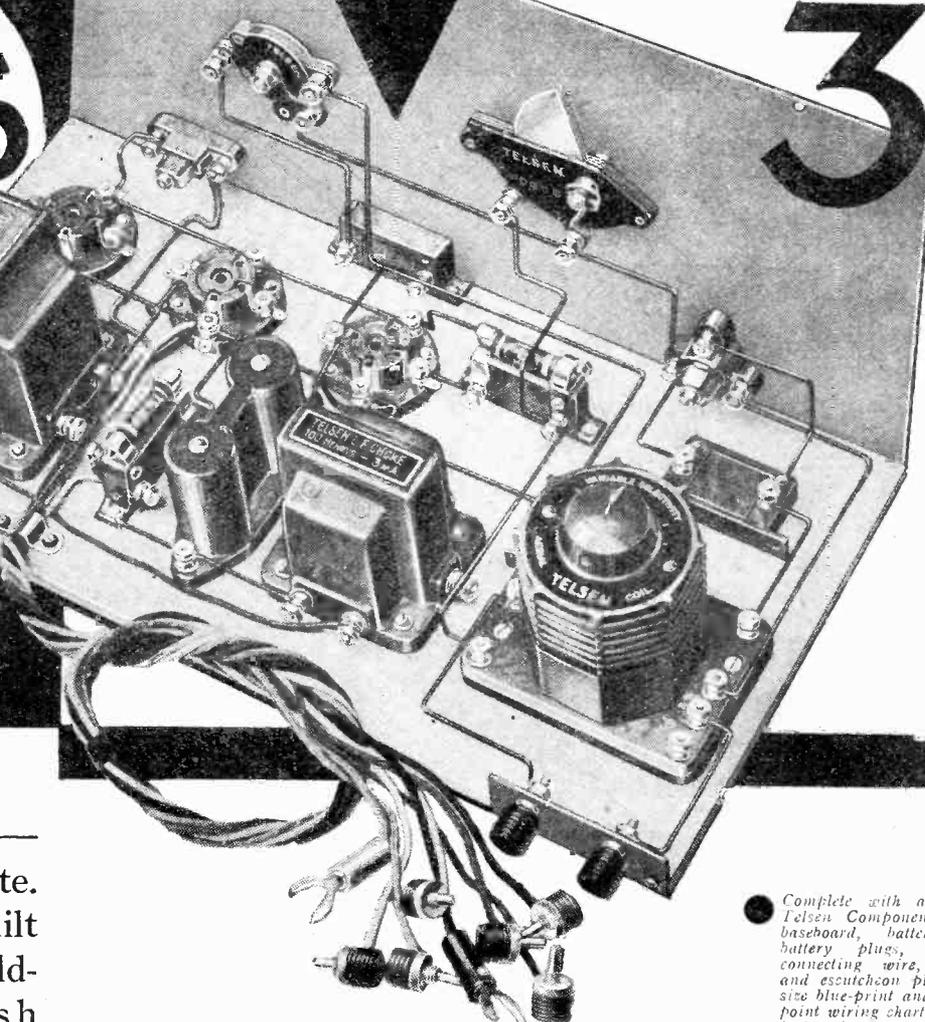
Note the numbers in the centre which denote the points to be heated, and the projecting arrangements of sheet-iron (marked F) which present large radiating surfaces.

BUILD THE TELSEN VICTOR

39'6

A super 3-valve receiver built entirely with All-British Telsen Components.

SIMPLE to build—simple to operate. A 3-valve receiver built entirely with the world-famous all-British Telsen Components, all matched for efficiency. Separation of Regional from National programmes is guaranteed, thanks to the incorporation of the Telsen Dual Range Aerial Coil. Ask to see the kit at your radio retailer's.



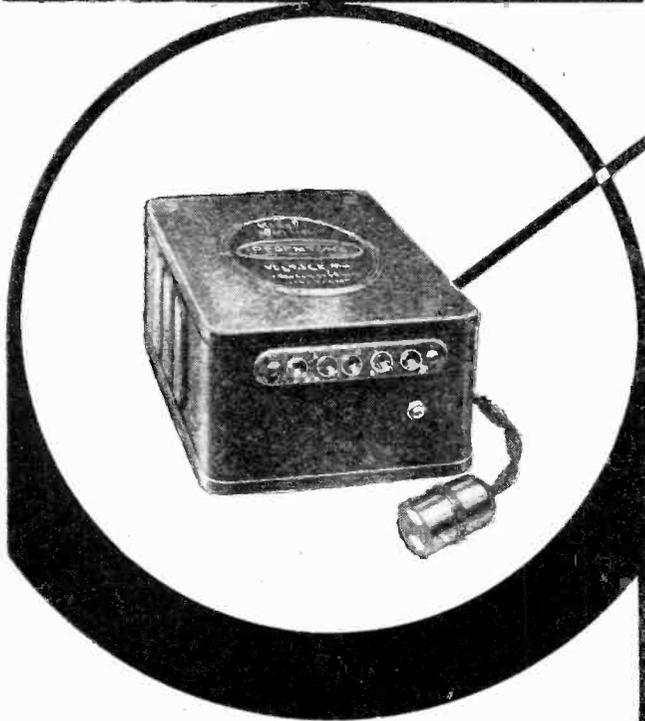
TELSEN

ALL-BRITISH
RADIO COMPONENTS

- Complete with all-British Telsen Components—panel, baseboard, battery, cord, battery plugs, terminals, connecting wire, terminal and escutcheon plates, full-size blue-print and point-to-point wiring chart, with full instructions, etc., etc.
- Super 3-valve receiver, built entirely with all-British Telsen Components, matched for efficiency.
- Separation of Regional from National programmes guaranteed by incorporation of Telsen Dual Range Aerial Coil.
- Very simply built and simply operated. Full constructional details with every kit.

Change from batteries to mains but. CHANGE WITH REGENTONE

Experts say



Regentone Model W.I.F. (H.T. only) **50/-**
Three tapings (S.G., Detector and Power). Output 120/150 v., 12 m/a.
There is a complete range of Regentone Mains Units for A.C. and D.C. Mains, H.T. only, and Combined H.T. with L.T. Charger. Prices from 35/- to £10.

"Regentone Mains Units are the finest in radio to-day."

Here is our proof. Before a manufacturer of a well-known set will recommend a Mains Unit for his sets he must be satisfied that it gives at least as good performance; that it is just as reliable; and that it is simple in operation.

Not one, but a considerable number of prominent manufacturers consistently specify Regentone for their sets. More than that, experts have tested them with all the popular Kit sets, and they recommend them, too. And if further proof is necessary, read what the Wireless Press say of Regentone:

"Our test of the Regentone Model W.5 gave perfectly satisfactory results with several commercial portables."

"Regentone have produced some fine Mains Units."

"These (Regentone) Units will prove attractive to those who want to make their sets as efficient and trouble-free as modern technique makes possible."

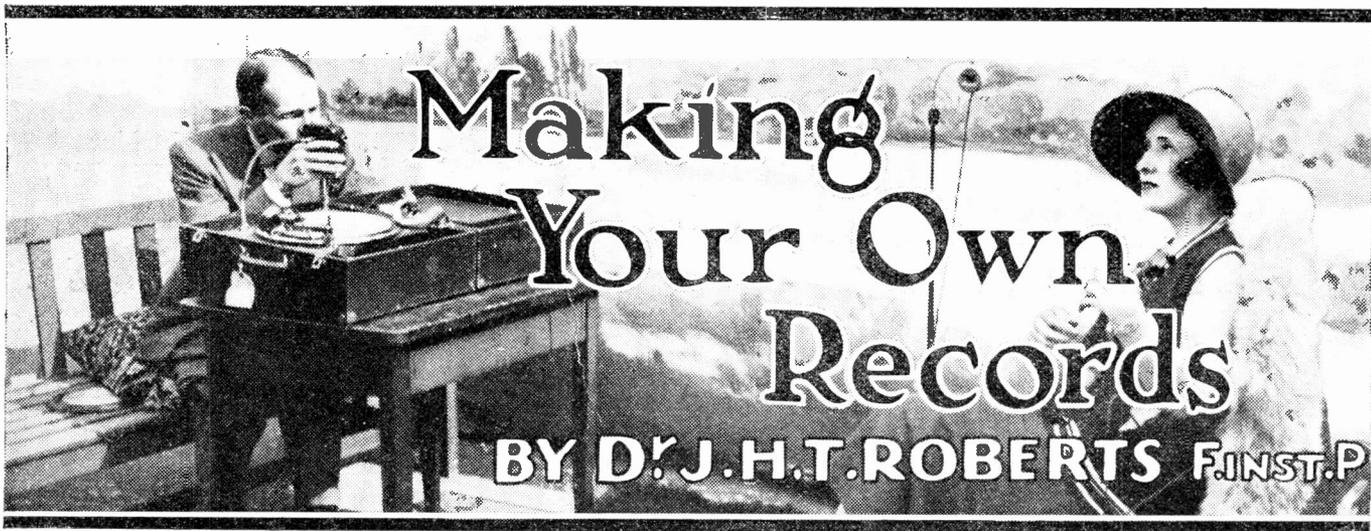
Regentone Mains Units are, without doubt, the finest in radio to-day.

Nothing could be simpler than to make your battery-operated set all-electric with Regentone. You have only to take out the run-down H.T. Battery and substitute a Regentone Combined Unit. Connect up the leads that originally went to the H.T. battery to the Regentone Mains Unit, and the two leads in the unit to the L.T. accumulator. Now you have an all-electric receiver—no more trouble, no more expense, just simple, reliable, care-free radio.

Write for the new Regentone Art Booklet "All-Electric Radio"—or get a copy from your nearest radio dealer.



REGENTONE LIMITED, Regentone House,
21 Bartlett's Buildings, E.C.4. Tel.: Cent. 8745 (5 lines).
Irish Free State Distributors: Kelly & Shiel, Ltd., 47 Fleet St., Dublin.



"COME along. Your turn next." "Oh, I couldn't possibly make a record." "Of course you can. It's perfectly simple." "But that's not my voice!" Visions of Christmas parties with the home recorder in great demand—a wonderful new toy to add to the fun and amusement of the occasion.

If you have never made a record before, you will be tickled to death to hear yourself—as others hear you. Whether the sound of your own voice brings feelings of pride, or covers you with embarrassment, (probably the latter) it will cause endless amusement and delight to your friends.

Friends in Australia.

I often wonder whether home recording has purely a novelty appeal, or whether it will prove of permanent interest. I am told that when I've made a record I can post it to my friends in Australia (why Australia I can't tell you; I should have thought it might just as well be India).

At first sight this seems very intriguing, but when I stop to think about it I find it doesn't amount to much, because I haven't any friends in Australia. And even if I had, I'm afraid I should promptly lose them (judging by the unkind observations on my attempts at home recording) if I dared to "say it with aluminium." Even my private letters have to be typed because nobody can read my handwriting.

But perhaps I have not got what you call a good recording voice, albeit when I broadcast some time back from the London Studio many of my readers were kind enough to say that I "came over" very well.

Voices vary greatly in their "recording" properties, and I have heard many home records which were remarkably good. Indeed, this variability in the characteristics of different voices, together with the need for a certain amount of practice and skill, makes home recording all the more interesting. In this respect it resembles that strange game of golf—if it were too easy it would lose all interest!

"Dubbing" Commercial Records.

By means of a home recording outfit it is possible, as I say, to obtain a lot of amusement, but at the same time you can make permanent records of the voices of your friends or of broadcast items of particular interest.

Readers should find this article of particular interest, in view of the fact that Dr. Roberts was for many years technical head of the great Columbia Gramophone concern, and has contributed several important patents to the industry.

You can also make duplicate copies of commercial records by "dubbing" (professional slang for picking-up and recording) from the commercial record to the aluminium disc; this last item is, however, more of experimental interest than anything else.

With regard to the making of permanent items, these records must be only for your private use; any attempt to deal with them in any other way constitutes, or may constitute, an infringement of copyright.

The methods of making home records, just as methods of reproducing records, fall naturally into two classes, the acoustic or "direct" method, and the electrical method. In the direct acoustic system you speak straight into a short metal trumpet, the lower end of which is inserted into a more or less ordinary form of soundbox, and the vibrations from your voice actuate the diaphragm which in turn vibrates the cutting needle. In the electric method you speak into a microphone; the speech currents from this are passed through a suitable valve amplifier, the output from the amplifier being fed into what is virtually an electrical pick-up, so as to actuate the cutting needle in the corresponding way.

Electrical Recording.

The advantage of the electrical method over the other is that it permits of greater amplitude of vibration of the cutting stylus, and also that it gives the speaker much more freedom of movement, since he is not obliged to put his mouth close up to a trumpet. In fact, with a fairly sensitive microphone and a good amplifier, the speaker may move about at a distance of several feet from the apparatus.

The recording is almost universally done upon small aluminium discs, although on the Continent a special type of celluloid disc is sometimes used instead. The cutting stylus is a specially-pointed steel or diamond needle and is secured in the needle holder of the soundbox or pick-up in the usual way.

There is scope for a certain amount of skill and judgment in the placing of the cutting needle, both as regards its orientation to the track and as regards the angle which it makes with the face of the disc and, indeed, success in making a good record depends very largely upon getting to know and understand the little idiosyncrasies of your recording stylus. It is impossible to turn out these recording

(Continued on next page.)

NEW SOURCE OF ENTERTAINMENT



You can do all manner of things with a home recorder—record favourite radio artistes, duplicate your own records, etc. And the necessary gear is by no means complicated, as this photo of an Ekco Radiorecorder clearly shows.

MAKING YOUR OWN RECORDS

(Continued from previous page.)

needles, especially if of diamond, to an absolute standard of uniformity, and therefore the user has plenty of room for experiment in finding out the most effective adjustments

"Tracking."

Apart from the arrangements for the cutting of the track, the only other essential feature of the recording device is the means for making the cutter progress gradually across the face of the record.

There are several devices on the market for this purpose, one of the simplest making use of what is called a "tracking disc." This tracking disc is for all practical purposes an ordinary commercial record of about 10 in. diameter, but the tracks have no sound impressed upon them, that is to say, they are *plain* tracks instead of having microscopic waves in them.

The aluminium disc to be recorded is smaller in diameter than the tracking disc, so that when it is placed upon the peg of the gramophone it covers only the centre portion of the tracking disc, leaving the outer part of the tracking disc exposed.

The recording arrangement is furnished with two needles, separated by a distance of perhaps a couple of inches; the outer needle lies in the groove of the tracking disc, whilst the needle nearer to the centre of the turntable is the cutting needle which rests upon the surface of the aluminium disc.

Entirely Automatic.

As the turntable rotates, the needle in the tracking disc is gradually progressed towards the centre of the turntable, and in this way it pushes or leads forward the soundbox carrying the cutting needle, so that the latter cuts a spiral upon the aluminium disc, this spiral being a replica, as regards pitch, of the spiral on the tracking disc. There are, as I say, other methods for "tracking," all comparatively simple and depending in some way or other upon the motion of a screw which turns in definite relationship to the revolutions of the turntable.

Home-recording outfits can now be bought very cheaply, and, as I say, there is a lot of

fun to be got out of them. The only "running expenses," so to speak, are the aluminium discs, but these can be bought in packets of half-dozens and dozens at very low rates.

Room for Improvement.

For the average user the aluminium disc is quite satisfactory and the serious experimenter can, in fact, obtain excellent results from these aluminium discs by the use of a good amplifier and microphone.

But I think that if home recording is to establish itself beyond the novelty stage, it will be necessary for someone to invent an improved type of recording disc, something giving a result nearer to that of an ordinary commercial record.

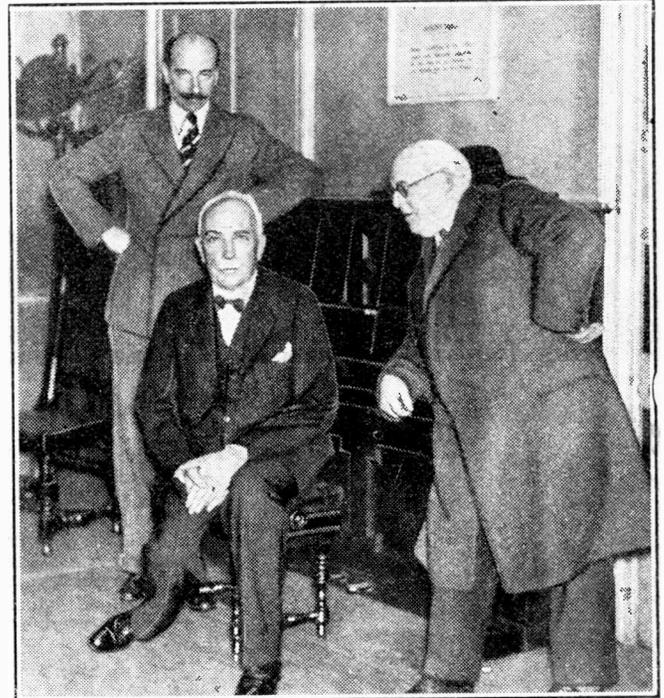
About the only remaining point needing any remark is the question of the strength of the gramophone motor. I have experimented a good deal with these home-recording devices and I have found that quite a number of ordinary gramophones are not powerful enough to turn the record uniformly against the friction of the cutting needle.

