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116 PAGES—OUR BIG SHOW NUMBER—3^d.

ALL THAT'S NEW IN RADIO

Amateur Wireless

Usual Price 3^d

and Radiovision

Vol. XIX. No. 484

Saturday, September 19, 1931

OLYMPIA



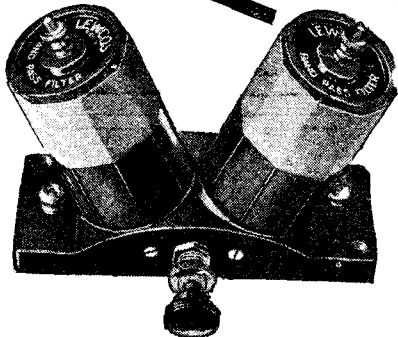
COMPLETE SHOW GUIDE



LEWCOS
NEW DEVELOPMENTS (Regd.)
AT
OLYMPIA

Perfect symmetry and elegance of design, and maximum efficiency on every technical point have made LEWCOS components the standard by which all others are judged. This pre-eminence has been achieved by skilled workmen using only the very finest of materials, and by a staff of experts who constantly experiment to ensure that LEWCOS components live up to their manufacturers' reputation for being in the forefront of radio design.

All-British materials and labour are used in the manufacture of LEWCOS products.

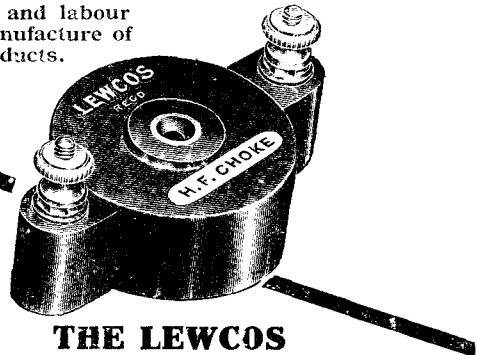


THE LEWCOS BAND PASS FILTER

For Super Selectivity. (Reference B.P.F.) Wavelength ranges, 235/550 m. and 1000/2000 m.

Price **12/-** each

Screen 2/6 extra. (Reference B.P.F.S.)
 Write for fully descriptive Leaflet Reference R.73

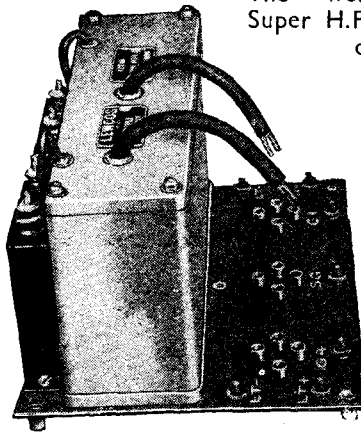


THE LEWCOS H.F. CHOKE

Price **2/6** (Reference M.C.)

The well-known LEWCOS Super H.F. Choke is now reduced to 6/-

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LEWCOS TRIPLE I.F. COIL UNIT

Price **31/6** (Reference I.F.U. 126/3)

Specially designed for Mr. W. James' masterpiece, the "Super Senior." See October issue of "Wireless Magazine."



WE ARE EXHIBITING AT



VISIT OUR STAND No. 27 (National Hall)

LEWCOS RADIO PRODUCTS FOR BETTER RECEPTION

THE LONDON ELECTRIC WIRE COMPANY AND SMITHS LIMITED, CHURCH ROAD, LEYTON, LONDON, E.15

BIGGER & BETTER THAN EVER



THE FAMOUS BULGIN CATALOGUE

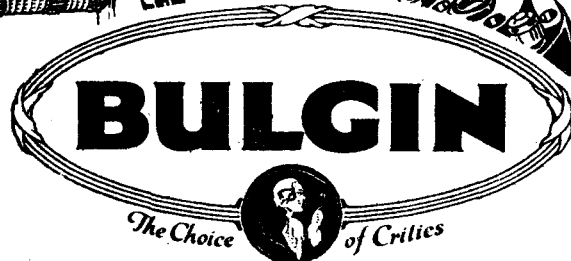
New 1931-32 Edition

HERE it is, 75 pages packed with details of new components essential to up-to-date radio.

Pages of practical hints and diagrams. An entirely fresh section detailing the new Bulgin Technical Service. Send 2d. postage for a copy without delay. Below are listed some of the BRAND NEW BULGIN PRODUCTIONS.

**SEE THEM ON STAND 102
Empire Hall - - Ground Floor**

Thermo Switch, New Range of Toggle Switches, Moving Coil Meters, Volume Controls, Valve Holders, D.C. Mains Equipment, New Range Anode Resistances, Grid Leaks, Spaghetts, Condensers, Fuseholders, Terminals, Pick-ups, Mains Plugs, Quickwyre, etc., etc.



QUALITY COMPONENTS

A. F. BULGIN & CO., LTD.

ABBAY ROAD, BARKING, ESSEX

Telephones: GRANGEWOOD 3266 and 3267

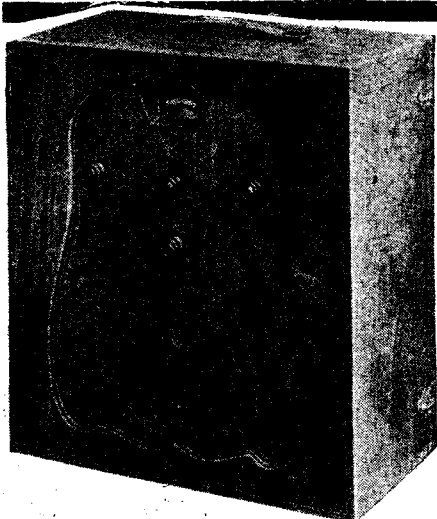
London Showrooms: 9, 10, 11, Cursitor Street, Chancery Lane, E.C.4

Telephones: Holborn 1072 and 2072.

**THE LARGEST RANGE IN THE WORLD
OBTAINABLE FROM EVERY DEALER OF REPUTE**

Advertisers Appreciate Mention of "A.W." with Your Order

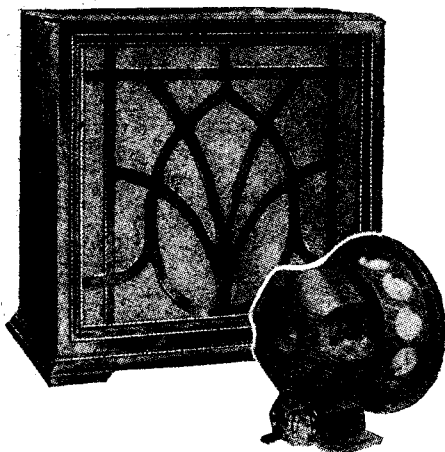
● New Value and Efficiency!



● A Portable with real punch!

Here is Model 66—the new Super-Tuned Portable IV—a set with amazing range and volume, fine-toned and exceptionally economical in use. High gain S. G. stage, compensated pentode output, special balanced armature speaker, single dial tuning calibrated in metres, automatic wavelength indicator and dual volume control. Provision for pick-up and external aerial and earth (constant calibration).

Super-Tuned Portable IV . . Price 16 GNS.



● The Supreme Speaker Unit

In only a few months, the Marconiphone permanent magnet moving coil unit (Model 91) has established its leadership in its class. Outstanding features are its extremely high sensitivity, due to the large cobalt steel magnet and very small air gap, its fine reproduction thanks to the duplex laminated one-piece diaphragm, and, of course, its complete reliability. Supplied with universal input transformer for super power, pentode and push-pull circuits.

Marconiphone "91" Price 6 GNS.
Complete with Cabinet "131" " 10 "

Striking New Mains Valves

A complete range for D.C.

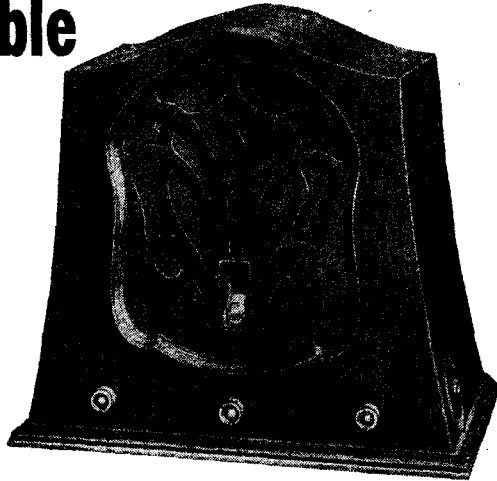
Marconiphone announce a complete range of high efficiency indirectly heated valves for D.C. mains. Each has a .25 ampere 16 volt filament, thus reducing the power of consumption of the average D.C. receiver to about 60 watts. Types available are:—

Marconi DS	Screen grid	Mutual conductance	1.1	-	-	-	-	Price	22.6
"	DH	General purpose	"	3.7	-	-	-	"	15.-
"	DL	L.F. & Power	"	4.5	-	-	-	"	17.6
"	DPT	Power Pentode	"	3.0	-	-	-	"	27.6

MARCONI VALVES — THE CHOICE

● The Intriguing Transportable

Another striking newcomer—The Moving Coil Transportable III (Model 42)—a set which initiates a new fashion in all-mains radio. Entirely self-contained, three new type high efficiency valves, compensated power pentode output, permanent magnet speaker, band pass bi-resonant tuning with 3 synchronised circuits, illuminated wavelength dial and switch indicator, provision for mains aerial, pick-up and external speakers, speech output 1½ watts, provides extreme selectivity with really superb quality of reproduction.



Moving Coil Transportable III Price **20**
A.C. or D.C. GNS.

● The Most Efficient of all Pick-ups now Reduced in Price!

