

LARGEST RADIO CIRCULATION IN THE WORLD

# Popular Wireless

Every Thursday  
PRICE  
3d.

No. 472. Vol. XIX.

INCORPORATING "WIRELESS"

June 20th, 1931.

## *Special* "COMPONENTS AND ACCESSORIES" *Number*

IF YOU ARE UNABLE TO CUT  
OUT ANY ONE OR EVEN  
TWO POWERFUL  
STATIONS BUILD  
THE  
REGIONAL  
"ERASER"  
(See Page 473.)





# SEEN IT? — THE JULY WIRELESS CONSTRUCTOR

An Unusually Fine Number!

Among the contents you will find

**THE  
SUMMA-CONE**

A novel and  
efficient home-  
made

**LOUD SPEAKER**

**A "TRAPPER"  
FOR THE NORTH**

which cuts out Moor-  
side Edge or other  
interfering stations and

**CLEARs THE DIAL**

**THE  
SUMMA-FILTER**

An easily-made  
and compact filter  
unit

**FOR THE OUTPUT**

Also



## "EXTENSER" FOUR

**VICTOR KING'S LATEST  
SIMPLICITY SET**

*Magnificent long-distance results are assured  
and perfect quality rendered possible by the  
employment of an H.F., Det., and 2 L.F.  
circuit of wonderful capabilities.*

It incorporates  
**SIMPLIFIED "EXTENSER"  
TUNING**

# The WIRELESS CONSTRUCTOR

**JULY  
NUMBER**

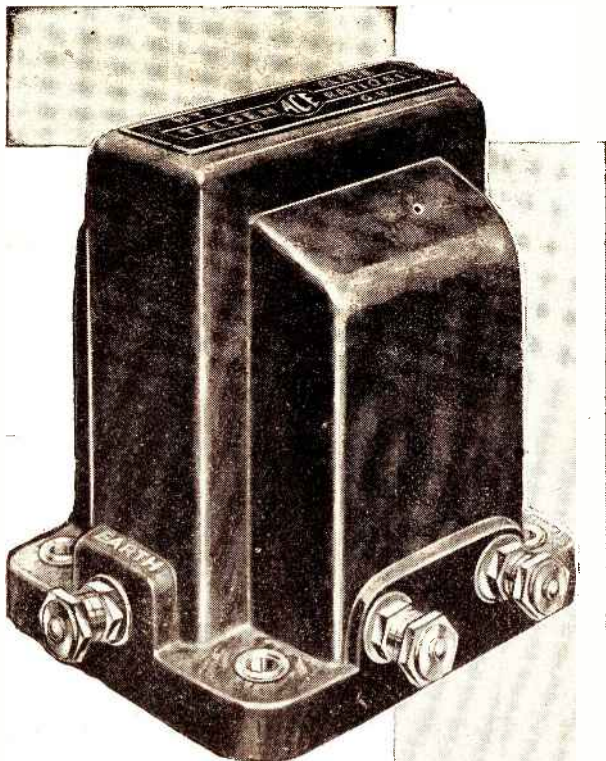
**ON SALE  
EVERYWHERE**

**PRICE  
SIXPENCE**



# TELSEN

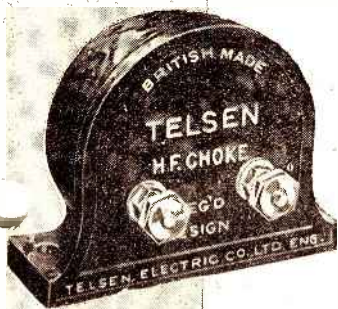
## RADIO COMPONENTS



**TELSEN STANDARD H.F. CHOKE.**

Designed to cover the whole broadcast range. Exceptionally low self capacity, inductance 150,000 microhenries, resistance 400 ohms. Price 2/- each.

2/-



**TELSEN GRID LEAKS.**

Absolutely silent and non-mercuric, practically unbreakable, cannot be burnt out and are unaffected by atmospheric changes. Telsens Grid Leaks are not wire wound, therefore there are no capacity effects. Made in capacities of 1, 3, 1, 2, 3, 4, and 5 megohms. Price 9d. each.

9<sup>d</sup>



THE WORLD-FAMOUS TELSEN TRANSFORMERS NEED NO INTRODUCTION TO the Radio Public—their sterling qualities of life-like reproduction cannot be excelled, their characteristics are being continually improved, and the new Telsens range embodies the latest improvements that technical research and design can produce. They are now more than ever "RADIO'S CHOICE" for "BETTER RADIO RECEPTION."

- Price, each
- ACE ratios 3-1 and 8-1 5 6
- 5-1 5 6
- RADIOGRAND ratios 3-1 and 5-1 2 6
- RADIOGRAND super ratio, 7-1 12 6
- RADIOGRAND TRANSFORMER, ratio 1-1 12 6
- OUTPUT TRANSFORMER, ratio 1-1 12 6
- MULTI-RATIO OUTPUT TRANSFORMER, ratios 9-1, 15-1, 22.5-1 12 6
- PENODE OUTPUT TRANSFORMER 12 6

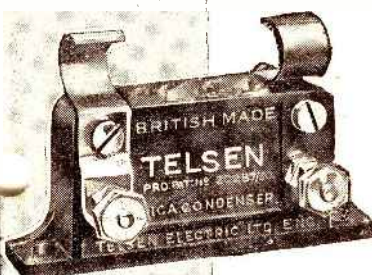
ACE 5 6

RADIOGRAND 8 6

**TELSEN FIXED MICA CONDENSERS.**

Prov. Pat. No. 20287/30. Made in capacities up to .002 and .0003 supplied complete with patent Grid Leak Clips to facilitate series or parallel connections. Can be mounted upright or flat. Tested at 500 volts. Price 6d. each.

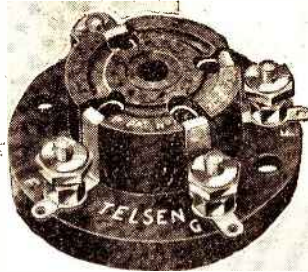
6<sup>d</sup>



**TELSEN VALVE HOLDERS.**

Prov. Pat. No. 20286/30. An improved design in Valve Holders embodying patented Spring contacts for split or solid valve legs, low capacity and self-heating. Prices: 4-pin, 6d. each, 5-pin, 8d. each.

6<sup>d</sup>



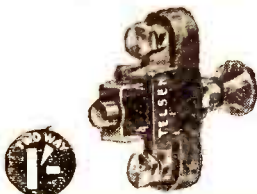
**COLOSSAL PRODUCTION**  
*makes possible*  
**ASTOUNDING PRICE REDUCTION**



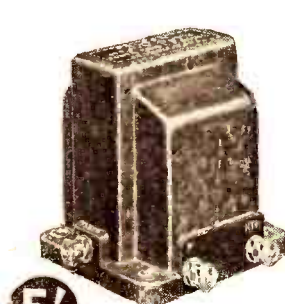
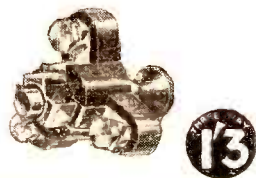
# TELSEN'S LEAD TO

Mass production enters the radio industry, and the home constructor benefits immediately ... First, all the established and world-famous Telsen components are reduced to amazingly low figures. Second, a further range of Telsen components is added at correspondingly low prices. Behind these new price levels are the brains of skilled engineers and costing experts, for the high standard of quality and performance, which has made Telsen famous throughout the world, is rigidly maintained.

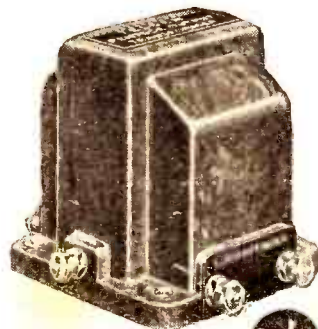
Specify Telsen when buying components.



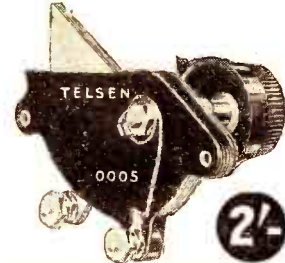
**TELSEN PUSH-PULL SWITCHES.** Prov. Pat. No. 14125/31. These Switches have many salient features—self-cleaning knife contacts, positive snap action, the spindle cannot rotate, eliminating all crackle, and is insulated from both contacts. The low self capacity makes it suitable for use in H.F. circuits. **TELSEN PUSH-PULL SWITCHES.** 2-way, Price 1/-, 3-way, Price 1/3.



**TELSEN L.F. INTERVALVE COUPLING CHOKE,** specially designed for use as coupling chokes in the anode circuits of modern radio receivers. Made in a range of three inductances—40, 100 and 125 henrys. Price 5/- each. **HEAVY DUTY POWER GRID L.F. CHOKE.** 40 henrys. Price 8/-.



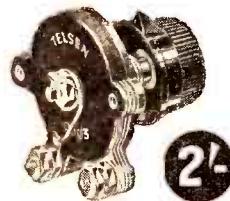
**TELSEN PENTODE OUTPUT TRANSFORMER.** Price 12/6 each.



**BAKELITE DIELECTRIC TUNING CONDENSER.** Made in capacities of .0003 and .0005. Price 2/- each.



**BAKELITE DIELECTRIC DIFFERENTIAL CONDENSER.** Made in capacities of .0001, .00015, and .0003. Price 2/- each.



**BAKELITE DIELECTRIC REACTION CONDENSER.** Made in capacities of .0001, .00015, and .0003. Price 2/- each. Capacities of .0005 and .00075. Price 2/6 each.



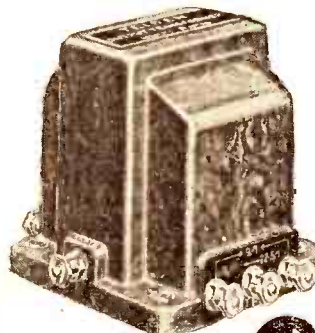
**THE TELSEN BINOCULAR H.F. CHOKE** has an exceptionally high impedance and low capacity resulting in an excellent performance curve.

It has a restricted field and covers the whole broadcast. Free from parasitic resonances.

INDUCTANCE...180,000 microhenrys  
SELF CAPACITY...000002 microfarad  
RESISTANCE...750 ohms  
Price 5/- each.



**TELSEN "4-POINT" PUSH-PULL SWITCH.** Prov. Pat. No. 14125/31. This model is a 2-pole switch with an insulated spindle—highly suitable for use in wave-changing on two coils or an H.F. Transformer. **TELSEN "2-POLE" PUSH-PULL SWITCH.** Price 1/6 each.



**TELSEN MULTI RATIO OUTPUT TRANSFORMER.** Ratios 9-1, 15-1, 22.5-1. Price 12/6 each.



**TELSEN RADIOGRAND TRANSFORMER.** Ratio 1.75-1, for super quality reproduction. Price 12/6 each.

THE LARGEST RADIO COMPONENT MANUFACTURERS IN THE WORLD



# THE RADIO WORLD



5/6

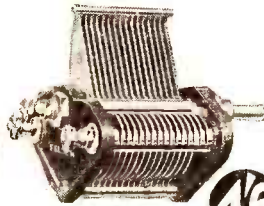
**TELSEN LOUD-SPEAKER UNIT** has been designed to provide, at a low price, a reliable Loud-Speaker Unit which will give a performance pleasing to the most sensitive ear. Employs Cobalt steel magnets, adjustments being extremely sensitive. A detachable rod, which carries the cone, is fitted with cone washers and clutch. The entire unit is enclosed in a beautifully moulded Bakelite dust cover.

**TELSEN LOUD-SPEAKER UNIT.**  
Price 5/6 each.



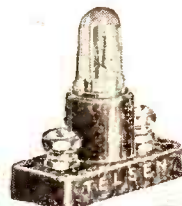
1/6

**TELSEN PRE-SET CONDENSER.** Has a very low minimum capacity giving a wide range of selectivity adjustment when used in the aerial circuit. Substantially made and easy to adjust. Made in capacities of .002 mfd., .01 mfd., .0003 mfd., .0001 mfd. Price 1/6 each.



4/6

**TELSEN LOGARITHMIC VARIABLE CONDENSERS.** Substantially constructed and of high insulation and low minimum capacity. The Vanes are clamped by a new process and frame is triple braced against distortion. Substantial terminals are provided with alternative connection to the stator. Made in capacities of .0005, .00025, and .00035. Price 4/6 each.



6/6

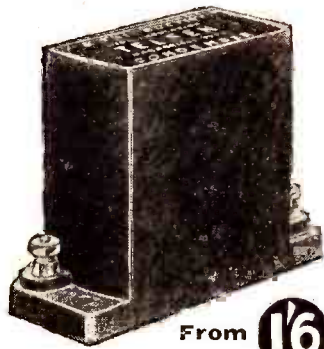
**THE TELSEN FUSE HOLDER** is a definite precaution against burnt-out valves. The terminals are easily accessible, and the Fuse Bulb is held firmly, giving perfect contact. Price 6d. each (without fuse.) Telsen Radio Fuse. Price 6d. each.



2/6

**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. Price 2/6.

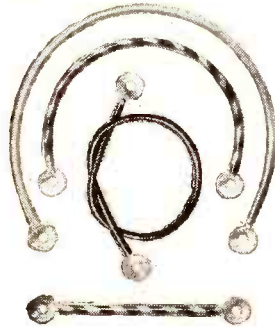


From 1/6

**TELSEN MANSBRIDGE TYPE PAPER CONDENSERS** are of the Mansbridge non-inductive type, and will not deteriorate in use, owing to the method of sealing—an exclusive vacuum process employed during manufacture. Made in capacities from .01 upwards.

500-volt Test 1,000-volt Test

|                | s | d | s | d |
|----------------|---|---|---|---|
| W. 83 .01-mfd. | 1 | 6 | 2 | 6 |
| W. 80 .25-mfd. | 2 | 0 | 3 | 0 |
| W. 79 .5-mfd.  | 2 | 3 | 3 | 3 |
| W. 78 1.0-mfd. | 2 | 3 | 3 | 6 |
| W. 77 2.0-mfd. | 3 | 0 | 6 | 0 |



From 6/6

**TELSEN SPAGHETTI FLEXIBLE RESISTANCES.** Terminal tags firmly fixed to the wire, clearly marked with resistance values, protected from corrosion by application of special insulating compound. Made in the following values—

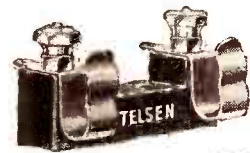
| Resistance Ohms   | Max Current | Price each |
|-------------------|-------------|------------|
| 300, 600.         | 42 mA.      | 6d.        |
| 750, 1,000.       |             |            |
| 1,500, 2,000.     |             |            |
| 3,000, 4,000.     | 23 mA.      | 9d.        |
| 5,000.            |             |            |
| 10,000, 15,000.   | 6 mA.       | 2/-        |
| 20,000, 25,000.   |             |            |
| 30,000.           |             |            |
| 50,000, 60,000.   | 3 mA.       | 1/6        |
| 80,000, 100,000.  |             |            |
| 150,000, 200,000. | 1 1/2 mA.   | 2/-        |



7/6

The Telsen Aerial Coil is the latest development in **DUAL RANGE AERIAL COIL DESIGN.** It incorporates a variable series condenser which can be set to give any desired degree of selectivity, making the coil suitable for ALL districts. This adjustment also acts as an excellent volume control. The wave-band change is effected by means of a three-point switch. A reaction winding is included. Price 7/6.

**TELSEN H.F. COIL AND TRANSFORMER.** This coil is designed for H.F. amplification in conjunction with screen-grid valves. It can be connected as a Tuned Grid or Tuned Anode Coil, or, by removing a link, as an H.F. TRANSFORMER. This Coil also makes a highly efficient aerial coil where the adjustable selectivity feature is not required. Reaction winding is incorporated. When used as an H.F. Transformer, the wave change is effected by means of a T.2 pole switch. **TELSEN DUAL RANGE H.F. COIL AND TRANSFORMER** No. 154. Price 5/6.



6/6

**TELSEN GRID LEAK HOLDER.** Will hold firmly any standard size or type of Grid Leak, ample clearance being provided between the terminal screws and the base-board. The terminals and fixing holes are accessible without removing the Grid Leak. Price 6d. each.

Send for the Telsen Component Catalogue—use the coupon below, and it will be sent post free.

# TELSEN

RADIO COMPONENTS

## ARE ALL BRITISH



To The Telsen Electric Co. Ltd.,  
Aston, Birmingham.

Please send, post free, the new Telsen Component Catalogue.

Name .....

Address .....

P.20-6



# Distortionless reproduction

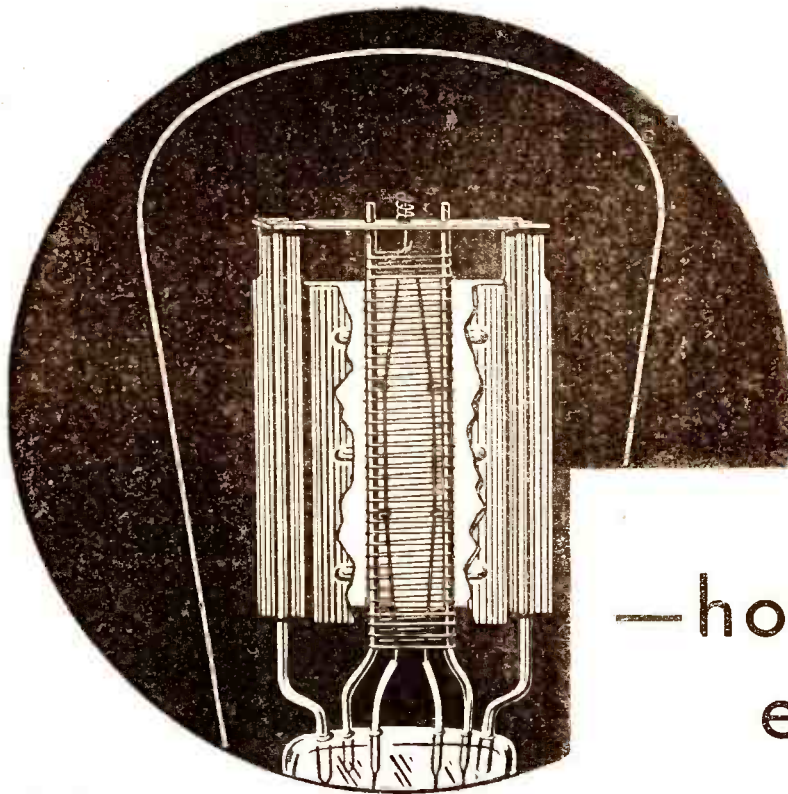
It is the power valve that finally conveys the magnified signals to your loud speaker, and it is this valve—the output valve—that very

largely controls the degree of purity. An inability to handle the signals passed to it from previous valves results in distortion—in

other words the power valve must be capable of handling large "grid swings."

Cossor Power Valves have been specially designed to handle large inputs and to pass on undistorted signals to the loud speaker.

The Cossor special insulated bridge method of construction assures that each element is securely anchored in life-long alignment resulting in an absolute "true-to-characteristic" valve. Therefore to get the best from your set, to obtain the maximum volume with crystal clear reproduction use one of the Cossor Power Valves—of which several types are available to suit 2, 4, and 6 volt battery operated and A.C. Mains Receivers.



—how it is  
ensured by

# COSSOR

POWER VALVES

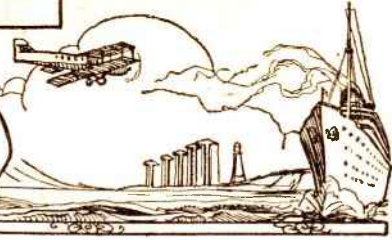
Send at once for one of our novel circular station charts, which give identification details of nearly 50 stations, with space for entering your own dial readings. Ask your dealer for a copy, price 2d. or send 2d. in stamps to us and head your letter, "STATION CHART P.V."

A. C. COSSOR, LTD.,  
Highbury Grove, London, N.5



# Popular Wireless

**LARGEST NET SALES**



Scientific Adviser:  
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**BLOTTO!  
 NOISES OFF!  
 OUR LONG WAVE  
 LENINGRAD**

**VALVE LONGEVITY  
 RADIO FOGHORN  
 NON-SELECTIVITY  
 GENTLEMEN DON'T!**

## RADIO NOTES & NEWS

### Bangkok on the A.A.

THAT Bangkok station, H S J. seems to be getting me into trouble! A certain scribe of Sheffield, whose initials are E. C., takes me severely to task because he reported this station (on 24.5 metres) to W. L. S., of Short-Wave Notes fame; and apparently W. L. S. didn't turn a hair, or reply, or do anything about it, and I am unfairly blamed for his masterly inactivity.

But I will say this for G. E. C. of Sheffield—he has a sense of humour and an eye for good sets, having bagged this said Siamese on a "Comet" Three, with Antipodes adaptor.

### "Blotto."

THE latest experiments with Newcastle's wave-length are to ascertain if it is practicable to work this station on the same wave-length as the North Regional. That is, to work without causing too big a "blotto" area between the two districts.

Somewhere along a line between the two places is an area where reception quality falls off and strength is uncertain owing to a sort of ether overlap, and this the engineers call the "blotto" district. So the experiments are to decide whether such disturbance is slight enough to warrant it being ignored in order that the benefits of the shared wave-length shall be enjoyed in the Newcastle district.

### Screws That Will Not Budge.

AMONG the many practical tips already mentioned in the above connection, there is one dodge that has been omitted, according to E. G., of West Hartlepool. And that is always try and

tighten the screw before attempting to remove it.