There are some types of gramophone which will work quite well, but in many cases you will find it necessary to assist the motor by turning the winding handle whilst the record is being made. To do this you wind-up the motor fully before commencing to make the record and then you continue to turn the handle whilst the record is being made, the force which you have to exert being determined largely by experience.

It is not too easy by this means to make the record turn at a uniform speed, but with practice you can get quite a good approximation to it. Incidentally, if someone can produce a type of home-recording blank disc which can be recorded with very

much less frictional reaction between the cutting point and the disc, so that it will really work easily on any gramophone motor without assistance, it will be a

RICHARD STRAUSS IN LONDON



The celebrated composer photographed with, left, Dr. Adrian Boult, of the B.B.C., and Mr. Percy Pitt.

considerable step forward. Here is a fine opportunity for all you experimenters to get to work.

CORRESPONDENCE

A couple of interesting letters received from "P.W." readers.

CURING MAINS HUM.

The Editor, POPULAR WIRELESS.

Dear Sir,—I notice Capt. Eekersley's reply to R.Y. (Newcastle) in your 24th Oct. issue, and would mention I have met the same trouble, but am wondering whether a mistake has not been made.

If two 1-mfd. condensers are connected between the two anodes and H.T.—they would not necessarily cure self-oscillation. That hum might be due to a badly made transformer core vibrating, and that hum picked up by the larger anode winding and modulating the D.C. output.

More likely what was meant is the same trouble mentioned by some valve manufacturers and cured by two 0.1-mfd. condensers connected between the two anodes and opposite sides of the filament (H.T. side).

I should also be glad if Capt. Eekersley will continue with the subject as he suggests, since I have not yet managed to cure my hum completely, partly owing to the fact that I get a pick-up effect from a nearby D.C. generator which masks the other almost entirely.

Yours faithfully,

J. H. W. SHIRLEY.

Regent's Park, N.W.1.

OUR FAULT FINDER.

The Editor, POPULAR WIRELESS.

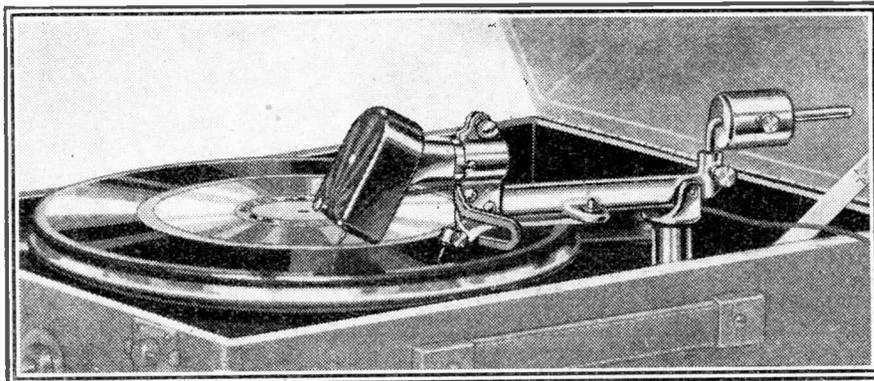
Dear Sir,—With reference to the "Complete Fault Finder" given with good old "P.W.," may I express my thanks for the tips given? Last night the set went completely plint! I sat down, read the "Fault Finder," went and tested the set right through and lo! found it—a broken connection on the H.F. choke. Once again, many, many thanks and wishing "P.W." all the best.

Yours faithfully,

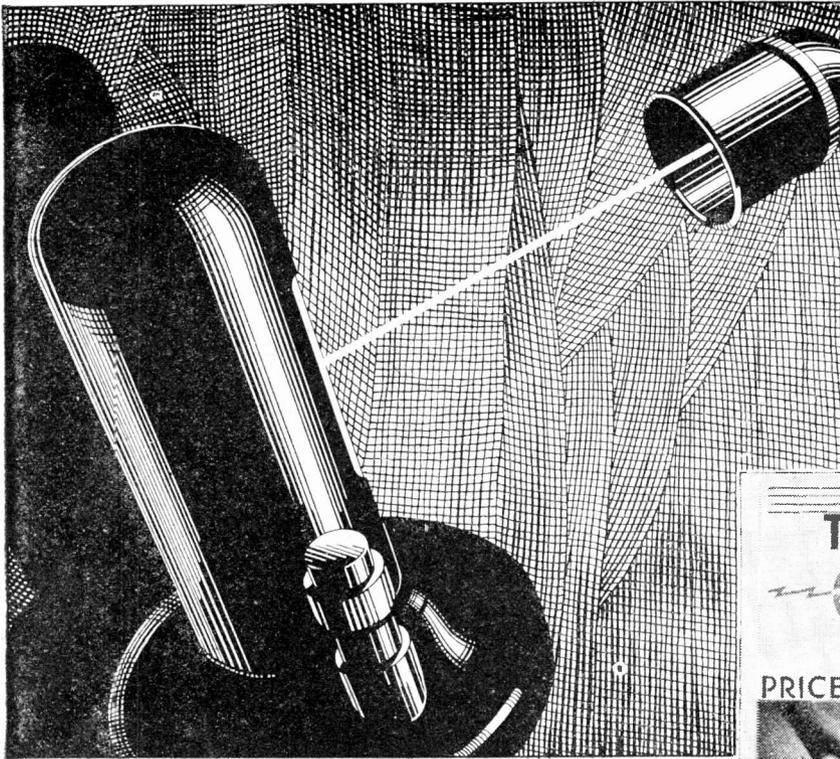
F. POOLEY.

Mathews Park Avenue, London, E.15.

EASILY FITTED TO ANY GRAMOPHONE



The Kingston-Wearite home recorder which is made by Messrs. Wright and Weaire.



A beam of light on a Sensitive Cell...

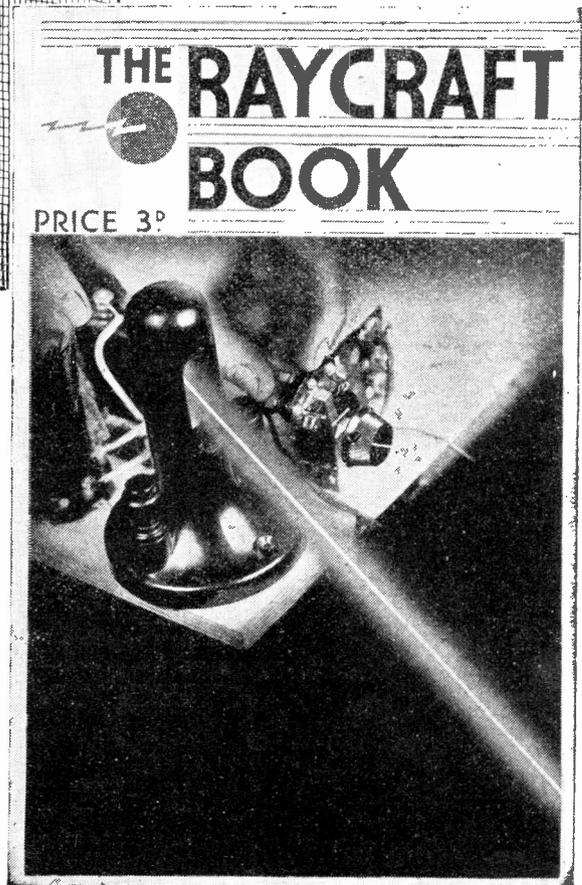
Here is something really new. Something modern and ingenious. You can buy it at little cost and build it in your own home; **Light control by Raycraft.**

Raycraft will switch on lights—start the radio—count—start machinery—time to a fraction of a second—trap burglars by alarm can be made to open doors—all by means of a beam of light, visible or invisible.

This modern device is a development of light control based upon the properties of Selenium. The Raycraft Bridge is a small, compact, easily handled Selenium Cell. It operates in conjunction with a switch apparatus—the Raycraft Relay. As often as light changes affect the sensitive Bridge so does the Relay open or shut automatically, instantly.

A simple and inexpensive Raycraft Kit has been designed, incorporating the Bridge, the Relay, and an Amplifier. It is easy to build. It is easy to utilise for any of the hundred and one applications of Raycraft.

In addition to its practical applications it offers many opportunities for the experimenter. Its future is tremendous. Read about it in the Raycraft Book—FREE from your Dealer, Electrician or from the manufacturers.



RAYCRAFT

AUDIOVISOR LTD.,
Domestic Division: Radiovision Patent Co., Ltd.
28, Little Russell Street, London, W.C.2.

SEND FOR FREE BOOK

Complete this coupon and send it to AUDIOVISOR LTD., 28, Little Russell Street, London, W.C., for free copy of the Raycraft Book.

Name.....

Address.....

P.W. 28/11/31



THIS "CLAQUE" BUSINESS

I ADMIT that I am a little biased about the argument as to whether there should or should not be a studio audience, because as I am a "gentleman" of the Press (if I do not put in these inverted commas, the Editor will put them in for me!) I am very frequently one of the studio audience.

So, as it is my clapping which you sometimes hear, I cannot speak without prejudice! When one is in the studio it seems quite a natural thing that artistes should be supported by a little honest applause.

It Helps the Artiste.

Without it an artiste becomes something of an automaton, beginning his performance in the stillly silence of the studio and ending it in a silence which seems even more deathly because it replaces what, to the artiste, at any rate, is the more usual applause. I am not at all sure, though, that it is a good plan to have this applause broadcast.

When anyone speaks of studio audiences and "clagues" I am reminded of George Robey's old gag when he couldn't get his audience into a laughing fit. He would walk down to the footlights, put his hand to his ear, and say, "Oi, what's the matter? There's only two clapping, and I paid for four to come in!"

Broadcast artistes do not pay for claps. Or "clagues." These things were done only in the old days of Italian opera, when there were paid professional applauders.

At least one broadcast artiste has confessed, though, how the orchestra in the studio helped him—once! It was Leonard Crocombe, who broadcast first in 1923 when the B.B.C. was a Company.

A Funny Story.

A year or so back when Crocombe was at Glasgow he thought of the idea of arranging for the studio orchestra to act as his audience and to laugh and applaud at the right moment. The right moments were signalled by Crocombe! The idea was such a success that the following day the *Glasgow Evening News* congratulated the B.B.C., and said what a good idea it was to have a studio audience.

So far so good. When he was at Glasgow a month later, he found a new orchestra who had not heard of this excellent applause scheme. The orchestra leader explained it to them briefly before he went out and before Crocombe was announced

Every listener has heard the B.C.C.'s "clapping claque," and no matter whether you like to hear the noise of the studio audience or not, you will be interested to read the comments of our Special Correspondent on the subject of studio applause.

over the mike. This is how he describes what happened subsequently.

"After my first funny story they gave a fine hefty howl of laughter. Excellent. After the second story the outburst of laughter was not so loud. At the end of my third story—dead silence! Yes. I turned round from the microphone in

IT SURPRISED HIM!



This is Leonard Crocombe, whose amusing story of the clapping that failed, and left him in the lurch, is recounted on this page.

astonishment, just in time to see the last of the men tiptoe out of the studio.

"It was explained later that my talk had taken place during their interval for refreshment. I have never ceased to wonder what

the 'unseen multitude' (if any) thought about the silence during the remainder of my talk."

It's all very well for listeners to say that a studio audience should not clap and laugh freely. When one visits a studio for the first time one wants so much to sneeze, cough, or make some other equally stupid disturbance, that the opportunity to have a good hearty laugh is too good to be missed.

Controlling the Audience.

There may be studio humorists who invite only their own personal friends. Who can blame them? I don't think they laugh any the more for that.

One radio producer who is very well known over the microphone has a lady studio manager who, before the broadcast starts, instructs the audience that, although within reason they may laugh and clap as they like, they must not clap too much when she gives a certain signal, for this would confuse the dialogue for listeners.

With musical broadcasts, studio applause brings in a new set of difficulties, because unless one is thoroughly musical there is the chance of being caught napping. You have only to be at the Queen's Hall and hear ignoramuses (a few of them) set up a feeble clapping between the movements of a symphony to realise how hefty is the disdain of the Highbrows.

Good Advice!

One can almost feel the weight of disapproval in the air when the intimate silence is broken. If you are ever invited to a highbrow musical performance in a studio and are in doubt about clapping, take the advice given me by a famous broadcast conductor whose character I will not profane by giving his name!

He said: "If you want to be considered a highbrow when at an orchestral concert, *don't* tap your feet or wag your head in time with the music; *don't* look pleased when you hear a melody you recognise, but be careful to smile graciously when the din is at its worst; and, finally, *don't* clap."

I think he is right.

A convincing argument I have heard against studio clapping is that the best broadcasters—the B.B.C. announcers and Jack Payne—don't have "clagues." The obvious answer to this is that I don't see how either of these could have "clagues."

EVERYTHING **The G.E.C. your guarantee** ELECTRICAL

Get better results with

Ostram 2 VOLT BATTERY Valves

with the NEW WEMBLEY FILAMENT

OSRAM S.21

Impedance 200,000 ohms.
Slope 1.1
(also metallised)

The screen grid valve particularly designed for low H.T. current, low leakage capacity, and stability—specially suitable for sets with 2 stages H.F. magnification.

OSRAM S.22

Impedance 200,000 ohms.
Slope 1.75
(also metallised)

The screen grid valve with the highest slope of any 2-volt S.G. type yet made. The ideal valve for S.G. sets with 1 stage H.F. magnification.

OSRAM H.2

Impedance 35,000 ohms.
Slope 1.0
(also metallised)

The High Amplification Detector Valve for Sensitive Reception and increased range.

OSRAM H.L.2

Impedance 18,000 ohms.
Slope 1.5
(also metallised)

The high slope, non-microphonic Detector for efficiency in detection and high quality reproduction.

OSRAM L.P.2

Impedance 3,900 ohms.
Slope 3.85

The high efficiency Loudspeaker Power valve, or L.F. amplifier, specially suitable for sensitive reception—adequate power and least possible H.T. consumption.

OSRAM P.2

Impedance 2,150 ohms.
Slope 3.5

The 2-volt super power valve capable of wonderful undistorted volume for the minimum of H.T. current consumption.

OSRAM P.T.2

Slope 2.5

The remarkable new 2-volt Pentode with amazing power output for the lowest possible H.T. consumption.

Sold by all Wireless Dealers.

**THESE
ARE
THE
TYPES**

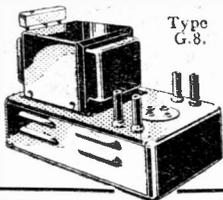
**BRITISH
PRODUCTS
DESIGNED FOR
BRITISH RADIO
CONDITIONS.**



WRITE for the Ostram Wireless Guide (1931 Edition) and also Station Indicator Card sent post free on request.

SUPREMACY IN RADIO - G.E.C. Radio

SCRAP YOUR WASTEFUL H.T. BATTERIES!



INSTALL AN ELIMINATOR FOR PERFECT RECEPTION

More sets to-day are going over to All-Mains. People are realising the cost involved in constantly replenishing batteries, which at their best are wasteful and inefficient. This wonderful "Stal" H.T. Eliminator, at a ridiculously low price considering its efficiency, guarantees an ample supply of smooth high tension current from the mains. Measuring only 7 x 5½ x 3¼ ins., it will fit snugly into the smallest receiver. Ready for immediate use with two adjustable tapings. Output 120 volts; suitable for 2-, 3-, 4- or 5-valve Sets. Send for one without delay.

Price of 47/6 includes Rectifying Valve.
Cash with order or C.O.D.

PRICE Complete
47/6 (A.C. Mains only)

Also "Stal" A.C. Trickle Chargers for 2- and 4-volt Accumulators.
19/6



J. E. SEXTON, H.T. ELIMINATOR
Rugby Chambers, Gt. James St., LONDON, W.C.1

LOWEST PRICE—HIGHEST QUALITY

FOLLOW THE LEAD OF EXPERTS CONDENSERS



In sealed bakelite cases. 750 volts tested.

- 1 MFD " 1/9
- 4 MFD - 3/11
- 2 MFD - 2/4

THE CIFEL "EXTRA"

L.F. TRANSFORMER
In Bakelite Case.

A special process treatment of the laminations gives improved reproduction and even amplification.



4/6

WORLD FAMOUS



WIRELESS PRODUCTS

SLOW MOTION DIAL



For all standard Condensers. Fitted with a simple two-speed device which permits of fast or very slow control.

2/6

DOUBLE READING VOLTMETER

0-6 and 0-120

Suitable for all tests. Accurate and Strong.