The Marconiphone pick-up, universally accepted as the world's finest electrical reproducer, is now, at its new price, within reach of all. Well-known superiorities include an average output of 1.5 volts R.M.S., compensation in the lower register for recording deficiencies, sharp cut-off at 5,000 cycles to minimise surface noise, negligible record wear and perfect tracking. Complete with rotating head and quick-grip terminals.



Marconiphone Pick-up - NOW ONLY £2.5.0

Marconiphone

New A.C. screen grid Types VMS.4 and MS.4b

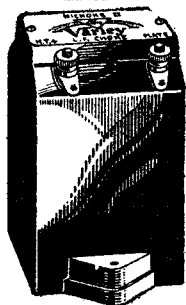
Two new indirectly heated A.C. screen grid valves of particular interest:—Marconi VMS. 4, the first "Variable Mu" valve, reducing cross-modulation and providing perfect control of volume. Marconi MS.4b, a screen grid amplifier with a mutual conductance of 3.2 M.A. per volt. Prices VMS.4 & MS.4b **22/6**

OF THE EXPERTS!

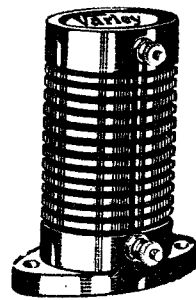
Radio *G. Marconi*

Advertisement of the Marconiphone Company Limited, Radio House, 210 Tottenham Court Road, London, W.1.

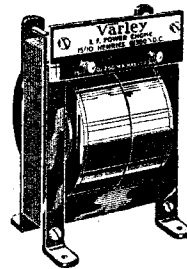
**SEE
THEM
AT
THE**



NICHOKE 11
The latest addition to the range of Varley Chokes. Inductance, no D.C., 20 henries. With 50 m.a. D.C., 14 henries. D.C. resistance, 450 ohms. List No. DP23. Price **10/6**



JUNIOR MULTI-CELLULAR H.F. CHOKE
Chokes efficiently on both wavebands, either in detector or H.F. stages. Inductance, 120,000 microhenries. List No. BP. Price **3/6**



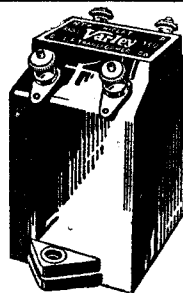
EP30 L.F. POWER CHOKE
Inductance, 15 henries (no D.C.), 10 henries (300 m.a.). D.C. resistance, 100 ohms. Price **45/-**

EP31 CENTRE-TAPPED L.F. CHOKE
Max. current, 120 m.a. Price **27/6**

GREAT NEW RANGE OF

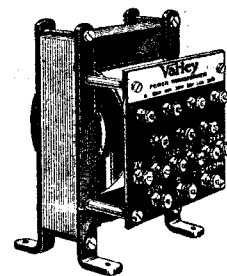


COMBINED PICK-UP AND TONE-ARM
Compensated bass output. Ball bearings. Suits all turntables between 10 in. and 12 in. Pick-up enclosed in dustproof black bakelite case. Arm in bronze finish. List No. CP138. Price **42/-** complete.



NICLET L.F. TRANSFORMER

Primary inductance, 45 henries with no D.C. Ratio, 3½ to 1. The primary will carry a steady D.C. current up to 3 m.a. Thus the price of 7/6 is an *ALL-IN* price. When resistance fed, ratios of 2.5, 3.5, and 4.5 to 1 are obtainable. List No. DP21. Price **7/6**

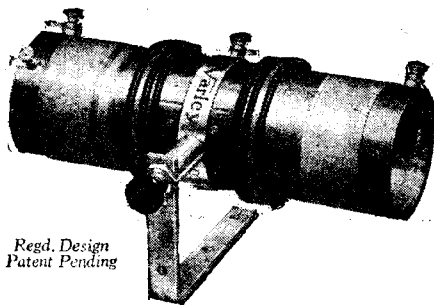


MULTI-VOLT MAINS TRANSFORMERS
For valve and metal rectifiers. Complete range of outputs. Prices from **32/6**

SQUARE

(REGISTERED)

TENFOLD INCREASE IN SELECTIVITY

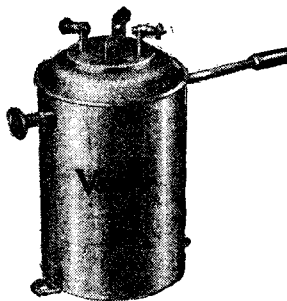


Regd. Design Patent Pending

VARLEY "SQUARE PEAK" COIL
Easily fitted to most existing sets. Needs no screening. Complete with wave-change switch and mounting bracket, **15/-** List No. BP5.

(New Model BP7 with terminals instead of switch, same price.)

MATCHED COILS ENSURE PERFECT GANGING

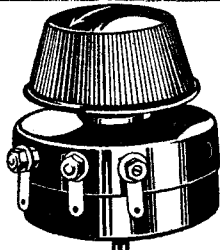



H.F. INTERVALLE COIL
(Dual range) for use with "Square Peak" Coil. Completely screened. Its inductance *inside screen* exactly matched to that of the "Square Peak" Coil to ensure perfect ganging. Complete with extension rods for coupling the switch to that of the "Square Peak" Coil. List No. BP6. **8/6**

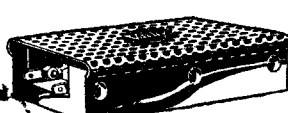
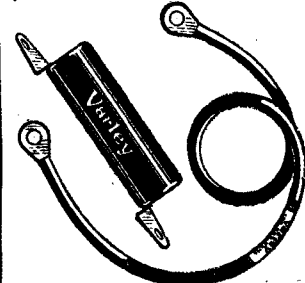
(New Model BP8, with terminals instead of switch, same price.)

Advertisement of Oliver Pell Control Ltd., Kingsway House, 103 Kingsway, London, W.C.2

To Ensure Speedy Delivery, Mention "A.W." to Advertisers

 <p>VOLUME CONTROL Two or more may be ganged together and controlled by a single knob. Values: 25,000, 50,000, and 250,000 ohms. Price 6/6 each.</p> <p>GANGING EQUIPMENT To gang two controls. Price 1/- per set.</p>	 <p>POPULAR RESISTANCE Spiral wire-wound. Values from 5,000 to 300,000 ohms. Prices (without Universal holders), 1/6 to 4/- each.</p> <p>UNIVERSAL HOLDER Price 1/6</p>
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COMPONENTS

 <p>THERMAL DELAY SWITCH Specially designed for use with Osram G.U.I. rectifier. Allows filament to be run for desired 1 minute before automatically switching on the anode current. Heater circuit, 4 volts, and is connected across the G.U.I. filament. Price 12/6</p>	 <p>SPAGHETTI RESISTANCE Twenty-two values, 100 to 100,000 ohms. Prices 6d. to 1/6</p> <p>"TAG" RESISTANCE Same values, wire wound, compact. Can be soldered direct to wiring. Prices 1/- to 2/-</p>
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The new range of Varley components. Recommended by the leading technical journals in the strongest terms. Carefully designed in every detail and made with the most scrupulous care. The standard of quality and workmanship, **VARLEY'S** standard . . . yet selling at these amazingly low prices!

Time is always short at exhibitions, so make a bee-line for the "Square Peak" Stand. Whatever you do be sure to see these new Varley components, the "Square Peak" coils, and the amazing new "Square Peak" Mains Receivers and Radiograms.

PEAK

TRADE MARK

Write for the new Varley Catalogues

Varley

STAND

No 58

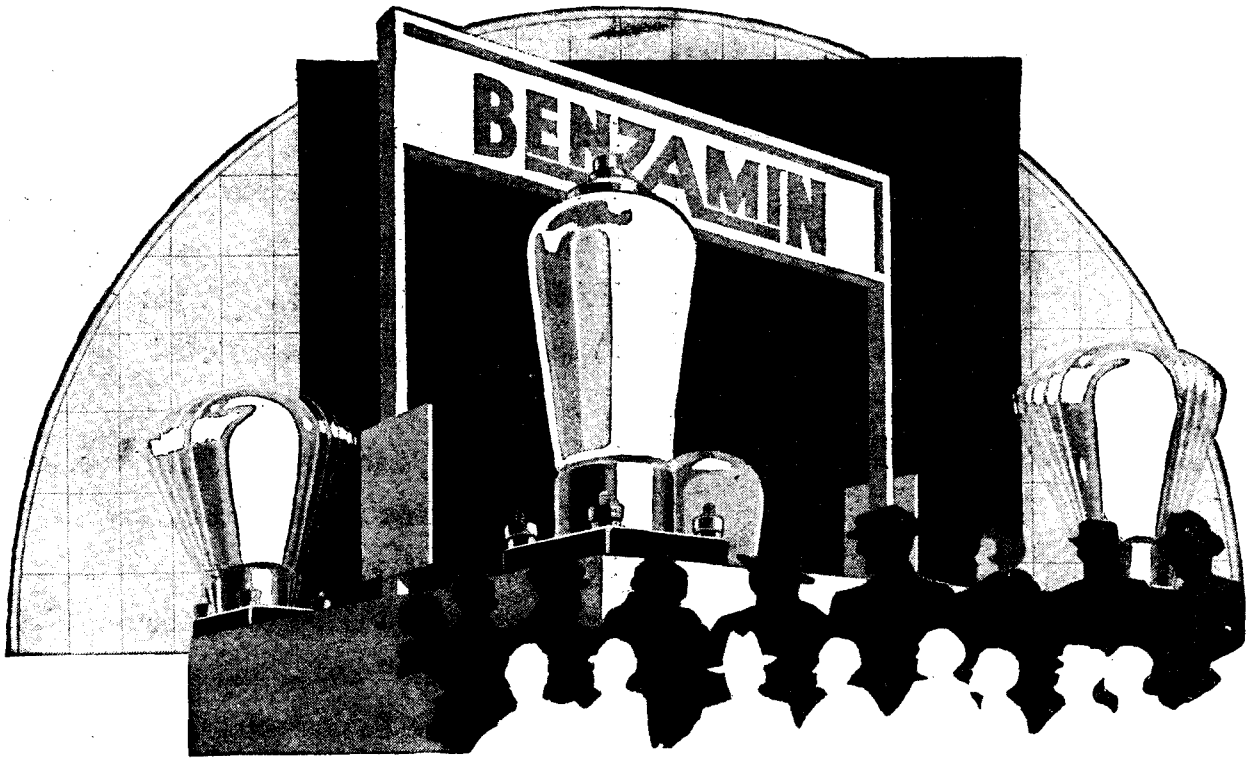
EMPIRE HALL

NATIONAL RADIO

EXHIBITION

Telephone: Holborn 5303

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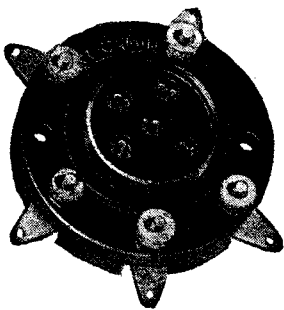


**"SAY 99" ... and see
the wobbly valve!**

STAND



OLYMPIA



Giant sprung valves, gently swaying to and fro look out for them on Stand 99 at Olympia.