"The reason for this is that it is always easier to overcome the friction between the screw and the surrounding material by continuing the motion which set up the friction rather than by a reversal of it.

This sounds a bit mixed, and I must say that I for one have not tried to shift a screw by tightening it in this way.

Daventry emits about twice a week, usually just before ten in the morning.

Listeners who have wondered whatever this clatter can be will be interested to know that it is a frequency test which is sent out to enable stations sharing a common wave-length to check their frequency from the master meter. It is, in fact, the means of keeping the various stations on the correct wave-length.

### Our Long-Waver!

CONTRARY to a good many hopes, nothing more has been heard recently about the possibility of Britain acquiring another long wave-length. There is still talk about the improvement of Daventry 5 X X, and I heard a rumour that Mr. Ashbridge, the B.B.C. Chief Engineer—following the good example set by Capt. P. P. Eckersley when holding that position—stoutly advocated Britain's claims for long wave-lengths at the Copenhagen conference. But I have not been able to gather a shred of official confirmation for this at the moment.

### Another Blow for Leningrad.

SINCE the Soviet stations have been gingering

up their power there have been some interesting items from Leningrad on 1,000 metres. But, generally speaking, reception from this station and, indeed, all on adjacent wave-lengths, is rendered hopeless by the incessant calls of the radio beacon stations.

Another one of these beacons has now been installed on May Island in the Firth of Forth, the idea being that during foggy weather a beam is to be transmitted every four minutes on a power of three kilowatts.

(Continued on next page.)

### LOUD SPEAKER LURES HOLIDAY-MAKERS FROM HOLLAND



The East Coast resorts have despatched the van shown to Holland with the idea of luring Dutch visitors to spend their holidays over here. Our photograph shows the send-off, with Miss Holland greeting Miss Britannia, in front of the amplifier equipment.

### Noises Off!

THOSE careless people who leave their sets switched on when there is no broadcasting, and invalids and "shut-ins," often wonder at the queer noises, bumps, squeals, and thumps, which can be heard outside programme hours.

Recently the various European broadcasting authorities were doing exhaustive tests with the idea of making field strength measurements, and the row they kicked up gave rise to a good deal of such speculation. Another mystery noise is the squeal which



## RADIO NOTES AND NEWS

(Continued from previous page.)

Its radius is supposed to be about thirty miles, but judging from past experiences it will be a blow to the hopes of those all over the country who listen for Leningrad.

### Have You Heard G 2 X T ?

**EXPERIMENTERS** who do a bit of diving down on 20 or 40 metres, would do a good turn to G 2 X T if they would let him know what his 'phone signals are like on those wave-lengths.

Reports can be sent via the R. S. G. B., 53, Victoria Street, London, S.W., or direct to Mr. J. R. Wilson, 23, Salters Road, Gosforth, Newcastle-on-Tyne. All reports will be answered.

### "Stay Away From My Door."

**SOMETIMES** I feel like saying to the postman what Jack Payne says to the river—"Stay away from my Door"! But, generally speaking, I do not suppose there is a nicer, friendlier, or more interesting lot of letters get delivered to any letter-box in the country than to mine.

I cannot answer them all, for, alas! they come dozens at a time, but I do appreciate the way you fellows let me know all the good things that are going.

### A Long-Felt Want.

**AND** included in one recent post was a neat little packet that proved to be a—what do you guess?

You're wrong! It was a Sardine Tin Opener. Yes, sir, a Sardine Tin Opener! And a real gem!

In a light moment a few weeks back I stated some of my long-felt wants, and amongst them I gave "efficient sardine tin opener." Almost immediately a sportsman of Balham—one H. F. N.—up and packs me off a real beauty!

At first I thought he was pulling my leg, but I turned the instrument over to my Domesticity Department, and they went into raptures over it. I was forthwith requested to thank said sportsman right heartily, which duty I now discharge, with gusto.

### Valve Longevity.

**E. N. B.**, of Eccles (where the cakes come from!), vouches for an instance of good valve life which is a credit to the manufacturer. He says he has had one of the first Ediswan A.R. 06 (remember 'em?) in almost constant use since he bought it, and fixed it up in an amplifier to a standby crystal set. And it still works.

### Another Blow for Trade.

**RADIO** manufacturers, by the way, are feeling a bit gloomy about Gaudhi. "The Board of Trade Journal" reports the withdrawal by the Government of India of the reduced duty of 12½ per cent on radio apparatus, so these goods will therefore presumably become subject to the normal duty which is 20 per cent ad valorem.

I suppose that some glumpy official, sitting somewhere in state has got a good reason for it, but I am afraid I can't see any brainy work in that decision. (In case you don't understand "glumpy" I ought to explain that it's a cross between glum and grumpy!

### Not Dead Yet!

**BUT** don't think that Britain's one bright industry, the radio trade, is now sliding down the steep slope to gloomy doom. Far from it. Some of these manufacturers are positively gay and buoyant. Why, only the other day "Mr. Cyldon" told me that he had never before had so many complimentary communications as he has received over the Extensor.

And, by the way, that's a point you fellows might remember. When a manufacturer turns out something unusually good he really does appreciate a pat on the back from the chap who uses it in a set.

## SHORT WAVES.

In order to encourage the "Come to Britain" movement, a loud-speaker van is to tour in the Netherlands. That ought to drive them over here in shoals!—"Punch."

### TOO STRONG.

"Radio" a writer tells us, "is a valuable medium for acquiring a language."

I doubt, however, whether the language my next-door neighbour's set has made me acquire can really be considered an asset.—"Daily Record and Mail."

We have been asked to state whether we think there is any possibility of the number of wireless talks being reduced in the near future.

Well, we've just heard that a certain professor has now perfected his death ray, which is said to destroy any life within a range of five miles.

### AN OLD ONE.

There was a young plumber of Aintree,  
Who tried every night to get Daventry,  
He had small success,  
But at Brum they had less.  
So they hung Captain Eck, on a plane tree.

The photograph of the North Pole taken by American airmen discloses only a hole in the ice.

It is presumed that some unscrupulous Eskimo has purloined the thing for his wireless aerial so that he can listen to Jack Payne's band.

### A BATTLE OF WORDS.

The B.B.C. whose daily demonstration  
Has hitherto roused little remonstrance—  
The English language, surely, is no joke—  
Are pointing out the pitfalls "as she's spoke."

And so the doc expectant British Nation,  
Punctilious, approves pronunciation  
Of words by experts erudite announced,  
And marks with care the way they are pronounced.

Let's hops the Yankee "talkies," to our  
ruining,  
Will never nullify the work they're doing!  
"Newcastle Evening Chronicle."

We can all write those snorty letters about punk-junk; but how many of us ever hand out a well-deserved compliment?

### Please Don't Oscillate.

**WRITING** a Please-don't-oscillate letter to the Editor of the Hull "Daily Mail," a spirited reader of that paper says: "Sir, for some considerable time past the Plumber Street neighbourhood has become a howling Inferno. An Inferno that would shock even Dante. This is most prevalent on and round the London Regional across tea-time."

So if any of you fellows live round Plumber Street way you had better not try any of your oscillating tricks round the London Regional. (Not, anyway, "across tea-time"!) )

### Radio Fog-horn.

**MESSRS. CHANCE BROS. & Co., Ltd.**, Lighthouse Engineers, are erecting a small wireless transmitting station on the River Ouse, at Blacktoft. It will be

used to communicate with a receiver—at Faxfleet, Ness, a danger-point further down the river—which will operate a fog-horn.

### Non-Selectivity.

**DWELLERS** in the North Region who find that the new National programme on 301 metres steps on the heels of its big brother are hereby reminded of the letter N.

This is the letter that you should print on your envelope (top left corner) before posting same to the Chief Engineer, B.B.C., Manchester (or 2, Savoy Hill, London). Inside this envelope you ask for the B.B.C.'s free pamphlet on "Selectivity," which, when received, will make all clear unto you. (At least, I hope so).

### Radio and Television.

**THE** Radio and Television Society, temporarily headquartered at 195, Hammersmith Road, London, W.6, is extending its scope by introducing a Q.S.L. service bureau. Particulars of the service will gladly be sent to all inquirers addressing letters to the Hon. Sec. as above.

The society reports that several new members were enrolled at the last meeting, and more will be welcomed.

### Trouble in Egypt.

**ONE** solitary page of "P.W." torn from our May 9th issue, has reached me in an envelope from Egypt. No covering letter was sent—just the page. It shows a pretty picture of "Radio Roma's Golden-voiced Announcer."

And above the photograph of that well-liked lady some Watcher of the Nile had written certain remarks! Phew! Vitriol!

Apparently the trouble is this. Rome short-wave station, which relays the main programme, prevents our Egyptian friend from hearing Chelmsford properly. Consequently he simply hates that "golden voice" that breathes o'er Rome, and doesn't hesitate to put in documentary evidence to that effect.

### Items for Purchasers.

**THE** Exide Battery people's head office and works at Clifton Junction, Manchester, has just had its seven-line 'phone number changed to Swinton 2011.

\* \* \*

Wright and Weaire were so tickled over that notion of modifying a "Titan" unit for Interwave coupling (as explained by Mr. A. F. Seymour in No. 469, page 379) that they have decided to supply Titan coils modified to suit the proposed circuit at the usual price of 15s.

### Gentlemen Don't Prefer Blondes.

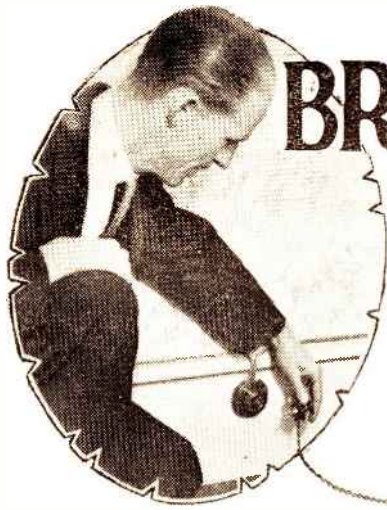
**THE** gentlemen referred to above are those in America who pick the would-be television stars. They have proved that whereas a nice curly-haired little brunette looks very dinkum indeed when "televised," a blonde looks just too homely for words.

(And when an American says a girl is "homely" he doesn't mean it as we use the word—he means she ought to go home, and stop there!)

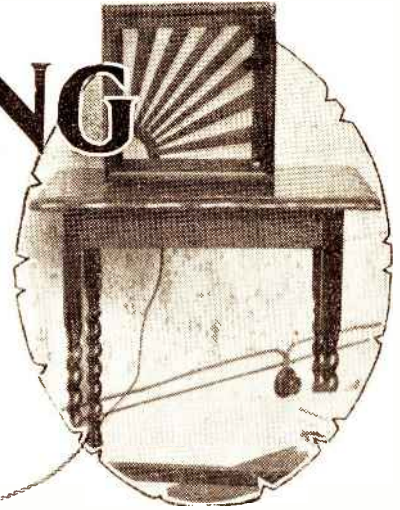
The Columbia broadcasters have picked pronounced brunettes for their television girls, and aim to have them on the air seven days a week in future.

ARIEL.





# BROADCASTING THROUGH WIRES



SOME years ago wireless enthusiasts were mildly interested in the announcement that wired wireless was about to make its debut before an admiring (?) audience of wireless listeners. We were told that methods had been perfected whereby wireless programmes, produced in the usual manner, could be superimposed on our electric-light wires, instead of broadcast into the ether.

As far as our existing wireless receivers were concerned, we would just couple them up to the electric-light mains through an intervening attachment—and pay the electric light company so much a month for the privilege of listening to its programmes.

### Quite Possible But—!

So far, so good. Technically, all that is quite possible. It is also possible to apply the scheme to our telephone wires. Why, then, has the scheme never been put into practice? In the first place, who wants it?

One of the joys of wireless broadcasting is that if you don't like a particular programme you can, if you have a suitable set, tune out the offending station and tune in another which is more pleasing (B.B.C., please note).

Furthermore, there is an enormous attraction in the freedom with which (suitable set again presumed) one can tour the world and listen to the music of foreign lands. It is safe to say that this is probably the greatest single factor in the early rise of wireless broadcasting to universal popularity, B.B.C. policy to the contrary and notwithstanding.

Who, then, wants to be tied to one or two programmes, good, bad, or indifferent, supplied, forsooth, by the local electric light works just round the corner, or by the local telephone exchange? No one, apparently, for it has not yet been done: at least, not in England.

What of the situation in America, where the territory is much vaster, and where vast projects mature more readily? The very magnitude of things in America has defeated the purpose of wired wireless up to

This special article, which deals with a fascinating development of radio which has recently received renewed publicity through the efforts of our own Radio Consultant-in-Chief, was written by A. Dinsdale. He is now residing in the U.S. after having occupied important wireless positions in this country for a long period.

the present, for it has become the cause of a battle of giants.

Some five years ago, when the National Broadcasting Company was formed, the American Telephone and Telegraph Company sold to it for a million dollars, station WEA F, in New York, and thereby retired from direct participation in the entertainment business which, it said, was not in its scheme of things anyway. Recently, however, the A.T. & T. has re-entered the entertainment business with the development and manufacture of gramophone records for broadcasting purposes.

### All at Loggerheads!

For several years past, Wired Radio, Inc., a subsidiary of a group of electric power companies, has been conducting its own experiments, but has not been able, up to the present, to come to an agreement as to

the means of disseminating its programmes into the homes of America's millions.

The telephone company is naturally insistent that its great wire communication service, extending to every nook and corner of the land, be utilised, while the electric power group is equally insistent that their power line networks be used.

Both interests have been ready to move forward for some time, but both have admitted that to introduce a duplicate and independent service would defeat both their ends. Obviously, the public is not going to pay monthly rates for two similar services.

### A Strong Combine.

The most important development of recent date occurred a year ago, when the Radio Corporation of America (of which the National Broadcasting Company is a 100 per cent subsidiary), with an eye on possible action by the telephone company to put out programmes over its wires, entered into a working agreement with Wired Radio, Inc.

Prior to this move being made, it was commonly supposed that the telephone company would derive its benefit from wired radio by collecting rental from the use of its lines to transmit wired radio programmes from one power network to another, just as it now derives a revenue of something like £700,000 annually from the use of its lines in distributing radio programmes for simultaneous broadcasting.

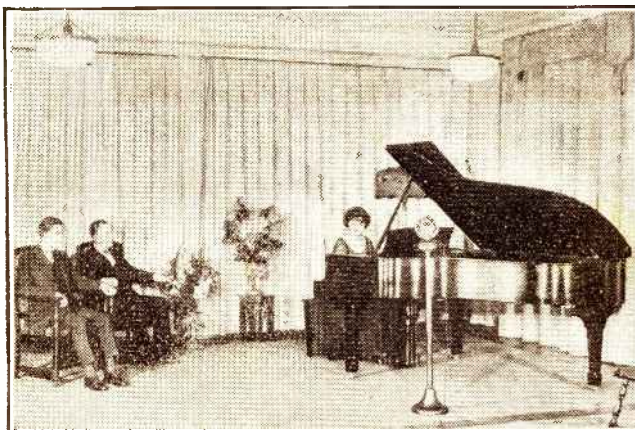
But with the advent of the R.C.A. into the picture, this aspect of the situation changed. Wired Radio, Inc., has been operating on a limited scale for some time past in Cleveland, Ohio.

Now it has opened laboratories at Ampere, N.J., a few miles outside New York, to test the possibility of transmitting programmes from New York to Cleveland by short-wave wireless, thus feeding programmes direct by wireless instead of by telephone wire into their power lines.

At present Wired Radio is up against the problem of getting a commercial licence for its short-wave link; it is operating on an experimental licence which precludes the transmission of

*(Continued on next page.)*

## SOLD FOR A MILLION DOLLARS!



The studio of WEA F, New York, a station which figured in a sensational financial transaction.



## BROADCASTING THROUGH WIRES

(Continued from previous page.)

commercial—i.e. sponsored, or paid advertising—programmes.

In this, as in other phases of the American radio situation, the ramifications of the problem are tenfold. For instance, the R.C.A., interested in Wired Radio, Inc., is confronted with the question of reconciling entertainment in the home over the electric light system with its own broadcasting interests and its sales of receiving apparatus.

### Overcoming the Difficulties.

This latter phase has been partially overcome by the expressed intention of Wired Radio to have its system dependent upon existing radio sets.

Only recently, however, it was learned that Wired Radio may modify this stand, and seek to install its own apparatus in homes which have no radio as yet, as a preliminary step in the development of public favour towards a form of entertainment for which the consumer will pay.

The power companies' interest in wired wireless is, of course, chiefly confined to the increased use of power which will be encouraged by the introduction of wired wireless, at the same time charging the consumer between six and eight shillings a month for the wired wireless programme.

### Moderate Cost.

On the other hand, the telephone company's plan, as originally announced, will involve only the one cost to the consumer for service under the heading of "home entertainment." He will be charged a monthly rate for his telephone receiving set operated independently by his electric light supply. Both plans, it is understood, involve free servicing, replacement of valves, etc.

Obviously, some compromise is indicated, and latest reports reveal that there is a tendency to form a separate company to handle this form of entertainment, a company which could draw upon the resources of both the power and the telephone people; in a word, a parallel to the National Broadcasting Company, which draws on the resources of the G.E.C., Westinghouse, and Radio Corporation of America.

In this way, programmes originating at one point would be sent from city to city, as at present, over the telephone lines, and

be fed into the home by means of the local power company's lines.

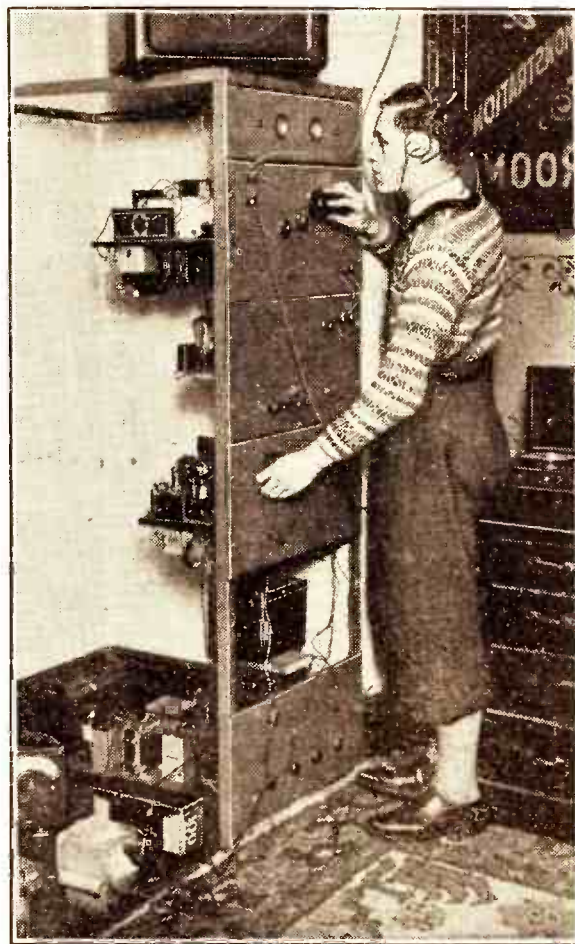
### Would It "Take On?"

At first glance, the scheme does not attract. Who wants it, you say, and how can payment be enforced? But all these things have a way of working out to the satisfaction of the sponsors—in America, as witness the advent of the talkies, which were certainly not wanted by the public when they first appeared.

But the powerful interests behind the technical development of the talkies wanted to sell their equipment, and sell it they did. And you and I have just got to lump it, willy nilly.

And, since what happens in America to-day will happen in England to-morrow (as witness broadcasting itself, and the

## PROGRAMMES "ON TAP"



The monster receiver which supplies 500 homes in Leeds with broadcasting. In this case, however, special wires connect up all the houses.

talkies), it behoves us to take serious notice of what is going on.

The tendency in America to-day is to group all forms of amusement under one head, controlled by a single gigantic trust, such for example as the R.C.A., which controls large interests in the broadcasting (N.B.C.), gramophone (Victor Talking Machine Co.), and cinema (Keith Orpheum circuit) industries.

The effect of a powerful wired wireless organisation on the present entertainment situation would be stupendous. Bringing the wealth of America's greatest and

richest public utilities (power and telephones), as a united force, to the amusement world would involve a colossal structure almost impossible to comprehend in its entirety.

From their united power there may develop an organisation with a world-wide monopoly of public entertainment which even foreign governments with their monopolistic ideas of electrical communications may not be able to withstand.

Drawing somewhat on his imagination, an executive of the telephone company (A. T. & T.) some months ago predicted that the home entertainment of the future would be provided according to the demands of the individual.

### A Variety of Programmes.

It will be possible, according to him, for a telephone subscriber to order from any part of the country, perhaps the world, any particular play, opera, concert, talking picture or sports event he wishes to listen to. With the introduction of televised wired radio the service will be augmented so that the individual consumer may then see, as well as hear, whatever performance he desires.

When one takes into consideration the fact that the American Telephone and Telegraph Company is rapidly extending its telephone service to all important centres of the world, it does not require much imagination to visualise a speedy realisation of the picture painted above. And the Radio Corporation is no less securely entrenched by virtue of its development of short-wave broadcasts in association with its "big brother," the G.E.C. of Schenectady.

These things will not happen to-morrow, nor even the next day. But both interests are steadily laying plans to that end. There are infinite problems still to be solved, conflicting interests to be reconciled, patent ramifications to be ironed out, and a durable structure to be built up. But all the indications point to an ultimate realisation of this gigantic plan, which will be in effect a single world-wide monopoly of home entertainment.