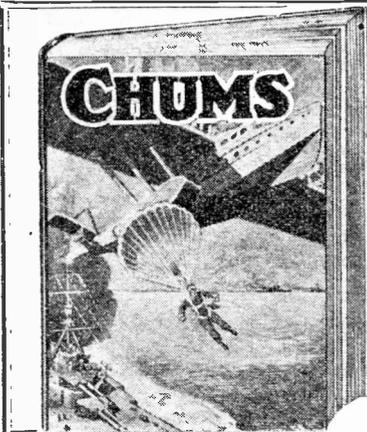


5/11

If unable to obtain from your local dealer write direct to:—

FONTEYN & CO., LTD.,
2-4-5 & 6, Blandford Mews, Baker St., London, W.1

Special terms to Dealers, Factors and Manufacturers.
SEND FOR LIST.



A Regular Book for A Regular Fellow

Here is the finest and biggest gift book for boys! Eight hundred and thirty-two pages of gripping fiction and articles. Something like a book that! It's CHUMS ANNUAL and there's no finer gift any boy could

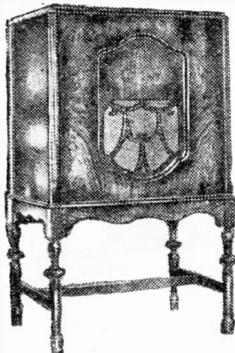
have. Twelve splendid colour plates and twelve pages of interesting photographs—just the sort of pictures boys like to look at. There are many months of delightful entertainment in

CHUMS ANNUAL

At all Newsagents and Booksellers.

12/6 net.

Make your Set BETTER in LOOKS and PERFORMANCE



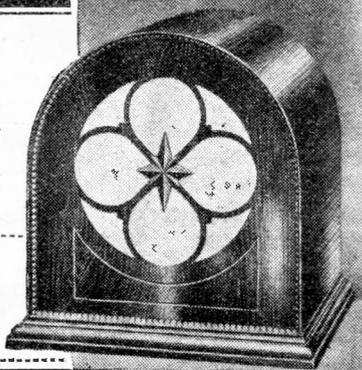
You can do this if you use a Cameo Cabinet. For graceful design, scientific and sturdy construction and fine finish Cameo are incomparable. Here are two typical Cameo Cabinets.

On the left is the Cameo "Lincoln" Pedestal Cabinet for Set and Speaker. This is a beautiful piece of furniture, finished in shaded walnut. Accommodates all-mains or battery-driven sets, with space for batteries if required. **25.17.6.**

On the right is the Cameo "Tru-tone" Speaker Cabinet. It is outstanding among small moving-coil Speaker Cabinets. Attractive appearance and sound construction. In shaded walnut finish. **30.** Write for FREE copy of the new 1932 Cameo 24-page Radio Cabinet Catalogue



CARRINGTON MFG. CO., LTD.,
Showrooms, 24, Hatton Garden, London, E.C.1.
Phone: HOL. 8202.
Works: S. Croydon.



NAME.....

ADDRESS.....

F.W. 20.

100% EFFICIENT



TESTS EVERYTHING



"The Sherlock Holmes of Radio."

An absolute necessity to every owner of a battery-operated radio set—the PIFCO "All-in-One" Radiometer puts a definite end to guesswork. With this instrument you can test valves, batteries, speaker and other components—tracing the most obscure trouble to its source instantly and easily. The "All-in-One" Radiometer enables even the novice to service his own set and eliminates the need for expensive expert assistance. It is the short cut to perfect radio performance.

Attractively finished in handsome maroon Bakelite case, complete with leads. Price

Also De Luxe Model for Mains Units, Electric Receivers and Battery Sets. Price £2:2:0.

12/6

Ask to see either model of the PIFCO "All-in-One" Radiometer at any Store or good-class Radio dealers.

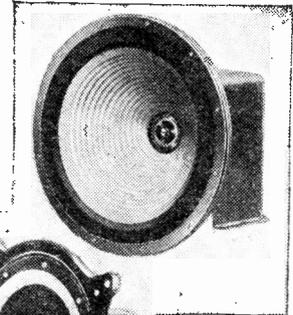
Booklet free from Patentees:

PIFCO LTD., HIGH STREET, MANCHESTER

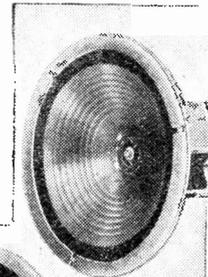
PIFCO
ALL IN ONE
RADIOMETER

© F3a

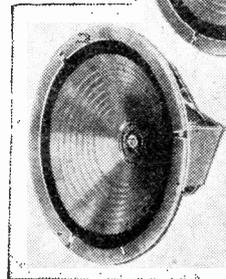
There's just THIS difference



1931/2 Models.
Senior A.C.
Model. New
Reduced Price
£7.15.0
Senior D.C.
Model. New
Reduced Price
£5.5.0



1931/2 Senior Per-
manent Magnet. New
Reduced Price £5.12.6



Minor Per-
manent Mag-
net Model.
Price £2.10.0.

Minor D.C.
Model. Price
£1.11.6.



MOVING COIL REPRODUCER

100% BRITISH MADE

GREENWICH
TIME FROM THE
MAINS



Have you seen the Edi-
swan A.C. Mains Elec-
tric Clock? Ask your
radio dealer. Prices
from 45/-

in a B.T.H.

It's 100% British to suit British tastes. Every note is given its true value—every note its true pitch. Radio is a real delight to listen to when it's heard through an R.K. Prices range from 31/6 (Minor D.C. model) to £7.10.0 (Senior A.C. model).

Ask your dealer for a demonstration.

EDISWAN RADIO



THE EDISON SWAN ELECTRIC CO. LTD.
Radio Division: 155 Charing Cross Road, London, W.C.2.

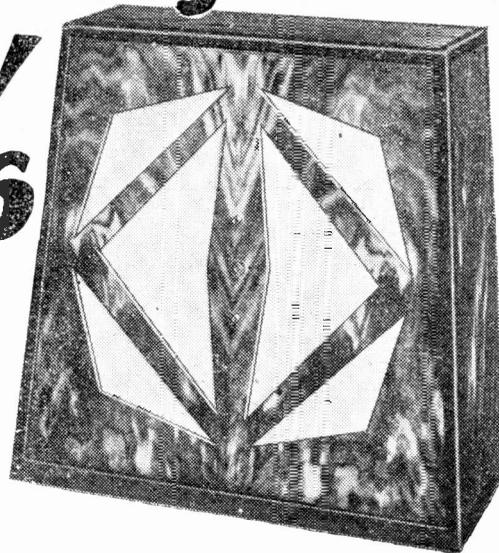
W.181

How to build a 2-guinea Loudspeaker for 5/6

Here is an intensely interesting development—the Home Constructor's Loudspeaker, which you can build for 5/6 and which for tone and volume compares with many 2-guinea speakers you may have heard. And from a distance of 2 feet away its handsome appearance closely resembles a solid walnut cabinet of fine finish.

A WONDERFUL FREE GIFT to every purchaser of the NEW LISSEN SOLENOID SPEAKER UNIT

That extra loudspeaker for the other room is now available to you at small cost. See the completed loudspeaker above. That is what the Lissen free gift enables you to build. You buy the new Lissen Solenoid Cone Unit for 5/6. With it you will get



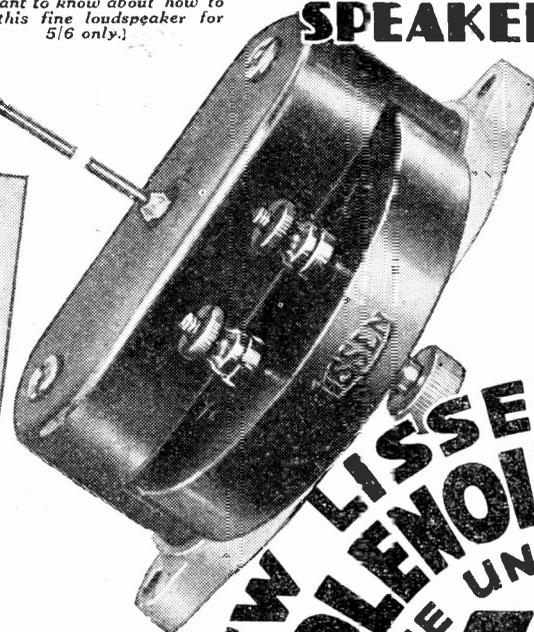
1. Special Cone paper printed to exact size ready for cutting out and gluing up to make a 14-inch cone.
2. Full Instruction Sheet with complete diagrams showing each operation in the building.
3. Sheet, size 28 in. x 35 in. lithographed walnut grained panelling, printed on reverse exact shapes and sizes for cutting out, including front fret. You have only to stick this on to cardboard to build up cabinet shown above.
4. The postal tube in which these gifts are packed, and which is also used in the construction.

Anybody can easily build this speaker—the essential parts are all provided for you at an all-in cost of 5.6. The other sundries such as gum you probably have at home already.

LOOK WHAT YOU GET FREE!

Go to your radio dealer now—he will tell you anything more you may want to know about how to build this fine loudspeaker for 5/6 only.

NOW YOU CANNOT FAIL TO MAKE A SPLENDID SPEAKER



NEW LISSEN SOLENOID CONE UNIT 5/6

RADIOTORIAL QUESTIONS AND ANSWERS

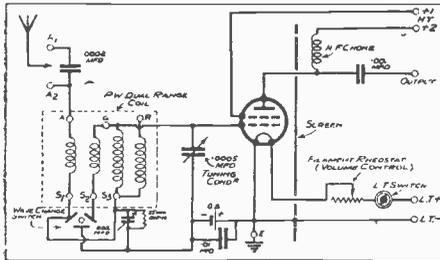
(Continued from page 758.)

cabinet for the battery. This is really the best place for the accessory. It is more accessible and is removed from the baseboard components.

Four short, flexible leads are needed for the grid-bias and coil tapplings. And the appropriate plugs and clips should be fitted to those wires.

Regarding the P.J.1, from the home-construction point of view this is quite a straightforward job, but correct sizes of former and wire must be used, and it is vital that the windings should be laid on with care, and the following instructions re direction of winding obeyed exactly.

MISSING LINKS, No. 22 AN S.G. H.F. UNIT



Here is last week's diagram repeated, but with the three missing "components" in place. It will be seen that they were an "Interwave" resistance, the G.B. battery, and the coupling condenser.

The P.J.1 coil is wound on a good-quality tubular coil former, 2 in. in diameter, and 3 in. long. The wire for all the windings is 30 D.S.C. and the photographs in the article itself show the general appearance of the completed coil.

Anchor the beginning of the "aerial" winding in the usual way by threading and rethreading through small holes near the edge of the former, and mark this beginning "A." Then wind on 9 turns, tapped at 4 and 6 turns, finish off, and mark the lead "X."

Next comes the grid winding, which must be separated from the "aerial" winding by a space of three-eighths of an inch. Its beginning is marked "G."

It consists of 64 turns of the same wire (30 D.S.C.) wound in the same direction as before. The turns are wound closely side by side, as for the aerial winding, and the end, when finished off at the 64th turn, is marked "Y."

Finally comes the reaction winding, which is spaced to leave a gap of 1/4 in. between its beginning and the end of the grid winding. It consists of 34 turns, beginning marked "Z," end marked "R."

It is vitally important that the direction of winding should be the same for all the coils, and that the spacing named should be maintained. In the commercial coils, a further aid to identification is afforded by coloured flexes, to denote the different leads.

These are given below, and can with advantage be copied by the constructor:

- | | |
|-----------------|------------------|
| A = Red flex. | Y = Black flex. |
| X = Blue flex. | Z = Green flex. |
| G = White flex. | R = Yellow flex. |

The Long-Wave Coil Quoit.—The beginning of the 30 D.S.C. wire is fastened to the coil quoit in the usual way, by threading it two or three times through small holes in the former until it holds fast. About 6 or 8 inches

should first be pulled through the hole, and will be used as a connecting lead.

Mark the beginning "Reaction," wind on fifty turns, hank fashion, and then don't break the wire, but bring out a long loop, and label it "Earth."

Continue winding in the same direction until 30 turns are neatly wound on. Do not break the wire at this point, but twist a neat loop in it, about 3/4 in. in length.

This loop will be allowed to stick out from the winding, and when its insulation has been scraped off the wire it enables a crocodile clip to make connection at the 30th turn.

(Continued on page 762.)

TECHNICAL TWISTERS

No. 89. CLASSES OF VALVES.

CAN YOU FILL IN THE MISSING LETTERS?

The fundamental difference between classes of valves is the number of; and valves having only two (filament and plate), such as half-wave rectifiers, are known as diodes.

Ordinary valves, with three electrodes, are classed as

S.G. valves, having four electrodes, are in the class.

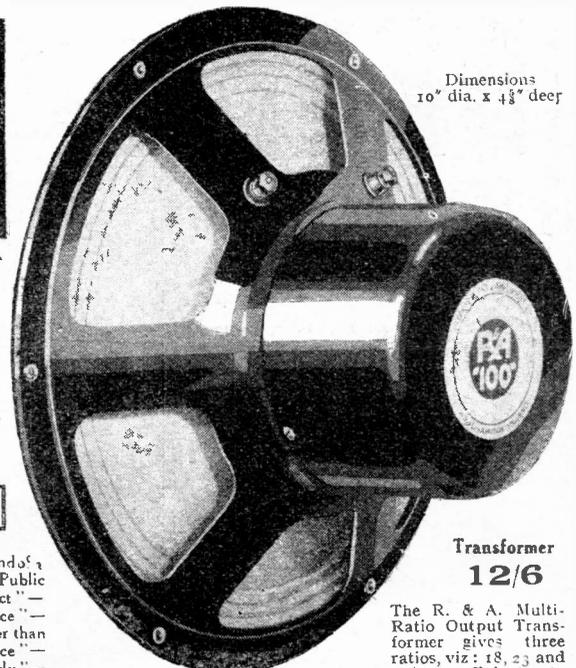
The special output valves of the five-electrode type are known as

Last week's missing words (in order) were: Switch; Disconnect; Negative.

AN EPOCH-MAKING REPRODUCER

The **R & A** "100" PERMANENT MAGNET MOVING COIL REPRODUCER

45!



A FULL-SIZED REPRODUCER — *not* a miniature speaker.

R. & A. Ltd., have risen to their present position as Specialists and Leaders in the field of Sound Reproduction by producing Loud Speakers that are above the ordinary and by making R. & A. design, workmanship and material so superior to competitive products as to make the ownership of an R. & A. Reproducer a matter of pride to the possessor. R. & A. could make cheaper reproducers by using inferior materials; this only at the sacrifice of our reputation. We prefer to produce the best, and have

offered them at a price which has been imitated, and of a quality which has not been equalled at the price. Public acclaim—"marvellous value"—"quality perfect"—"output doubled"—"astonishing performance"—"wonderful tone"—"amazing results"—"better than any other"—"good value at four times the price"—"demonstrate R. & A. pre-eminence unflinchingly"—"in loud speakers R. & A. is the hall mark of quality"—These are extracts from letters in our possession.

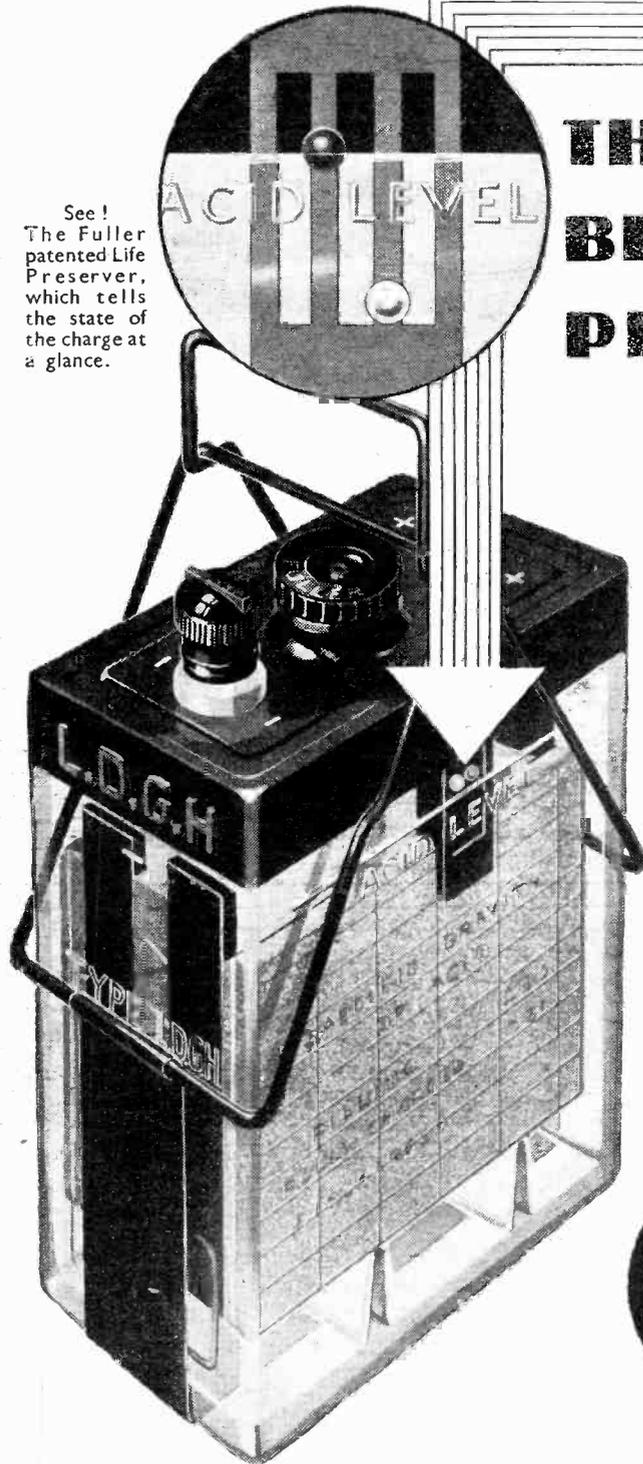
Transformer 12/6
The R. & A. Multi-Ratio Output Transformer gives three ratios, viz: 18, 23 and 32/1, sufficient to cover the whole range of power valves, including Pentodes. Primary inductance 12.5 henrys, leakage inductance 2.5%.