You need not examine them, they stand for the Benjamin system of supporting valves in sprung holders so as to damp out shocks and protect sensitive filaments from premature loss of emission.

Just let these wobbly valve holders remind you that these same Benjamin valve holders have literally sold in millions, that they are to-day as at any time in the past five years outstanding the most popular valve holders made, that they are the only valve holders used by those who know the wisdom of protecting their valves from shock or jar.

BENJAMIN

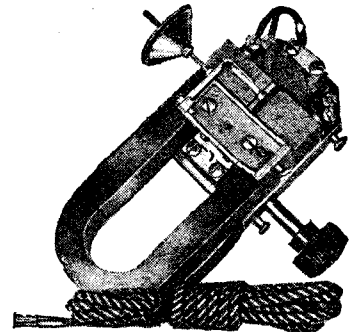
The Name is Benjamin and the Stand Number is 99

The Benjamin Electric Ltd., Tariff Road, Tottenham, N.17. - Tottenham 1500

To Ensure Speedy Delivery, Mention "A.W." to Advertisers

MOTOR LOUD-SPEAKERS UNITS & CHASSIS

Render
the
Real
Thing



MoToR SUPER UNIT S.8

This new MoToR balanced-armature unit is a revelation in clarity, tone, purity, and power. It is unapproached for superb workmanship at a more than reasonable price.

23/6

YOUR set gets the programmes you want to hear, but your loud-speaker determines **WHAT** you hear. The quality of speech or music can be no better than your loud-speaker permits, and experts are agreed that it can be no better than the rich and realistic reproduction of the new 1932 MoToR balanced-armature Loud-speaker Units.

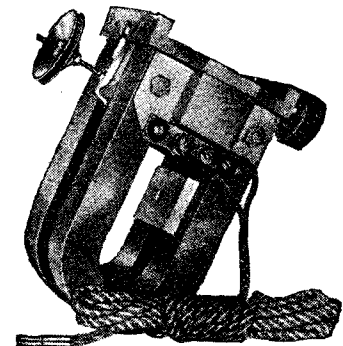
Unlimited research facilities and vast resources combined with persistent striving after the ideal in sound reproduction, have produced a range of MoToR Units that set up a new conception of loud-speaker excellence, new high

standards of pure tonal quality, of rich and undistorted volume, of vivid realism that fascinates and even thrills the most critically sensitive ear.

Three new MoToR Units and three corresponding Chassis assemblies are designed and priced each to afford the finest loud-speaker value in its class. Each is double-tapped and provided with two pairs of terminals so as to ensure best results with YOUR output valve; handling immense power without overloading, tremendous volume without the slightest trace of chatter or distortion. High notes are sweet and clear, bass notes rich and full, speech just natural and easy to hear.

The five new MoToR Cabinet Speakers combine the superlative qualities of MoToR Units with the dignified and exquisite charm of Caucasian Walnut Cabinets accurately and scientifically proportioned for the best acoustic properties.

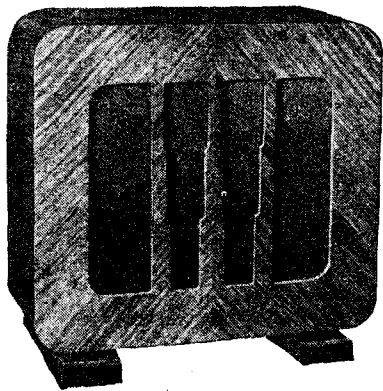
See and hear these new wonder MoToR loud-speakers at your radio dealer's and ask for the complete MoToR catalogue. In case of difficulty only, send the name of your nearest dealer to:—



MoToR SUPER POWER UNIT S.9

This is the masterpiece of all balanced armature units. Double powerful magnets, super sensitive adjustment, and amazing in its punch and rich tonal quality.

35/-



MoToR LOUD-SPEAKERS

The "Beta," at 47/6, is typical of the value and the distinctive beauty of the five cabinets in the new MoToR range, each proportioned after exhaustive tests for the best acoustic properties.

TEKADE Radio & Electric LTD.

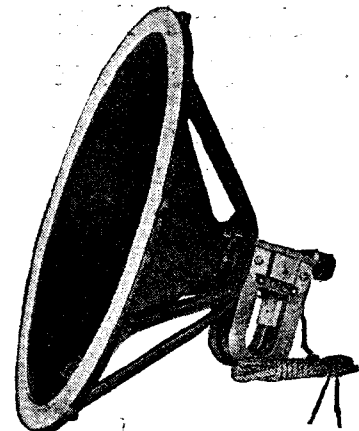
147 FARRINGDON ROAD, LONDON, E.C.1

Telephone: Clerkenwell 2486.

Northern Wholesale Distributors: L. KREMNER, LTD., 2 Bradshaw Street, Manchester; HARDMAN & CO., LTD., The Baum, Yorkshire Street, Rochdale; 61 Bridge Street, Manchester; 12 Back Lord Street, Blackpool; 25 Trinity Street, Leeds.

Agent for Scotland:—R. G. J. NISBET, 132 Renfrew Street, Glasgow, C.2.

West of England:—BRUNWEC, LTD., 28 Cumberland Street, St. Paul's, Bristol.



MoToR CHASSIS	Model C88	
fitted with S8 unit		43/6
MoToR CHASSIS	Model C46	
(S4 unit)		47/6
MoToR CHASSIS	Model C99	
(S9 unit)		56/-
(as illustrated)		

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention

**20 M.A.
OUTPUT**

**ALL BAKELITE
ELIMINATOR**

60/-

2 Variable Wire Wound Resistances
0/120, and 1 Fixed 120 volts.

MODEL A.C.1A.
20 m.a. output and trickle charger - **80/-**

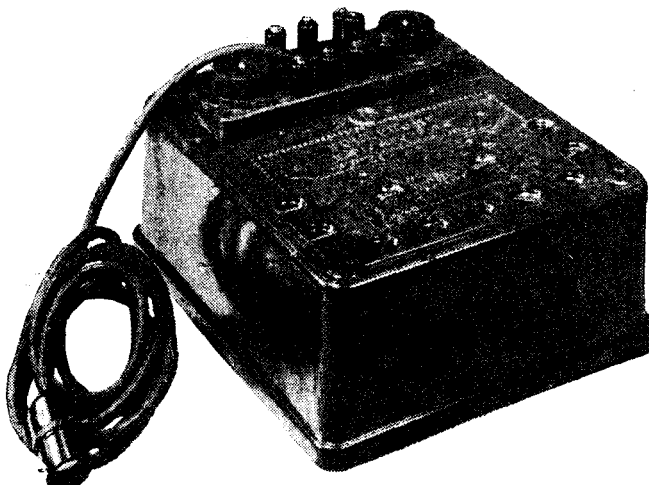
**DE-LUXE
MODELS**

A.C.2
30 m.a. output **80/-**

A.C.3
30 m.a. output and
trickle charger **£5**

A.C.4
30 m.a. G.B. 1½-16 v. **£5**

A.C.5
30 m.a. G.B. and
trickle charger **£6**



All de luxe models are fitted with 2 variable tapings,
4 v. raw A.C., 1 fixed max. 150 volts.