### It is Bound to Come.

The whole thing seems sinisterly inevitable, for standardised entertainment is already with us. Theatre, cinema, radio, wired radio, television, the concert hall and opera house, gramophone records, sports, everything that has to do with the public's entertainment is irrevocably tied hand and foot to the manufacturing and communication industries under present-day technical progress, so it is small wonder these two powerful industries of our modern age seek to consolidate their positions still further.

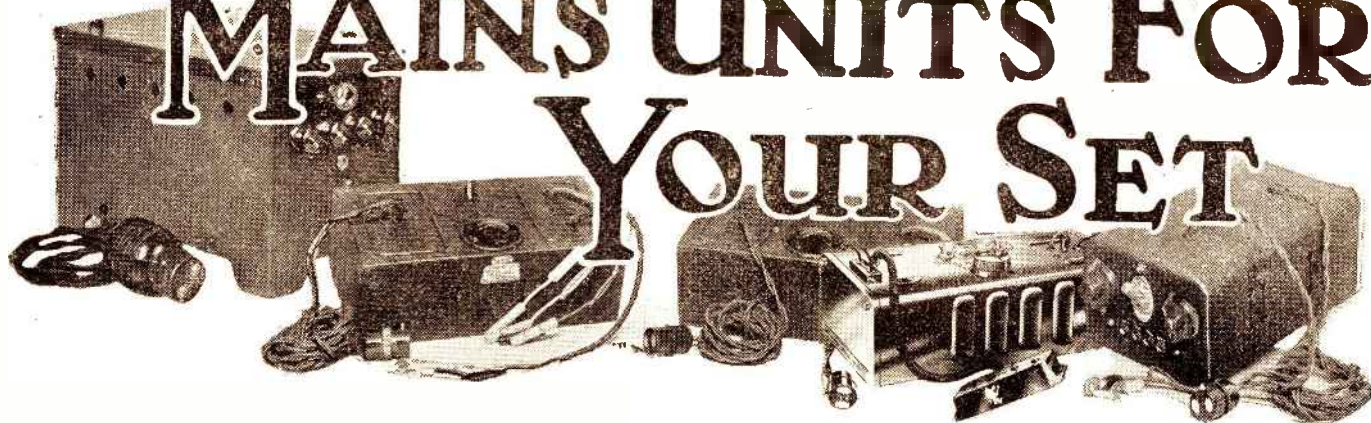
It all sounds as if we are building for ourselves some revolting Frankenstein monster which will deprive us for ever of personal freedom of choice in the matter of our amusements.

But, where there is a public demand there must inevitably follow the supply. At present we do not feel disposed to accept wired wireless, let alone demand it. But that is due very largely to ignorance.

We have never tried it, so we don't know what it will be like. One thing is certain, and that is that the introduction of wireless broadcasting has created a public taste for home entertainment.



# MAINS UNITS FOR YOUR SET



THE mains unit is one of the most convenient and economical pieces of radio apparatus that has ever been devised. Usually conveniently compact it enables a pure and unfailing supply of H.T. (and often L.T. and G.B.) to be obtained by anyone fortunate enough to have electric light in their home.

Very many types and makes, of course, are necessary in order that the multitudinous requirements of a large listening public may be met, but whether for D.C. or A.C. mains they are equally effective.

In choosing an H.T. mains unit there are several important points that should be considered, and it is hoped that the following brief chat on the subject will help those readers who are still hesitating whether or not to change over from H.T. batteries to mains supply.



A neat and efficient mains unit due to "Regentone."

No hesitation should be necessary, whatever, provided the initial outlay for a suitable mains unit is not beyond the power of the pocket to supply. For trouble-free set operation is assured if a really good unit is obtained.

### Buy the Right Type.

The first thing to decide is whether you want a D.C. or an A.C. unit. This will depend on your mains, and you can find out if they are D.C. or A.C. by (1) looking at the meter, which will be labelled to that effect or (2) by asking your local electrician or, better still, the electric light company. Ask them also for the "periodicity" if the mains are A.C., and in any case for the voltage.

Having got these points you must pass on the information to the manufacturer or dealer from whom you want to get the mains unit, and also give some further simple particulars about the set with which the unit is to be used.

Mains units are made in various sizes and to supply various voltages and current

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**Some helpful advice concerning an accessory that needs to be very carefully chosen.**

**By K. D. ROGERS.**

\*-----\*

outputs. Consequently if you have a unit designed to give 120 volts and 15 milliamps (a small unit this), you could not very well expect it to feed a set requiring at least 150 volts max. and 25 milliamps.

### You Want Several Tappings.

Then there is another point about mains units that must be considered, and this is the question of tappings. Ordinary battery H.T. sets often have various H.T. terminals, requiring to be fed with various H.T. voltages. In order that the mains units shall be suitable for use with such sets they must also have tapping points from which the required voltage can be "drawn off." In short, as regards voltages and tappings the mains unit should be just like the H.T. battery which it is replacing.

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**When ordering a mains unit always specify the voltage and type of mains, and give full details of the set you will be using with it.**

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Thus, when ordering a mains unit the number of tappings required should be stated, together with the voltages required at the tappings and the maximum voltage and current-consumption of the set.

From a D.C. mains unit you cannot get more voltage than something a little lower (the drop is due to the smoothing circuits) than that of the mains; but in the case of A.C., anything up to 250 volts is available in commercial units.

But, whatever unit you require always allow about 25 per cent excess current provision. If your set takes a maximum of 25 milliamps, get a unit that will supply at least 30, at the maximum voltage you require. I have stressed this point because so many people get mains units which will give them their required milliamps, but only at a voltage less than the maximum required for proper operation of the set.

### Remember that L.T.

And don't forget, if you have an S.G. stage or two, that the eliminator must have a suitable tapping for the screening grids (preferably variable) as well as for the detector valve. This latter voltage tap should always be variable except in the simplest and most inexpensive of units.

But, of course, it is not essential to purchase a mains unit ready made. It is easy enough to build one of your own, from designs published in "P.W." and its associated journals. Such units are carefully designed to meet the needs of users of home-constructed sets, and have always a large factor of safety where power supply is concerned.

It is advantageous, too, whether buying or building, to look out for the possibility of using a trickle-charger with the unit (either incorporated in it or used separately), because this will enable you to keep your L.T. up to scratch, and thus almost completely "electrify" your receiver. Not completely, perhaps, because we have still an L.T. battery in existence, even if it is charged at home.

### The Ideal Arrangement.

If you really want all-mains operation it would be better to rebuild the set accordingly, using proper mains valves.

But the ordinary H.T. unit is a good proposition, and if the points I have brought forward are borne in mind and the fullest possible details of the receiver with which the unit is to be used are given, then there is no reason why you should not gain very real advantage from a change over to mains H.T. The unit you make or purchase must be of reliable design, from a reputable radio journal or a well-known and respected manufacturer. There is still a certain amount of shoddy apparatus about, though I am glad to say that in the case of mains units it is fast disappearing, and of all the pieces of radio apparatus that must be well made and reliable the mains unit is the most important.



One of those compact and high-grade Tannoy mains units.

Reputable makers and dealers will be only too glad to help you choose a suitable unit. Take them into your confidence; tell them as much about your set as you can, and you will be well satisfied with the results of your new venture.



## THE "D.G." IN AMERICA

Sir John Reith, Director-General of the B.B.C., has been visiting the U.S.A., and studying their competitive advertising methods. He took the opportunity of presenting the British point of view with characteristic vigour.

By THE EDITOR.

BY the time this issue of POPULAR WIRELESS is on sale, Sir John Reith—the Director-General of the B.B.C.—will be back again in this country after his whirlwind visit to America. Sir John seems to have made quite an impression in the States, where the newspapers call him "The Czar of Radio."

In one of his speeches, Sir John compared the differences between British and American broadcasting, and incidentally explained the policy and management of our own B.B.C. It is a curious fact that Sir John seems to have succeeded in giving his explanation much better on the other side of the Atlantic than he has on this.

### Fewer Stations.

In Sir John's view the number of radio stations is bound to diminish considerably because of a tendency in radio to work from relatively few foci, the explanation being the lack of available channels. There was also, Sir John Reith pointed out, a programme explanation as well.

American receiving sets with high selectivity, necessary because of the great number of stations in operation and the relatively few waves, had a choice of programmes unknown anywhere else; but the result had not been that more stations had been listened to, but fewer.

In other words, Sir John maintained that those who had come out high in the struggle for the favour of listeners were those who commanded not only first-class technical, but also first-class programme resources. Whatever other aspects of commercial competition in broadcasting might command attention, Sir John believed the only thing that really mattered—and for which broadcasters competed—was the interest and confidence of the public.

Sir John went on to say that our B.B.C. is rather like the Royal Mint, for it operates under standards that are established and recognised. Public service, in fact, is the sole motive, and few will disagree with him when he maintains that although the B.B.C. may be accused of many things—of timidity in putting coinage into circulation, of stamping its products with unattractive designs—it can never, and never has been accused of "debasement of the currency."

### A Free Hand.

Sir John went on to point out to his American audience that, unlike in Great Britain, it is possible in America for anyone who sets up a technically satisfactory station to broadcast what he likes and according to his own particular standard. Sir John compared it to a private Mint, with its own currency, but he pointed out that practically the goodness of the radio coinage in America is dependent not on constitutions nor on institutions, but upon the character and the conscience and upon the public service of certain key-men.

"If I may be permitted to question your broadcasting system," said Sir John, "it

is on this ground, at any rate—and perhaps pre-eminently—that it would appear that lack of institutions is preventing you from getting full value out of your keymen."

### "Ballyhoo"—Broadcasting!

Dealing with the educational side of broadcasting, Sir John made references to "Ballyhoo"—which he understood to mean more than mere advertisement.

"It is the cry by which the antagonised listener or reader vents his opinion of the clamant thrusting of wares upon his attention. I submit that there is a risk of educational ballyhoo as well as of commercial ballyhoo. It is not so vulgar; it is less aggressive, different in form, quite different in motive; but is it not more or less

## GETTING A LOOK-IN!



This is the recently-opened headquarters of a television company in New York, and the control engineer, instead of listening, is looking at the quality being transmitted.

the same fundamentally—an assertion that this labelled brand of culture is the only culture, as this labelled brand of soap is the only soap? It has been discovered that this is not the way to sell goods to the radio audience, whether the goods be material or spiritual. Ballyhoo, in fact, and whether pontifical or commercial, violates the first principles of showmanship and presentation."

British listeners will appreciate that! And when Sir John has time we hope he will remember those words and keep a firmer hand on some of the gentlemen at Savoy Hill who are more than inclined to go in for a little "ballyhoo" themselves.

He also made it clear to his American friends that one of the chief motives of the establishment of central control in England was to secure coverage for the whole country. The technical result of following the then current American practice—

namely, complete freedom to erect commercial stations *ad lib*—would have been competitive chaos in the favoured areas and little or no service in the rest.

### Do it Properly.

But experience soon disclosed a qualitative as well as a quantitative side to these problems. There is not one who would dispute the incalculable responsibility put upon those who control the ether, in terms of political, social, intellectual, moral, and religious power. But the unconditional handing over of a specified quantity of channels, or of time, to people who are not broadcasters may be a sin against the principle of good coverage.

Non-broadcasters do not possess, though by close contact they may acquire, that peculiar flair for what constitutes good broadcasting that its possessors so well understand but cannot always explain. Arbitrary allocations to other bodies, of whatever sort they may be, have been tried in other countries, but they are commonly judged unsuccessful. It is the same at the other end of the scale with arbitrary allocations to commercial interests when the advertiser wastes his opportunities in

direct sales talk. Crystallised rigidities of any sort are inapplicable to broadcasting, which is living and flexible.

### British Methods Best.

In short, 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, and why it is that, as far as broadcasting is concerned, competition is bad, because the competitors spend time and energy and money in beating each other instead of devoting their energies to giving a first-class service.

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. organisation is the best thing of its kind in the world.

Let's admit it—Sir John is perfectly right!



# WORTH WHILE RADIO GADGETS



**H**OWEVER big your set may be, or however small, you can always do with a new gadget or two. Nothing expensive, but just a little "thing-a-me-bob," to put the final touches to the "doings"!

All true radio men love those little "bits and pieces" with which a set can be finished off. And every wireless shop has something of the sort on the counter or in the

## INEXPENSIVE AND EFFECTIVE



This photo shows the very ingenious method of valve socket springing adopted in the Benjamin valve holder.

window to tempt the small change from its patrons' pockets. One of the most "fetching" devices, I think, is a panel light. It takes a very little current from the accumulator, but

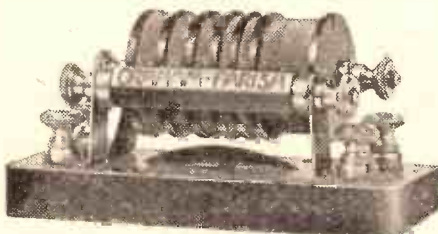
all the time that the set is in use there is a friendly little red glow from the panel to warn the owner that the set is "on."

### A Useful Accessory.

And if, after the Epilogue on a Sunday evening, you sit on quietly for a little while before turning in and forgetting to get up and switch off, there is no fear of wasting H.T. and L.T. by leaving the set running all night. The little light leaps out quite clearly from the gloom as soon as you put the room in darkness, and what little current it has been taking from the accumulator is saved over and over again by its timely reminder.

A lighted tuning dial is another luxury, of especial use when the set is placed in a

## COMPACT AND COMPLETE



An ingenious choke-coupling unit for high-frequency amplification.

Some notes about those handy little odds and ends that make all the difference to the upkeep of a radio receiver

By P. R. BIRD.

shady corner of the room. And, talking of tuning, there are many devices in the deluxe dial class that you will find are not only pleasant to handle, but will give the set an added touch of efficiency in foreign-station-getting.

### Improving Reaction.

Not every constructor realises how great an improvement can be effected simply by using a good dial—preferably of fair size—instead of the smaller ones often supplied. It will often revolutionise reaction control.

Another direction in which the proper gadgets make all the difference is in the various connections. Proper battery cords, connectors, clips—how easy and how secure our leads can be made if they are employed.

Some firms specialise in these with amazing success, with the result that there are dozens of different connectors available, at low prices, for exactly suiting your needs.

The new anode connectors for S.G. valves are a case in point. You can get them in horizontal or vertical types, cleverly insulated everywhere, accessible, easy to fit, making perfect contact, and costing only threepence. Quite irresistible!

For L.T. leads there are fit-all terminals, properly marked and soundly constructed, that cost twopence! And this sum is all that is charged for those spring-screw wander-plugs that make G.B. and H.T. connections simpler and safer.

### Many Clever Ideas.

Another excellent idea for connections is a hooked spade tag, and yet another is the spring spade terminal. This latter has strong prongs, so that it will stay put even if the terminal itself becomes unscrewed.

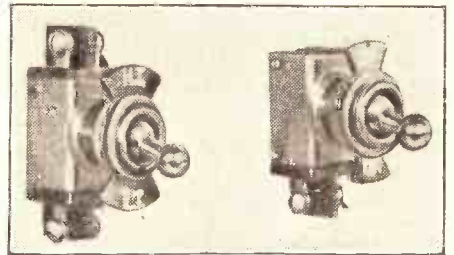
With this type the whole flex lead—wire, fray, and rubber—is gripped strongly, and connecting becomes a one-hand job. The neatness and convenience over old-fashioned methods are almost unbelievable.

Fuses and fuse holders are another happy hunting-ground for the gadget-collector. They are obtainable concealed in wander-plugs, in twin-units for mounting through

the cabinet and other ingenious forms, providing set-safety for a few coppers.

And while some radio concerns specialise almost entirely in the smaller components and gadgets, the set-makers, etc., also find the gadget market irresistible, and nearly all are represented by some small but useful device.

## CERTAINTY IN SWITCHING



Examples of the Bulgin range; the model on the left being an H.T. Trickle-Charging Switch.

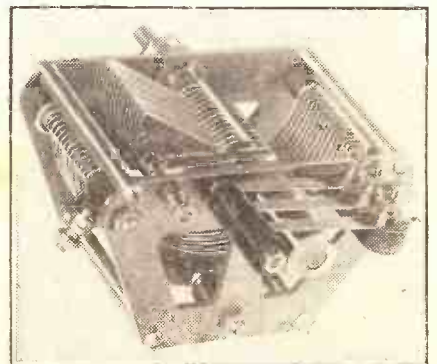
Lightning arresters and earthing switches are lines that never fail to appeal, and there is one earthing switch (which is fitted outside the house and operated from indoors) that is asked for all over the country every time there is a thunderstorm!

### Safety First Always!

This device incorporates a spark-gap, and when the switch is "off" not only is the aerial shorted to earth but the set is completely disconnected, as well.

The makers of Spaghetti type resistances may not feel flattered at the description, but one is tempted to label these valuable little components as "gadgets," because they are so very handy.

## THE "EXTENSER"



The Cydon "Extenser" is not a gadget, but it has all the slick appeal of the smaller article!



THE MIRROR OF THE B.B.C.

**THE BERNARD SHAW  
AFFAIR: BEHIND THE  
SCENES.**

**SIR JOHN'S RETURN—THE  
KING'S BROADCAST—B.B.C.  
and R.A.F.**

I WAS amused the other day to get the whole story of the Bernard Shaw affair.

It seems that the idea of the broadcast originated with the Committee which is working for the erection at Rouen of an adequate memorial to the memory of Saint Joan. But, the Committee (of which Cardinal Bourne is president) did not specifically approve that Bernard Shaw, one of its members, should do the broadcast.

The B.B.C., noting Mr. Shaw's name as a member of the Committee, naturally insisted; there was no protest from the Committee; there was indeed an intimation of pleasure from the Chairman of the Committee. So far so good! And the B.B.C. gave Mr. Shaw his head.

The result is common knowledge. But a curious thing was that even Mr. Shaw, for all his avidity for the unconventional had some doubts on the desirability of the publication of his talk. But the B.B.C. went on with it.

This display of courage at Savoy Hill is an excellent symptom. Let's have more, much more of stimulating challenging, competent utterances! The era of molly-coddling should be deposited in historical records.

**Sir John Reith's Return.**

Sir John Reith, who sailed from Quebec last Saturday in the Prince of Wales' suite on the liner "Empress of France," will be back at Savoy Hill soon after these lines are in print. He has had a very successful and characteristically strenuous tour of the North American Continent.

American newspapers were attracted by his personality, appearance, and utterances, the favourite headline description being "Britain's Radio Czar." After a royal welcome in New York (there were 120 bouquets of flowers waiting for them at their hotel), Sir John and Lady Reith visited friends in Swarthmore and Philadelphia, then going on to Illinois, to the Grand Canyon of Colorado, then to California, where they visited Santa Barbara, Los Angeles, and San Francisco.

I have not heard whether he managed Hollywood but I do know that he spent a few hours in Portland, Oregon, before going north to Spokane, and from there through Crow's Nest Pass in the Canadian Rockies to Medicine Hat and back to Chicago by way of Minneapolis and Saint Paul, winding up with a brief visit to aged relatives in Paris, Ontario.

There was some talk of his being induced to address a public meeting at Ottawa, but I have not heard whether this materialised.

**The King's Broadcast**

Listeners generally throughout the country will welcome the news that His Majesty the King will be heard during the National

programme on Saturday, July 18th, when he speaks at the opening of the Ilford Hospital.

Fortunately the day is a Saturday, when the majority of listeners are able to hear an afternoon programme, and many will forgo their tennis and golf to hear the King for the first time this year.

We have not heard His Majesty since last October, when he spoke at the opening of the Indian Conference, one of the three occasions during 1930 that he spoke before the microphone, the others being at the Naval Conference and the opening of India House.

The King, like so many of his subjects, is an enthusiastic listener, and we shall look for-

ward to hearing him again after the anxious time through which he has been passing since last autumn. Not many people know that His Majesty has very definite ideas about programmes, and expresses them, too!

**B.B.C. and R.A.F.**

It seems a pity that something more than a running commentary cannot be arranged from that excellent annual function, the Royal Air Force Display, which this year takes place at Hendon on Saturday, June 27th. Some years ago an effort was made to relay the wireless instructions to a squadron of aeroplanes in actual flight, but something went wrong, and it was generally believed that local jamming was the cause.

**NEXT WEEK**

Look out for the  
**"P.W." ALL-MAINS TWO**

Just the set you have been wanting!

**COMING SHORTLY:**

**THE "POP" PORTABLE**



**FOR THE LISTENER**

By "PHILEMON."

A running commentary on the B.B.C. programmes, on the tendencies they show, and the people that they bring to the microphone.

MR. A. J. ALAN cannot come to the microphone too often for me; but I had a shock the other day when I learned that he is not Mr. Alan at all, but somebody of a quite different name.

Who he really is, nobody "except a few high officials" at Savoy Hill really knows. Somebody in the Foreign Office, they say. But it looked such a dead-right name!

"George Eliot" deceives nobody; neither does "A. N. Other" in a cricket team; but "A. J. Alan" deceived me. It looks and sounds as natural as any name in the Telephone Directory. I feel as if I'd been "had."

Anybody can see that Flotsam and Jetsam are not real names. Besides, if a man is called "Mr. MacEachern," which looks like—for I haven't the foggiest idea what it sounds like—a sneeze that has stopped half way, it's up to him to get a pet name or a pen-name of some sort if he hopes to make any mark in the world.

I believe that this queer name, so stiff with a capital letter in its inside, is the name

of Flotsam or Jetsam, and I congratulate him on a change for the better. But at least there is no deception about it. "A. J. Alan" is deceptive in its very innocence.

**What's In a Name?**

What's in a name, you say? Well, I admit that it doesn't matter very much for the distinguished and professional gentlemen in the programmes. They can use fancy names if they like.