Insist on an R. & A. "100" and refuse substitutes. If any difficulty, write us.

Illustrated Descriptive Leaflet Post Free on Request.

REPRODUCERS & AMPLIFIERS, LTD., FREDERICK ST., WOLVERHAMPTON

See!
The Fuller
patented Life
Preserver,
which tells
the state of
the charge at
a glance.



THIS BRITISH BATTERY PROTECTS ITSELF

The most destructive thing you can do to an accumulator is to overcharge or over-discharge. Fuller batteries are far too good to be ill-treated, so for self-protection every Fuller L.T. Accumulator of the Free-Acid type in glass or celluloid box is fitted with this patent "Life-Preserver." You simply can't mistake its message.

This is just one example of the British thoroughness which characterises the design and manufacture of all Fuller Batteries. The particular type illustrated—the L.D.G.H. L.T. accumulator—shares with all the "Mammoth Plate" and "Standard Plate" types many other patent features exclusive to Fuller. Double grease-cup terminals absolutely prevent corrosion and bad contacts. Coloured moulded polarity signs leave no doubt regarding positive and negative. A non-slip metal carrying handle folds out of the way when not in use. Mammoth micro-porous pasted plates ensure exceptional capacity, strength and long life.

Ask your dealer to show you this accumulator—L.D.G.H.—2 v. 60 a.h. Price 9/6. Dry charged. (Other sizes for low intermittent current service.) It is just what you want. And the unqualified satisfaction you will have in using it will daily serve to emphasise the wisdom and the benefit of **Buying British.**

FULLER SUPER BATTERIES

LONDON AND PROVINCIAL DEPOTS:—LONDON: Hanover House, 73-78, High Holborn, W.C. 'Phone: Chancery 7453. BIRMINGHAM: 29, Guildhall Buildings, Navigation Street. 'Phone: Midland 3103. MANCHESTER: 19, Chapel Walks, Cross Street. 'Phone: City 0857. GLASGOW: 101, West Nile Street. 'Phone: Douglas 4367. BRISTOL: 28, Cumberland Street. 'Phone: Bristol 7958. LEEDS: 9, Mill Hill. 'Phone: Leeds, 22865. SHEFFIELD: 48, Sandford Grove Road. 'Phone: Sheffield 51187. HULL: 69, Ryde Street. 'Phone: 502Y2. NEWCASTLE: 59, Side. 'Phone: Newcastle 24068/9. SWANSEA: 10-11, St. Helen's Road. 'Phone: Swansea 3208. BELFAST: Stocks and service at 57, Dublin Road, Belfast. IRISH FREE STATE: Mr. Daniel R. Baker, 4, Oliver Plunkett Street, Cork.

Full list of H.T. Dry Batteries and L.T. and H.T. Accumulators on request.
FULLER ACCUMULATOR CO. (1926) LTD., Chadwell Heath, Essex.
'Phone: Seven Kings 1200. 'Grams: "Fuller, Chadwell Heath."

Contractors to British and Overseas Government Depts., Railways, etc.



CAR & MOTOR CYCLE BATTERIES
— Acid proof patent double grease cup terminals—Micro-porous pasted plates—high capacity—long life—exceptional strength. Models for every Car and Motor Cycle—List M.3.



NON-SPILL L.T. ACCUMULATORS
—(Jelly Acid Type) safe in any position—Micro-porous pasted plates—indestructible separators—reinforced containers—non-spill vents—patent double grease cup terminals. 16 Sizes for all Portable Receivers. From 14 to 40 A.H. Prices 9/- to 17/-, fully charged, List W.3.

RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 760.)

The scraping of the insulation is best left till the coil is made. During the winding you simply make the loop at the 30th turn, and then carry on the winding in the same direction as before.

At the 60th turn another loop must be made, and then 90 more turns must be put on (still winding in the same direction) before the end is fastened off.

This fastening is done by cutting the wire and drawing it through small holes in the coil, exactly as at the start of the winding. And, as before, 6 in. or so should be left with which to make the connections to the coil. This end is marked "G."

THE COIL QUIT OF THE "DUAL-RANGER."

H. J. (Wisborough Green, Sussex).—"I have built the 'Dual-Ranger.' One point I am not clear of. That is, the Quoit Coil, and how the leads are fixed to it from the switch. And also the one from the P.J.3 Coil. (The Quoit Coil I have in use is a Peto-Scott.)"

Referring first to the Coil Quoit there are five different places on this to which external connections can be made.

The beginning of the winding is one of them; and after the first 50 turns (for reaction) had been wound on the quoit a "loop" or tapping-point was arranged at the fiftieth turn, where reaction etds and joins the grid coil. This is the second connecting-point, and it is marked "E" because it will be connected to Earth.

Then another 30 turns of wire were laid on, and the third connecting-point is reached. We will call this the "30" tapping.

And after another 30 turns there is another connecting-point which we will call the "60" tapping. Finally, there is the end of the grid coil, making five connecting-points in all. Taking them one by one, the start of reaction must be joined to "Z" on the P.J.3 coil.

"E" (Where the grid coil and reaction coil meet) is joined to the moving vanes of the 0005 tuning condenser, which is connected via filament-pin of V₂ valve holder, etc., to earth.

Thirdly, the end of the grid coil is joined to that section of the wave-change switch which is connected to "Y" on P.J.3.

There is one more connection to be made, and there are two points to which it can go.—namely, the "30" or the "60" tapping. The connection in question is that coming from "X" on the P.J.3, and one side of the wave-change switch.

It should be tried first on the "60" and then on the "30" tapping, to see which is better. In nearly all cases the "60" is the better tapping, because it gives greatest strength and sufficient "sharpness" of tuning.

In cases where great selectivity is necessary, owing to a near-by station, the "30" tap may be required, instead of the "60." But a test will soon decide which is better, and then the connection can

qualified success, as the "Economy" Three was a rather special circuit arrangement.

You would need a 3-point wave-change switch, a .002 compression-type condenser, a 25,000-ohm Spaghetti, and also an H.F. choke in addition to the "P.W." Dual-Range coil.

The present coil holder would, of course, need to be removed, and replaced by the Dual-Range coil, and you would have to mount the new wave-change switch on the panel.

This could be placed underneath the differential reaction condenser, and incidentally, the three leads from this component also should be "stripped," as it will need complete rewiring.

The new connections will be as described below. A terminal on the terminal-strip to "A" on the coil-unit, "G" on the coil-unit to the fixed vanes of the tuning condenser, which are joined to the 0903 mfd. as before.

"S2" on the coil-unit goes to one contact of the wave-change switch. S₁ and S₃ on the coil unit are

"P.W." PANEL, No. 47. Overloading Amplifying Valves.

Although results which are virtually distortionless can be obtained from valves worked under proper conditions, all amplifier valves can be overloaded.

As the name implies, the condition exists when excessive voltages are delivered to the valve in question. Its output being strictly limited, the effect of an excessive input to a valve is that the output can no longer faithfully correspond with the input, and consequently there is a distortion of the wave-form.

The effect is chiefly noticeable on the local station's programme, and can be removed by a suitable volume control.

be left there, the other tapping point being left vacant and unused.

If the set is to be used in Sussex we expect you will find that best results are obtained by using the "60" tapping, and leaving "30" blank.

USING DUAL-RANGE COIL IN THE "ECONOMY" THREE.

A. E. M. (West Ham).—"Can I use a 'P.W.' Dual-Range coil in the 'Economy' Three? Would it mean a lot of rewiring?"

"Will you please let me know how to wire the set with the 'P.W.' coil?"

There is a fair amount of rewiring to be done for this, and we are not sure that it would be an un-

joined together and also to another contact of the wave-change switch, and to one side of the new .002 semi-variable (compression) condenser, and to one side of the 25,000 Spaghetti resistance.

The remaining side of this resistance is joined to the remaining side of the .002 condenser, to the third contact on the wave-change switch, and also to the Earth terminal on the terminal strip, which still connects with the filament terminals on V₁, V₂, V₃, tuning condenser and on-off switch.

Instead of the lead which formerly joined E, etc., to the moving vanes of the differential, you need a similar lead, but going this time to one set of the fixed vanes of the differential.

The other set of fixed vanes must be joined to the R terminal on the new coil unit. Finally, the anode-circuit wiring must be completed as follows.

(Continued on page 764.)

Lanchester



MOVING COIL
Speakers

COBALT STEEL PERMANENT MAGNET

**High Sensitivity
Full Musical Response
Speech Perfect**

Designed by F. W. Lanchester
(the originator of the Lanchester
Car) and produced under his
personal supervision.

BEAUTIFULLY ILLUSTRATED
CATALOGUE

Free & Post Free
WRITE FOR IT

WE SELL DIRECT TO PUBLIC ONLY

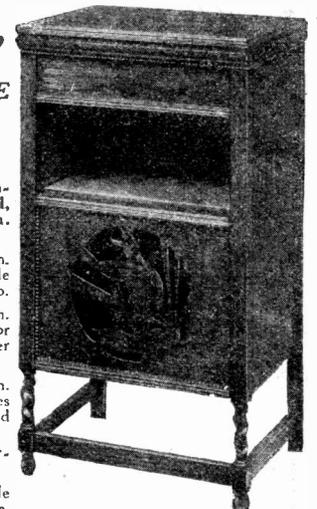
**14
DAYS' FREE
TRIAL**

Moving Coil Speakers
From £1:10:0 to £3:3:0
Complete in Cabinet
From £2:10:0 to £4:15:0

LANCHESTER'S  LABORATORIES
TYSELEY LIMITED BIRMINGHAM

LARGER AND BETTER THAN EVER!

THE NEW
"LANGMORE"
RADIO-GRAMPHONE
CABINETS
(No. G.1.)



These cabinets are very strongly constructed of selected Oak. Size overall, 3 ft. 6 in. high by 21 in. wide by 15 in. deep.

THE TOP SECTION. Size, 4 1/2 in. high, by 18 in. wide by 14 in. deep, gives ample accommodation for gramophone or pick-up.

THE CENTRE SECTION. Size, 10 in. high by 18 in. wide by 14 in. deep, is for the Wireless Set, to take a panel either 18 in. by 7 in. or 18 in. by 8 in.

THE BOTTOM SECTION. Size, 16 in. high by 18 in. wide by 13 1/2 in. deep, gives accommodation for Loudspeaker and Batteries.

Wooden panels to fit, with oval aperture, 12 in. by 5 1/2 in. 2/- extra.

The whole of the back is enclosed by double doors, so that all parts are easily accessible. ALL are fitted with hinged top, heavy platform to take a 12-in. turntable for the Gramophone, and a substantial baseboard for the Wireless Set.

BEAUTIFULLY FINISHED
JACOBEAN OAK.

Price **49/6** each

Packed FREE and sent Carriage
Paid to any address in Gt. Britain.

Trade Inquiries Invited.

THE MISCELLANEOUS TRADING CO., LTD.,
13 & 17, NEW OXFORD STREET, LONDON, W.C.1

'Phone: Holborn 4894'



**WORKS WONDERS
WITH YOUR OLD
BATTERY SET**

ALL-MAINS RADIO FOR BATTERY SETS AT ONLY 1^d. A WEEK

**NO BATTERIES
NO TROUBLE
H.T. & L.T.
Always reliable.**



**ANY MODEL DELIVERED
TO YOU FOR**

ONLY 10/6 DOWN

Balance in Easy Monthly Payments

BATTERY ELIMINATORS

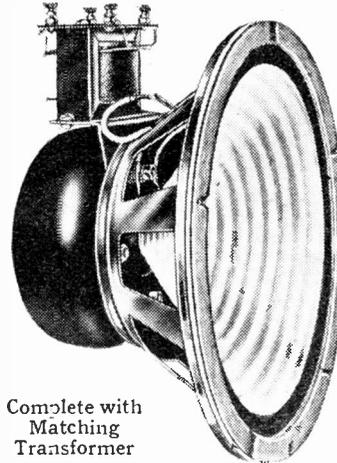
"MULTIVO" "VOLTEX" "MINIVO"

H.T. OUTPUT: 25 milliamperes. 1 variable tapping-0/100 volts. 1 tapping .. 50/90 .. 1 tapping .. 150 .. Trickle charger for 2-, 4-, and 6-volt accumulator at 5 amps. CASH PRICE £5 5 0	For indirectly-heated valves. H.T. OUTPUT: 25 milliamperes. 1 variable tapping-0/100 volts. 1 tapping .. 50/90 .. 1 tapping .. 150 .. L.T. OUTPUT: 4 volts 4 amps. (Raw A.C.) CASH PRICE £5 5 0	H.T. only. OUTPUT: 120 volts at 20 milliamperes. 1 tapping .. 50/90 volts. 1 tapping .. 90/100 .. 1 tapping .. 120/150 .. CASH PRICE £3 3 0
---	--	---

*If your dealer cannot supply, write direct
for fully illustrated catalogue "E" to:—*

ARTHUR PREEN & CO., LTD.,
GOLDEN SQUARE, PICCADILLY CIRCUS, LONDON, W.1.
Works Address: CROWN WORKS, SOUTHAMPTON.
See also page 764.

AMPLION MOVING COILS



**M.C.6 UNIT.
PERMANENT
MAGNET**

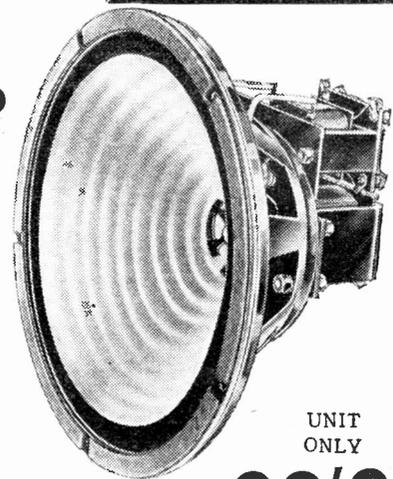
This famous Amplion M.C.6 Unit is acknowledged as the most efficient moving-coil speaker of its type. Its sensitivity and true reproduction are really remarkable, and it handles without distortion adequate volume for all normal requirements. It is as sensitive as a balanced armature speaker, and the universal transformer which is fitted enables the speaker to be correctly matched to either power, super-power or pentode output from standard 2-, 3-, or 4-valve receivers.

Complete with
Matching
Transformer

67/6

THE E.M.644 UNIT. D.C. ENERGISED MODEL

Another of Amplion's successes is this D.C. Energised Model. Ideal for A.C. sets. Its perfect performance and reproduction has been proved by its inclusion in the famous "Amplion Six" receiver, which has reached record sales. Ideal for home constructors to incorporate in A.C. receivers and radiograms. A most efficient unit for D.C. voltages 100/110, 200/240. Full details of alternative methods of operation supplied with each model.



UNIT
ONLY

29/6

UNIT WITH
MATCHING
TRANSFORMER

42/-

M.C.9 UNIT. PERMANENT MAGNET

The M.C.9 Unit is a permanent magnet, but is much larger and more powerful than the M.C.6. **UNIT ONLY.** A suitable matching transformer for this model can be supplied at 15/- extra. **£6:0:0**

GRAHAM AMPLION LTD., 26, Savile Row, W.1

RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 762.)

Anode terminal of the V1 valve holder to the moving vanes of the differential, and also to one end of the H.F. choke. The other end of this choke goes to the P. terminal on the R.C. unit.

This completes the alterations, and the operation of the switch gives long- or medium-wave tuning, selectivity on long-waves being governed largely by the setting of the .002 compression condenser, as so often described in "P.W." sets where this system of "Interwave" coupling is employed.

THE "P.V. PLUS."

R. C. (Stafford).—"Having constructed 'P.V. Plus.' I am puzzled about the tap from the .001 mfd. When this is tapped to the red or lower taps on P.J.3 I can only get National, 1.554 metres, nothing else. But when tapped to .0003 mfd. (same terminal as white from P.J.3) everything seems O.K., getting stations on both wave-bands. The coil quitoes I wound myself."

Are you sure that this coil quito is wound correctly? We suggest you re-read the description, to see if you went astray in this part of the work.

The likeliest cause of the fault you mention is a dud component causing bad results from the H.F. stage.