**D.C.
MODELS**

D.C.1
30 m.a. output **27/6**

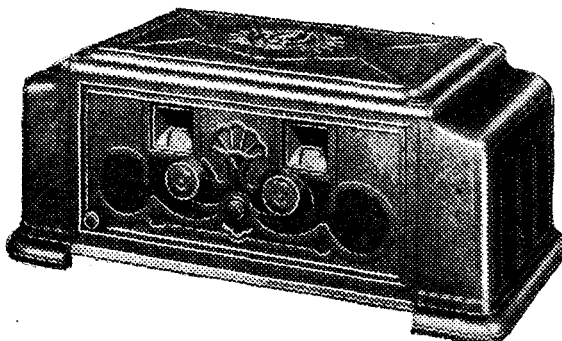
D.C.2
30 m.a. 2 variable
tapings **42/-**

NIGHTINGALE S.G.3 KIT

**ALL BAKELITE
CABINET**
19" x 8" x 9"

**Ganged Extenser
Condenser**

**Automatic Long and
Short-wave Switch**



£3.15.0

As illustrated
Less valves

With valves

£5.15.0

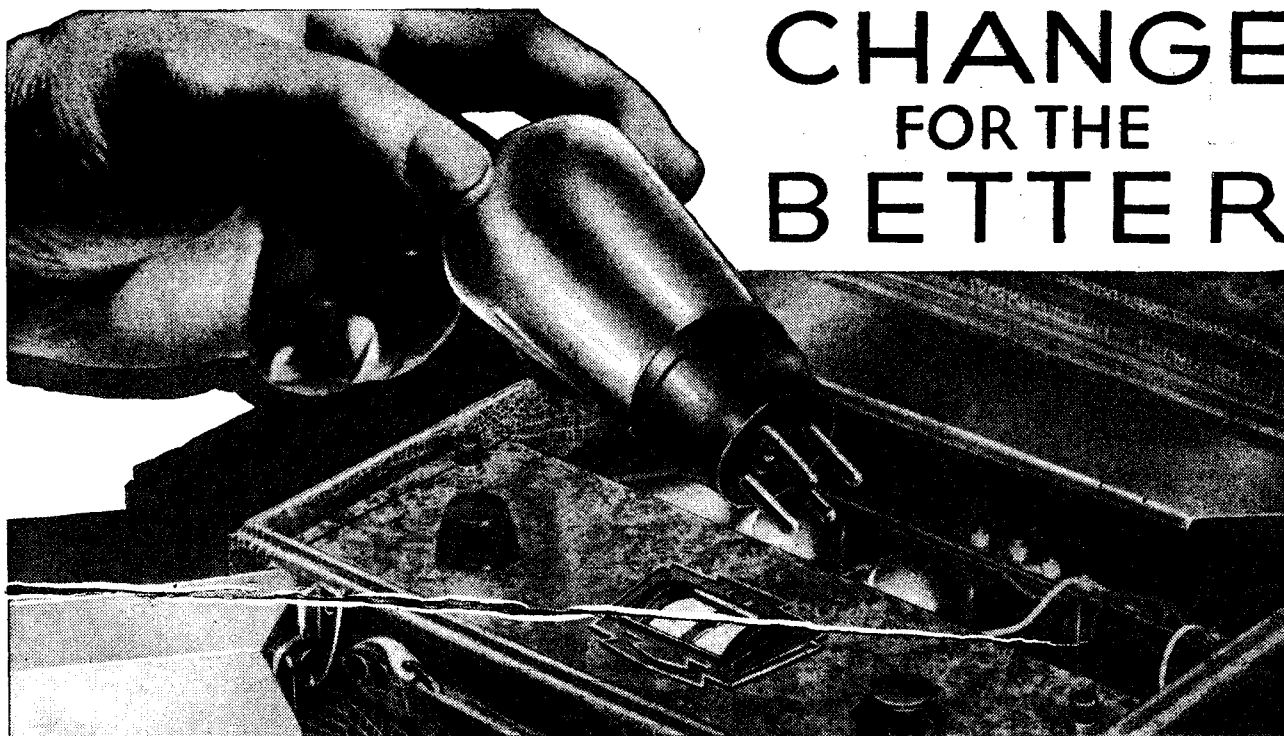
All above models can be purchased for 10/- down and 12 monthly instalments

**SEE US ON STAND No. 12
OLYMPIA**

BULLPHONE RADIO PRODUCTS

BARKINGSIDE, ESSEX

Phone: Chigwell 162



CHANGE FOR THE BETTER



-change to MAZDA

If you can't get that station you want—**change to Mazda.** If you need a little more selectivity—**change to Mazda.** "Amazing" was the original verdict—and amazing still they are. There is exactly the valve for your purpose in the Mazda range. Ask your dealer for Mazda valves and see that you get them.

THE AMAZING

MAZDA

THE
BRITISH
VALVES

STAND No.
21
NATIONAL
RADIO
EXHIBITION
OLYMPIA

The Edison Swan Electric Co. Ltd.



155 Charing Cross Road, London, W.C.2

V.131

Don't Forget to Say That You Saw it in "A.W."

GRAHAM FARISH

— LTD. —
BROMLEY :: KENT



GRAHAM FARISH FIXED CONDENSERS
Complete range of capacities, upright or flat mounting. Registered design No. 723271 and tested on 750 volts D.C.
 .00005 mfd. to .002 mfd. ... 6d.
 .003 mfd. to .006 mfd. ... 1/-
 .007 mfd. to .01 mfd. ... 1/6



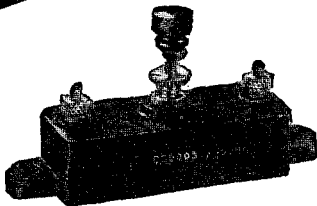
GRAHAM FARISH KONE KAP GRID LEAKS
A good carbon type Grid Leak. Fits all condensers and holders. Made in 1, 2, 3, 4, and 5 megohms. Price 9d.



GRAHAM FARISH STANDARD GRID LEAKS
Counterpart of above, but fitted with terminal ends for sure contact. Price 10d.



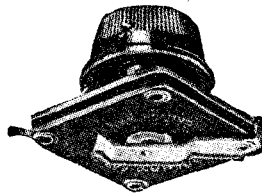
GRAHAM FARISH HOLDERS
Suitable for all resistances. Upright or horizontal mounting. Price 6d.



GRAHAM FARISH PRE-SET CONDENSER
Popular capacities covering all requirements.
 F. .000005 to .0001 mfd.
 J. .000025 to .0003 mfd.
 G. .0002 to .001 mfd.
 H. .001 to .002 mfd. Price 1/6



GRAHAM FARISH VOLUME CONTROL
Potentiometer type for pick-up or any grid circuit control. Finely graduated, with smooth action. Max. value, 500,000 ohms approx. Price 3/6

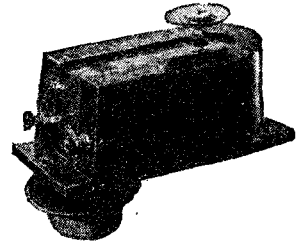


GRAHAM FARISH "LITLOS" VARIABLE CONDENSER
A solid dielectric tuning condenser, with log midline capacity variation. With knob. Made in capacities .0001 mfd., .0003 mfd., and .0005 mfd. Price 2/-

GRAHAM FARISH "LITLOS" DIFFERENTIAL CONDENSER
Similar to the tuning condenser but with two sets of fixed vanes, each side being accurately matched. Complete with knob. Capacities, .0001, .00015, and .0003 mfd. Price 2/-



GRAHAM FARISH FLEXIBLE RESISTANCE LINKS
Nickel chrome wire wound, accurate and well within their ratings. All sizes from: 1,000 ohms to 20,000 ohms 1/-
 25,000 ohms to 100,000 ohms, 1/6

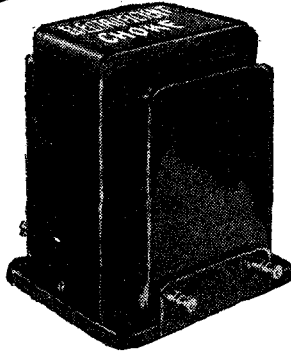


GRAHAM FARISH "SNAP" SPEAKER UNIT
A marvellous production at the price. Powerful cobalt magnet gives sensitivity and the unit handles large outputs. Bakelite cased and complete with reed. Price 5/6

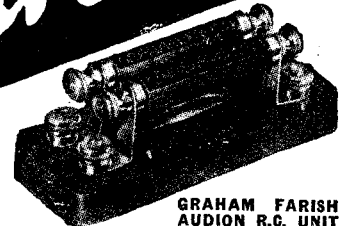


GRAHAM FARISH PICK-UP AND TONE ARM UNIT
Extraordinary large output, with even balance. Moulded in walnut or mahogany in modern design. Ball-bearing pivots. Price 32/6

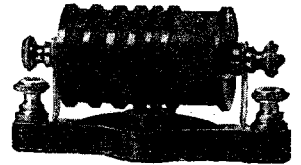
See what Graham



GRAHAM FARISH AUDION L.F. CHOKES
A range of chokes covering all L.F. requirements and including smoothing chokes.
 25 henry 15 milliamperes Price 10/6
 25 henry 20 milliamperes 15/-
 30 henry 50 milliamperes 20/-

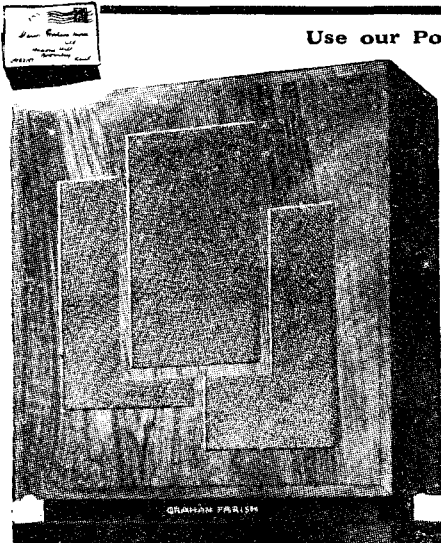


GRAHAM FARISH AUDION R.C. UNIT
Another popular line reduced in price. Incorporates "Ohmite" (100,000 ohms) and "Megite" (2 meg.) resistances on base with sealed MICA condenser of correct capacity. Price 4/6

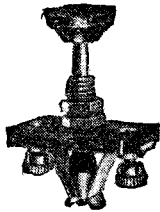


GRAHAM FARISH MULTI-WAVE H.F. CHOKES
Specially designed Choke for all radio frequencies between 50 and 3,000 metres. Impedance at 480 metres, 147,000 ohms. Complete with holder. Price 4/6