For these men never come really close; one admires them from a distance; they cannot be described as one's friends, not in the sense—

Well, what I mean is, when a man like A. J. Alan worms his way into your heart by telling you intriguing stories, and makes a warm corner for himself there, and becomes one of your household gods, and suddenly you find that he isn't A. J. Alan at all but somebody quite different—well, it's a shock, isn't it?

(Continued on page 493.)



# A REGIONAL "ERASER"

This little unit will eliminate any one or any two interfering stations, and instead of impairing a set's efficiency, as do many ordinary wave-traps, it adds both power and general selectivity. Moreover, it can quickly be coupled to any receiver, and is very easy to make.

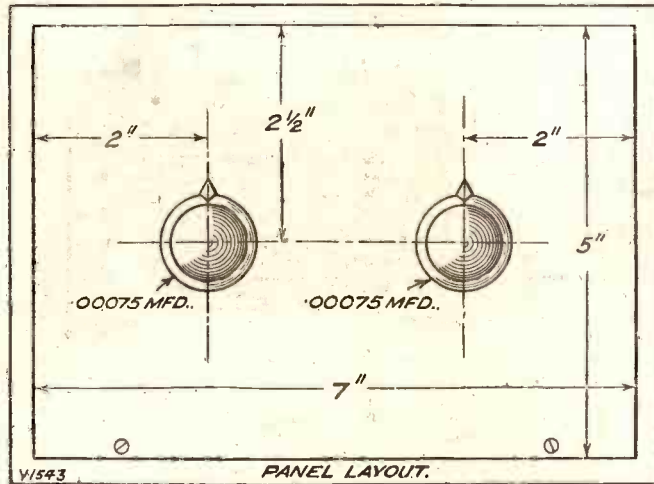
**T**HERE are frequent occasions these days when the listener wants to eliminate two powerful transmissions. The single type of wave-trap will deal more or less efficiently with one interfering station, but that does not necessarily leave the other entirely free for picking up distant programmes.

Especially is this the case when you are close to one of the twin broadcasters such as Brookmans Park or the North Regional. A simple trap will subdue the one wavelength only to leave the other sprading over the dial just as much as before.

control only to find that in doing so you have completely upset the first adjustment!

Nothing like this happens with the "P.W." "Eraser." By combining our famous "Brookmans Rejector" idea with a totally different series rejection scheme, it has been possible to achieve absolute independence.

You slowly turn the little knob until the first transmitter is subdued and the setting arrived at can be retained. Then you proceed to deal with your other interfering station with the other condenser control.



But the Regional "Eraser" will simultaneously silence any two transmissions on the medium wave-range, leaving you to pick and choose among the other available programmes.

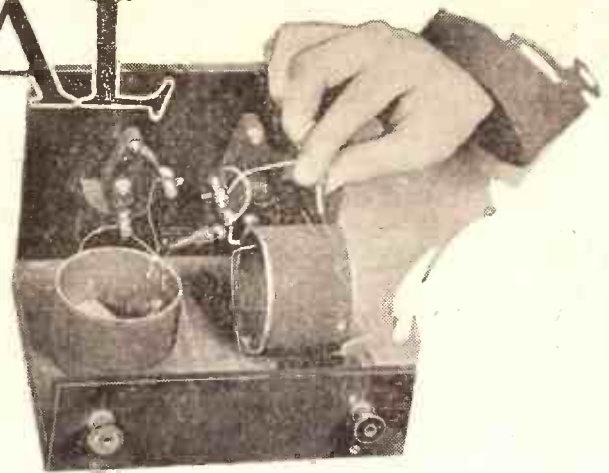
It can be used with any set and it is but the work of a moment to connect it up. And that it is very inexpensive and simple to assemble brings it within the scope of all.

### Meeting the Demand.

As you will see by glancing at the illustrations, it is provided with two small "solid dielectric" variable condensers. These enable close and consistent settings easily to be obtained.

There are extremely few truly double wave-traps of any type in existence, though that is not because there is no demand for such devices. The fact is they are extremely difficult things properly to design.

Using conventional ideas it is impossible to arrange matters so that the two parts do not react on each other, thus making the adjustments excessively difficult to carry out. You set the one control for the elimination of the one station, then tackle the other



You need not build the unit into a cabinet, and there is no need to adhere exactly to the baseboard and panel dimensions so long as you make the coils precisely as specified and mount them so that they conform identically with the positions shown in the wiring diagram. These are very important.

Needless to say, a divergence of condenser values is liable to cause a falling off in efficiency. You must make sure to get condensers exactly as described in the list of parts.

### One Gauge Only!

And no other wire than 26 D.S.C. will serve. Single Silk or Double or Single Cotton covered wire, even though it is of the same gauge (No. 26), will not be suitable alternatives. A different wire could possibly be used, but the winding dimensions of the coils would have to be altered—perhaps quite considerably.

The coils are wound in single layers on simple tubular formers and, as you will see if you refer to the wiring diagram, each is tapped. These taps are merely loops that are bared of insulation so that metallic connection can be made to them by the crocodile clips.

These, if you have not yet made their acquaintance, are little articles something like tie-clips in appearance. A pair will cost you only a few pence, and really they are worth buying because they enable rapid and yet efficient and permanent contact to be made with the tapping points.

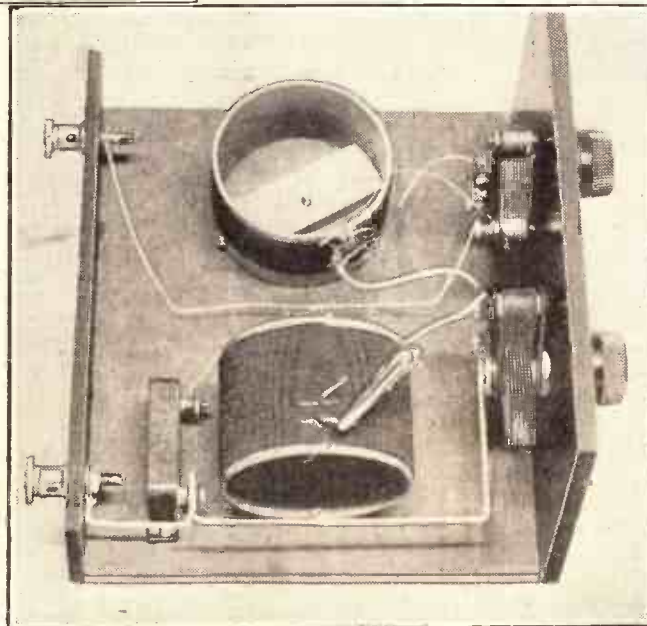
### Easy to Fix.

The one coil is screwed direct to the baseboard by small screws passing through its former, and the manner of fixing the other coil with a cross piece of wood is plainly to be seen in the photo and diagram.

You must be very sure that you get the coil taps arranged at the right ends of the coils. The 50-turn coil

## STRIKING RESULTS

You will be staggered by the complete ease of control. A touch on one knob—exit the one transmission. You then wipe out your second interfering station merely by adjusting the other little control.



IT SILENCES TWO STATIONS

(Continued on next page.)



## A REGIONAL "ERASER"

(Continued from previous page.)

tapped at the 5th, 10th and 15th turns from bottom end. You can see how the taps occur on the 75-turn coil because they are very plainly shown in the wiring diagram.

### Ensuring Flexibility.

You do not have to adjust the position of the crocodile clip every time you alter the controls of the "Eraser." You set these tap positions when you first install the device and they must remain in those positions until such time as you alter your aerial or change your set. You see, they

To place the "Eraser" in use, take the aerial lead off the set and join this instead to the  $A_1$  terminal on the "Eraser." Connect the  $A_2$  terminal to the aerial terminal of the set. You are now in a position to knock out any one of two interfering stations without affecting in any way the other qualities of your set. More probably its power will be increased!

You will also find that the general selectivity of the set will be improved. That is to say, not only will the two powerful interfering stations be entirely subdued, but also you will be able to separate the distant programmes more easily.

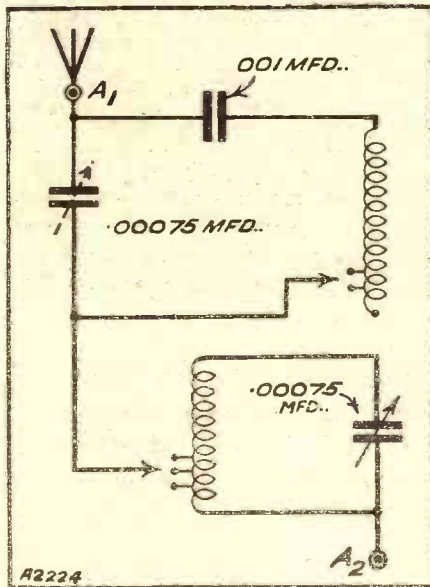
There is a good reason why this should be the case. If you glance at the theoretical diagram in the first column you will see that the aerial is joined directly to two condensers and that the aerial energy must pass through one or other or both of them.

### A Useful Combination.

The effect is exactly the same as that given by the series aerial condenser which often figures in sets, to reduce the aerial load and give added selectivity.

It is one of the advantages of the "P.W." "B.R." system that it automatically incorporates this valuable feature.

### A FINE COMBINATION



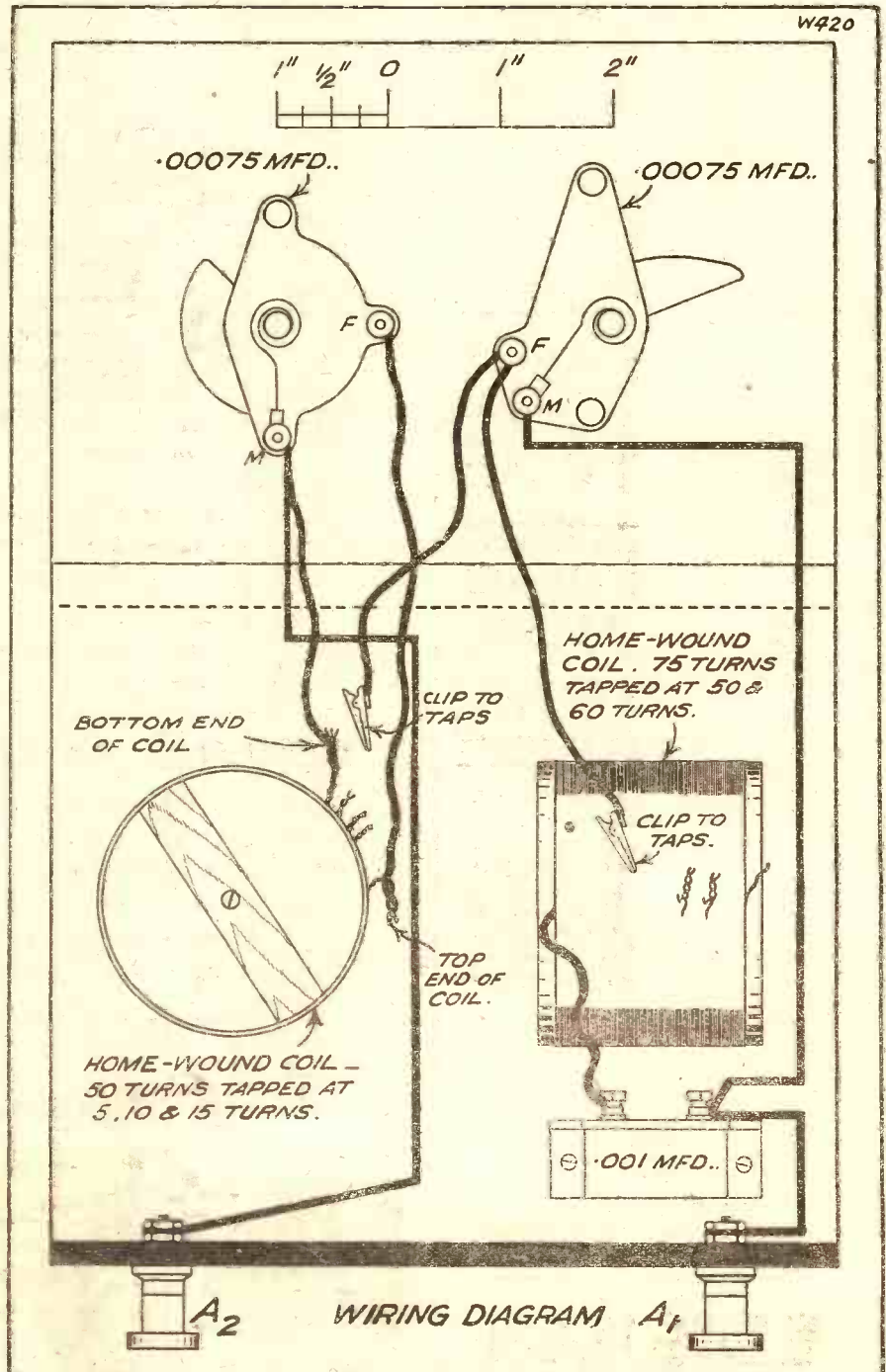
The circuit comprises a "P.W." Brookmans Rejector in series with a special wave trap.

are there merely to ensure that you can adapt the instrument exactly to your own individual conditions.

#### LIST OF COMPONENTS.

- 1 Panel, 7 in. x 5 in. x 1/4 in. (Parex, or Goltone, Permcoll, Becol, Lissen, etc.).
- 1 Baseboard, 7 in. x 6 in., and cabinet to fit (Gilbert, or Keystone, Osborn, Pickett, Camco, Lock, etc.).
- 2 .00075-mfd. solid dielectric variable condensers (Ready Radio and Polar, or Burton, Dubilier, etc.).
- 1 .001-mfd. fixed condenser (Teisen, or Ready Radio, T.C.C., Dubilier, Ediswan, Ferranti, Lissen, Mullard, Igranie, Watmel, Formo, Graham-Farish, etc.).
- 1 Terminal strip, 7 in. x 2 in. (Parex, or Goltone, Permcoll, Becol, Lissen, etc.).
- 2 Terminals (Ealex, or Igranie, Clix, Belling & Lee, etc.).
- 2 Formers, 2 1/2 in. diameter, 1 1/2 in. long (Pirtoid, or Paxolin, Becol, etc.).
- 2 oz. 26 D.S.C. wire.
- Flex and crocodile clips, Glazite or Lacoline, screws, etc.

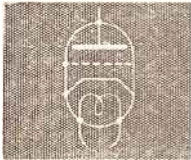
### THIS WON'T TAKE YOU LONG!



Here you have the full plan of the Regional "Eraser," and you can see that it is a perfectly straightforward job.



# Mazda Achievements



Mazda engineers introduce the first indirectly heated valve—1926. Made the all-mains set a commercial possibility.



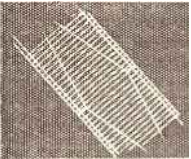
Mazda engineers invent method of applying insulating coating direct to heater. Now universally adopted by valve manufacturers.



Mazda engineers introduce first indirectly heated S.G. valve—1928. And the first indirectly heated pentode—1930.



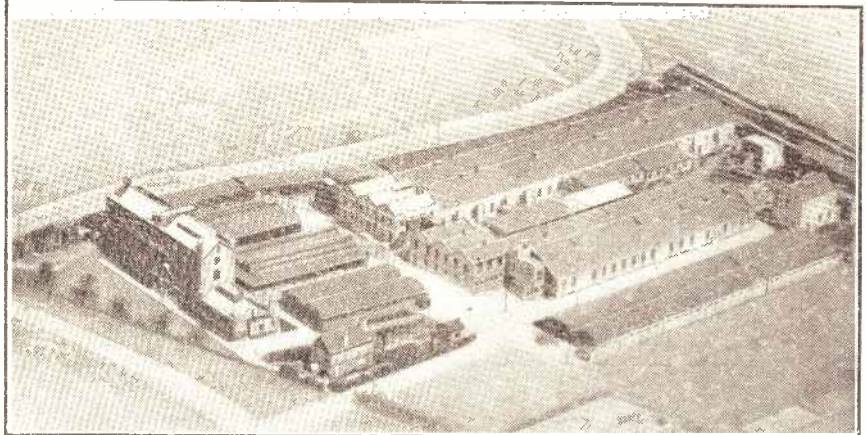
Mazda announce the new Unitary Structure principle and so ensure absolute uniformity of characteristics.



Mazda introduce anti-microphonic filament supporting books and produce the first really non-microphonic battery valve.



Mazda market the first D.C. mains valves already standardised by leading set makers.



Where Mazda Valves are made—Brimsdown, Middlesex.

In all those epoch-making developments which have attended the evolution of the modern radio valve, Mazda has led the way. From the time when the first indirectly heated valves made the commercial all-mains receiver a practical possibility, Mazda engineers have been in the van of achievement.

## MAZDA RESULTS

The reason for the amazing success of Mazda valves need not be sought. They are used by the leading set manufacturers and are generally acknowledged by public, trade and press to be the finest range of valves the radio world has known. Remember that when you equip your set with Mazda valves you get Mazda experience—Mazda quality—Mazda performance.



THE EDISON SWAN ELECTRIC CO. LTD.  
 for the Wiring Supplies, Lighting Engineering  
 business of the British Thomson-Houston  
 Co. Ltd.  
 Division:  
 London, W.C.2  
 Il. Towns.

# MAZDA

## THE BRITISH VALVES

All-mains, battery and  
 rectifier types from  
 all good radio  
 dealers.



# PETO-SCOTT'S famous 3-WAY PLAN

**C.O.D.**  
PAY THE POSTMAN—it costs no more—WE PAY ALL CHARGES

**CASH**  
Cash with order—Carriage Paid

**H.P.**  
Strict Privacy Guaranteed on all Easy Payment Orders

## ACCESSORIES FOR BETTER RADIO

### SUPER HET-ING?

Peto-Scott are pioneers in Super-Heterodyne Equipment: Frame Aerials, Intermediate Coils, etc. If you are Super-Het-ing, get your component parts from Peto-Scott.

**FRAME AERIAL—Century Type.** Supplied with Solid Base, accurate fitting bearing bush, wave-change switch, 5-way leads and six spacers. Enamelled multi-stranded wire covered overall, which ensures maximum results. Correct centre-tapped. This is a new type frame aerial designed for the modern Super.  
Pay the Postman **£1. 0. 0**

**WEARITE SUPER-HET KIT.** The Oscillator Coil is designed for panel mounting and is fitted with flexible connecting leads.  
Pay the Postman **£2. 10. 0**

**LEWCOS SUPER-HET COIL KIT.** Has an eight-kilocycle wave-band separation and consists of one triple wave-band Oscillator Coil, two I.F. Coils.  
Pay the Postman **£2. 10. 0**. Sent C.O.D. Pay the Postman.

**15/- VARLEY CONSTANT SQUARE PEAK COIL.** Specified in the Square Peak Three.

### COMET 3 Foundation Circuit

**Kit A** (less valves and cabinet) **£4-0-0**  
C.O.D. or CASH with ORDER or 12 monthly payments of 7/3.  
**KIT "B"** (with valves) C.O.D. or cash, **£5. 7. 6.**, or 12 monthly payments of 9/10.  
**KIT "C"** (with valves and cabinet), C.O.D. or cash, **£6. 7. 6** or 12 monthly payments of 11/8.

### FLEXI-COUPLED COMET 3

**Kit A** (less valves and cabinet) **£4-16-6**  
or 12 monthly payments of 8/10.  
**KIT "B"** (with valves) C.O.D. or cash, **£6. 4. 0.**, or 12 monthly payments of 11/5.  
**KIT "C"** (with valves and cabinet), C.O.D. or cash, **£7. 4. 0.**, or 12 monthly payments of 13/3. Any parts supplied separately. If value over 10/-, sent C.O.D.

### COIL QUILTS

Peto-Scott first and best. As specified and included in latest P.W. Sets. Bakelite moulding with winding holes ready drilled, shoulder for coil assembly and lug for baseboard mounting.  
Ask your dealer. Or 8d. Post Free. **6d. EACH**

### POP-VOX

See P.W. May 16th and 23rd.

**Kit A** (less valves and cabinet) **£4-8-0**  
C.O.D. or CASH with ORDER or 12 monthly payments of 8/1.  
**KIT "B"** (with valves) C.O.D. or cash, **£5. 15. 6.**, or 12 monthly payments of 10/8.  
**KIT "C"** (with valves and cabinet), C.O.D. or cash, **£7. 0. 6.**, or 12 monthly payments of 12/11. Any parts supplied separately. If value over 10/-, sent C.O.D.

See P.W. June 6th.

**Kit A** (less valves and cabinet) **£4-1-5**  
C.O.D. or CASH with ORDER or 12 monthly payments of 7/6.  
**KIT "B"** (with valves) C.O.D. or cash, **£5. 8. 11.**, or 12 monthly payments of 10/7.  
**KIT "C"** (with valves and cabinet), C.O.D. or cash, **£6. 7. 11.**, or 12 monthly payments of 11/9. Any parts supplied separately. If value over 10/-, sent C.O.D.