Examine carefully, and if possible, see that a coil terminal is not separated from the winding by a severed lead, as sometimes happens.

OPERATING A MAINS SET.

A. D. E. (Bordeaux).—"What are the chief points for the inexperienced person to watch when using a mains set? I have to leave home for periods of five months at a time and should like to leave behind a clear idea of the correct treatment for the wireless set, for the benefit of my wife."

The modern wireless set run from the electric-light mains is a very trouble-free proposition, and

provided it is properly installed, and worked with ordinary care, it should give no bother whatever and require no more attention than the mere switching on and off.

Usually the maker supplies explicit operating notes covering the various operations to be performed, and these can generally be simplified considerably because they embody installation as well as operation; and, of course, the actual mode of installing the set will not need to trouble an inexperienced person who is called upon to handle it only after it is in place in the home.

MAKE AN INSTRUCTION CHART.

Probably the best plan is to paste-up a sketch of the set showing each control-knob, etc., marking this one "down for long waves," that one "don't alter," etc., as required by circumstances. Then nothing can go wrong but what any maintenance service (dealer's or manufacturer's) can put right at once, provided the general care of the set is reasonably good.

This implies that aerial and earth are in good condition, and will not be interfered with, and that satisfactory earthing switch-contacts (if these are provided) will be maintained for long periods. (Usually a once-a-year overhaul is sufficient for this class of contact.)

All wires to or from the set, and particularly those from the power-point, should be regarded as fixtures to be left alone, for constant shifting of them, such as occasioned by moving the set about, or by careless movements during mopping and cleaning, etc., might result in a fracture of the wires.

If such precautions are taken, and no unauthorised person is allowed to interfere with the set, it will "carry on" indefinitely without giving a moment's trouble or uncertainty.

AN ADVERTISER'S CORRECTION.

The attention of our readers is directed to an important omission from the advertisement of British Ideal "Daptacon" Pick-Ups in our last issue. The "Daptacon" Junior Pick-up at 17s. 6d. was described as having a British Steel Magnet, whereas it has a British COBALT Steel Magnet, of everlasting strength. (This pick-up is entirely British, and it is claimed that its sensitivity is so developed that with it the owner of the most modest wireless set can make a really efficient radiogram.)

MIRROR OF THE B.B.C.

(Continued from page 726.)

All these items are for National listeners, while London Regional has its vaudeville on Monday, a Military Band programme and a concert by the Pall Mall Players on Tuesday, an Orchestral Concert conducted by Joseph Lewis on Wednesday, a Chamber Music Concert on Thursday, and an Orchestral Concert entitled "Memories" which follows a repeat performance of Ernest Longstaffe's pantomime on Saturday.

Madrigals and Mummings.

Provincial stations are also busy with seasonable programmes, and I learn that as early as Saturday, December 12th, West Regional listeners will hear a special Christmassy entertainment to be given by the University of Bristol Madrigal Singers.

The choral side consists of original music and arrangements of traditional Christmas tunes, and there will also be pianoforte solos played by J. J. Bryant, of Bristol University, including Balfour Gardiner's "Noel," and Percy Grainger's arrangement of the "Sussex Mummings Christmas Carol."

On the same day listeners will get their first ghost story of the festive season in the form of a true tale told by Mr. H. C. Lawlor in the Belfast Studio.

"A Lesson from Mrs. Siddons."

Meanwhile, there are many other interesting programmes between now and Christmas, including the comedy entitled "A Lesson from Mrs. Siddons," in which

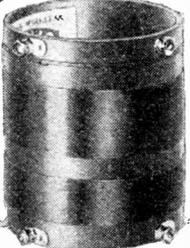
(Continued on page 766)

ALL ROUND EFFICIENCY

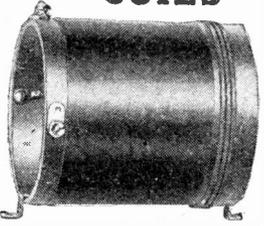
is guaranteed with



FORMO COILS



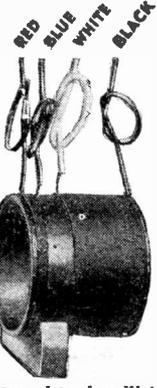
POP-VOX
3/9
each



P.J. COILS
2/-
and
2/9
each



DUAL RANGE COILS 12/6



RED BLUE WHITE BLACK

Complete Catalogue of all Formo Products from:—
ARTHUR PREEN & CO. LTD., Golden Sq., Piccadilly Circus, London, W.1.
 Crown Works, Southampton. See also page 763.

LOTUS: we hold extensive stocks!

Of Lotus Table Consoles. Supplied for A.C. and D.C. Mains and enclosed in a handsome cabinet, moving coil speaker. Price £15.15.0.

We hold extensive stocks and can give immediate delivery—order now. All sets on easy payments. Hear them in our demonstration rooms.

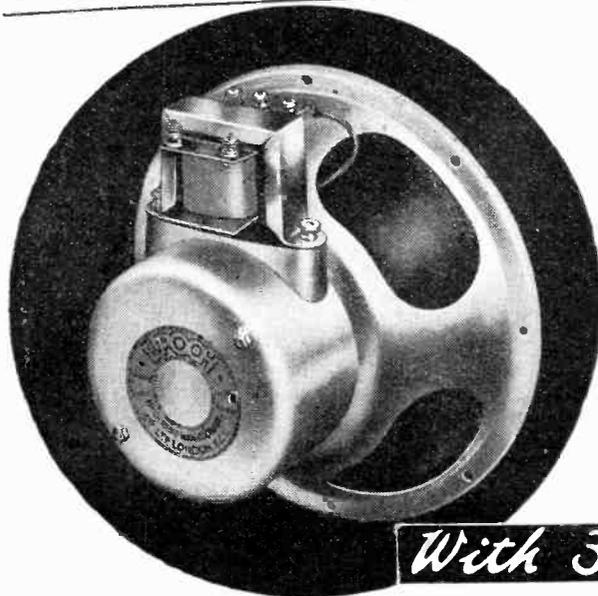
WILL DAY LTD.

19 Lisle St., Leicester Square, London, W.C.2
 Telephone: Gerrard 4476.

EPOCH REAL PIONEERS YEARS AHEAD

PERMANENT MAGNET

in experience, research and design



MODEL J.1. 18 months before the many so-called pioneer claims to the production of the Permanent Magnet Moving-Coil Speakers, Epoch designed, developed and manufactured the first practical Permanent Magnet. Epoch's leadership in this class is definitely established by a new standard of comparison for performance and price set by Model J.1. The lowest price Permanent Magnet Moving-Coil Speaker on the market comparable to instruments costing far more. The 3-Ratio Transformer fitted makes it ready to work instantly from any set with Pentode or Super Power output. When purchasing a Moving-Coil insist upon EPOCH.

Send for Free Art Booklet P.S.5.

Complete with aluminium covered cobalt steel magnet, one-piece moulded linen diaphragm and 3-ratio input transformer. Ask your dealer for it. He will gladly demonstrate this or any Epoch Model. If you have any difficulty send for nearest dealer's name or call at our new showrooms and hear it.

45/-

EPOCH RADIO MANUFACTURING CO., LTD., Exmouth House, Exmouth Street, E.C.1
At the junction of Rosebery Avenue and Farringdon Road.

With 3-Ratio Input Transformer

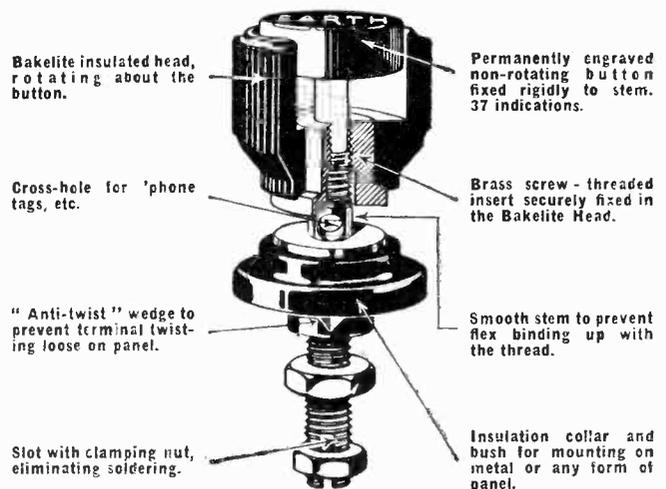
Say
Player's
please



They always do!

N.C.C.16

WHERE ELSE CAN YOU FIND THESE SPECIAL FEATURES?



TYPE "B" TERMINAL 6D.
for the "FULL RANGE" TWO 6D.

BELLING-LEE
FOR EVERY RADIO CONNECTION

Advt. of Belling & Lee, Ltd., Queensway Works, Ponders End, Middlesex.

MIRROR OF THE B.B.C.

(Continued from page 764.)

Dame Madge Kendall is taking the part of Sarah Siddons for National listeners on Saturday, November 28th.

Dame Kendall, as many people know, is the representative of the family of great actors who gave Mrs. Siddons to the world. Her first and only play broadcast was "Grannie's Juliet," with Lady Tree in 1924, since when this "grand old lady" of the stage has made several striking and successful broadcast appeals and addresses.

FOR THE LISTENER

(Continued from page 726.)

from the mother. But something in the blood had not forgotten, and probably would never forget.

I remember that the friend with whom I stayed took me one day in a motor-car to visit an English settler who lived in one of the remoter parts of Cape Province. He was no longer a young man; and had been in South Africa for many years; but, before ever he could speak a word to me, he held me long by the hand, and his lips quivered, and tears were in his eyes.

Veldt, Bush and Backwoods.

Something of this feeling must be common throughout the overseas dominions; and the thought that they will be listening every day to a voice speaking to them from England, about what is going on at home, what people are saying and doing at home, will be very gratifying to countless of our

fellow-countrymen who now share little with us, but still share our blood.

It is a miracle that it should be possible. We are so accustomed to wonders in these days that we can hardly realise how great a miracle it is. That a lonely family on the South African veldt, or in the Australian bush, or among the backwoods of Canada, should be able, at the very moment of its utterance, to hear a home voice giving home news; and to hear it with a warm, living immediacy, as if it were on the very threshold of their homestead!

I do not imagine that anyone living here at home will take serious exception to the carrying out of this plan. We must remember, however, that it will cost money. I see that it has been estimated that the plant will cost £40,000 and that its maintenance, together with the transmission of programmes, will cost a similar sum each year.

The Money Question.

I take it that it is we who will have to pay for this. It will come out of our licences; out of such part of them as the Government leaves the B.B.C. to pay with.

And this at a time when the B.B.C., like everybody else just now, is trying to reduce expenses. The money which will provide maintenance for the Empire Station at Daventry will mean that there will be so much less for our programmes. I do not think that anyone will grudge it.

I have never heard anybody yet complain that he didn't get his money's worth for his licence; but I do frequently hear complaints that the cost of the various items of the programmes might be over-

hauled to the advantage of the greater number of listeners.

Many listeners are not satisfied that so colossal a sum should be spent annually on the B.B.C. Symphony Orchestra, for example. It does not tickle their fancies very much that this should be one of the finest orchestras in the world. They do not like to see other and more popular parts of the programmes being starved for the sake of this international competition in orchestras!

Demand for Better Vaudeville.

Music-lovers of the higher-brow quality are certainly getting enough for their money; the stuff provided for them is first-rate; but others who, for instance, use the wireless chiefly for amusement, feel that they are being obliged to put up with what is second-rate.

Eighty per cent of the vaudeville programmes is, not to put too fine a point on it, second-rate; nor is the case much better, if any, with the light music, with the revues and similar shows. It is perhaps a question of lack of funds. Peter is robbed to pay Paul.

A good deal of the drama, and a considerable proportion of the Talks, are second-rate. Speaking generally, the more popular side of the programmes is second-rate. Ought this to be?

At any rate, while everybody will wish success to the Empire Station, the majority of listeners will fervently pray that the finding of the money will not mean the further starving of the "entertainment" side of the programmes. It is not particularly good soup as it is; but as yet it isn't quite skilful.

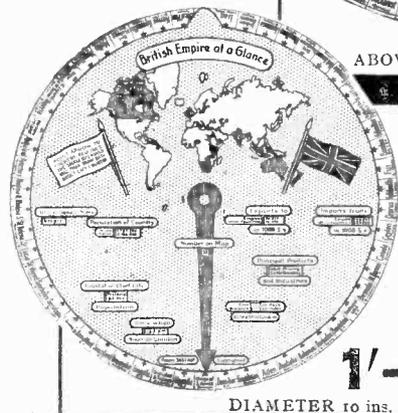
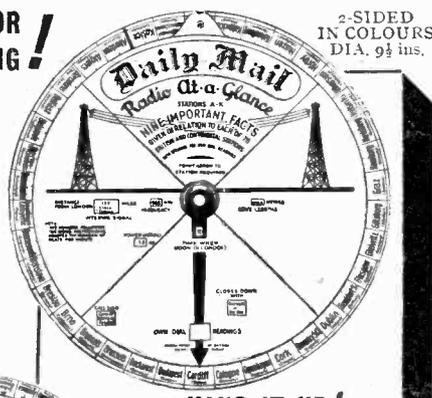
A SHILLINGSWORTH

HARD TO BEAT FOR THE XMAS STOCKING!

LOCATE AND IDENTIFY 76 BROADCASTING STATIONS "AT-A-GLANCE" WITH THE AID OF THIS CLEVER

DAILY MAIL RADIO WHEEL

DON'T WASTE YOUR TIME TURNING OVER LEAVES OF BOOKS AND PAPERS.



OVER 500 FACTS BY A TURN OF THE POINTER. PRESENTED IN AN ENTERTAINING MANNER.

EUROPE — BRITISH EMPIRE — SCOTLAND — IRELAND — ENGLAND AND WALES — U.S.A. — N. AND S. AMERICA — TIME, &c.

GEOGRAPHY MADE EASY

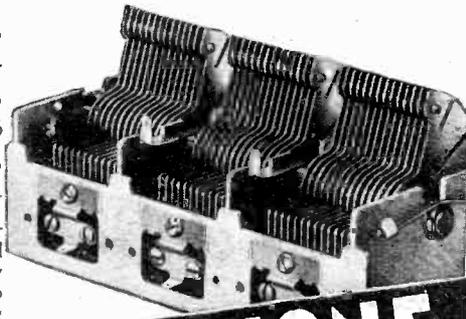
AT ALL STATIONERS, BOOKSTALLS, RADIO STORES, ETC. OR IF ANY DIFFICULTY WRITE DIRECT TO FRANK PITCHFORD & CO., LTD., WELL STREET, LONDON, E.C.1

SIMPLIFYING SELECTIVITY

The wonderful new Radiophone Ganged Condensers are specially designed to meet the requirements of modern circuits demanding very high selectivity, smooth action and accurate matching. WE GUARANTEE ACCURACY.

- 2-Gang 18/- Dustproof cover 3/-
- 3-Gang 28/- Dustproof cover 3/6
- 4-Gang 38/- Dustproof cover 4/-

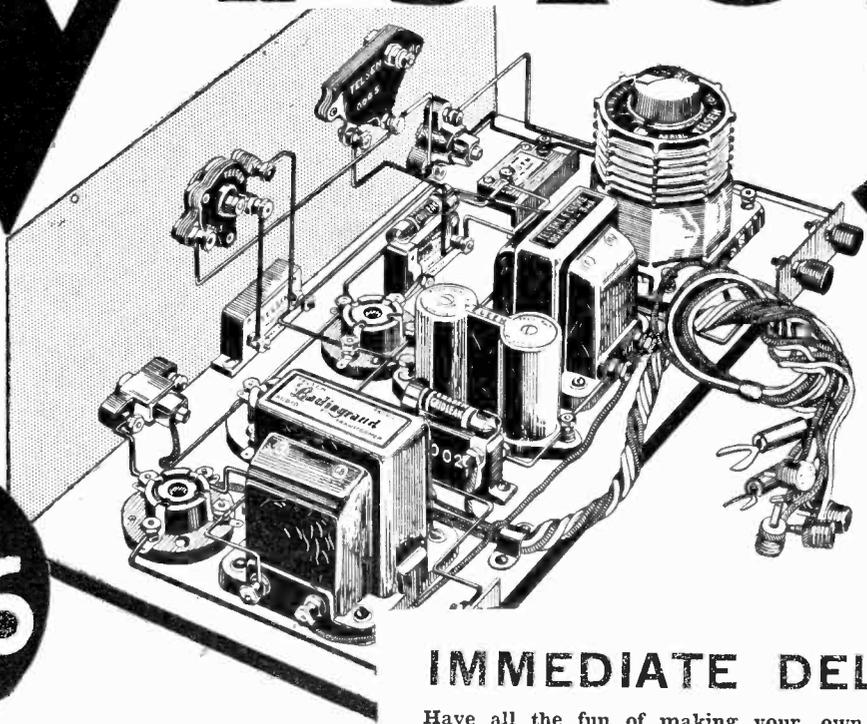
Oxidised Silver Escutcheon and Drive Assembly with pilot lamp and attachment 5/-



RADIOPHONE GANGED CONDENSERS

Write for descriptive illustrated brochure. THE BRITISH RADIOPHONE LTD., Aldwych House, ALDWYCH, W.6.2

TELSEN BUILD THE VICTOR 3



39/6

- Super 3-valve receiver built entirely with all-British Telsen Components, matched for efficiency.
- Complete with panel, baseboard, battery cord, battery plugs, terminals, connecting wire, terminal and escutcheon plates, full-size blue print, and point-to-point wiring chart, with full instructions, etc., etc.
- Separation of Regional from National programmes guaranteed by incorporation of Telsen Dual-Range Aerial Coil.
- Very simply built and simply operated. Full constructional and operating details with every kit.