Use our Post Free Mail Order Service if your Dealer does not Stock

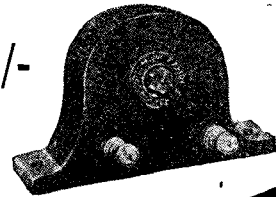


THE GRAHAM FARISH "AMAZING" SPEAKER
Permanent cobalt magnet system of great power. The piston movement cone gives remarkable sensitivity at all frequencies and ensures a fidelity of tone value unsurpassed by any. The cabinet work is second to none and can be supplied in oak, mahogany, or walnut at the same price. Price **42/-**



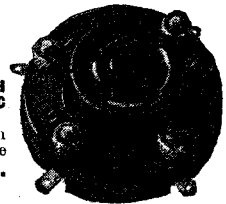
GRAHAM FARISH PUSH-PULL SWITCH
Exceptional value. Positive contact with snap action. Will give satisfaction for years. Self-cleaning contacts. Price **8d.**

2/-

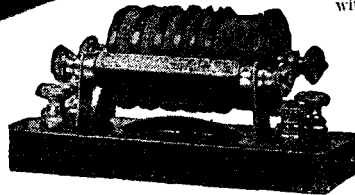


GRAHAM FARISH H.F. CHOKE
Of new design, this choke covers medium and long broadcast wavelengths. D.C. resistance, 400 ohms. Price

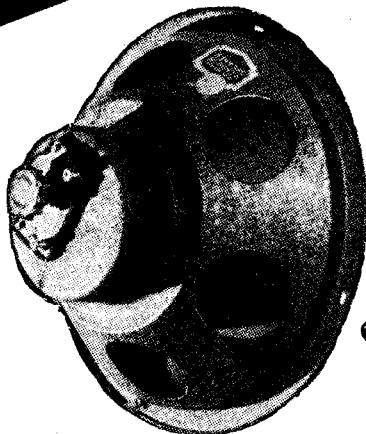
Farish does to prices!



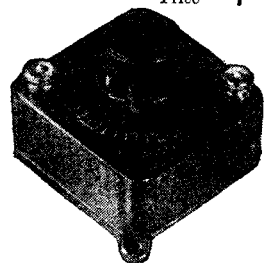
GRAHAM FARISH ANTIMICROPHONIC HOLDER
Beautifully sprung with spring contacts, sure grip, easy withdrawal. Price **9d.**



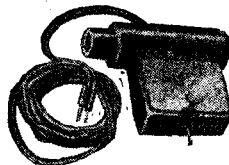
GRAHAM FARISH COUPLING UNIT
A complete I.F. coupling unit incorporating the "Multiwave" H.F. choke and "Megite" grid leak, mounted on base, with sealed condenser. Price **5/6**



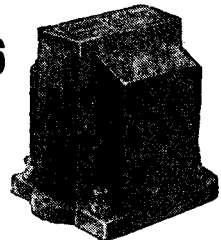
GRAHAM FARISH A.C. 4 CHASSIS SPEAKER
Incorporating powerful and sensitive motor, with special waterproof fabric cone of new design. Aluminium housing, finished in frosted black. Price **21/-**



GRAHAM FARISH AERIAL CAPACITY UNIT
A continuously variable condenser for series aerial connection, conveniently arranged for mounting. Price **3/6**



GRAHAM FARISH "SNAP" L.F. TRANSFORMER AND CHOKE
A remarkable transformer of small size—gives true stage gain at high and low frequencies, especially when used in conjunction with the "Snap" L.F. Choke in parallel feed following detector valve. Price **5/6**
Transformer—3 : 1, 5 : 1 5/-
"Snap" L.F. Choke 5/-



GRAHAM FARISH PICK-UP
Of similar internal design to the Pick-up and Tone Arm Unit, but without arm, for easy connection to existing tone arm. Price **22/6**



GRAHAM FARISH OHMITES AND MEGITES
A popular resistance for all general purposes. "Better than Wire Wound." All values from 300 ohms to 5 megohms. Price **1/6**

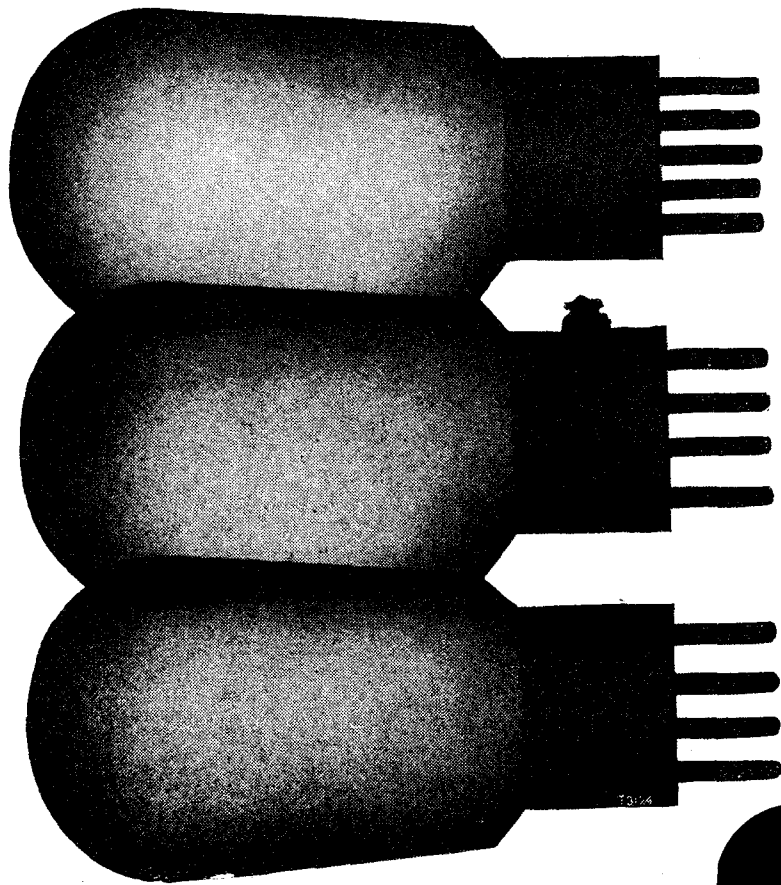


GRAHAM FARISH HEAVY DUTY OHMITE
Where the required current is too high for the ohmite resistance use the heavy duty type. All values from 300 ohms to 5 megohms. Price **2/3**

: STAND 32 AT OLYMPIA :

will have a complete range of our Radio Components. We shall be there to answer your questions. You will have an opportunity of seeing the quality of Graham Farish components. Our eleven years' experience of component manufacture has enabled us to give you tip-top quality at rock-bottom prices. This is our invitation—we shall be pleased to see you at Olympia.

THE NEW TUNGSRAM HIGH POWER OUTPUT VALVES



TUNGSRAM

The four new Tungsramp High Power Output Valves, P414, P430, P460, and P4100, are particularly useful to constructors of gramophone amplifiers where immense volume is required.

Using these four types, an undistorted output of the amplifier ranging from 500 to 4,500 milliwatts can be obtained. The filaments can be operated from a 4-volt accumulator, or from the secondary winding of a suitable transformer.

P414, P430, and P460 are suitable for operation at an anode voltage of 200, 250, and 220 volts respectively. The anode current consumption is 18, 25, and 50 m/A respectively at grid bias voltages of 20, 25, and 35 volts. P4100 can be operated at an anode voltage of 400 volts, the grid bias at this voltage being 35 m/A and it consumes 30 m/A. It has an undistorted output of 4,500 milliwatts. By connecting two or more valves in push-pull or parallel, even greater output can be obtained. Write for further particulars to Dept. S.T.4.

Prices: P414, 8/-; P430, 11/-; P460, 16/-; P4100, 17/- Other types from 5/6 to 19/-.

Tungsramp Barium Valves are manufactured under one or more of the following British patents: 289,762, 289,763, 311,705, and 313,151.

TUNGSRAM ELECTRIC LAMP WORKS (Gt. Britain) Ltd.

Radio Department, Commerce House, 72 Oxford Street, London, W.1.

Makers of the famous Tungsramp Electric Lamps

Birmingham, Bristol, Cardiff, Glasgow, Leeds, Manchester, Newcastle, Nottingham, Southampton.

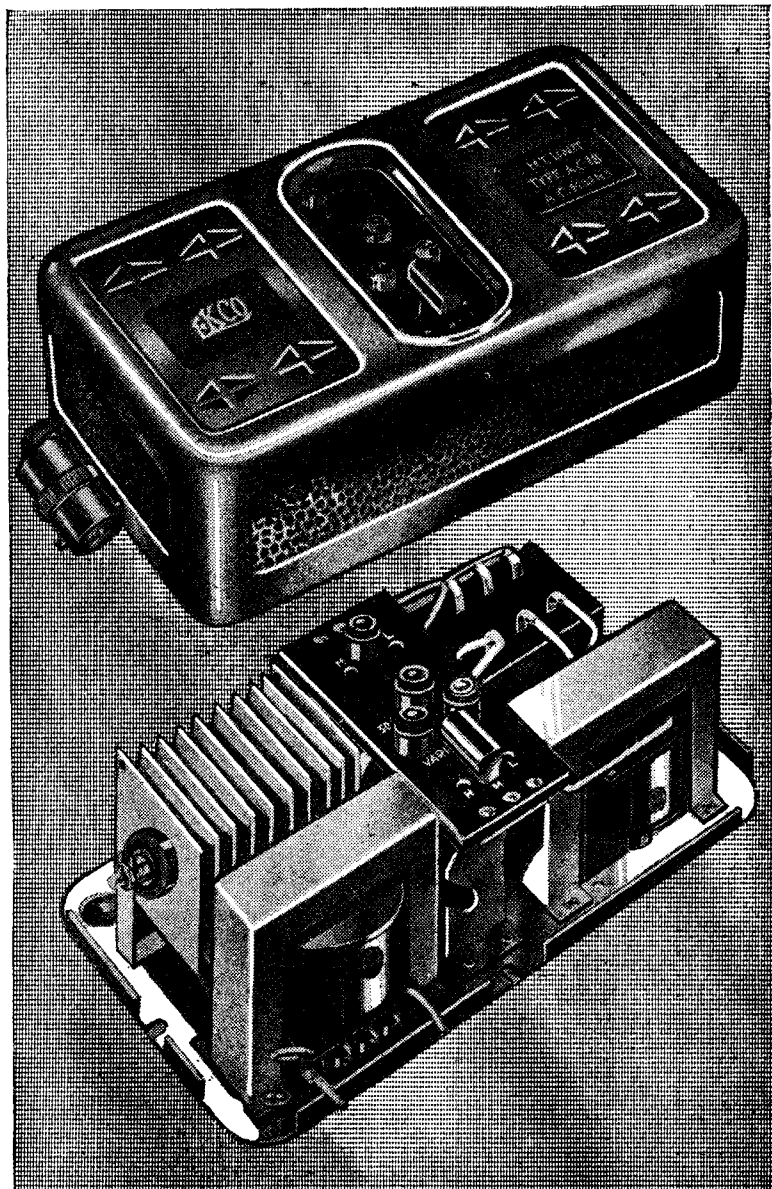
Lamp, Valve, and Glass Factories in Austria, Czechoslovakia, Hungary, Italy, and Poland.