**ATLAS A.C. ELIMINATOR TYPE A.C. 244.** 3 tappings—S.G., detector, power. Output 120 volts at 20 m.a.  
Cash Price or C.O.D. **£2 19 6**  
Balance in 11 monthly payments of 5/6 only

**BLUE SPOT SPEAKER UNIT TYPE 66R.** 4 pole balanced armature with Major Chassis and Cone (37 cm). Cash Price **£2 10 0**  
Balance in 11 monthly payments of 8/10 only

**EXIDE 120-VOLT WH. TYPE ACCUMULATOR.** in crates.  
Cash Price or C.O.D. **£4 13 0**  
Balance in 11 monthly payments of 8/6 only

**LAMPLUGH OR FARRAND INDUCTOR SPEAKER** for perfect reproduction. Unit and Chassis complete, ready mounted.  
Cash price or C.O.D. **£3 10 0**  
Balance in 11 monthly payments of 8/5 only

**EPOCH PERMANENT MAGNET SPEAKER** with type B5 unit only.  
Cash price or C.O.D. **£4 4 0**  
Balance in 11 monthly payments of 7/9 only

**EPOCH PERMANENT MAGNET MOVING COIL SPEAKER, Type A.z.**  
Cash price or C.O.D. **£3 3 0**  
Balance in 11 monthly payments of 5/9 only

**W.B. PERMANENT MAGNET MOVING-COIL SPEAKER** (without transformer).  
Cash price or C.O.D. **£4 10 0**  
Balance in 11 monthly payments of 8/4 only

**WUFA 60 pole unit** with chassis.  
Cash price or C.O.D. **£2 0 0**  
Balance in 5 monthly payments of 7/1 only

### TRADE NOTE.

Peto-Scott Coil Quilts, Frame Aerials and other Super-Heterodyne Equipment are available to the Trade. Terms upon application.

## PETO-SCOTT CO. LTD.

Head Office:—77, CITY ROAD, LONDON, E.C.1. Clerkenwell 9406.

62 HIGH HOLBORN, LONDON, W.C.1. Chancery 8266. MANCHESTER: 33 WHITELOW ROAD, CHORLTON-CUM-HARDY. Phone: Chorlton-Cum-Hardy 2028. NEWCASTLE, STAFFS: 7 ALBANY ROAD. Phone: 67190.

PLAYERS MEDIUM AVY CUT

That reminds me, have a

# PLAYER

The Quality and Quantity Cigarette

"We're Fluxite and Solder—The reliable pair, Famous for Soldering, Known everywhere! If your Set is in trouble There's no need to moan, Let US come and help you Restore it to 'tone'!"

See that Fluxite and Solder are always by you—in the house, workshop, garage—anywhere where simple, speedy soldering is needed. They cost so little, but will make scores of everyday articles last years longer! For Pots, Pans, Silver and Brassware; Radio; odd jobs in the GARAGE—there's always something useful for Fluxite and Solder to do.

ANOTHER USE FOR FLUXITE. Hardening Tools and Case Hardening. Ask for Leaflet on improved method.

All Hardware and Ironmongery Stores sell Fluxite in tins. 8d., 1/4 and 2/8. NEW "JUNIOR" SIZE. 4d. per tin.

### FLUXITE SOLDERING SET

Simple to use and lasts for years in constant use. Contains special "small space" soldering iron with non-heating, metal handle; pocket blow-lamp, Fluxite, Solder, etc.; and full instructions COMPLETE 7/6. or LAMP only 2/6.

FLUXITE LTD. (Dept. 324.) ROTHERHITHE, S.E.16

ALL MECHANICS WILL

# FLUXITE

IT SIMP



# MODERN COMPONENTS AND ACCESSORIES

## AN IMPARTIAL CRITIQUE



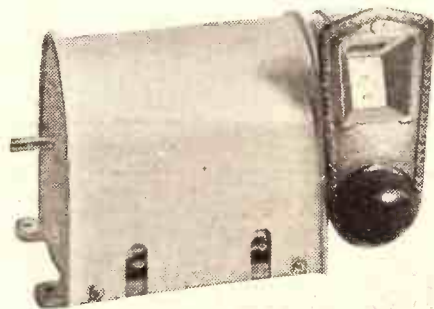
PERHAPS there are many of you who are wondering how it is possible to judge the merits of the different makes of radio accessories and components that are exhibited in such profusion in the shops. There is mighty little in radio that can be judged purely on its "face value." Indeed, that phrase has hardly any meaning

\*-----\*

A guide for the prospective purchaser of radio gear. Even if you are not at the moment contemplating buying anything, you will find this article very interesting, for it indicates the outstanding features to be found in the goods on view at your local shops.

\*-----\*

Tell the assistant behind the counter that you are "just going to have a look round." He won't mind, that you can be sure; if he is an alert salesman and there aren't any other customers to serve, he will point out the "high lights" of his display for your benefit. If you have an inquiring mind you could ask a number of questions that he would



An example of modern condenser engineering, the Polar Two-Gang with a drum drive.

are not often able to penetrate into these guarded preserves.

Readers would no doubt be surprised and gratified if they knew how many advertisements the editor has refused because, after investigation, the specious claims of various potential advertisers have been found to be vastly exaggerated.

### Have a Good Look Round!

Quite frequently it should be mentioned, such exaggerations and mis-statements of fact have been of an innocent character and due either to excessive enthusiasm or to genuine ignorance.

When you are in a radio store making a purchase, do not fail to take the opportunity of examining all the latest lines that are on view. You will find it possible to spend a very interesting and informative half an hour or so in this manner.



A representative of the fine "Atlas" range of mains units.

in wireless or electricity. That is, if you except the names and trade marks of the manufacturers. As a matter of fact, these must largely be your guides.

And you cannot go far wrong if you carry in your mind a bunch of the names occurring in the advertisement columns of POPULAR WIRELESS. "Junk" and "catch-pennies"

find very difficult to answer. For instance, you might ask him why it is that some L.F. transformers are quite large and others comparatively tiny, while, again, some of the large ones are much heavier than others.

We'll tell you now so that you can be armed with the right answer! (1) An L.F.

(Continued on next page.)

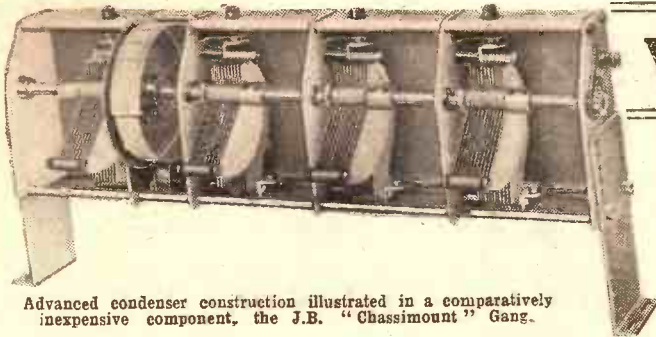
### ARTICLES THAT GIVE BOTH SATISFACTION AND SERVICE



At the extreme left is one of those efficient Lewcos X coils, and then comes one of the very latest valves (a mains Pentode), a nickel-iron L.F. Choke, a Goltone D.C. Trickle Charger and a Blue Spot Loud-Speaker Unit.



# WHAT TO LOOK FOR



Advanced condenser construction illustrated in a comparatively inexpensive component, the J.B. "Chassimount" Gang.

it has got ball bearings. It is a common fallacy that these are fitted to make the moving vanes move freely. That is not the case. You do not want

spring that serves to make a definite contact between the moving vanes and the metal frame of the device.)

A metal "brush" is now to be seen in the products of one or two concerns.

The modern gang and dual and triple

transformer of unusually small dimensions may possess either an inadequate supply of "ordinary iron" or an adequate supply of special iron. (2) A large case is prima facie evidence of large contents. In the days when all manufacturers used "ordinary iron" for the cores of their transformers, no L.F. transformer was considered as a possible candidate for the "highly efficient" class unless it were large and heavy.

the vanes of a variable condenser to swing as freely as the wheel of a bicycle in which ball bearings are used. Smoothness of motion and not freedom from friction is what is needed, and it is, of course, to get this that many makers use ball bearings in their variables.



A magnificent all-mains set, the "Ekco" Model 313 for D.C. or A.C.



The Belling & Lee "B" terminal makes positive connection with tag, spade and wire with great facility.

A few makers of what are really tiny transformers still think it advisable, for psychological reasons, to preserve the large dimensions, so they build their tiny transformers into large cases.

### Condenser Improvements.

If you compare a number of different makes of variables you will note that the "pig-

drum assemblies include some beautiful examples of engineering in which the mechanical and electrical aspects of the art are expressed in their highest forms.

And however little you know of the theory of radio you will be able to appre-

### Don't be "Had!"

There is nothing at all savouring of sharp practice in this so long as the transformer delivers the goods. If it doesn't—!

If there happens to be a variable condenser lying about removed from its carton, the odds are that you will pick it up and "twiddle it," thus giving vent to one of the most widespread urges of this mechanical age.

Don't be misled into thinking that it must be "one of the best" simply because



One of the most modern speaker units, the Ferranti Magno Dynamic.



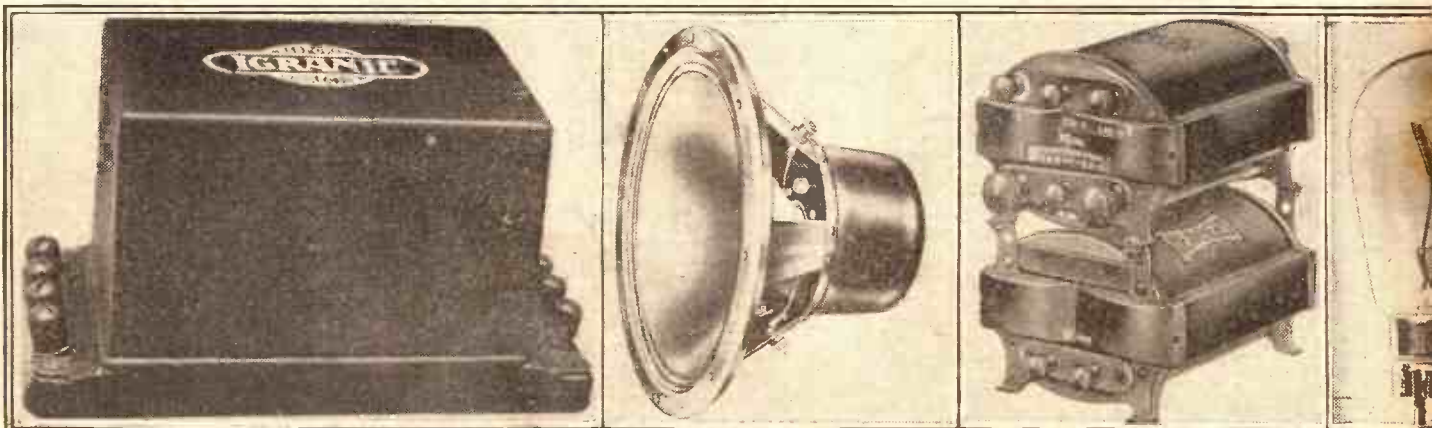
Two views of the new Junit "Lolos" valve-holder.

tail" is no longer universal. (A pig-tail is that little spiral of wire or loose metal

ciate the excellence of the "slow motions" to be found either "built in" or in separate dial and drum drives.

One of the latest developments of the variable condenser is the Extenser, and no doubt by the time this article appears in print there will be several makes of this component on view at every radio store.

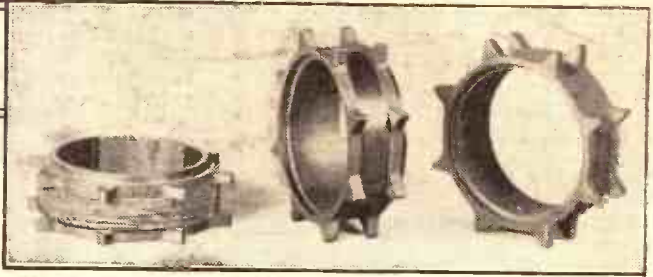
## SOME PRACTICAL ILLUSTRATIONS OF PRESENT-DAY RADIO



Here is an excellently representative range of modern components and accessories. First we have the Igranite Response Corrector for realistic record reproduction, after which we have the inexpensive Amplion Moving-Coil Unit, a Heavberd Mains Transformer-Choke combination, the Osram K.L.



# IN THE RADIO STORE

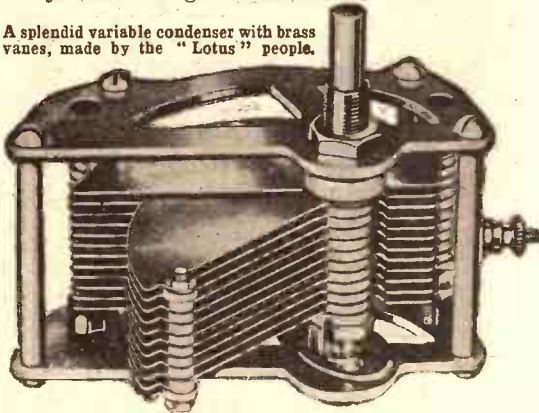


One of "P.W.'s" own contributions to better radio. "Coil Quits," made by Peto-Scott.

In these Extensers the inquiring constructor will discover numerous points of interest. He will be able to note the different ways in which the different manufacturers have tackled the design of the "self-changer" that automatically carries out the wave-changing.

It is also possible that he will have the opportunity of examining Extensers in sets

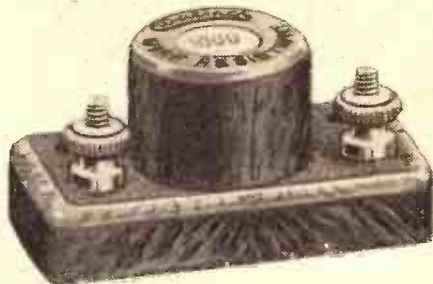
A splendid variable condenser with brass vanes, made by the "Lotus" people.



and be able to see for himself how greatly they contribute to the simplification of construction and control.

### Tried an "Extenser" Yet?

Indeed, if he hasn't handled one of these devices on a previous occasion we do not doubt but that he will be quite surprised by the almost spectacular contribution they



The Watmel Wire-Wound Resistance is a particularly neat little device.

can make to simpler and more logical receiver design.

There has been a tendency on the part of a few people to wave aside the Extenser as being "nothing but a combination of variable condenser and wave-change switch." But it is considerably more than the literal interpretation of that phrase.

Undoubtedly the greatest variety in form and efficiency is to be found in the loud speaker. That accessory is, in fact, the most confusing of all radio articles. Its appearance is no guide at all as to its technical abilities, and the constructor who misses a chance of hearing a number of loud speakers demonstrated is losing an excellent opportunity of a most edifying experience.

We have said that wireless apparatus must not be judged on its "face value." We would like to add that loud speakers must not be judged at "ear value."

edifying experience.

We have said that wireless apparatus must not be judged on its "face value." We would like to add that loud speakers must not be judged at "ear value."



A boon for those who suffer from electrical interference. The Dubilier Anti-Interference Unit.

Very few radio stores have the facilities for the proper demonstration of speakers.

### Testing Loud Speakers.

The first desideratum is a room approximating in size and furnishing the average living-room of the average house. Neither the "open" shop nor a closed listening cabinet of the dimensions of a large telephone cabinet are suitable alternatives.

The second essential is that the set which supplies the energy for the loud-speaker tests should be of first-rate quality, and operated so that it can deliver at least a fair approach to a straight-line output.

There are those who say that demonstration sets should be no better than the average receiver used by the average listener. But that is, in our opinion, quite wrong. Given that the loud speakers to be demonstrated are "unknown quantities" to the prospective customer, surely it is vital that the energy fed to them should be as nearly above reproach as is humanly possible?

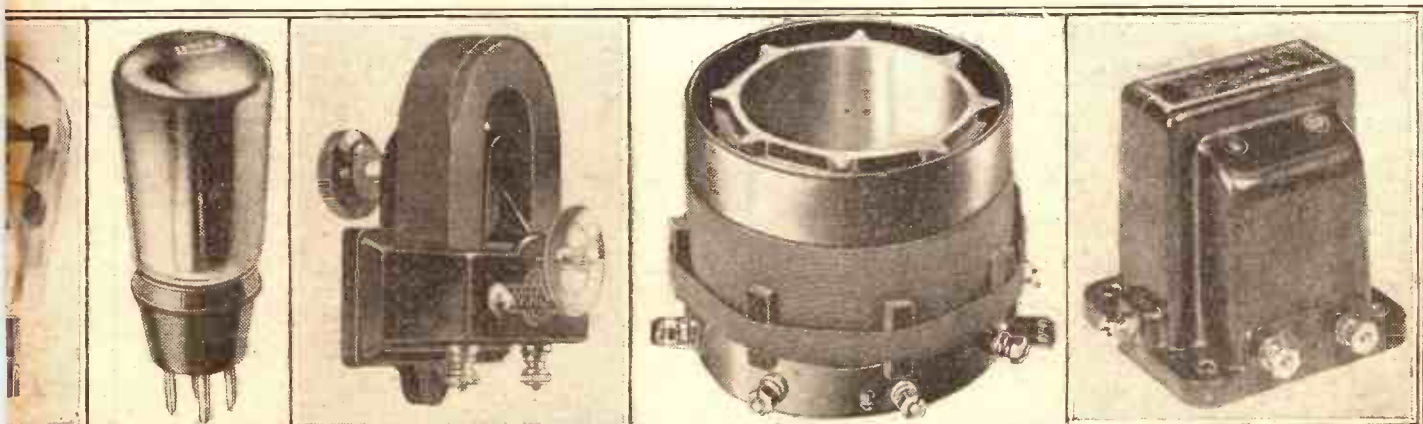
A set having a distorted output might quite conceivably work one loud speaker



The Mazda A.C./PEN, a famous A.C. Power Pentode.

(Continued on next page.)

## PRACTICE AMONG OUR LEADING MANUFACTURERS



Valve (which was a pioneer of all the indirectly-heated mains valves), a Lissen Battery Valve and Ormond Electro-Magnetic L.S. Unit, the Ready Radio version of the "P.W." Dual-Range Coil, and last, but by no means least, the Telsen Radiogrand L.F. Transformer.



## MODERN COMPONENTS AND ACCESSORIES

(Continued from previous page.)

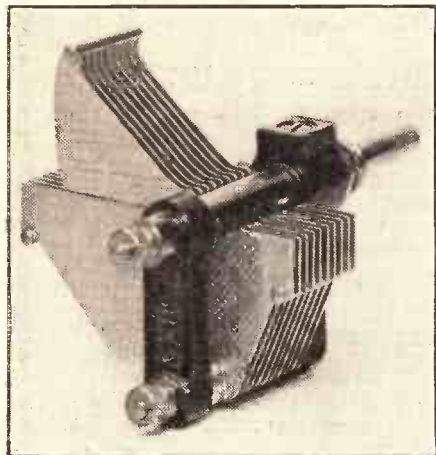
much better than others simply because that loud speaker possessed faults that, to some extent, tended to negative or smother the faults of the set.

No; you only commence to have the basis for a fair comparison between several different loud speakers when you have the best possible outfit to connect them to. Also it must be remembered that all loud speakers are not similar in regard to the output circuits that best suit them, and that a demonstration receiver should incorporate some scheme for varying the coupling within sufficiently wide limits to satisfy the majority of requirements.

### A Great Pity.

Shop assistants who hook their loud-speaker wares on to the first ill-adjusted set to hand to the makers of the loud speakers concerned a grave disservice.

Another point to note is that not a few loud speakers are sold merely on the strength



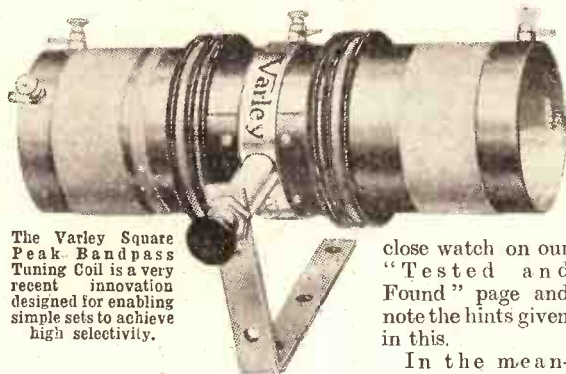
The Formo condensers are noted for their quality as well as their reasonable price.

of their rendition of particular types of music. Now, the average listener is no music

critic; anyway, he is unable to analyse the finer shades of harmonic construction.

With this well in mind, demonstrators all too often confine their tests to that cinema kind of music that still sounds quite pleasant, owing to its well-known and widely liked melody, when trimmed and "mellowed" by a badly "inert" loud speaker.

We are not going to give advice as to how the constructor can pick out the best loud speaker of a bunch demonstrated to him in a shop. He will be well advised either to obtain the help of an impartial someone who has expert knowledge, or to keep a



The Varley Square Peak Bandpass Tuning Coil is a very recent innovation designed for enabling simple sets to achieve high selectivity.

close watch on our "Tested and Found" page and note the hints given in this.

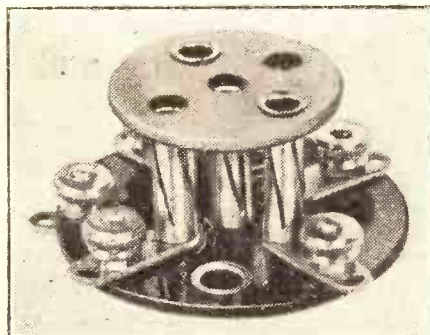
In the meantime, whether he is

actively in the market for a loud speaker or not, he will find it interesting closely to examine as many loud speakers as there are in the store in which he is presumed to be lingering.

Those well-known makes he sees advertised in "P.W." will, for the most part, reveal excellent woodwork and, if he can peer inside, sound engineering in regard to the "unit." There will probably be other loud speakers with beautifully glossy fronts, and tough, splintery backs and rough, flimsy units. Then he will see cabinet designs that make him wonder (1) who on earth is possessed of such a curious mind as to design such things, and (2) who on earth pays money to have such objects in their houses.