IMMEDIATE DELIVERY

Have all the fun of making your own radio set—with success guaranteed. No expert skill is needed to build the Telsen Victor 3. An evening delightfully occupied and you are ready to tune in for the first time. And a child can operate it when complete—simple to build and simple to work—with a performance that will astonish you.

- KIT 1** Exactly as supplied by Telsen, with Base-board, Metal Panel, flex and terminal connections, in sealed Carton as advertised - **39/6**
- KIT 2** As Kit 1 with Valves as specified (Mazda HL2, Mazda L2, Mazda P220A) less Cabinet - **70/-**
- KIT 3** As Kit 2 with Valves as specified and Cabinet. Cash or C.O.D. or 12 Monthly Payments of 8 - **82/6**

MONEY RETURNED IF NOT SATISFIED

BOYNTON'S
67 & 68, STAFFORD STREET
BIRMINGHAM

ORDER FORM

To BOYNTON'S
67-68 Stafford Street, BIRMINGHAM

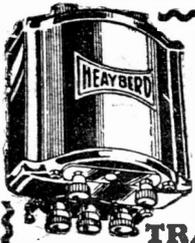
Please send Kit 1.....(Cash or C.O.D.)
 Kit 2.....(Cash or C.O.D.)
 Kit 3.....(Cash, C.O.D. H.P.)
 (Place X against kit required)

For which I enclose £ . s. d.

Name.....

Address.....

P.W.28/11/31



Step your
MAINS—
up or down
with an
AUTO-

TRANSFORMER

The lack of uniform Mains voltages often occasions trouble and cost to Radio Owners. If you want to buy a set designed for a lower or higher voltage than your mains—convert your mains with our "Mains Voltage Converters."

Model 400.—From 200-250v. to 100-110v., or from 100-110v. to 200-250v. (100 watts) **22/6**

Model 401.—From 200-250v. to 100-110v. (50 watts) **16/-**

Model 402.—From 100-110v. to 200-250v. (50 watts) **16/-**

Model 403.—From 200-250v. to 200-250v. (50 watts) **17/6**

POST NOW

Send 3d. stamps for illustrated list 951 and diagrams showing typical examples of mains converting.

M.....
Address.....



MASTERS OF THE MAINS.

10, FINSBURY STREET, LONDON, E.C.2
(One minute from Moorgate Und. Stn.)

ENGINEERS!—Are you earning less than £1 per week? If so, you cannot afford to carry on without reading "Engineering Opportunities." This 200-page book is filled with matters of vital importance to you. Among other things, it explains the methods of our unique Appointments Department, gives details of all leading Eng. Exams. (A.M.I.Mech.E., I.E.E., B.Sc., G.P.O., etc.) and outlines modern Courses in Civil, Mech., Elec., Motor, Aero, Radio, Talkie, and all other branches of Engineering. This book will alter your entire outlook and earning power. It is quite **FREE**. Send a P.C. for your copy **NOW**.

BRITISH INSTITUTE OF ENGINEERING TECHNOLOGY,

401, Shakespeare House, 29/31, Oxford St., London.

MAKE OR BUY A GRAMOPHONE

at a quarter shop prices, or buy Cabinets for Wireless. British double spring motor 12" velvet turntable, wax arm, metal sound-box, amplifier, needle case, for £1/16/0 p.p., and build your own Cabinet. Portable Gramophones from 15/6, postage 1/6. Motors from 7/6. Lists free, 64 pp., 1931 Catalogue No. 220, with Reduced Prices. Drawing and How to Make Gramos., 3d.

REGENT FITTINGS CO. (P.W.), 120, Old Street, London, E.C.1

AWAY WITH WAVE TRAPS

FIT A 'PIX'

ON YOUR AERIAL

IMPROVES ANY SET

Put this neat 3 in 1 gadget in your aerial and get knife-edge selectivity. Cut out the "local" and bring in those elusive foreigners. Control volume down to a whisper without distortion and improve the tone of your set beyond belief. Nothing like it ever offered before. Superhit selectivity on a three-valve set!

RUSSELL WIRELESS INC., 14, Newgate St., London, E.C.4



2/6 POST FREE

PLEASE be sure to mention "Popular Wireless" when communicating with Advertisers. Thanks!

TECHNICAL NOTES

Some diverse and informative jottings about interesting aspects of radio reception.

By Dr. J. H. T. ROBERTS, F. Inst.P.

Buying a Pick-up.

IN choosing a pick-up many people are influenced mainly by the question of price and do not pay enough regard to the more important matter of performance. This is really a mistake, because there are now so many good quality pick-ups on the market at a reasonable price that there is no excuse for having a bad one.

I think it is a good principle, in regard to a pick-up (as with a motor-car) to make a careful survey of those of your various friends before coming to a decision. From them you will hear a hundred-and-one little points which you would never learn from the dealer and which you would otherwise have to find out by your own experience.

The same sort of thing applies also in the case of loudspeakers: in fact, pick-ups and loudspeakers are very much in the same category from the point of view of making a choice.

Varied Characteristics.

Some pick-ups give too much bass preponderance, others favour the high frequencies, with the result that the reproduction sounds too low- or too high-pitched, as the case may be, instead of being nicely balanced. Some produce a special kind of "surface noise" whilst others are too stiff in the movement, or too free.

Again, some of them will "chatter" badly, which is very objectionable and seems as though the record were suffering in the process. Whether the record actually suffers through a "chattering" pick-up is a matter of opinion; personally, I think it does.

Some types of pick-up obviously bear the mark of the expert, and the various points, both electrical and mechanical, have evidently received proper and skilled attention. Other examples, on the other hand, may best be described as modified telephone ear-pieces with a needle holder secured to the armature.

Making Adjustments.

A "noisy" pick-up is a great nuisance, as it has to be covered up when a record is being played. I have known cases where the pick-up gave forth a kind of "reedy" sound on certain notes, for all the world as though it were stripping all the skin off the record!

Sometimes this sort of thing is due to a lack of proper damping in the pick-up, or to want of adjustment, and may not be due to inherent bad design. If so, it is quite possible to remedy the trouble by adjusting the movement, but remember that adjusting a pick-up is in most cases a ticklish job and one that you should not undertake unless you feel confident that you can carry it out properly.

If you think your pick-up requires adjustment, and you do not know how to set about it, far better to take it to some expert

(Continued on next page.)

Enclose your set in this
BEAUTIFUL CABINET

Here is a Cabinet of outstanding beauty at a really remarkable price. It costs only **24/6** and enables you to enclose all batteries, etc., giving a neatness and beauty of appearance worthy of your set.



Carriage and Packing Free England and Wales.

Constructed mainly of oak, finely polished a rich nut-brown shade, this Cabinet stands 36 inches high. The panel space measures 18 x 7 ins., while the top is 21 ins. wide by 14 1/2 ins. deep. The loudspeaker aperture is 10 ins. diameter and is covered with fine amber silk. There is a removable panel back giving free access to batteries and speaker. The deep-hinged lid enables the set to be removed bodily. Decide **now** to have this fine Cabinet in your home. Money back if not entirely satisfied.

Fit up your own Speaker and save cash



Polished Oak Speaker Case. Specification: Height 15" Width 13" Depth 5 1/2" Fret covered Silk Gauze. Back perforated and base covered in velvet, at the low **7/6** cost of Or complete with guaranteed British-made Speaker Unit 15". Carriage Paid England, Wales and Scotland. Do not be content with radio in one room only. Fit up these speakers in any room at fractional cost. Early application advised as stock is limited.

Send to-day to:—
SOLOCA MANUFACTURING WORKS,
38, Stroud Green Road, London, N.4.
(List of Furniture and Wireless Bargains free on request.)

EXACT TUNERS

250 to 2,000 metres. Thousands of these tuners are in use, and we can strongly recommend them. No further coils are required. Send P.C. for particulars and circuits—**FREE**.

THE EXACT MANUFACTURING CO.,
Croft Works, Priory street, Coventry.

LOUD SPEAKERS REPAIRED, 4/-

(Blue Spot a Speciality, 5/-)

Transformers 4/-, Headphones 4/-, all repairs magnetised free. Tested, guaranteed, and ready for delivery in 24 hours.

Discount for Trade. Clerkwell 9059
E. MASON, 44, EAST ROAD, N.1.

WET H.T. BATTERIES
Solve all H.T. Troubles.
SELF-CHARGING, SILENT, ECONOMICAL
JARS (waxed), 2 1/2" x 1 1/2" sq. 1/3 doz.
ZINCS, new type 10d. doz. Sacs 1/2 doz.
Sample doz. (18 volts), complete with bands and electrolyte. 4/1. post 9d.
Sample unit, 6d. Illus. booklet free.
Bargain list free.
AMPLIFIERS, 30/- 3-valve set, £5.
P. TAYLOR, 57, Studley Road, STOCKWELL, LONDON

AGENTS WANTED to sell Wireless Goods (all makes). Cash or easy terms. Only reliable people who can introduce good business are invited to apply for terms and commission to: **NEW AUTO SUPPLY CO., 241, Park Rd., Aston B'ham.** The old established and reliable firm.

YOU CAN BUILD A £40 GRAMOPHONE WITH OUR SCALE 40/- DRAWINGS FOR 40/-
Book of instructions, 3d. Catalogue of Motors, Tone-arms, Sound-Boxes, latest internal Amplifiers, Gramophones, or Cabinets Free. Cash or terms.
V. BURT, 185, High St., Deptford

REMEMBER! "POPULAR WIRELESS" has the largest sale of any **WEEKLY WIRELESS JOURNAL.**

TECHNICAL NOTES

(Continued from previous page.)

friend (make sure he understands it!) or to return it to the dealer or the makers. A good pick-up is rather like a watch; it wants careful treatment and proper handling if you are to get the best out of it.

Is Sensitivity Important?

Many people attach too much importance to the question of sensitivity in a pick-up. It is true that, other things being equal, the greater the sensitivity of the pick-up the less amplification you require after it, which naturally makes it more economical.

But it is possible to push this principle too far. Extreme sensitivity in a pick-up has to be paid for in other ways, even if it economises in valve "juice." The pick-up, if unduly sensitive, is apt to become delicate and to exhibit various caprices.

It is also in danger of developing resonances or peaks, which are worse than anything. A pick-up of good but not extreme sensitivity is, in my opinion, best for all-round use and will be found much more manageable than one which has been tuned-up for the last atom of sensitivity.

The Needle Armature.

The so-called "needle armature" pick-up has a good deal to recommend it. The moving system is very light in weight, so that the reaction on the record is very small, and also the needle system is able to respond more faithfully to the record track.

Furthermore, owing to the small restoring force when the armature is displaced from its mean position, there is less chance of peaks or resonances being encountered.

It is now a very general practice to use a volume control of one sort or another with a pick-up, so as to regulate the input to the first valve. A common form of control consists of a potentiometer having a fairly high, but not too high, resistance: about 100,000 ohms is a fairly high value for the resistance, and this may even go as low as 20,000 ohms.

Earthing and Stability.

A point of practical importance, which often makes quite a lot of difference to the working of a pick-up, is to earth the case or cover of the pick-up. Of course, if the case is in metallic contact with the arm, and the latter is properly earthed (as it should be), then there is no need to earth the pick-up separately.

You will soon notice whether the pick-up requires to be earthed by bringing your hand close up to it. Sometimes you will get a continuous howl or whistle when the pick-up is not earthed, which, of course, makes it impossible to operate the set until the earth connection is made.

Magnetic Recording.

I made a number of tests some time back with the new Stille talking tape machine, as used by the B.B.C. As you probably know, this is a modernised version of the original "telegraphone" of Poulsen; although the principle is the same, the difference between the original and the modern instruments is, of course, enormous.

In the days of the original telegraphone there were no valve amplifiers to aid in impressing the sounds upon the wire or in

(Continued on next page.)

New Times Sales Co

SEND NOW FOR OUR CATALOGUE IT'S FREE!

MANUFACTURERS' KITS

V3 RADIO FOR THE MILLION

10/- DOWN and 11 monthly payments of 10/10.

Screened-grid, Detector and Power. With Valves less £5:17:6
Cabinet. CASH PRICE

VICTOR 3

TELSEN CASH PRICE £1:19:6 5/6 WITH ORDER

Comprising Detector and 2 stages of L.F. with panel and baseboard. Balance in 7 monthly payments of 5/6.

TELSEN COMMODORE S.G. THREE KIT "A"

Author's Kit less Valves & Cabinet. Cash or C.O.D. 7/10
Balance in 11 monthly payments of 7/10. DOWN
Cash or C.O.D. £4.5.5. Cabinet 17 6.

COSSOR

234 EMPIRE MELODY MAKER

Screened-grid, Detector and Power. With valves and cabinet. CASH PRICE £6:15:0
Balance in 11 monthly payments of 12/6. WITH ORDER
Finished instrument. Royalties Paid £7:10:0
Cash or £2 deposit and 11 monthly payments of 11/-.

OSRAM NEW MUSIC MAGNET 4

Two Screened-grid, Detector and Power. With valves and cabinet. CASH PRICE £10:15:0
Balance in 11 monthly payments of 19/8. WITH ORDER
Finished Instrument. Royalties Paid. £11:15:0
Cash, or £2 deposit and 11 monthly payments of 19/6.

TELSEN CONQUEROR THREE KIT A

Author's Kit, less valves and cabinet Balance in 8 monthly payments of 5/-
Cash or C.O.D. £1.19.9. DOWN
Valves for above £1 7s. 6d. Cabinet 17 6.

ELIMINATORS

EKCO K.12 H.T. ELIMINATOR AND L.T. TRICKLE CHARGER. Delivers 12 m/a. Tapped at 80 v. (S.G.), 120/150 v. Charges 1/2-amp. at 2, 4, or 6 v. Cash Price £3 19s. 6d.
Balance in 11 monthly payments of 7/2. With 7/2 order

ATLAS A.C. ELIMINATOR TYPE A.C.244. Three tappings, S.G., Detector, and Power. Output, 120 volts at 20 m.a. Cash price £2 19s. 6d.
Balance in 11 monthly payments of 5/6. With 5/6 order

SPEAKERS

AMPLION MOVING-COIL SPEAKER, TYPE M.C.6. Permanent magnet, with output transformer. Complete. Cash price £3 7s. 6d.
Balance in 11 monthly payments of 6/2. With 6/2 order

BLUE SPOT SPEAKER UNIT AND CHASSIS. Type 100 U. Cash price £1 19s. 6d. Balance in 7 monthly payments of 5/5. With 5/5 order

NEW CELESTION TYPE J.12 SPEAKER AND CHASSIS. Incorporating the famous Celestion reinforced diaphragm. Cash price 38/6
Balance in 7 monthly payments of 5/3. With 5/3 order

CELESTION PERMANENT MAGNET MOVING-COIL SPEAKER. Type R.P.M.8, with 8-in. reinforced diaphragm. Excluding input transformer. Cash price £3 10s. 0d.
Balance in 11 monthly payments of 6/5. With 6/5 order

MAGNAVOX PERMANENT MAGNET MOVING-COIL SPEAKER. With 2 ratio input transformer. Cash price £3 3s. 0d.
Balance in 11 monthly payments of 5/9. With 5/9 order

GARRARD INDUCTION GRAMOPHONE MOTOR. Model 202. Mounted on 12-in. Nickel Motor Plate with electro-automatic start and stop switch. Cash price £2 18s. 6d.
Balance in 11 monthly payments of 5/4. With 5/4 order

Established in 1921—First with Easy Terms

EKCO A.C.25 H.T. ELIMINATOR. Tappings —S.G. 50/80 volts, 100/150 volts at 25 m/a. Cash price £3 17s. 6d.
Balance in 11 monthly payments of 7/1. With 7/1 order

REGENTONE H.T. ELIMINATOR for D.C. Mains, Type D.C.1. Adjustable S.G. Tapping; Detector and Power, 25 m/a. Cash Price, £1 15s. Balance in 7 monthly payments of 4/9. With 4/9 order

REGENTONE W.5A COMBINED H.T. ELIMINATOR AND TRICKLE CHARGER. One adjustable S.G., 1 variable and 1 fixed tapping for H.T. L.T. charging for 2 and 0 volts. For A.C. mains. Cash price £4 12s. 6d.
Balance in 11 monthly payments of 8/6. With 8/6 order

EPOCH PERMANENT MAGNET MOVING-COIL SPEAKER. Type A.2. Cash price £3 3s. 0d.
Balance in 11 monthly payments of 5/9. With 5/9 order

ORMOND PERMANENT MAGNET MOVING-COIL CHASSIS (No. 464). With tapped input transformer. Cash price £3 5s. 0d.
Balance in 11 monthly payments of 6/-.