I.F.S. Organisation, Tungsramp Lamps & Radio, Ltd., 11 Burgh Quay, Dublin.

Tungsramp Photo Electric Cells: Nava "E" (for scientific measurement), £2 17s. 6d.; Nava "R" red sensitive cell (for colour matching devices), £3 3s. 0d.; Nava "EH" (for talkie work), £3 13s. 6d.

Don't Forget to Say That You Saw it in "A.W."

New Ekco Power Units . . . a triumph over all previous standards



EKCO—leading specialists in All-Electric Radio—introduce their unique range of 1931-32 Power Units . . . surpassing all previous achievements. Wonderfully compact . . . triumphs of efficiency . . . housed in beautifully designed bronze-metal cabinets . . . embodying unique features . . . combining highest efficiency with greatest simplicity.

Immediately adjustable for different output voltages by a method which eliminates all variable resistances and their attendant defects. Adjustable to every type of receiver and valve. All the controls compactly arranged, readily accessible, clearly marked. Cleverly recessed, too, so that they do not protrude above the surface of the cabinet. Measuring 9 in. by 5 in. by 3½ in. . . . ideal for portable sets . . . and for all other receivers. Banish all battery worries, renewals and expenses for ever . . . and give you better radio . . . permanently . . . for only a few pence a month.

EKCO NEW H.T. UNITS

(For A.C. Mains)

- Model A.C.12 for 1 to 3 valve sets (12 m/a output) £2 15 0
- Model A.C.18 for 1 to 5 valve sets (18 m/a output) £3 7 6
- Model A.C.25 for multi-valve sets (25 m/a output) £3 17 6
- Model D.C.15/25 for D.C. Mains (15 or 25 m/a output) £1 19 6

EKCO NEW COMBINED H.T. AND L.T. CHARGER UNITS

(For A.C. Mains. Supply H.T. and also keep your accumulator constantly charged).

- Model K.12 for 1 to 3 valve sets (12 m/a output) £3 19 6
- Model K.18 for 1 to 5 valve sets (18 m/a output) £4 12 6
- Model K.25 for multi-valve sets (25 m/a output) £5 7 6

All obtainable on EASY PAYMENT
TERMS from as little as 3/8 per month!

Worth knowing more about! Post coupon now for full details.

To E. K. Cole, Ltd., Dept. K.11, EKCO Works, Southend-on-Sea.

Please send me full descriptions of EKCO Power Units with which I can finish with batteries for ever and obtain permanently perfect radio at a cost of only a few pence a month.

Name

Address

(If you require details of Easy Payment Terms put a cross here.....)



Woburn

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention

**Convert your
"CENTURY SUPER"
"1931 ETHER SEARCHER"
"1931 BRITAIN'S FAVOURITE 3"**

**TO AN AUTOMATIC RECORD - CHANGING
RADIO-GRAMOPHONE OR AN ARMCHAIR-
CONTROLLED RADIO - GRAMOPHONE**



In a handsome walnut cabinet of compact design is fitted the new "His Master's Voice" automatic record changing mechanism, pick-up and volume control. By connecting it to your radio receiver eight, 10 or 12 inch records (unmixed) may be played at one loading or a single record repeated up to eight times. A unit you have been waiting years for. A.C. or D.C. Model 117.

Price 18 guineas

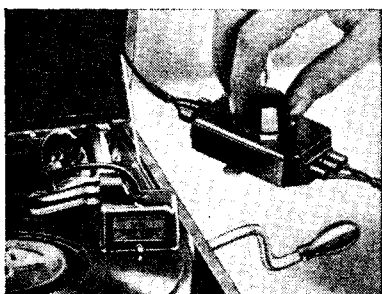
The new "His Master's Voice" pick-up, volume control, electric turntable motor and automatic start and stop, housed in an oak cabinet of pleasing design. By connecting it to a loudspeaker radio-receiver records may be played from one's armchair. Interchangeable resistances may be clipped in to the volume control to match the pick-up to any radio receiver. A.C. or D.C. Model 116.

Price 10 guineas



NEW "HIS MASTER'S VOICE"

RADIO ACCESSORIES FOR THE RADIO EXPERIMENTER

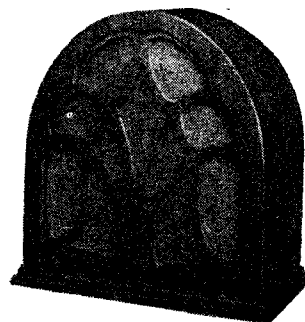


This pick-up is similar to the one fitted to all our new instruments. It can be attached easily to any type of tone-arm and is supplied complete with a logarithmic volume control and connecting leads. The weight of the pick-up is 5½ ozs.; it has an input of over 1 volt R.M.S., and a D.C. Resistance of 6,000 ohms.

Price Complete 2 gns.

A permanent magnet moving-coil loudspeaker in an arched walnut cabinet of attractive design. It is extremely sensitive and will handle up to 3 watts without difficulty. A universal input transformer incorporated in the instrument enables it to be matched to receivers with triode, pentode or push pull output.

Price 5 guineas



★ See all the new "His Master's Voice" Models at the "His Master's Voice Modern Hall of Music," opposite Olympia, September 18th-26th. Admission free. Special measuring apparatus designed in the "His Master's Voice" Research Laboratory will be shown publicly for the first time.

"His Master's Voice"

The Gramophone Co. Ltd., London, W.1.



To Ensure Speedy Delivery, Mention "A.W." to Advertisers



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NEWS & GOSSIP OF THE WEEK

OLYMPIA--AND "A.W."

WELL, here is the first of the Special Bumper Show Numbers of AMATEUR WIRELESS, and the largest issue ever to be published. A wonderful three-pennyworth, isn't it? There is no need for us to blow our own trumpets and detail the contents. Go through the pages for yourself and see the full Olympia report, the particulars of our new set for Olympia, the "Olympian Three," the new "Amateur's Linen Speaker," and many other good things.

SEEING THE SHOW

THE Show opens to-morrow, Friday, September 18, and full details of Olympia, times, prices of admission, and so on are given on the first page of our detailed Show Report, page 392.

MEETING IN ROME

AS a preparation for the meeting of the International Broadcasting Union in Rome on October 14, the Technical Commission is now considering ways and means at Brussels. It is hoped that, following the Rome meeting, when the proposals of the Technical Commission will be discussed, a sequel will be a meeting between the broadcasters and administrations of Europe.

LUGANO PLAN?

IF the B.B.C.'s highest hopes are realised, the Lugano meeting may result in the

Olympia, the Mecca of radio "fans" while the National Radio Exhibition is open from September 18 to 26. Read all about the Show in this issue

formulation of a new plan of wavelength distribution to take the place of the out-of-date Prague plan now in operation.

GERMAN OPPOSITION

THE idea of a Lugano plan or some other plan implying a greater separation than 9 kilocycles between adjacent high-power stations is opposed by the German post office and Rundfunk organisation. The German attitude is that it is better to leave the present wavelengths alone than to sacrifice wavelengths in an endeavour to obtain wider frequency separation. We hope the Germans will be overruled in this matter, for however many wavelengths one may have in theory, the present practice shows that practically all wavelengths are mutilated.

THE ECONOMY CUT

WE now have some inside facts about the B.B.C.'s fight for existence in opposing the drastic cut in revenue suggested by the May Report. It may surprise readers to know that the amount of the proposed cut entertained in some quarters was no less than half a million pounds. There was even a suggestion that three-quarters of a million would not be too much of a cut.

B.B.C. SELLING TIME

AS the Treasury was asked to regard the whole of the B.B.C. revenue as a tax on

receiving apparatus and not necessarily as payment for programmes, it was suggested that the B.B.C. had no real right to any of the money. The suggestion was seriously considered by a certain section of the Treasury that the B.B.C. should be deprived of its present source of revenue and should pay for its programmes with money made out of selling broadcast time to advertisers!

A FUTURE POSSIBILITY

AS things have turned out, the B.B.C. will not have to commercialise itself. But the idea of selling time has been merely postponed for two years, when there is quite a possibility of a drastic change in the B.B.C.'s mode of existence. During the last two or three weeks we have been much nearer to advertised broadcasting than any of us could possibly have imagined.