### Many Types of Receivers.

And much the same sort of thing will apply to a number of the commercial receivers on view. But these curious "lines" are mostly designed to meet a very real demand for things that are "different." Tastes differ so widely that what some of you consider to be Epstein at his worst—but we forget, there are many who sincerely admire and like the work of this noted sculptor.

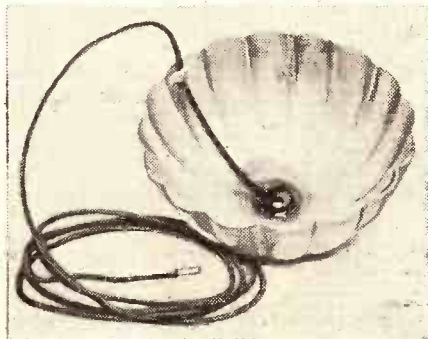


An ingeniously effective valve holder, the Lectro-Liux "Clix."

In the sets as such the constructor will have only an academic interest, for he is one who "makes his own." Nevertheless, inasmuch as he will no doubt be called upon to give advice to friends and relatives concerning the choice of sets, it behoves him to look and learn.

There are some fine sets to be seen in the shops this year, too. No longer is the constructor able to "look down" on the products of Britain's radio factories. Many of them are magnificent pieces of radio engineering, and if the majority of them of necessity have sacrificed something "in production" it must not be assumed that in so doing they sink to any low level of mediocrity.

One or two of the "commercials" hotted up would set a really world-beating pace. Nowadays it is only when something like



The "Ealex" Earth Bowl provides 100 per cent efficient earthing.

the Extenser comes along that the constructor is able to leap ahead in the true sense, though, of course, he is always "well up" in regard to costs. Further, he is inevitably just that bit in advance in results that constitute the difference between the laboratory model and its production version.

## ACCESSORIES WELL WORTH NOTING—AND BUYING



Here are a Wearite Wave-Change Frame Aerial, a W.B. Permanent Magnet Moving-Coil Loud-Speaker Unit, a Barton Biconical H.F. Choke, an Edison Bell Permanent Magnet Moving-Coil Speaker Unit, and a Burne-Jones Dissolver for controlling both record and radio volume.



# THREE-VALVE EFFICIENCY

## from the "POP-VOX" TWO by using

# READY RADIO COILS

Every Ready Radio "POP-VOX" Kit contains the famous Ready Radio "Star-Turn" Selector Coil and the special Ready Radio short and long wave coils. The amazing sensitivity and selectivity attained by all the "P.W." "POP-VOX" sets is entirely due to the specified Ready Radio Selector Coil, while performance is still further improved by the Ready Radio short and long wave coils, which are specially suitable for use with the new "Extenser" System.

**BUY YOUR "POP-VOX" from Ready Radio and get best possible reception!**

**Immediate Dispatch**

**Cash or Easy Payments**

Send for the Ready Radio Catalogue. A complete encyclopædia of all modern Sets, Speakers, Equipment, Components and Accessories, including everything needed by the set-builder. Price 1/-, post free.

**IMMEDIATE DESPATCH ORDER FORM**

To: READY RADIO (R.R.) Ltd., 159, Borough High Street, London Bridge, S.E.1

**CASH ORDER FORM.** Please despatch to me at once the goods specified for which I enclose payment in full of £.....

**C.O.D. ORDER FORM.** Please despatch to me at once the goods specified for which I will pay in full the sum of £.....

**EASY PAYMENT ORDER FORM.** Please despatch my Easy Payment order for the goods specified for which I enclose first deposit of £.....

NAME.....

ADDRESS.....

*TO INLAND CUSTOMERS*  
Your goods are despatched post free or carriage paid.

*TO OVERSEAS CUSTOMERS*  
All your goods are very carefully packed for export, and insured, all charges forward.

**KIT REQUIRED**.....

**THE "POP-VOX" TWO**

*As good as the average "Three"!*

|  |               |
|--|---------------|
| 1 Ebonite panel, 7 in. x 8 in. x 1/4 in., drilled to specification | 2 9           |
| 1 ReadiRad Cabinet, specified for the "Pop-Vox" Two                | 18 6          |
| 1 Cyldon .0005-mfd. "Extenser" condenser                           | 17 0          |
| 1 ReadiRad on-off switch   | 10            |
| 1 ReadiRad Star Turn Selector coil                                 | 15 0          |
| 1 ReadiRad .00015-mfd. differential condenser                      | 5 0           |
| 2 Telsen 4-pin valve holders                                       | 1 0           |
| 1 Telsen "ACE" L.F. transformer                                    | 5 6           |
| 1 ReadiRad .0003-mfd. fixed condenser                              | 10            |
| 1 ReadiRad 2-megohm grid leak and holder                           | 1 4           |
| 1 ReadiRad 15,000-ohm Link resistance                              | 1 3           |
| 1 Grid Battery clip  | 2 6           |
| 1 ReadiRad coil  | 8 6           |
| 2 ReadiRad coils, low and high waves specified                     | 2 6           |
| 1 Pkt. ReadiRad "Jifflinx" for wiring                              | 6 6           |
| 2 Terminal blocks, 2 in. x 2 in. x 1/4 in.                         | 1 0           |
| 4 Belling-Lee "R" terminals  | 19 0          |
| 2 Mullard Valves to specification (det. and power)                 | 1 4           |
| Flex, plugs, screws, etc.  | 1 4           |
| <b>Total (including valves and cabinet)</b>                        | <b>£5 4 6</b> |

**KIT "A"** (less valves and cabinet) **£3:7:0**

or twelve equal monthly instalments of 6/2

**KIT "B"** (with valves less cabinet) **£4:6:0**

or twelve equal monthly instalments of 7/10

**KIT "C"** (with valves and cabinet) **£5:4:6**

or twelve equal monthly instalments of 9/7

**THE P.W. "POP-VOX" TWO**

Completely assembled with valves and Cabinet ready for use and aerial tested.

**PRICE (Including Royalties) £6:11:0**

or twelve equal monthly payments of 12/-

**THE "POP-VOX" THREE**

*As good as the average "Four"!*

**KIT "A"** (less valves and cabinet) **£5: 0:0**

or twelve equal monthly instalments of 9/2

**KIT "B"** (with valves less cabinet) **£6: 7:6**

or twelve equal monthly instalments of 11/8

**KIT "C"** (with valves and cabinet) **£7:12:6**

or twelve equal monthly instalments of 14/-

**THE P.W. "POP-VOX" THREE**

Completely assembled with valves and cabinet, ready for use and aerial tested.

**PRICE (Including Royalties) £9:5:0**

or twelve equal monthly payments of 17/-

*Ready Radio*

**159, BOROUGH HIGH STREET, LONDON BRIDGE, S.E.1.**

Telephone: Hop 5555 (Private Exchange) Telegrams: READIRAD., SEDIST.





# CAPT. ECKERSLEY'S QUERY CORNER

**WHY USE VALVES?—A QUESTION OF EFFICIENCY—WHY NOT CITY STATIONS?—WHICH KIND OF M.C. ?**

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 to Captain Eckersley, however, a selection of those received by the Query Department in the ordinary way will be answered by him.

**Why Use Valves ?**

N. S. (Birkenhead).—"Is it absolutely necessary to employ such a transmitter as that at Brookmans Park in order to radiate modulated waves ?

"Since such a station operates on a fixed wave-length, would it not be possible for the aerial to be energised directly by an alternating generator designed to provide power at a frequency of (for the National transmitter) 1,148,000 cycles. I take it that an alternator could be designed to operate at such a high-frequency and the only objection to the arrangement would appear to be the need for fixing the wave-length of the station 'for ever.'"

I do not want to seem to belittle your competency. I think your question perfectly rational—but what do you think one would gain by using an alternator ?

I suggest the valve methods of creating the continuous waves are more practical than alternator methods, and that any gain in efficiency which might conceivably be manifest with alternator methods is offset by the greater complication and expense entailed. The alternator has been used to create very high frequencies, but apart from many minor problems it is difficult to maintain the constancy of speed necessary to make the alternations always the correct frequency.

Then, again, one would need many wet towels round one's head to solve problems concerned with getting absolute linearity of response, in spite of using iron in the principal circuits. The valve method, in spite of minor headaches, is so fundamentally simple and robust, that I think it will be many decades before it will be fundamentally superseded.

After all, we do not waste much power when it is considered that the wave must be modulated linearly. One of the greater economies will be effected when we find means to produce a large emission of electrons from the cathode without the expenditure of anything like so much power as must be used to-day.

**A Question of Efficiency.**

W. M. P. (Hackney).—"Could I increase the efficiency of my moving-coil loud

speaker pot. by increasing the current passing through it—if this is so, then possibly I would get better results by obtaining a 100-volt pot. and using it on my 200-volt mains."

Steady! Could I increase the efficiency of my (hot wire) electric lamp by increasing the current passing through it?—if this is so, then possibly I could get better results by obtaining a 100-volt lamp and using it on 200-volt mains!

**It Just Isn't Done !**

Obviously I must not put a 100-volt lamp into a 200-volt socket, because the lamp would go "phump" in one gratifying flare. You cannot push more energy into

There are about 110 different available wave-lengths for use by the broadcasting stations of Europe, Eastern Russia, and Northern Africa (also Constantinople and Iceland)—of these 110 wave-lengths, Britain is allowed 10 wave-lengths.

**Large Range Essential.**

The use of so few stations involves the use of high power, so that the greatest possible number of persons may be served. The London station has a power of about 70 kilowatts.

If a station of this power and of a size proportional to that power were located in Central London, it could "wipe out" many millions of listeners who would thus

be condemned to listen only to the B.B.C. No foreign station reception would be possible!

Moreover, the waves would lose a lot of energy in the densely-built-over terrain surrounding the station, and people in the home counties would be robbed of signals while, as pointed out above, those in the town would have embarras de richesse.

The economic question would forbid the purchase of the 39 or 40 acres of land in the centre of London necessary to accommodate the station. Lastly, the London County Council would probably object even if the idea was a good one!

**Which Kind of M.C. ?**

M. L. (Preston).—"I am purchasing a moving-coil loud speaker, and I am not sure whether it would be advisable for me to get a permanent-magnet or electro-magnet type. I have the mains available, and I am wondering whether the magnetic type has any advantages over the permanent magnet. Can you help me ?

The permanent-magnet type is theoretically, and usually practically, slightly less sensitive, other things being equal. Nevertheless, it is quite sufficiently sensitive to be highly practical when mains do not exist and where, therefore, costly battery energy is required to produce the necessary magnetisation.

If you have mains your choice is dictated more by best performance of a particular design than any other considerations.



\*  
**ARE YOU A  
VALVE  
MURDERER ?**  
\*  
To wring the neck of a valve is to destroy its usefulness, to cut it off in its prime to take its life !  
Get into the habit of gripping its base to pull it out of the valve holder, as shown to the left. To pull on the bulb itself (right) is simply asking for trouble.  
\*



any electrical machinery than such machinery was designed to handle, otherwise things get too hot and burn up.

You might completely re-design the magnet system of a moving-coil speaker so that you could put more power into the windings, but the gain over a properly-designed magnet system would not be considerable.

**Why Not City Stations ?**

B. R. (Clapham).—"Why is it when the B.B.C. wish to serve a large town such as London, that instead of placing the transmitter in the centre of the town (which seems to me to be the obvious place), they erect it at a considerable distance from the town ?"



## The perfect jelly acid battery . . .

Engineers have known for a long time that the jelly acid battery would be the ideal battery for portable sets if only it could be made as efficient as a liquid acid battery. Its advantages in safety and cleanliness were obvious.

But jelly acid batteries suffered from certain serious electrical defects and they were not suitable for general use until these had been removed. Exide have removed them. The new Exide Gel-cel Battery compares in efficiency with the best liquid acid batteries and yet has all the advantages of jelly acid. It is **absolutely unspillable**

and leak-proof. As an extra precaution against the escape of residual acid this battery has an improved acid trap and a seamless case with double bottom. It is the **safest battery** ever produced. When the present battery in your portable set must be replaced, take no risks — fit an Exide Gel-cel.



There is a size to suit every set. Prices range from 13/6

From Exide Service Stations or any reputable dealer. Exide Service Stations give service on **every** make of battery. Exide Batteries, Clifton Junction, near Manchester. Branches at London, Manchester, Birmingham, Bristol and Glasgow. M 15.



FROM THE TECHNICAL EDITOR'S NOTE BOOK.

# Tested and Found-?



### A "MIGHTY ATOM."

It is just as well that the "Parafeed," R.I.'s new L.F. transformer, was not introduced four or five years ago, for in those days few would have given it a second thought. The average constructor might have glanced at it interestedly, but he'd never have troubled to try it, for he'd considered it impossible such a transformer could work.

But the "Parafeed" could not have been developed four or five years ago, because our knowledge of the use of special nickel-iron alloys for the cores of L.F. transformers was not as fully developed as it is now.



The "Parafeed" is only about one and a quarter inches square.

Messrs. Radio Instruments are, of course, specialists in this particular branch of radio, and in the "Parafeed" they have made an astounding step forward.

This new component is undoubtedly the smallest L.F. transformer ever designed to give first-class results. And it does give these in practice; indeed, some of its N.P.L. curves are better than any others I've seen.

And it is to sell at a price competitive with the cheapest L.F. transformers at present sold!

The "Parafeed," as its name suggests, is specifically constructed for shunt-feed H.T. circuits. It cannot be used directly in the anode circuit of a valve, or its characteristics are completely upset.

But, in view of its price, it is still a remarkable little proposition even when the cost of a fixed condenser and resistance are added. Portable set makers should find it a boon indeed, while its compactness will no doubt be very greatly appreciated in ordinary designs as well.

So long as it is viewed as an element in the special and ever-increasingly popular shunt-feed form of transformer coupling, types of which are illustrated in a diagram on this page, it cannot fail to stand as one of the year's most notable contributions to radio. But, as I have said, you must not be tempted to use it with the H.T. current flowing through its primary winding, or its

advantages will be almost entirely lost.

### JUNIOR FLUXITE.

Fluxite, Ltd. have introduced a new size tin of Fluxite especially for amateurs, and those others who may find it convenient to purchase a smaller tin than has previously been obtainable.

The new size is known as the Junior Fluxite, and is sold at 4d. per tin.

### A FINE CATALOGUE.

The 1931 catalogue issued by Cecil Ridley, of Middlesbrough is a magnificent affair of over 120 pages. A very human touch is given to it by the inclusion of photographs of all the leading personalities connected with this enterprising firm.

### "MOTOR" LOUD SPEAKERS.

Quite recently I have had the opportunity of testing various of the "Motor" loud speakers and units and chassis which are handled by the Tekade concern. They are first-class productions, and at the prices at which the various models are listed constitute excellent value for money.

There is a cabinet model at 45s. which particularly appeals to me. The cabinet itself is of highly polished walnut with rounded corners, and there is a handsome front.

This speaker is sensitive and will work well even with a small two-valver although, on the other hand, it will handle creditably the output of a much more powerful receiver.

Its response is good and free from the muzziness that is associated with the performances of far too many of the cheaper cones.

Those constructors who make their own loud speakers could do far worse than employ one or other of the "Motor" units. The super unit costs 22s 6d., and is a particularly notable production.

### "COMET" CABINETS.

Owners of "Comet" Two's and Three's, whose sets are not yet housed in proper cabinets should be interested to learn that Chas. A. Osborn, of New North Road, London, N.1 is producing a special "Comet" cabinet in solid oak at 12/- unpolished or 15/- polished and finished.

And at these prices the articles are packed free and sent carriage paid anywhere in the United Kingdom. I have inspected a sample, and it seems to me to be quite a good proposition.

### GAMBRELL MOVING-COIL LOUD SPEAKER.

Loud-speaker enthusiasts should make a point of sending for the Gambrell Radio Ltd. leaflet which deals with the new Gambrell Varichromatic Moving-Coil loud speaker. It appears to be a particularly interesting instrument.

### ELECTRADIX RADIO.

The new Electradix catalogue details a remarkably varied range of radio and electrical apparatus. There are all sorts of fascinating items from ex-service radio transmitters and receivers to Marconi seven-valvers at very low prices.

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 guarantee their safe return undamaged, 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.

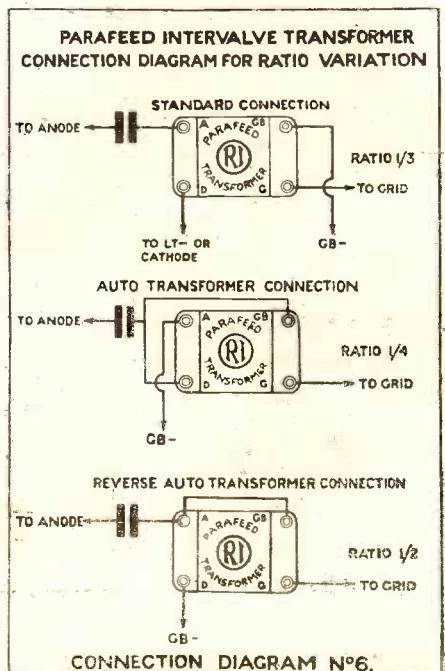
### GRAWOR LOUD SPEAKERS.

Henry Joseph, of Red Lion Square, High Holborn, London, W.C.1, offers to send his latest list of Grawor loud speakers to any "P.W." reader on application.

### NEW MARCONI TWO-VOLTER.

The new Marconi H.L.2 is particularly suitable for the detector stages of "Pop-Vox" sets. It has an impedance of about 18,000 ohms, and an amplification factor of 27, just the characteristics that I recommended for this particular job.

The filament consumption is only .1 amp. and the price 8s. 6d. It can, of course, be used with advantage in a detector position on most other sets, and has its applications in H.F. stages as well.



Three ways in which the new R.I. Transformer can be wired up.



# Announcing the



In response to an insistent demand, Dubilier are now producing a Spaghetti Wire-wound Resistance. This Resistance is flexible and is exceptionally convenient for fitting into a Radio Set. These Resistances are highly efficient and are at present available in values of 30,000 and 50,000 ohms. A full range of values will be available in the near future.

Here's proof of its ability to do its job . . . R.I. recommend it for use with their new PARAFEED L.F. Transformers together with a Dubilier Type B.B. 1.-m.f. or a .5-m.f. Paper Di-Electric Condenser. Such a combination of irreproachable components will give you unexcelled results.

**RECOMMENDED  
FOR USE WITH THE**



**PARAFEED  
L. F. TRANSFORMER**



**DUBILIER CONDENSER Co. (1925) LTD.**  
Ducon Works, Victoria Road, N. Acton, London, W.3

# The new RADIO WONDER



**Everlasting High Tension  
for any Set—Standard  
or Portable—1-4 Valves**

Don't tolerate inefficient and expensive H.T. Batteries any longer. The new "ATLAS" H.T. Unit Model A.C. 244 will assure you of the maximum H.T. for your Set at any time from the Mains, provided you have A.C. Electric Lighting in the home. This Model—A.C. 244—is the finest A.C. Unit ever produced at the price and will last a lifetime, and is suitable for all popular 2, 3 and 4 Valve Sets.

**Read about the outstanding features:—**

Three Tappings are provided, 60/80 Volts for Screen Grid Valve, 90/100 Volts for Detector Valve, and 120/150 Volts for Pentode or Power Valve. Output 120 Volts at 20 m/A or 150 Volts at 15 m/A. It Incorporates the Westinghouse Metal Rectifier, and is guaranteed for 12 months.

# "CLARKE'S ATLAS" MAINS H.T. UNIT A.C. 244

Ask your dealer for demonstration or write for Folder No. 56, direct to:  
**H. CLARKE & CO. (M/CR.) LTD.**  
Atlas Works, Old Trafford, MANCHESTER.  
LONDON OFFICE: 60, Chandos St., Strand, W.C.2.  
*Telephone: Temple Bar 7130*  
GLASGOW OFFICE: 24, Oswald Street. *Telephone: Central 5119*



# STATIONS WORTH HEARING

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.

**Q**UITE likely you saw in print that Beromünster was now putting out his full 77 kilowatts, but if you didn't see the statement you probably guessed that something of the kind was happening from the effects on your loud-speaker. The other big Swiss station of Sottens is still using only 32 kilowatts, but there is not a great deal to choose between them in this country as regards volume.

This is rather curious, since normally the station on the longer wave would be expected to be the more powerfully received at five hundred-odd miles, even if both were using the same power. As it is, Sottens has both lower power and a wave-length shorter by 56 metres.

## A Curious Case.

It may well be, though, that in localities other than mine Beromünster comes in with considerably more strength than Sottens. Wireless is full of curious happenings like this!

You may remember that I mentioned in recent notes a curious case of reception of Brussels No. 1 and No. 2. In one house No. 1 is by far the more powerful station;

another less than a quarter of a mile away No. 2 has No. 1 beaten to the proverbial frazzle.

## Two Powerful Transmissions.

Another instance is provided by Rome and Stockholm. Here are two big stations using the same output power, differing in wave-length by only 5 metres, and both lying at almost the same distance from the middle of this country. It is generally found that a transmission coming from a northerly or southerly direction has a greater range than one of the same power coming from east or west.

We should expect, therefore, that Rome and Stockholm would have very much the same strength, but that on the whole Stockholm would be rather the more powerful of the two. Certainly I never have found this to be so.

Rome has always been much the stronger for me, and I do not ever remember having had daylight reception from Stockholm, though I frequently obtain it from Rome. I know, though, that there are localities even in southern England where the Swedish station is better received than the Italian.

All of the stations so far mentioned are coming in well just now except that Stockholm is not usually really strong until daylight has begun to depart. At the moment of writing, conditions, apart from a little atmospheric interference, are simply amazingly good.