ROLA PERMANENT MAGNET MOVING-COIL SPEAKER. Complete with input transformer. Cash price £2 17s. 6d.
Balance in 8 monthly payments of 7/1. With 7/1 order

W.B. PERMANENT MAGNET MOVING-COIL SPEAKER, TYPE P.M.3. With 3-ratio input transformer. Cash Price £2 12s. 6d.
Balance in 11 monthly payments of 4/10. With 4/10 order

B.T.H. SENIOR PICK-UP. With tone arm. Cash price £2 5s. 0d.
Balance in 11 monthly payments of 4/2. With 4/2 order

MARCONIPHONE PICK-UP. With tone arm. Cash price £2 5s. 0d.
Balance in 11 monthly payments of 4/2. With 4/2 order

NEW TIMES SALES CO. 56, LUDGATE HILL, LONDON, E.C.4. Phone: CENTRAL 2716.

- (a) Please send me FREE your 1932 Radio Catalogue
- (b) Please send me further particulars of.....
- (c) I enclose..... s. d. as first payment for

NAME.....

ADDRESS..... P.W. 28/11/31



Your Gift
CLIX CONSTRUCTOR'S KIT

Contains an assortment of nineteen fittings specially selected for "Popular Wireless" receivers.

3/5 VALUE FOR 3/-

See list of contents on lid.

From all dealers or direct. Folder 'P' Free.

Cheapest PERFECT Contact

LECTROLINX, Ltd., 254, Vauxhall Bridge Rd., S.W.1

OAK CABINETS, hand polished. 12" x 7" 14" x 7" x 10" 6" x 16" x 7" 18" x 7" x 10" 6" 6" 21" x 7" x 10" 8" Baseboards, 6d. extra. Cash with order. R-fund unsatisfied. Carriage, 1/6. State nearest station. Send for price of type of cabinet required. Panels, wireless components, etc. Cabinets supplied to trade. **F. S. GIBSON, Cabinet Maker, 99, Burnley Rd., Ainsdale, Lancs. Tel.: 7557. Stamp for reply**

RUN YOUR SET FROM THE MAINS

SEND for ILLUSTRATED CATALOGUE SHOWING COMPLETE RANGE OF M.P.R. MODELS TO SUIT ANY SET. A.C. MODELS FROM £2.2.6.

ADAPTUS CO., 12, ALBERT RD., ROMFORD, ESSEX.

BRITISH MADE

GLOSTER COMPONENTS

"P.W." DUAL COIL	...	...	...	6	d.
STAR-TURN SELECTOR COIL	...	...	...	7	6
B.B.C. SIX-PIN COIL	...	...	...	2	6
SIX-PIN DUAL WAVE COIL	...	...	...	5	0
VARIABLE CONDENSER, .0005" or .0003	...	...	...	3	6
DIFFERENTIAL CONDENSER	...	...	...	2	9
REACTION	...	...	...	2	9
NEUTRALISING	...	...	...	2	6
3-POINT SWITCH	...	...	...	1	0

From your dealer or direct from manufacturer.

T. R. FRANCIS,

28, Gloucester Street, Clerkenwell, London, E.C.1.
POST ORDERS Promptly Attended to.

REPAIRS

IN 48 HOURS

TRANSFORMER REPAIR CO., Post Free 3/3
53B, GARRATT LANE, LONDON, S.W.17 Terms to Trade

PLEASE be sure to mention "Popular Wireless" when communicating with Advertisers. Thanks!

THE PICTURE PAPER WITH THE MOST NEWS
SUNDAY GRAPHIC
and Sunday News.

TECHNICAL NOTES

(Continued from previous page.)

magnifying them when they were reproduced. Consequently the invention was bound, as you might say, to await the advent of valve amplifiers before it became a commercial possibility.

Background Noises.

The modern instrument is certainly a practical success. I have seldom heard anything so wonderful as the recording and immediate reproduction of the voice. The recording is well-nigh perfect; at any rate, as good as, if not better, than the recording of commercial records, and the volume is just anything you like to make it.

Whilst I was recording there happened to be a street musician or a barrel organ (what's the difference?) playing some distance away, so far away that it could be heard only very faintly in the recording room; but in the reproduction, sure enough the organ was there all right. Which shows you how extremely sensitive the instrument is and how it gets all the "background."

Long Life.

One of the most interesting points about this instrument, from the purely scientific point of view, is the fact that the magnetic impressions upon the tape do not "run into one another" to any noticeable extent, although to secure this condition it has been found necessary to run the tape at a certain minimum speed, so as to "space out" the impressions sufficiently far apart.

Another very interesting point is that the magnetic impressions are not destroyed by winding the tape naked upon a spool (like a film), or by rough handling, and do not "decay" appreciably with time. All this makes it possible to store these magnetic tape records for long periods in the same way as ordinary commercial records.

Frames and Capacity.

Readers often wonder why it is that a frame aerial should receive signals even when in the "zero" position, that is, when "broadside on" to the direction of the incoming waves. According to the simple theory of the action of the frame, the effects in the different parts ought just to balance out in this position, leaving no overall or resultant signal energy to be delivered by the frame.

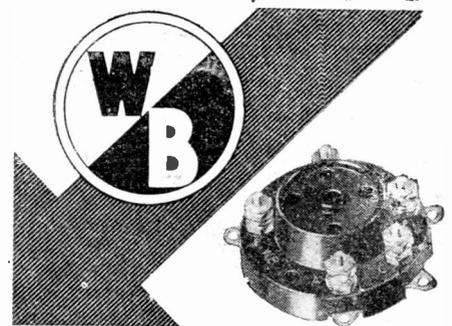
Every one who has used a frame aerial knows, however, that in practice the minimum response is seldom truly zero and the question arises as to how the frame manages to pick up reception in these conditions. There are various causes that contribute to the effect, one of them being the "capacity effect."

One end of the winding on the frame is connected to the grid of the valve, which has very little capacity to earth; the other end, however, is connected to the filament, which in turn means the filament battery and here we have quite a considerable "capacity to earth." This effect upsets the balance referred to above and allows a certain amount of signal current to flow in the frame windings.

This is sometimes explained by saying that the frame acts, to a small extent, as an ordinary line aerial; it is obvious that anything capable of conducting will act to

(Continued on next page.)

1,000,000



VALVEHOLDERS AND SWITCHES

are sold annually. Precision in manufacture, neat finish and utmost reliability are the reasons.

- 5-pin Rigid Valveholder (illustrated) 8d.
- 4-pin Rigid Valveholder - - - - 6d.
- 4 or 5-pin Valveholder for A.C. Valves 10d.
- 4 or 5-pin Universal Screen Grid type 1/-
- W.B. Antiphonic Valveholders - - 1/3

Made by the Makers of the famous W.B. Permanent Magnet Moving Coil Speakers.

Write for latest illustrated lists (free).

WHITELEY ELECTRICAL RADIO Co., Ltd., NOTTINGHAM RD., MANSFIELD, NOTTS.
Irish Free State Distributors: Kelly & Shiel, Ltd., 47, Fleet Street, Dublin.

The "TONIC"

Self-Generating Trickle-Charger Kit enables everybody using a 2-volt accumulator to keep them fully charged at home.

Price 7/-. Postage 9d.

Williams, Netherend, Cradley, Birmingham.

KAY'S CABINETS
The "Popular," 42" high, 21" wide, 14" deep, for panels 18" x 7". Can be adapted to other sizes by suitable free vignette. Speaker chamber 16" square fitted with 7-pl. sub-baffle, hole cut to suit type of speaker used. Back wholly removable. Soudly constructed of oak and richly polished. PRICE 30/-
Illustrated lists of 60 Cabinets free
H. KAY, Cabinet Manufacturer, Mount Pleasant Rd., London, N.17
Walthamstow 1626

ALL COMPONENTS

for the **"FULL RANGE TWO"**

Described in this issue **AT KEENEST PRICES**

Send for List giving Complete Range and Prices to Dept. P.

G. CUNNINGHAM,
RADIO ENGINEER, 1573, GT. WESTERN ROAD AND 264, CROWN ST. GLASGOW

It pays you to ask your Retailer for genuine guaranteed

WAVEMASTER

Variable Condensers and Extensers for all the latest Circuits

WEBB CONDENSER CO., LTD., 42, Hatton Garden, London, E.C.1.

SAFETY FIRST

The Ealex testing Prods, improved type. The points can be fixed in the "out" position, if required, by a sharp turn. For testing sets



with intricate wiring, they prevent short circuits, and save you money in replacements. PRICE **3/6** Per pair Red & Black.

The NEW 1932 model

E E L E X

TREBLE DUTY TERMINALS

The new T2LC Terminal is similar to the old type, the indicating tabs are interchangeable. The Head, although free to rotate is non-detachable.

Write for list A 15

J. J. EASTICK & SONS, Ealex House, 118, Bunhill Row, London, E.C.1. Telephone: Metropolitan 0314,576.



SENSITIVE MICROPHONES

For all Purposes. Latest Improved Types.



For DEAF AIDS, DETECTAPHONES, PUBLIC ADDRESS, SPEECH and MUSIC TRANSMISSION, ANNOUNCEMENTS THROUGH LOUDSPEAKER (with or without Valve Amplifier), WIRELESS TR ANSMISSION, LOUDSPEAKING TELEPHONE, CRYSTAL AMPLIFIER, BABY ALARM or INVALID CALL from Bedroom through distant Loudspeaker. HOME-RECORDING OF GRAMPHONE RECORDS.

British made throughout. Illustrated Lists Free.

FREDK. ADOLPH, Actual Maker, 27 Fitzroy St., London, W.1. Phone: Museum 8329

REMEMBER! "POPULAR WIRELESS" has the largest sale of any WEEKLY WIRELESS JOURNAL.

TECHNICAL NOTES

(Continued from previous page.)

a greater or less extent as an aerial or pick-up of energy if connected in the proper way.

It is unfortunate that the minimum should not be actually zero and in some cases, of course, the minimum reception is not even as small as it might be, so that it becomes correspondingly more difficult to cut out unwanted stations by turning the frame broadside on to them. By the way, in determining the best position or setting for the frame, remember that the "minimum" position is more sharply defined than the maximum position.

A Loudspeaker Problem.

It often happens that you want to use the set in one room and have the loudspeaker free to be put in any of perhaps two or three different rooms in the house. Although this is in one sense perfectly simple, there are certain precautions which you should observe in order to get good results.

As a rule, it is not sufficient merely to run twin flex from the set to the position of the speaker in the distant room. The long leads will be in the anode circuit and if there should be a short circuit, from any cause, or even leakage, the results will be very undesirable. Furthermore the leads will almost certainly have a noticeable effect upon the tone and quality of the reproduction.

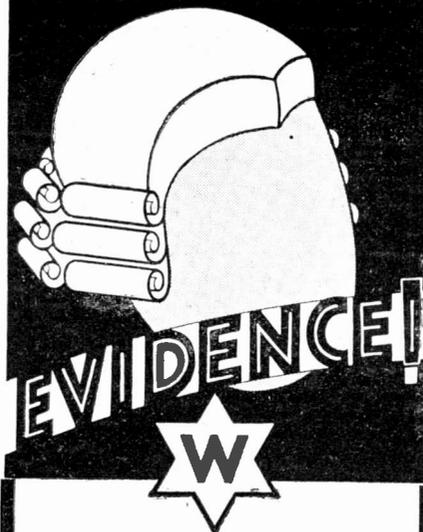
It is much better, in a case like this, to use a filter or transformer output. With such an output device the anode current does not pass through the long extension leads: the only current passing in the leads is the A.C. current due to fluctuations in the anode current, and the dangers mentioned above are entirely avoided.

Separation of Leads.

There is another important point with regard to the extension leads: it relates to the electrostatic capacity between the wires. If ordinary twisted electric light flex is used, the two wires are in very close proximity throughout their entire length and are, in fact, arranged in a way that gives, as you see, just about maximum capacity between them.

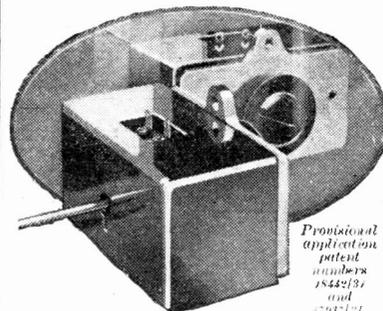
Therefore, it is advisable not to use twin flex for the purpose, because the capacity mentioned may have the effect of suppressing some of the higher notes in the repro-

(Continued on next page.)



A new All-British Guaranteed Loudspeaker Unit for **7/6**

"I ADVISE ANYONE WHO IS IN DOUBT ABOUT THE EFFICIENCY OF AN EXISTING SPEAKER TO WRITE FOR LITERATURE DESCRIBING THIS NEW UNIT WHICH IS NOT ONLY CHEAP BUT APPEARS TO BE A VERY SOUND ELECTRICAL JOB." OBSERVER, "AMATEUR WIRELESS"



Provisional application patent numbers 184297 and 1294101.

It is a loud-speaker unit different both in design and construction to anything else on the market and we guarantee the "PURETONE" FOR ONE YEAR.

- BRITISH MADE AND GUARANTEED.
- HIGHLY SENSITIVE.
- A VERY TRUE TO LIFE REPRODUCTION.
- VERY ROBUST—NOT A SCREW OR BOLT IN ITS CONSTRUCTION.
- AND ONLY 7/6.
- SPECIALLY CONSTRUCTED CONE FOR USE WITH THE PURETONE, Price 2/6 (not essential)
- "SPEAKS FOR ITSELF"

Write to us for full particulars.

Orders dealt with promptly.

Trade Enquiries Invited.

BUY BRITISH COMPONENTS.

The WALTER PURETONE loudspeaker unit

J. & H. WALTER, LTD.

31a, FARM LANE, FULHAM, S.W.6.

Telephone: Fulham 5645. (M.O.107)

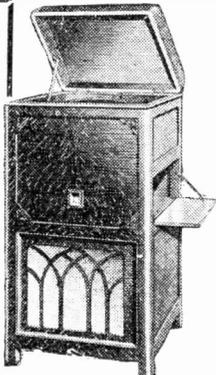
OSBORN

SPECIALLY CONSTRUCTED RADIO-GRAM CABINET for the OSRAM "FOUR" (NEW MUSIC MAGNET) and any set which has side controls THE OSBORN "MAGNET"

Specially constructed Radio Gramophone Cabinet for the Osram Four (New Music Magnet) and any set which has side controls. 3' 6" high, 1' 10 1/2" wide, 1' 8 1/2" deep. The baffle behind the speaker, 20" x 17". There is storage for 100 records and a door on either side of cabinet as illustrated, offering easy access to controls. Also door at back.

Assembled Ready to Polish, Oak, £4. 0. 0. Assembled and Polished, Oak, £5. 0. 0. Ready to Polish, Mahogany, £5. 0. 0. Assembled and Polished, Mahogany, £6. 0. 0. Assembled Ready to Polish, Walnut, £6. 0. 0. Assembled and Polished, Walnut, £7. 0. 0. All Models Carriage Paid. Send 3d. in stamps for 56-page illustrated catalogue.

CHAS. A. OSBORN, Dept. P.W., The Regent Works, Arlington St., London, N.1. Telephone: Clerkenwell 5095. And at 21, Essex Rd., Islington, N.1. (1 min. from the Agricultural Hall). Telephone: Clerkenwell 5634.



All Applications for Advertising Space in "POPULAR WIRELESS"

must be made to the Sole Advertising Agents, JOHN H. LILE, Ltd., 4, Ludgate Circus, London, E.C.4. Phone: City 7261.

PERMCOLO

Nothing looks worse than a dull and discoloured panel. Use mirror polished PERMCOLO, the new Ebonite which is guaranteed never to discolour. Its beauty and polish will delight you, and its cost is less than 1d. per square inch. Don't spoil that set but insist on PERMCOLO, the modern permanent colour Ebonite. From all dealers or direct The British Hard Rubber Co., Ltd., Middlesex. Ponders End.

"CLEAR CUT" CONE PAPER
 20" x 25" Fully Tested by "P.W." Five Vellum Tints, 1 sheet 1/3, 2 sheets 2/-. Post Free. GAHAN, Northdown Rd., Margate. P.O. with order.

Wireless is the World's finest hobby, Make it a profitable one.

MAKE MONEY! MAKE MONEY! NO OUTLAY!

JOIN THE ELECTROSET CLUB!

Every Wireless Amateur, Experimenter, Constructor:

Should write his name and address in the margin, and post this advertisement in a 1d. unsealed envelope to:—

"P.W." THE ELECTROSET CLUB, Poplar Road, Solihull, BIRMINGHAM

EASY PAYMENTS

"There's No Place Like HOLMES."
 The first firm to supply Wireless parts on easy payments. Seven years advertiser in "Popular Wireless." Thousands of satisfied customers.