SEVERE CUT

THE cut in the B.B.C.'s revenue now decided upon by the Treasury is severe but not crippling. Everything in the B.B.C. service is to be scaled down, but nothing essential is to be impaired. Broadcasting House will certainly suffer from the economies. The furnishing schemes will have to be simplified. We understand that the cut will be about 10 per cent. of the B.B.C.'s present licence revenue.



NEWS · & · GOSSIP · OF THE · WEEK —Continued

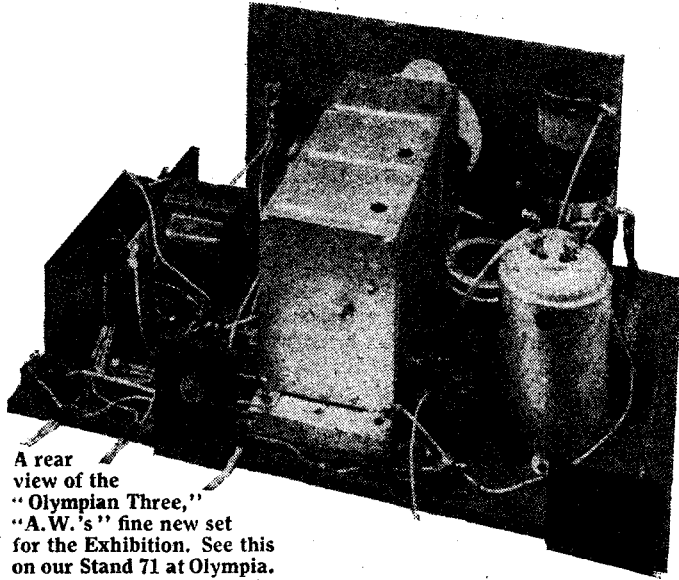
B.B.C.'s CASE

THE B.B.C. takes the attitude that the May Committee have no right to touch the B.B.C., since it is not a Government Department, but a Corporation working under Royal Charter. We believe that the efforts of Sir John Reith and Mr. Whiteley, the Chairman of the B.B.C., were largely responsible for saving the B.B.C. from

is to tell the story of his escape, was in charge of a landing party on Direction Island when the *Emden* was attacked.

BEATING THE POLICE

IN America efforts are being made to check criminals by means of wireless-equipped police cars controlled by a headquarters broadcasting station. But trouble is experienced from enthusiastic radio fans, who pick up the calls and arrive in their cars at the scene of the latest crime as soon as the police. That is one of the interesting disclosures made in a five-page illustrated article dealing with radio and crime that appears in the October *Wireless Magazine*.



A rear view of the "Olympian Three," "A.W.'s" fine new set for the Exhibition. See this on our Stand 71 at Olympia.

FREE STATION LOG

THIS particular issue of *Wireless Magazine* (it is published on Friday, September 18) is the largest yet published. Our "big brother" has made great strides during the past year and is now the un-

disputed leader in its field. Each copy of the Autumn Double Number contains a free-gift station log that will be of value to every listener and there is a "key to the circuit diagram" for the benefit of beginners. Better get a copy, only 1s.—and the best shillingsworth in radio!

FOR THE SHORT-WAVER

THE private Portuguese transmitting station CTIAA is now operating on a

A SECOND BUMPER SHOW NUMBER!

NEXT week's issue of "A.W." will be a second Bumper Show Number, extra large and full of good features. There will be for the interest of Showgoers a description of the outstanding exhibits, and all the new sets and components will be dealt with. Constructional notes for the "Olympian Three" and the "Amateur's Linen-diaphragm Loud-speaker" will attract home constructors, and listeners will find many special articles and features.

USUAL PRICE 3d.
ORDER YOUR COPY NOW

wavelength of 291 metres and with a power of 2 kilowatts, says a Philips Special Correspondent. Regular transmissions take place on Mondays, Wednesdays, and Saturdays, from 10.20 p.m.—12.20 a.m. On Thursdays, there are short-wave transmissions (wavelength 42.9 metres) which are announced in five languages—Portuguese, French, English, German, Italian. Short-wave enthusiasts should try for this.

A WADE PLAY

PHILIP WADE is known to all listeners to the programmes emanating from the Productions Department of the B.B.C. As a broadcast actor he has appeared before the microphone on many occasions. He has now turned his attention to the writing of plays and sketches for broadcasting and listeners will hear a sketch by Mr. Wade called *Next to Godliness* on September 21.

commercialisation or from a crippling of the Regional Scheme.

AFTER OLYMPIA

AFTER the Olympia Show comes the Northern National Radio Exhibition in the City Hall, Deansgate, Manchester. This runs from October 7 to 17 and is of outstanding interest to all Northern listeners.

B.B.C.'s NEW MEDIUM

LISTENERS who crave to see their favourite radio folk in the flesh, so to speak, will have an opportunity when the B.B.C.'s annual swimming gala takes place on September 23 at the Marshall Street baths, Regent Street. Members of the Military Band will be in the water as well as Derek McCulloch as Master of Ceremonies.

THE OPERA SEASON

THE coming season of opera in English at the Covent Garden Opera House is the first to be held there for many years. The season opens on September 14 and the B.B.C. will relay excerpts from many of the thirteen operas to be performed. With one exception, the artistes taking part are all British, and many of them are well known to listeners.

ANOTHER "ESCAPE"

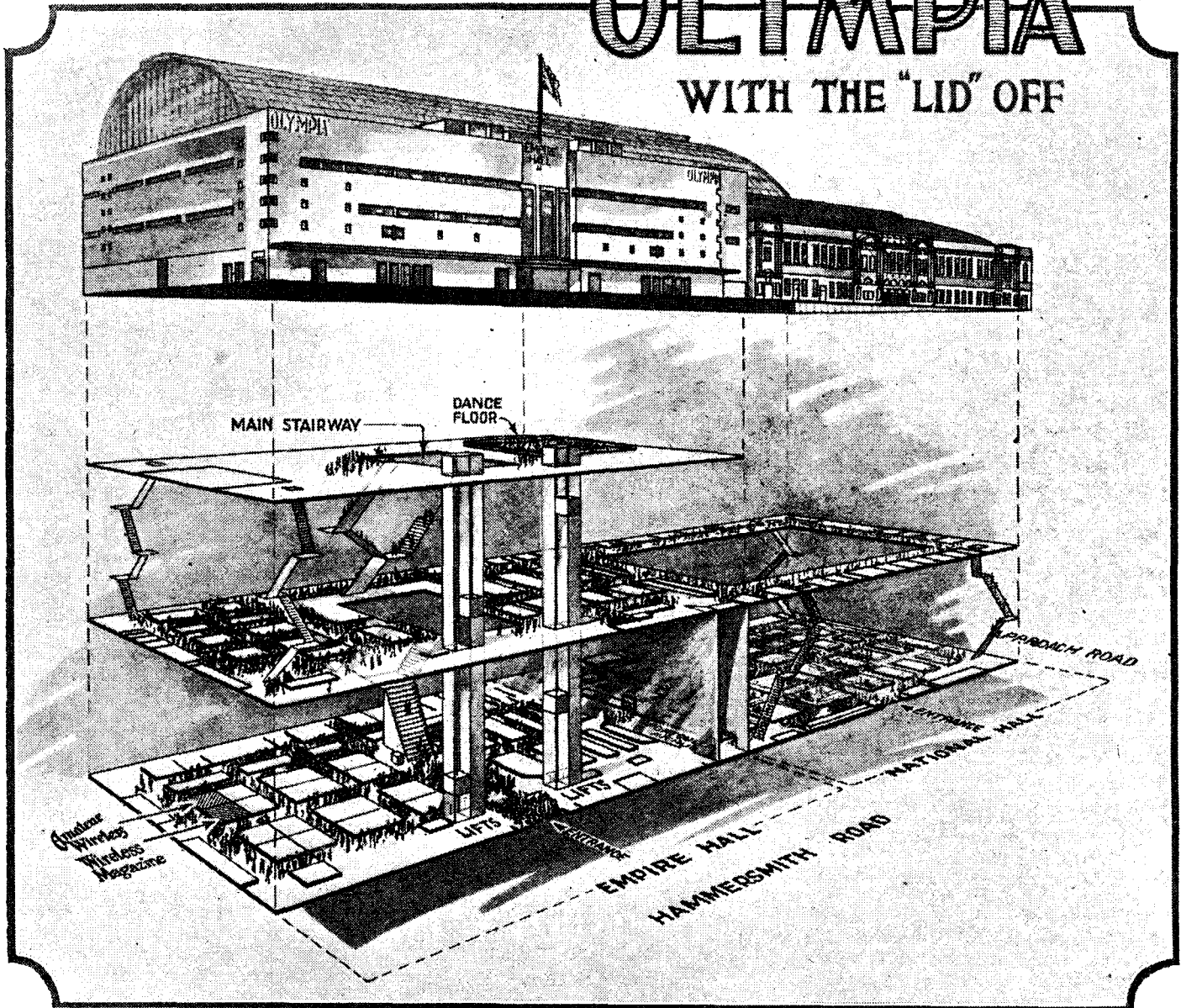
ANOTHER thrilling instalment in the "Escape" serial will be heard on September 26. This episode will deal with the *Emden*, the German warship that was eventually sunk by the Australian cruiser *Sydney*, after the former had captured or sunk fifteen ships within two or three months. Kapitanleutnant von Mücke, who

In the studio at WGBS, one of the New York stations which give television broadcasts. To right and left of the microphone and artiste are the photo-electric cells, while the scanning light source can be seen through the small window of the Control Room. These television broadcasts are relayed through W2XR, a station often heard by DX enthusiasts



OLYMPIA

WITH THE "LID" OFF



Make sure you see everything! This impression of Olympia shows how the exhibits are arranged in the National and Empire Halls. Study this in conjunction with the detailed floor-plans given in our Exhibition Report, starting on page 392.