The long-wave stations with one exception are coming through as I have never heard them any summer of the last three years. The only exception is Oslo, who is having a spell of mysterious weakness.

He seems to suffer from this kind of thing every now and then. Similar weak periods were noticeable in the third week in May and the first week in June. Possibly experiments with the transmitter are still in progress.

On the medium-wave band, Budapest, who completely disappeared at about the end of April last year, remains always audible. Sometimes he is a weak transmission, sometimes good reception is possible again.

Vienna is not at present maintaining the strength which he showed at the end of May, but Milan has staged a remarkable come-back, good reception being the rule on most evenings. Langenberg is always there, and Berlin Witzleben is not too bad. Katowice suffers a good deal from interference, and Bucharest is seldom good just now.

## All Worthy of Attention.

On the other hand, Toulouse, Frankfurt, Hamburg, Mühlacker and Breslau are always worth the attention of the long-distance man. Gothenburg is coming through particularly well on most nights, though he had a spell of fading at the beginning of June. Hilversum is an excellent station, but Turin has been very badly heterodyned of late.

**A**S is usual in these matters, quite a number of logs for the "P.W."

Competition have reached me far, far too late. None of them, however, is good enough to be even in the running for top score, so that the late-comers can console themselves by reflecting that they have not lost anything!

Here is news of the Wilkins Expedition, kindly sent in by a number of readers, and extracted from a source where I should have seen it myself weeks ago if I had read more carefully: W S E A, the "Nautilus," transmits daily at 15.00 and 21.00 E.S.T. on 9,820 k.c. (30.55 metres). He is looking out for amateurs on the 7 m.c. (42-metre) band, and wants reports via A R R L, 38, La Salle Road, West Hartford, Conn., U.S.A.

## An Unusual Opportunity.

I believe that I have seen it mentioned that he also uses a 26-metre wave-length for amateur work. He has five available altogether.

"L.W.O.," of Uxbridge, reports reception of the Canadian Pacific liner "Empress of Britain," but gives no details. Signals from the Graf Zeppelin at Friedrichshaven have also been heard lately on about 35 metres. Perhaps she is tuning up for the forthcoming Polar flight.

Incidentally, this should afford unusual opportunities for a "scoop." It is not often that one has the chance of hearing two sets of signals from near the North Pole, one from an airship and the other from a submarine.

Now that the curiosity of those who

## SHORT-WAVE NOTES

A few interesting observations concerning happenings down on the short waves, by W. L. S., a very well-known amateur transmitter and a leading expert on the subject.

wanted to know about my receiver has been satisfied, I am being worried for details of my heterodyne wave-meter.

Further, this demand is backed up by black-and-white evidence taken from these notes in the January 18th, 1930, issue of "P.W." I am therefore writing up a brief description of the simplest possible wave-meter of this type, with a few words on its calibration. "J. S." please note.

Now for a few words about "When to listen for them." The following times hold good for about a month from the time this appears in print, and applies to amateur bands only. On 21 metres, as follow: U.S.A. East Coast, 19.00-01.30. West Coast and Central, 05.00-08.30. South America, irregularly between 22.00 and 08.00. In the early mornings only Peru and Ecuador appear to be heard.

## The Best Times to Listen.

South Africa, 17.00-19.00. Australia, uncertain, but possible between 06.00 and 08.00. Asia (China, Japan, India, Sumatra, etc.), 15.00-20.00. Hawaii, occasionally

about 07.00. Europe, the whole twenty-four hours. All times are given in B.S.T.

For 40 metres, the times are as follow: Australia and New Zealand, fairly regularly at about 07.00. U.S.A., all parts, 00.00-08.00. West Coast, 04.30-08.00. South Africa, almost impossible. Asia, scarce, but occasionally between 15.00 and 19.00. South America and Central America, 23.00-02.00. Europe, at all times except about 05.00-07.00.

For 80 metres, nothing appears to be heard outside Europe and North Africa. The best times for working above 1,000 miles are either 07.00-09.00, or between 21.00 and midnight.

## Earthquake's Effect on Conditions.

After the month is up I will revise the list, in conjunction with some reliable listeners, and give you another version.

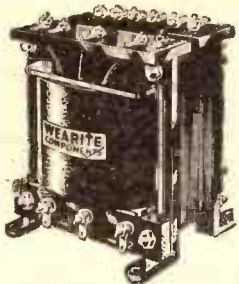
The arrival of our "pocket earthquake" certainly spoilt radio conditions for the following day. I listened on 40 metres during the morning, and could hear nothing except Londoners for quite a time. When one or two more distant stations did arrive, they were unbelievably weak. Whether this falling-off is merely a passing phase or not remains to be seen.

## A Catalogue for Keen Constructors.

We would advise all readers to take advantage of the offer contained in the Telsen advertisement pages. Providing the coupon is filled up a copy of "The Secret of Perfect Radio Reception" will be sent to anyone post free.



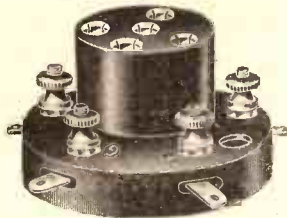
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Every listener who has attempted to make a good soldered earth connection out of doors will appreciate this Wearite Earth Tube. The earth wire is connected by twisting it

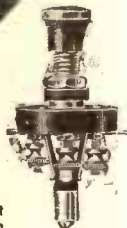
around the top cup containing solder and flux. then fill the lower cup with methylated spirit and apply a match—that's all! Price

**3/6**



**Wearite Dual Range Frame Aerial**  
Centre tapped with rotary movement, 180° Litzendraht wire. Price

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**Three Point Shorting Switch**  
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The constructional articles which appear from time to time in this journal are the outcome of research and experimental work carried out with a view to improving the technique of wireless reception. As much of the information given in the columns of this page concerns the most recent developments in the radio world, some of the arrangements and specialities described may be the subject of Letters Patent, and the amateur and the trader would be well advised to obtain permission of the patentees to use the patents before doing so.

## QUESTIONS AND ANSWERS

### PARALLELING RESISTANCES.

B. T. R. (Redditch).—"I want to find the value of two resistances when placed in parallel, and according to the book I get the

$$\text{formula } \frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$$

"I do not quite get what it means. Can you explain it? What has  $\frac{1}{R}$  to do with the resistance I want?"

R is what you want, namely the equivalent resistance of the two resistances when in parallel.

(The formula just leaves it at  $\frac{1}{R}$ , because if you know that, you can get the value of R, which is what you want.)

$R_1$  and  $R_2$  are the two known resistances. And the formula states that if  $R_1$  is divided into 1, and  $R_2$  is divided into 1, and these two results are added together, the total when divided into 1 will be equal to the unknown resistance.

To take an easy example, what is the total resistance of two 4-ohm resistances ( $R_1$  and  $R_2$ ) joined in parallel? We must first divide each into 1, and add them. This gives  $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$ . Now we must divide the result into 1, to give us R, which is  $\frac{1}{\frac{2}{4}} = 2$  ohms.

This, then, is the required resistance, and other examples of two or more resistances are all worked out in the same way.

### A LOW WHISTLE.

S. H. (High Wycombe).—"What is the cause of a low whistle like a tuning note that seems to come from the eliminator, but which does not happen when a dry battery is used?"

(Continued on page 490.)

## "WHY IS IT SO NOISY TO-DAY?"

Perhaps the switching doesn't work properly? Or some mysterious noise has appeared and is spoiling your radio reception? —Or one of the batteries seems to run down much faster than formerly?

Whatever your radio problem may be, remember that the Technical Query Department is thoroughly equipped to assist our readers, and offers an unrivalled service.

Full details, including scale of charges, can be obtained direct from the Technical Query Dept., POPULAR WIRELESS, The Fleetway House, Farringdon Street, London, E.C.4.

A postcard will do. On receipt of this an Application Form will be sent to you post free immediately. This application will place you under no obligation whatever, but, having the form, you will know exactly what information we require to have before us in order to solve your problems.

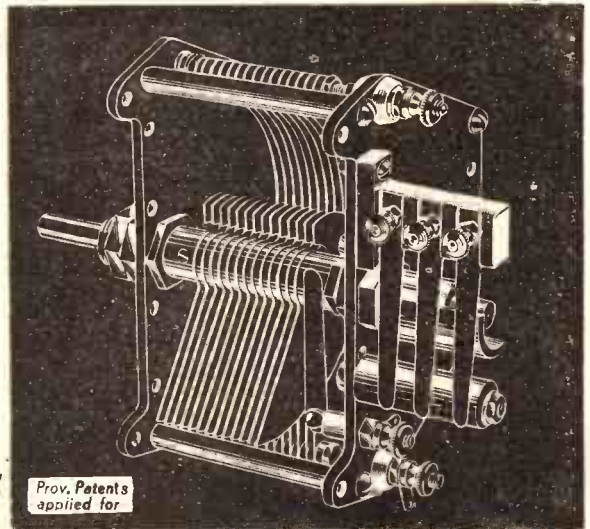
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**THE TOP SECTION.** Size 4½ in. high by 18 in. wide by 14 in. deep, gives ample accommodation for gramophone and pick-up.

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## RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 488.)

The set is the 'Radiano'—Three, using one H.F., one L.F., and one power valve?"

In all probability your trouble is due to low-frequency oscillation caused by a coupling effect in the eliminator circuit. It is often possible to remedy such a defect by inserting an anti-motor-boating device in series with the detector valve. The resistance used should be about 25,000 ohms and the value of the condenser should not be less than 2 mfd.

### THE CAUSE OF THE CRACKLE.

P. S. (Sutton, Surrey).—"Can you tell me why my aerial causes the set to crackle? Most of the time when I am receiving there is a most irritating noise going on, but if I take the aerial off, the set is quite quiet, though this does not happen if I take the earth off."

"I have looked at the aerial but cannot see anything wrong with it. Would you take it down if you were me, and if so, what sort of trouble should I look for?"

It seems quite clear that something is wrong in the aerial circuit, so your best plan would be to go over the whole thing again very thoroughly. Do not forget that part of the aerial circuit lies in the receiver: also in the room, for the lead-in is part of the aerial circuit, and often a bad contact in this or in a terminal has been the cause of blame fixed to the aerial itself.

The best thing to do is to trace out the circuit from inside the set. Make sure first of all that the internal connections to the aerial terminal are perfectly sound, and that the terminal itself is O.K.

If really good sound contact has been made to the lead-in, then examine this along its whole length, or if it is of flex wire, replace it by a new piece temporarily to make sure that there is not a fault inside it. If the lead-in goes to an earthing switch pay particular attention to this, for it is very frequently in the aerial switches that such troubles arise.

A good clean up with emery paper or a file might improve results, and a tightening up of the contacts should be undertaken, or if this is out of the question a new switch should be fitted. If the crackle persists after all this, and the lead-in and all other connections

seem to be O.K., take down your aerial wire and examine it for a broken strand, and also examine the insulators, which may be cracked.

In any case, if it has been up for more than twelve months we should put in a new wire, and thoroughly clean the insulators while you are about it. (Soapy water will make the porcelain type look like new.)

### RESULTS ON LONG WAVES.

"LONG-WAVER" (Warwickshire).—"Is it a fact that broadcasting from the long-wave stations such as Daventry 5 X X is not affected by the Heaviside Layer like that on the medium and short waves? Does this explain the comparative regularity of long-wave reception as compared with the reception of shorter waves?"

The truth is that radio is such a comparatively new science that a great deal of observational work will still have to be carried out before the laws governing the propagation of waves are fully understood.

It has been fairly generally assumed that reflection from the Heaviside Layer plays quite a small part in

the propagation of the long waves, at fairly short distances, but quite recently exhaustive experiments by research workers have appeared to indicate quite definitely that the intensity of the reflected wave depends very markedly upon the direction of propagation, and is much more influenced by down-coming waves from the upper atmosphere (Heaviside Layer effects) than is generally supposed.

It was demonstrated that even at fairly short distances the magnitude of the down-coming wave was sometimes as much as 40 per cent of the direct wave, so that much more experimental and research work must be done before it can be said with certainty what part the ionised atmosphere plays in long-wave reception.

### RENEWING THE L.T. ACID.

D. S. F. (Betchworth, Surrey).—"Having ruined one L.T. battery through letting it get dry in the summer I have since paid particular attention to the maker's instructions to fill up with distilled water when the level of the liquid drops to the top of the plates. I have also taken particular notice that distilled water only should be used, and not acid."

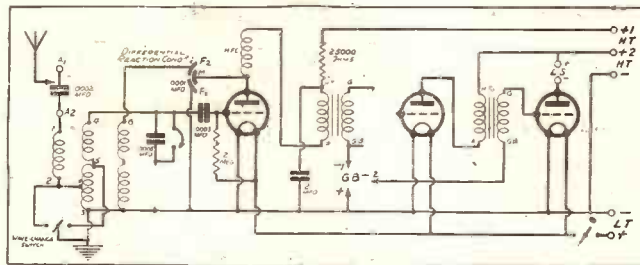
"Imagine my surprise then when at the charging station I saw a car accumulator the other day topped up with acid, and although the garage hand who was doing it could not explain why acid was used instead of distilled water, he was quite positive that distilled water would have been unsuitable, and that it was acid the battery wanted."

"Is there some difference between car batteries and those for wireless which explains this?"

(Continued on page 492.)

## MISSING LINKS, No. 10.

A DET. 2 L.F.



Two of the "components" have been omitted from this diagram of a Det., 2 L.F., a circuit using the 6-pin type of plug-in coils, and suitable for short waves as well as long and medium wave-length working. Can you fill in the missing components? Look out for the answering diagram next week.

# DON'T BE CONTENT...

No longer need you be content with a speaker having a tone claimed to be as good as a Moving Coil.

Gone for ever are the two main objections held by thousands of listeners to the purchase of a Moving Coil Speaker, namely HIGH COST AND DIFFICULTY OF OPERATION.

Amplion by the introduction of their M.C.6 unit (a permanent magnet), have at last brought Moving Coil reproduction within the means of everyone.

It requires no external excitation and it is remarkably sensitive, working splendidly from the output of most standard sets.

## A FEW POINTS TO NOTE ABOUT AMPLION MOVING COILS.

1. In addition to the M.C.6 unit, a larger model is also available, the M.C.9. This also is a permanent magnet but much more powerful.
2. The diaphragms of both these units are unaffected by any change in climatic conditions.
3. The M.C.6 and M.C.9 can be supplied in really beautiful cabinets—Oak and Walnut.
4. Except in the case of the M.C.9 when bought as a unit—a suitable transformer is fitted and is included in the list price.
5. This transformer provides three alternative ratios, enabling the speaker to be correctly matched to the output.
6. An Amplion transformer for the M.C.9 Unit, 15/- extra.

The M.C.9. unit and all Moving Coil Cabinet Models may be purchased on deferred terms.



Height 9 1/2 ins.  
Width 9 ins.  
Depth 5 1/2 ins.

COMPLETE with TRANSFORMER & READY for MOUNTING

Ask your dealer for full details and prices of AMPLION MOVING COILS or write for folder W.L.58 to Graham Amplion, Ltd., 26, Savile Row, W.1.

# AMPLION

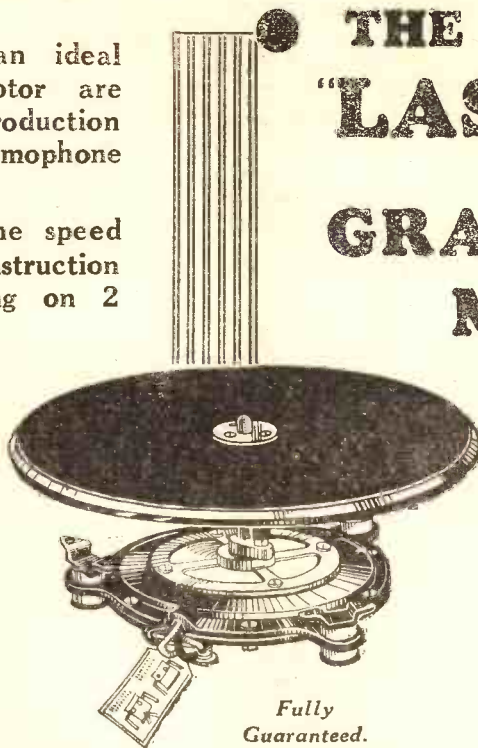


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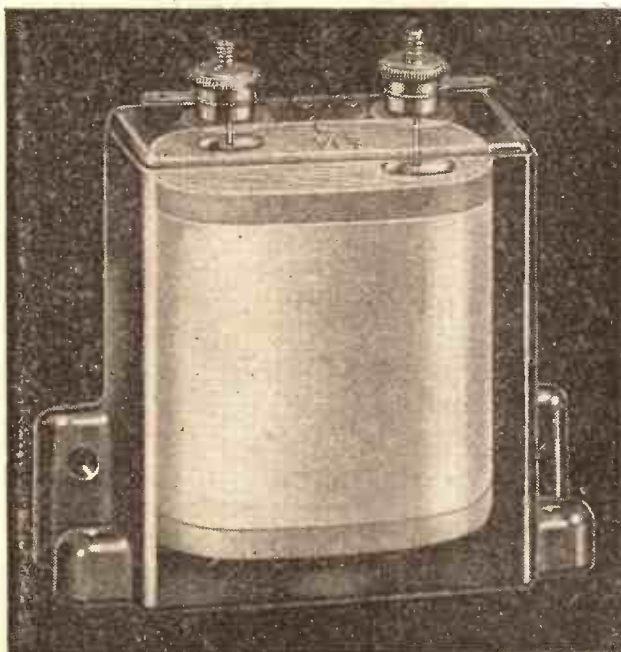
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**W**HEN you buy a Condenser you buy on faith. Even its capacity you take on trust, it may—or may not be—correct. And as for the materials within . . . . . you cannot see them. Take for example the insulation in a Paper-type Condenser. We use only the purest Rag Tissue. By using inferior paper we could produce a cheaper condenser—but this would jeopardise its working life. We cannot afford to risk our 25-year-old reputation. No matter what capacity T.C.C. Condenser you buy, you get the same high quality—the same remarkable dependability. That is why you can always trust a T.C.C. Condenser to do its job.

You are safe when you choose

**T.C.C.** "Green for Safety"



## RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 490.)

No. The battery used for lighting and starting a car, etc., is exactly the same in principle as a wireless battery, and requires the same sort of treatment.

The reason that you saw acid being used, instead of water, to replenish that particular accumulator, was that it had lost its liquid not by evaporation, but possibly by spilling, or by heavy gassing.

When the loss takes place by evaporation over long periods, it is only the water that evaporates, and the acid content of the cells is unaffected; so that although there is less liquid in the jar, it is of greater strength than formerly. Water then restores it to normal.

If, however, the battery is accidentally tipped up and some of the liquid is spilt, or if it is allowed to charge violently and gas for considerable periods,

### WHEN WRITING TO US

will readers please note that all Technical Queries, Orders for Back Numbers and Orders for Blue Prints should be addressed to The Fleetway House, Farringdon St., E.C.4, and *not* to Tallis House.

some of the actual acid is lost, and renewal with distilled water would leave the cell with insufficient acid.

It is in cases like that, that acid (of the correct specific gravity) must be put into the cell to replace that which was lost.

### COUPLED CIRCUIT FOR SELECTIVITY.

T. A. D. (Lowestoft).—"To make the set more selective I have disconnected the aerial circuit from the grid circuit altogether and provided it with a separate tuned aerial circuit (as shown in my sketch). It is certainly better than before, but not half so good as I had expected from what I have heard of the

benefits of another tuned circuit interposed between aerial and the first tuned grid circuit.

"Are the values right as stated in the diagram?"

By using a 40-turn coil in parallel with a '0005 condenser for the aerial tuned circuit you are bringing into play a rejector effect which is not suitable for the purpose you have in mind. A far better arrangement would be for the '0005 condenser to be put in series with a 75-turn coil.

In other words, aerial to fixed plates of the variable condenser, moving vanes to the 75-turn coil, other side of the 75-turn coil to earth.

Do not fit the two-coil holder into position permanently until you have discovered what position gives the required degree of sharpness of tuning combined with strength, after having decided which, you will probably find the arrangement quite satisfactory.

### A BROOKMANS PUZZLE.

P. M. (Bayswater, London, W.).—"I have arranged a compact form of Brookmans Rejector wound on a long thin tube, from which I generally get exceedingly sharp rejection points. But in the latest model I have made of this, I get trouble because the adjustment seems to shift after the trap has been set.

"None of the other rejectors I have made give the same trouble. Yet I have proved several times that in order to get a correct rejection point I must set this particular trap so that it is screwed down too far if I want the adjustment to hold good when I take the screwdriver away. Why should that be?"

### "P.W." PANELS, No. 24.—MOUNTING THE COMPONENTS.

It is a very good plan to test components, for continuity, insulation, etc., before they are mounted, especially when they are to be fixed in comparatively inaccessible positions.

In any case, a quick run round with screwdriver and pliers to see that no slack parts exist is advisable.

With valve holders, for instance, the underneath screws or nuts can be tightened in a second or so before the component is mounted. But if a loosely fitting socket is permitted to pass it may result in noisy reception, or the necessity for "un-wiring" the whole valve holder to effect an overhaul.

## The Pick of Gramophone Pick-ups.

THE Edison Bell Pick-up is the outcome of intensive research which had as its objective the production of an electrical reproducer which would have extreme sensitivity at all frequencies with a rising characteristic towards the lower frequencies permitting emphasis of the bass notes, lightness and freedom from record-wearing tendencies.

The Pick-up is enclosed in a moulded Bakelite case which is attached to a counter-balanced, ball-bearing, telescopic Carrier-arm. The Arm is provided with an elbow-joint permitting adjustment of the angle at which the Pick-up meets the record, thus giving as perfect tracking as possible.