	Deposit	Monthly Payments
COSSOR KIT	£8/15	10/- 11 of 12/3
OSRAM KIT	£10/15	19/8 11 of 19/8
EXIDE H.T. Accum., 120v.	£3	6/- 9 of 6/3
BLUE SPOT 66R & CHASSIS	£2/2/6	5/8 9 of 4/3
WUFA UNIT & CHASSIS	£2	4/5 9 of 4/5
AMPLION M.C.6	67/8	7/5 9 of 7/5
BLUE SPOT 100U Induc. for Type	39/8	5/8 7 of 5/4
EKCO Eliminator A.C.18	67/-	7/5 9 of 7/5
B.T.H. JUNIOR Pick-up	27/-	5/- 5 of 4/10

New Goods Obtained for Every Order. Send us a list of the parts you require and the payments that will suit your convenience, and we will send you a definite quotation. Anything Wireless. **H. W. HOLMES, 29, FOLEY STREET, Great Portland Street, London, W.1.** Phone: Museum 1414.

AGENTS. Radio in all its branches. Convert your hobby to advantage. Apply for terms of our system of trading. Complete kits by return of post. A.C., D.C. mains receivers. Cash or easy terms.—**Brookman Rapid Radio Service.** Head Office: 105, Spencer Street, Birmingham. Showrooms: 61, Hampton St. and Hockley St. (Corner). The progressive firm with a system.

MODERN WIRELESS
 is
Britain's Leading Radio Magazine.

TECHNICAL NOTES

(Continued from previous page.)

duction. It is much better to use ordinary single conductors—bell wire does very well—and to fasten these to the wall, separating them two or three inches apart throughout their length.

You have only to run a pair of leads like this through to any rooms in which you want to use the speaker, completing each pair with a suitable wall plug, and then you can carry the speaker from one room to another and plug in as desired. It is, however, advisable to disconnect all loudspeaker leads from the set except the pair actually in use.

Reservoir Condensers.

I am often asked whether it is necessary to use a large capacity fixed condenser across the H.T. terminals of a receiver. This question probably arises because you sometimes notice such a condenser used, whilst sometimes a condenser is omitted and naturally beginners are apt to wonder why it should be necessary in some cases and not in others.

NEXT WEEK
"P.W.'s" SPECIAL
 and
ENLARGED XMAS NUMBER
 will be on sale
THURSDAY, DECEMBER 3rd

Here are some of its fine features:

XMAS PAST AND PRESENT

By Capt. P. P. Eckersley, M.I.E.E.

MY RADIO MEMORIES

By Sir Oliver Lodge, F.R.S.

STOCKINGS I WOULD LIKE TO FILL

By Leonard Henry

SOME SEASONABLE SUGGESTIONS

By Victor King

DON'T MISS THOSE XMAS PROGRAMMES

By G. V. Dowding, Associate I.E.E.

HOW TO BUILD "S.-Q. STAR"

Order Your Copy NOW—"P.W.'s"
 Xmas Numbers ALWAYS meet
 with COLOSSAL Demand.

PRICE THREEPENCE AS USUAL

A large fixed condenser of this kind is often referred to as a "reservoir" condenser, and its duty is to store the electricity delivered by the H.T. battery, or whatever it may be, and to supply this to the circuit more smoothly than would otherwise be the case. It is for all the world like a reservoir of water which is so large that when moderate quantities of water are drawn off the "head" of water (representing the pressure) is scarcely affected.

A reservoir condenser of this kind is very useful, for instance, in a case where the H.T. supply consists of a dry battery which is getting run down: such a battery is liable to be variable and to cause all kinds of noises in reception.

To Prevent Howling.

Another function of this reservoir condenser is to bypass high-frequency currents which otherwise would pass through the high-tension battery and, getting mixed up with the L.F. currents, would be liable to cause instability.

As regards the reason why such condensers are sometimes used and sometimes omitted, this is largely a question of economy in the construction of the receiver. There are some cases where the equivalent of the condenser is provided in some outside component, such as a mains H.T. unit, in which case the condenser across the H.T. terminals is not really necessary.

At the same time you are never likely to do any harm, and will usually do some good, by using such a condenser provided, of course, that you take care that it has been thoroughly tested to withstand a voltage at of least 50 to 100 per cent. greater than that which is likely to be applied to it in use.

One of the most fascinating books for boys on the market is the **MODERN BOY'S ANNUAL** which is published at 6s. net. From cover to cover it is crammed with up-to-date attractions—aeroplanes, locomotives, motor-cars, ships, motor-boats and so forth—all dealt with in cheery chatty fashion! There are three complete stories, coloured plates and hundreds of photographic and other illustrations. What a grand gift for a schoolboy.

PAREX

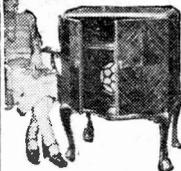
Products PAR-EXcellence
 are used and recommended for the
FULL RANGE TWO

P.J.1 COIL	2/6
QUOIT COILS, wound to specification, each	2/6
.0005 mfd. Solid Dielectric CONDENSER	2/6
.0015 DIFF. REACTION COND.	4/6
H.F. CHOKE	3/6

SPAGHETTI RESISTANCES, ALL SIZES.

Direct from
E. PAROUSSI 10, Featherstone Buildings,
 High Holborn, London, W.C.1
 Phone: Chancery 7010.

PICKETTS' PIANO-TONE CABINETS For YOUR Radio



"The nicest I have seen," says Wireless Constructor.

The sort people desire to possess and keep. Tasteful beauty—Piano finish—advantages also of **PIANO-TONE** baffle chamber. The **BETTER REPRODUCTION** that your Set is really capable of gives you a joyous sense of achievement. Sent **ON APPROVAL** direct from the makers. Prices 35/- to £15 (Cash or Easy Payments). You may return at our expense if you wish to part with it. Photographs and List **FREE!** **PICKETTS' Radio Furniture (P.W.), Albion Road, Bexleyheath, Kent.**

MAINS TRANSFORMER REPAIRS

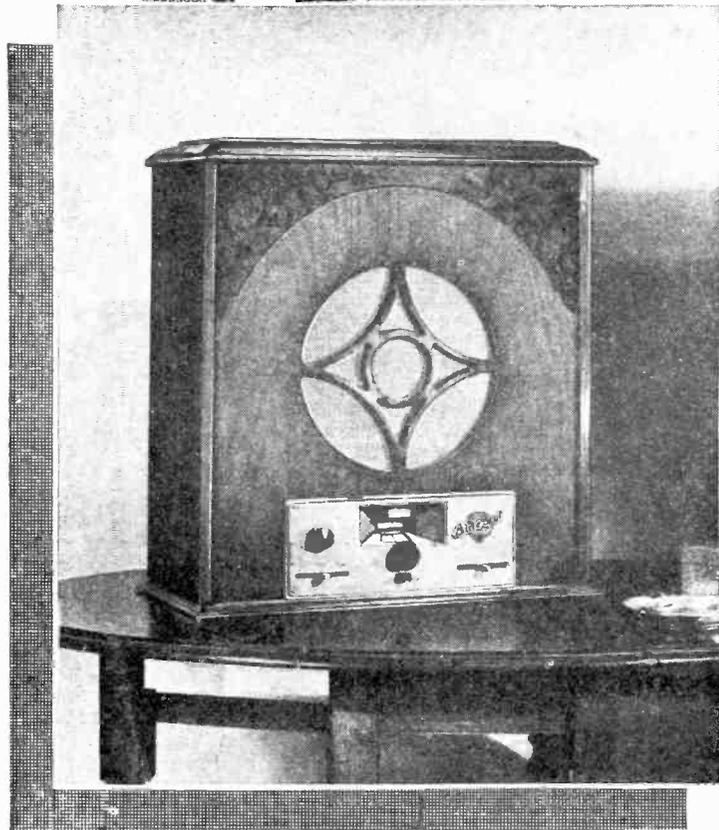
If you have a faulty or burnt-out Mains Transformer we will repair or rewind it for you at a very moderate charge. Send now for quotation, giving full details, to **THE STURDY ELECTRIC CO. (Dept. P.W.), 170, Gloucester Rd., NEWCASTLE-ON-TYNE.**

Make
THE DAILY SKETCH
 YOUR Picture Paper

ADVERTISERS PLEASE NOTE!

The Rate for a one-inch single Column Advertisement is 30/-
 Minimum Space Accepted:
 Half-an-inch .. 15/-
 Send Remittance with instructions to
JOHN H. LILE, LTD.,
 4, LUDGATE CIRCUS, LONDON, E.C.4.
 Telephone - City 7261

A BLUE SPOT SET
with a
BLUE SPOT SPEAKER



In the past we have stated that the speaker is the ultimate test by which all receivers are judged. "A wireless set," we said, "is only as good as its speaker." We believe that still. But now we can offer you a set that IS as good as its speaker, because both are made by BLUE SPOT.

Listen to the BLUE SPOT receiver slipping in Home and Foreign stations without a trace of overlapping or interference. See how quickly you can flit around Europe picking from the choicest programmes the tit-bits that please you most. Admire the wonderfully rich tone of the speaker. Only a BLUE SPOT speaker can achieve such perfect reproduction.

Carry the set about? Of course you can. It will play wherever there is an electric point handy. Just plug in and tune in. It costs no more to run than a reading lamp. The complete Table Grand Receiver in its beautiful cabinet of walnut, complete with moving coil loudspeaker, valves, and Royalties paid, costs 25 gns.

Ask your dealer to let you hear Blue Spot.



OTHER MODELS

- UPRIGHT GRAND exactly the same as the Table Grand but with attractive walnut stand to match receiver. Moving coil speaker. Price 27 gns.
- W.S. 400 in attractive oak cabinet with Inductor-type speaker. Price 20 gns.
- W. 400 in walnut (without loudspeaker) Price £18.
- W. 400 in oak—similar in design to loudspeaker 100 D. (without loudspeaker.) Price £18.

All Blue Spot Receivers have a five valve circuit including two screened grid valves, detector, power output and rectifying valve, and are sold complete with B.R.V.M.A. valves and Marconi Royalty paid.

Send for Receiver Catalogue No. P.W. 18.



SUPER RECEIVERS

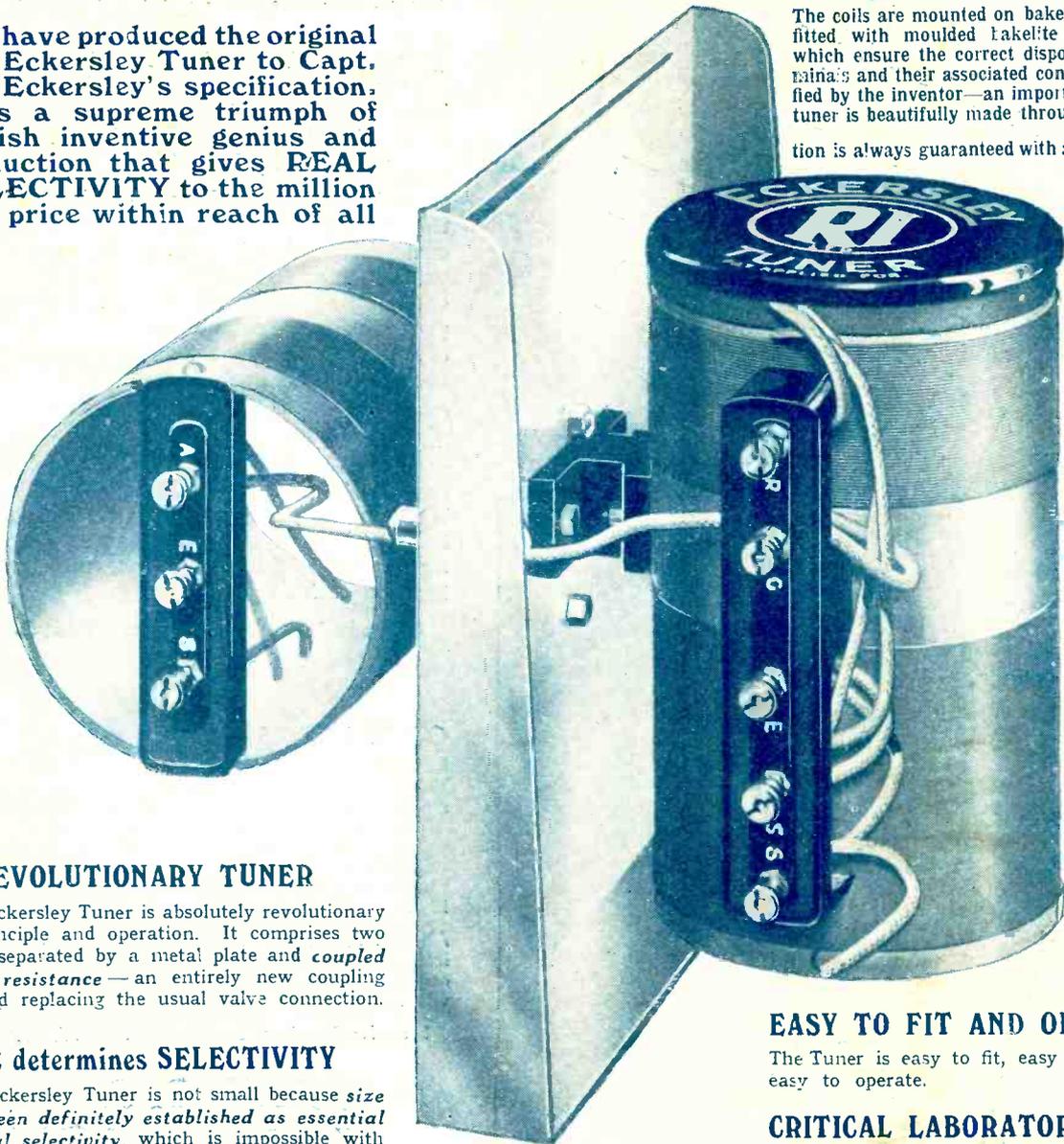
THE BRITISH BLUE SPOT COMPANY LTD.
BLUE SPOT HOUSE, 94/96 ROSOMAN ST., ROSEBERY AV., LONDON, E.C.1
Telephone: Clerkenwell 3570. Telegrams: "Bluospot, Isling, London"
Distributors for Northern England, Scotland and North Wales: H. C. RAWSON, (Sheffield and London) Ltd., 100, London Road, Sheffield: 22, St. Mary's Parsonage, Manchester: 183, George Street, Glasgow.

The 'ECKERSLEY' TUNER

A Miracle in Station Separation

RI have produced the original Eckersley Tuner to Capt. Eckersley's specification. It is a supreme triumph of British inventive genius and production that gives **REAL SELECTIVITY** to the million at a price within reach of all

The coils are mounted on bakelite pedestals and fitted with moulded bakelite terminal panels which ensure the correct disposition of the terminals and their associated connections as specified by the inventor—an important feature. The tuner is beautifully made throughout. Satisfaction is always guaranteed with an **RI** product.



A REVOLUTIONARY TUNER

The Eckersley Tuner is absolutely revolutionary in principle and operation. It comprises two coils, separated by a metal plate and *coupled by a resistance*—an entirely new coupling method replacing the usual valve connection.

SIZE determines SELECTIVITY

The Eckersley Tuner is not small because *size has been definitely established as essential to real selectivity*, which is impossible with small high resistance coils unless elaborate costly tuning apparatus is employed.

INTERFERENCE REJECTED BEFORE VALVE AMPLIFICATION

The modern practice of coupling two tuned circuits by a valve, magnifies interference. *The Eckersley method of resistance coupling tunes first*, cuts out mush, obviates sideband jamming and passes only clean, selected signals for first and subsequent amplification.

EASY TO FIT AND OPERATE

The Tuner is easy to fit, easy to connect and easy to operate.

CRITICAL LABORATORY TESTS

This R.I. model has been fully approved by the inventor and the Editors of "Popular Wireless" and "Modern Wireless" and each Tuner, as in the case of all our apparatus, is subjected to the most critical laboratory tests before release.

SELECTIVITY at a PRICE WITHIN REACH OF ALL 15/6

List No. BY.30. Provisional Patent 29404-22.10.31

Ask your dealer, or us, for a copy of the "Eckersley Tuner" Leaflet and the 1931-32 Catalogue.



The Advertisement of Radio Instruments Ltd., Croydon, Surrey. 'Phone: Thornton Heath 3211.

Printed and published every Thursday by the Proprietors, The Amalgamated Press, Ltd., The Fleetway House, Farringdon Street, London, E.C.4. Advertisement Offices: Messrs. John H. Lyle, Ltd., Lutigate Circus, London, E.C.4 (Telephone: City 7261). Registered as a newspaper for transmission by Canadian Magazine Post. Subscription Rates: Inland and Canada, 17/4 per annum; 8/8 for six months. Abroad (except Canada), 19/6 per annum; 9/9 for six months. Sole Agents for Australia and New Zealand: Messrs. Gordon & Gotch, Ltd.; and for South Africa: Central News Agency, Ltd. Saturday, November 28th, 1931. S.S.