The design is such that the Pick-up can be turned in a half circle to facilitate the changing of needles.

By adjusting the telescopic arm and counter-balancing screw it is a simple matter to attach the complete instrument to any motor-board, and by virtue of these adjustable parts the Pick-up will be found to give an absolute minimum of surface noise. The Pick-up is suitable for use with any set having two or more valves including a reasonably good output stage.

Model No. 448 is a fresh departure in pick-up design. Retaining all the desirable features and remarkable frequency response curve of the Edison Bell Model 407, with the additional advantage of output control by variation of the magnetic flux density, obviating the use of resistance volume controls with their unavoidable effect on the output characteristic.

Model No. 455, as its name implies, is for use in cinemas. It is enclosed in a pleasing Brown Bakelite moulding attached to an Edison Bell counter-balanced ball-bearing tone arm.

An extending arm for use with 16-inch records is available at slightly additional cost.

Write to us for your nearest dealer or any other information of Edison Bell products.

**EDISON BELL, LTD.,**  
LONDON, S.E.15.

Edison Bell condensers—Best for all purposes

It looks as though you may have placed your adjustable condenser and coil in such relative positions that when adjusting the former with a metal screwdriver you hold this in such a position that it reduces the effective inductance of the coil.

It is quite possible to do this, and if you remember how the old tin-hat screens used to affect the inductance of screening coils in the same way, altering the condenser settings, you will appreciate how necessary it is to keep large conductive surfaces away from the tuning coils.

We are rather surprised that a screwdriver should cause the trouble, but we think you will find that if for making the adjustment you use a wooden skewer with a sharpened end instead of a metallic screwdriver, the difficulty in adjusting will be overcome.

### IMPROVING "THE MAXI-POWER" FOUR.

A. T. D. (Salisbury).—"Would it be possible to Extensersise the 'Maxi-power' Four, and if so, what are the alterations necessary?"

Yes. The switching done by the wave-change switches in the "Maxi-power" Four can be done automatically by Extensers contacts.

All you have to do in a circuit of this kind is to replace the variable condensers by Extensers (or by a dual Extensers), removing the three wires from each wave-change switch, and joining them instead to the appropriate three contacts of the respective Extensers.

Then the mere rotation of the dial takes you over both wave-bands automatically.

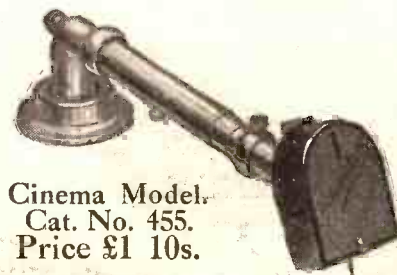
The makers inform us that Edison Bell Pick-ups have been greatly reduced in price, the 37s. 6d. and 45s. models now costing 27s. 6d. and 35s. respectively, while the 30s. model No. 407A is priced at 21s.



Cat. No. 407. Revised Price,  
£1 7s. 6d.



Cat. No. 448.  
Revised Price,  
£1 15s.



Cinema Model.  
Cat. No. 455.  
Price £1 10s.



# Easy Terms

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Type G.B.1

## FOR THE LISTENER

(Continued from page 472.)

It's like making friends with a neighbour, Mr. Ebenezer Harrison; inviting him to your house, sharing him with your family at the seaside, taking money from him at bridge, and generally holding him to your bosom; only to discover when it is too late that he isn't Ebenezer Harrison at all, but William Sykes or Charles Peace!

There would be a sudden coolness, wouldn't there? Naturally.

Now that is exactly how we treat these friendly, humorous, and very engaging broadcasters, like Leonard Henry. But he may not be Leonard Henry. My whole confidence is undermined. I begin to suspect an alias everywhere.

### A Hogsorton Mystery.

I have called him Leonard. I have written of him as Mr. Henry. In moments of romantic devotion I have even called him, privately, Lenry. And he may be somebody quite different.

What is Tommy Handley's name in the telephone-book? Or Gillie Potter's? I mean, is that how they call him at home? Does his wife call him Gillie? Does his neighbour across the garden fence say, "Hallo, Potter, old man, how goes it this morning?"

Is that the name he is known by in the village of Hogsorton? Does the vicar refer to him in the vestry meeting as "My dear churchwarden, Mr. Potter"? Is that his name on the Census or the income-tax return? Or has he won my hero worship under a disguise?

And then a horrible thought! The women may be just as bad. I could, after a while, survive the discovery that "men were deceivers ever"; but now this seed of doubt implanted in my mind by that wretch, A. J. Alan, has grown like Jonah's gourd, and I cannot feel sure.

### A Different Girl Again?

They said of a certain Mary that, when she died, the name of Calais would be found written on her heart. It would comfort her to know that it was there. And, good heavens, the names that I have engraven on my heart!

They have bitten deep. I have lived with them since they first appeared on the programmes.

Hermione Gingold, for example, is my particular bright star in the Ridgeway Parade. Is she Hermione? Is she Gingold? Is it pronounced with a soft "g" or a hard one, or sometimes one and sometimes another? Or is she a different girl again?

Have I got the wrong name on my heart? What rubber can erase it? And what is the right one that should be graven there? I feel that I have been mocked, and life turns to ashes in my mouth.

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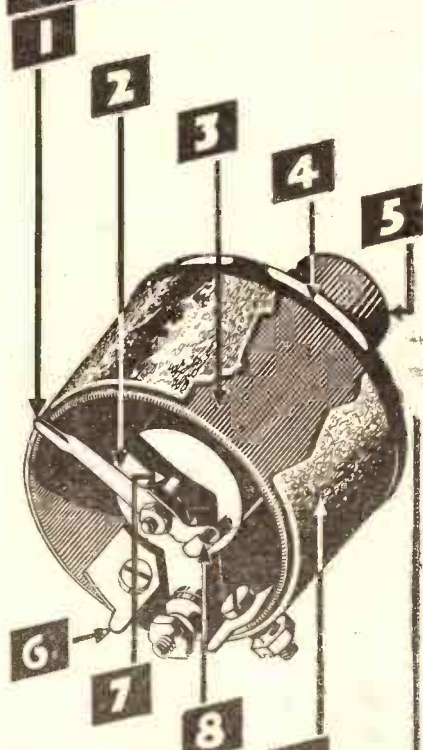
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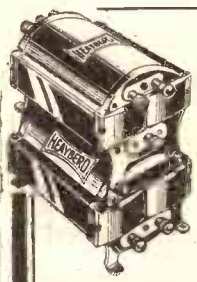
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**TECHNICAL NOTES.**

Some diverse and informative jottings about interesting aspects of radio reception.

By Dr. J. H. T. ROBERTS, F.Inst.P.

**A Common Mistake.**

I CONTINUE to receive queries from readers from time to time relating to pentode valves, and you will remember that I dealt with this subject in these Notes some little while back pretty fully. One of the commonest errors, however, which people make with regard to pentodes is to think that the output valve of the set has only to be pulled out and replaced by a pentode when, Hey Presto, without any other precautions whatever, the set will immediately give enormously improved results.

Now, as a matter of fact, the pentode does in many cases give very wonderful results, I mean considering what is ordinarily to be expected from a single stage. But to get these results it is essential to see that the exacting requirements of the pentode are properly supplied.

**Pentode Precautions.**

I had a case recently where a pentode was substituted for the last valve of a set; there was plenty of power and the quality was very good also, but unfortunately, whenever the set was operated, there was always an annoying whistle accompanying the reproduction. All the usual sources of trouble were gone over and in addition the voltages on the anode and the extra terminal of the pentode were carefully checked up, as well as the filament voltage, but still the trouble continued.

In this case it turned out that the whistle was due to high-frequency current getting into the L.F. part of the receiver—trouble which might, of course, just as well have occurred with the ordinary power valve in position. I suspect that this trouble must have been present in the above-mentioned case before the pentode was substituted for the power valve, but owing to the smaller amount of amplification the trouble was not noticed. When the pentode came on duty the extra amplification made the trouble much more prominent.

**H.F. Astray.**

For the benefit of those of you who may have had the same sort of trouble I should say that the usual high-frequency "stopper" proved in the above case entirely satisfactory; a quarter-megohm grid leak was put in series with the lead to the control grid of the pentode, and there was no more trouble due to the whistle.

High-frequency impulses in the low-frequency part of the set are always liable to cause trouble and it really becomes a question of degree—whether the receiver is just on the edge of instability or whether it goes over the edge and definite oscillation sets in. This is a point to look for always when you are troubled with a whistle in the receiver, and especially where any considerable amount of amplification is being used.

**Neutralising**

Talking about high-frequency brings me to another point which is often raised by readers of these notes, and that is the question whether ordinary neutralisation gives as good results as screen-grid. This is very much like the old argument about transformers and resistance-coupling for low-frequency amplification and there will, I suppose, always be those who take the one side and those who take the other.

There are plenty of people who believe that their neutralised sets are quite as good as any screen-grid set and in many cases the results would certainly seem to bear out the claims. But with the neutralised valve, just as I have been saying above with regard to the pentode for L.F., it is very important that the conditions—in this case the neutralising condenser—should be adjusted to suit the valve.

I have known two or three cases where the valve in a neutralised stage has been burnt out, or replaced for some other reason, without the neutralising condenser being

**TECHNICAL TWISTERS**

**No. 66. METALLISED VALVES. CAN YOU FILL IN THE MISSING LETTERS?**

The object of coating the valve is to simplify the . . . . .

In the battery types of metallised valves the metal coating is electrically connected to one of the . . . . . pins, and thus will be in contact with that circuit.

In the mains valves the metallic coating is connected to the . . . . .

When such valves are inserted into a set to replace ordinary valves it may have to . . . . . the wiring to the valve's . . . . .

Last week's missing words (in order) were: Condensers, Condenser, High-Tension, Loud Speaker, Instability.

readjusted for the valve which was substituted for the original one, and the results obtained with the set were far from satisfactory.

**Versus Screen-Grid.**

Not all users of neutralised sets seem to realise that the neutralisation is often quite a ticklish business and only when precise adjustments have been made will the neutralised valve be rendered really stable. On pointing this out to quite knowledgeable set-users I have been sometimes told that the second valve was precisely the same as the first, of the same manufacture, same characteristics and everything.

This may be true, but it does not alter the fact that you will still have to make quite appreciable alterations in the adjustment of the neutralising condenser to suit the second valve. The mere fact that the two valves are supposed to have identical characteristics does not mean that the characteristics will be sufficiently close for the purpose. Of course, once you have got your second valve in position and neutralisation adjusted

(Continued on next page.)



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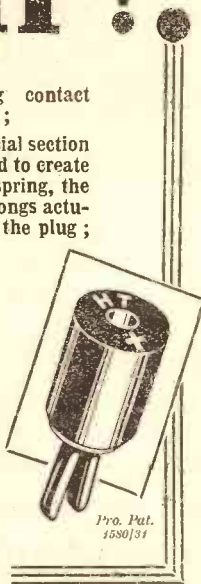
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## TECHNICAL NOTES

(Continued from previous page.)

to the best value, it should require no further attention.

The correct adjustment of neutralisation with high-frequency amplification is absolutely necessary if you are receiving weak or distant signals, because unless matters are properly adjusted you will have trouble with tuning the receiver owing to oscillation continually setting in.

### Dial Pointers.

There are a good many slow-motion dials on the market, but not all of them are really satisfactory. Some dials have a conventional one-hole fixing, whilst others require a number of holes, which, although somewhat more trouble, gives a more rigid mounting.

In some cases the effect of the vernier is to make the direct drive very stiff, because when turning the dial you have to turn the vernier control at a much higher speed owing to the step-up ratio; if there is much friction in the vernier control this means that quite considerable force has to be exerted with the direct drive, which is very objectionable.

As regards the actual ratio, this should be sufficiently step-up or step-down, whichever way you care to regard it, to give you a fine magnification of the movements of the main dial, but on the other hand the ratio should not be so great that a large movement of the vernier produces an almost infinitesimal movement of the direct dial. This is carrying thing to extremes and the operation of the dial becomes so slow that the advantages of the magnification are outweighed.

Another thing which you want to be very careful of in slow-motion dials is any looseness or backlash in the parts, as this gives rise to confusion, especially when reversing the direction of rotation of the dial, and makes for unsatisfactory working generally. The dial should be smooth in its operation, and there should not be any stiff parts which give rise to jerky motion.

### Smooth Working.

In some dials the vernier control engages with the main dial by means of a friction drive with a rubber tyre, and I have known some cases where, owing to eccentricity in the mounting of one or other of the dials or to irregularities in the depth of the tyre, the motion has been very stiff in some places whilst slipping has occurred in other places.

The places where slipping occurs are more aggravating than anything else, because unless you happen to have your eye on the dial you suddenly discover that you have been solemnly turning the vernier knob and expecting to hear stations coming in when, in fact, nothing has been happening at all!

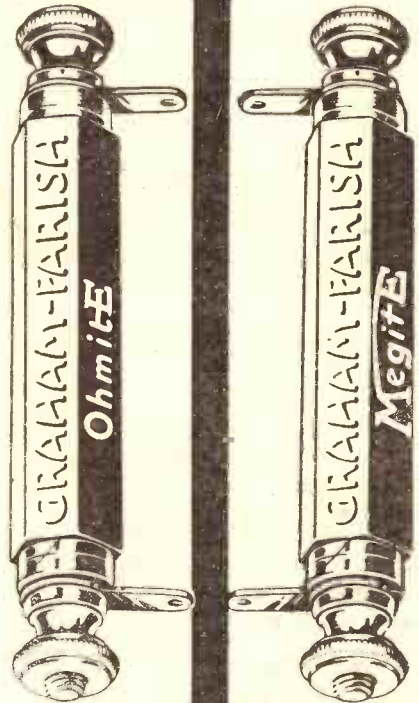
You would think it was quite a simple matter to design a satisfactory slow-motion dial, but it is surprising how very few of the slow-motion dials on the market can really be recommended.

### A Tiresome Job.

Did you ever try any hook-up, or indeed any experiment, however small, in wireless work that did not involve the scraping of the ends of a few pieces of insulated wire? It

(Continued on next page.)

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## TECHNICAL NOTES

(Continued from previous page.)

does not seem to matter how many ends you have scraped or how many pieces of bared wire you think you have on hand, you always have to start baring the ends of a few more pieces every time any connections have to be made.

I shudder to think how many pieces of flex I must have scraped during the whole course of my scientific work, both since radio and before—it must be thousands and may be millions. Well, anyway, what I was going to say was that if you use a very sharp or even a fairly sharp knife you will find that almost invariably you will cut through a number of strands of the wire (I am referring to electric light flex in particular) and you may be left with just a few strands only, which means that you have to cut these off and start all over again a bit higher up.

This can be avoided entirely by using a rather blunt knife or a fairly coarse small file or, better still, a blade with a number of different size V-shaped notches filed in it, the blade being drawn along the insulation at a suitably-sized notch.

### Making it Easy.

If you are using heavily insulated wire it may be necessary to make a cut carefully round the place where the insulation has to be severed, continuing the cut right down to the copper and then making a longitudinal cut from that position to the end of the wire. This applies particularly to cable with fairly heavy rubber covering, and the covering may be very nicely cut by means of an old safety-razor blade.

Some cables have a great lot of plaited cotton covering over them, and having got the end of the wire bare it is often rather a job to get rid of all the fluffy ends of the cotton. A very simple dodge in this case is to apply a lighted match to the "whiskers" (on the cable, I mean), when with a little care you can burn them right off without leaving the flame long enough to damage the remaining insulation.

### Decoupling.

Since I mentioned decoupling condensers the other week, several readers have asked me various questions both in regard to decoupling and bypass connections generally. Decoupling devices have only become really widely used amongst radio amateurs comparatively recently.

I suppose it is not more than two or three years since we first talked of "motor-boating" and of remedies for the same. Nowadays decoupling devices are not only quite commonly used, but set designers would not think of putting forward a set design in which the requisite decoupling arrangements were not provided.

Since the advent of decoupling the question of stability in a receiver has assumed quite a new significance. Before the decoupling era, people were content with what we would now regard as only stability "of sorts."

For instance, take two stages of transformer-coupled low-frequency amplification, in which the tendency to L.F. howling was so frequently marked; the use of decoupling devices has enabled us to use this

arrangement and to avoid entirely the old trouble so commonly associated with it.

### Easily Applied.

In this connection perhaps I should mention for the benefit of those of you who may not be entirely familiar with decoupling arrangements in a transformer-coupled L.F. amplifier, that the introduction of the decoupling arrangement is really quite simple; it was mentioned in these Notes during the past few weeks.

By this simple arrangement the stability is greatly increased and distortion may be virtually eliminated.

The anode current consists of a steady current from the battery, and upon this the low-frequency signal impulses are superimposed. We want these low-frequency impulses to pass through the primary of the transformer, but if they pass also through the battery they are liable to cause trouble as it is in this way that instability is set up.

By means of decoupling arrangements indicated above, however, we are able to keep the two things more or less separate, at any rate in the part of the circuit where their joint presence causes trouble, and so we get stability in the circuit in a perfectly simple way.

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| 1-mf. . . . .   | 3.7      |
| 2-mf. . . . .   | 4.9      |

For thirty years Helsby Condensers have been supplied to the exacting standards of the G.P.O. and the Admiralty. Plates are of pure metal foil, and each condenser is vacuum-dried, impregnated with non-hygroscopic material and tested to double working pressure. Capacity is guaranteed accurate within 10 per cent. These are reasons why one large manufacturer has recently ordered 130,000 Helsby Condensers, and why dealers everywhere are finding them such ready sellers.

# Helsby condensers

Made in all sizes from the smallest to those which weigh more than two tons. For full particulars and terms, write to the makers: BRITISH INSULATED CABLES LTD.

PRESCOT LANCASHIRE.  
 Makers of B.I. Cables.



# SAFEST TO SELL OR TO USE



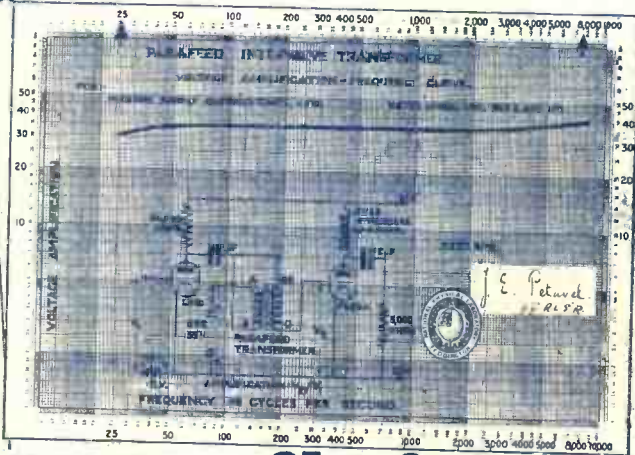
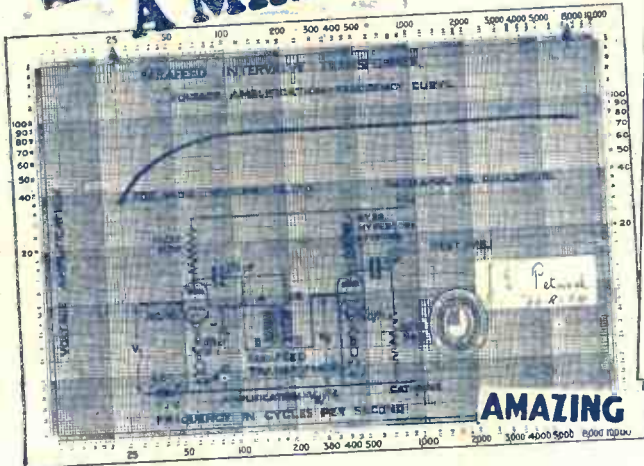
SUPER NICKEL CORE  
SCREENED INTERIOR  
WEIGHT 3½ OZS  
Patent No-316449



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# PARAFEEED

A MIRACLE in TRANSFORMER AMPLIFICATION



AMAZING N.P.L. CURVES 25 to 8000 Cycles

Always ahead in transformer design, R.I. have produced a masterpiece in modern amplification, the "Parafeed," which achieves two remarkable successes—One: Amazing and unequalled performance, proved by N.P.L. curves (see above) 25 to 8,000 cycles, with a rising characteristic. Two: Lowest price of any transformer of the SUPER-NICKEL alloy core series.

The "Parafeed" differs from other intervalve transformers inasmuch as it is designed for use with the Parallel Feed System. Any existing Resistance of 30,000 or 50,000 ohms and paper Condenser of ½ or 1 mfd. may be used with the "Parafeed" to divert the anode current. Resistances and Condensers made by the Dubilier Company have been specially approved as suitable.

### NOTE THESE IMPORTANT "PARAFEEED" ADVANTAGES:

**INCREASED BASS AND HIGH NOTE RESPONSE**

**ABSOLUTE FREEDOM FROM ELEC. TROLYSIS AND BREAKDOWN**

**BETTER L.F. STABILITY**

Much lower values of speech current flowing through H.T. source render the "Parafeed" less liable to motor-boating than other transformers.



**THREE VARIATIONS OF RATIO by Auto Connection: 2:1; 3:1; 4:1.**

**IMPROVED VOLUME CONTROL** by use of variable anode feed resistance instead of fixed.

**ASK FOR THE "PARAFEEED" BOOK**  
Ask your dealer for a free copy of the "Parafeed" Way to Better Amplification. It explains the evolution and principles of L.F. Transformer Amplification in a lucid manner most useful to every constructor.

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