THE National Radio Exhibition at Olympia opens its doors on Friday, September 18—this time an even bigger exhibition than before. The new Empire Hall is included this year in what is the tenth Radio Exhibition since the start of broadcasting and the fourth held under the auspices of the Radio Manufacturers' Association. The pictorial diagram above shows the positions of the Exhibition Halls and will prove a help in locating any particular portion of the show.

The exhibition is open daily from 11 a.m. till 10 p.m. and runs from Friday, September 18, till Saturday, September 26—eight days chock full of interest to radio fans. The price of admission each day is 1s. 6d., but there are special arrangements whereby parties may be admitted at

special rates. Provided application is made before actual admission is desired, parties of 12 to 19 members are admitted for one

facturers' Association in advance.

Olympia is within easy reach of all Londoners, being served by many bus routes from the West End, and also by the Metropolitan and Underground Railways. Motorists should note that there is a large car park under R.A.C. supervision in North End Road.

In the Complete Guide to the Exhibition, which commences on page 392, you will find, in numerical order of stands, a detailed description of the sets and components shown by leading manufacturers. On page 393 of this Exhibition Report also is a complete list of the exhibitors in alphabetical order.

OUR STAND-71

See the **AMATEUR WIRELESS** and **WIRELESS MAGAZINE** Stand first. Come and see the latest "A.W." and "W.M." sets actually in the making, and make a detailed inspection of the "Olympian Three" described in the centre pages of this issue. There is a representative selection of full-size blueprints and handbooks to help set buyers and set builders. You can't miss our Stand. See it first.

shilling each, while for parties of 20 and over there is a special rate of 9d. each. Application should be made to the Radio Manu-

Use "Amateur Wireless" as your Show Guide.

THE COMPLETE GUIDE TO THE EXHIBITION COMMENCES ON PAGE 392



The AMATEUR'S — LINEN SPEAKER — WITH MANY DETAIL IMPROVEMENTS

Constructional details of an improved type of linen speaker which is simple to construct and gives remarkable reproduction over the whole frequency scale

HERE is the new "Amateur's Linen Speaker."

The "A.W." Technical Staff produced linen-diaphragm speakers way back in 1927 and instruments of this type and also doped paper diaphragm speakers are well-known to old readers of AMATEUR WIRELESS. New readers will not be so well acquainted with the theory of this type of speaker though, unless they have friends owning a linen instrument, and may not know of the exceptionally fine reproduction that these give.

There is a special reason for the good reproduction. In a linen speaker there is a single diaphragm of high-quality linen which is stretched at considerable tension, and the natural tension of which is increased by "doping" the strands of the linen with a special preparation.

A Single Diaphragm

The diaphragm is tensioned on one side by means of a second support which does not in any way act as a diaphragm or affect the resonance, apart from stretching the main diaphragm so that naturally the latter emits a drum-like note when tapped with the finger.

The driving-rod of the speaker movement is connected by means of a solidly constructed chuck device at the centre of the diaphragm (solid construction is necessary because of the considerable vibration of the diaphragm centre) and this imparts the movements of the unit to the diaphragm.

The natural tension of the whole of the moving parts of the speaker is readily adjustable and at the same time, all fixing screws are damped to prevent undesirable resonances. The peculiar construction of the diaphragm results in the speaker having a fine deep tone and, in fact, many users of linen speakers prefer the natural tone to that of a moving-coil speaker, because the high notes are very well maintained with the linen diaphragm, despite the preponderance of "lows."

So far, you see, the theory of the speaker is simple and differs only from that of an ordinary free-edge cone in that with this type one relies on the natural unrestricted vibration of the cone, whereas with a linen

diaphragm one takes advantage of the vibration periods produced by adequate tensioning.

The theory is simple. The actual design and the arrangement of dimensions are not so straightforward though the construction is simple.

Special Features

For this new "Amateur's Linen Speaker" the Technical Staff has tried several models, several methods of tensioning, and very many sizes and types of diaphragm. Not only is the size of the main diaphragm of great importance, but the special quality of the linen used and the amount of "doping" done affect the tone.

In these initial laboratory experiments,

too, many good diaphragms are strained and even damaged by accidental over-tensioning, because one has over-estimated the strength of the linen. But in this final design all snags have been overcome and if you make up the new "Amateur's Linen Speaker" with the material specified and exactly according to size, then you will have no trouble in getting good results and you will not damage the diaphragm or the mechanism of the speaker unit. The main components needed will be obvious from an inspection of the scale drawing.

The Diaphragm

The big diaphragm is made up on a 7-ply board measuring 24 in. by 24 in., and a 20-in. diameter hole must be cut in the centre. This can be marked out by drawing diagonal lines to find the exact centre of the 2-ft. square board and improvising a pair of compasses out of a piece of string and two nails.

One nail should be lightly tapped into the centre of the board and the string secured to it. At a distance of 10 in. the string should be twisted round the other nail and the 20-in. circle can thus be scribed.

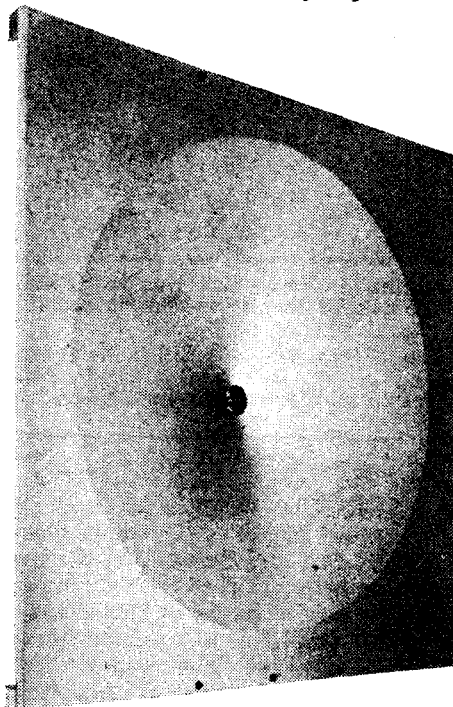
The next job is to cut this out with a fretsaw. With the 7-ply wood used this is fairly easy, but it is well worth taking time to get a nice circular edge. In any case, this is the most difficult part—if such you can call it—of the constructional work, and all the rest is plain sailing.

The Frame

The small scale layout is a great help and from this you can measure off the dimensions of the wooden supports and back pieces, but a large blueprint has been prepared for this speaker and can be obtained, price 1s., post free, from the Blueprint Department of AMATEUR WIRELESS, 58-61 Fetter Lane, London, E.C.4.

This is much more useful even than the scale layout, which is given as large as possible on next page. From it you can measure off direct the sizes of the various supports and of the wooden frame for the tensioning cross-piece.

Two supports for the tensioning device are required, measuring 24 in. by 4 in. and preferably cut with sloping ends, as shown. The plywood support for the tensioning cross-piece is 10 in. square, and has a 7-in.



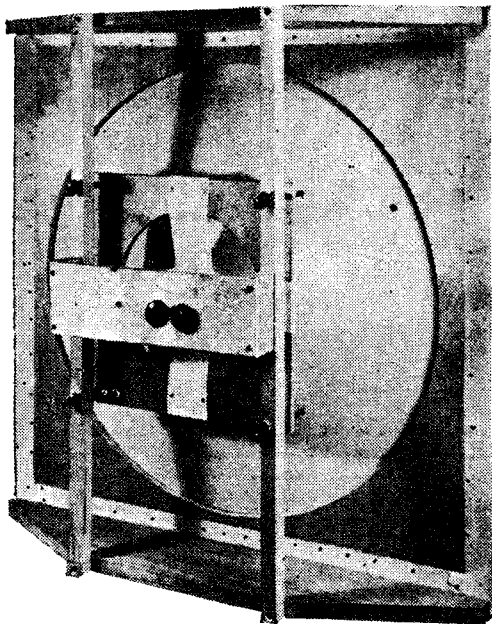
This picture shows the front of the speaker which lends itself to decorative treatment, or it may be enclosed in a cabinet

A LIST OF FULL-SIZE BLUEPRINTS OF "A.W." AND "W.M." SETS APPEARS ON PAGE 484

A FINE SPEAKER YOU CAN MAKE YOURSELF (Continued from preceding page)

diameter hole. This is carried on two battens on the 4-in. by 24-in. back supports.

The speaker unit itself is carried on a 7-ply platform which should measure 10 in.



A rear view of the Amateur's speaker showing the tensioning arrangements

by about 3 in. For tensioning four window-sash type thumb screws are used. These can be obtained from any hardware stores.

The holes for the four tensioning thumb screws should be drilled in the 10-in. board, a trifle smaller than the actual diameter of the bolts. A difference of 1/64-in. is enough to make the bolts cut their own thread in the wood. The brass clamps on the other side of the 10-in. board are threaded, of course, and these should be screwed tightly to the board.

Having cut all the wooden supports and the 20-in. and 7-in. diameter holes in the 7-ply wood, you can start with the construction of the diaphragm and tensioning cross-piece. The new special doped linen supplied by various manufacturers for this speaker is best used.

One side of the 24-in. by 24-in. board should be thinly spread with glue. The linen may then be stretched tightly over it in every direction, turned over on the four sides, glued on the turnovers, and tacked securely. It is very important to get the linen stretched evenly and

reasonably tightly at this initial stage.

The cross-piece of undoped linen should be cut to the size shown and stretched over the edges of the 10-in. square board. This, too, should be securely glued and tacked.

Now the 4-in. by 24-in. side-pieces can be firmly screwed at opposite sides of the 24-in. square board, and the whole woodwork of the speaker may be loosely assembled, but at this stage the screws should not be tightened down.

Assembling

To strengthen the main diaphragm a very small circle of linen may be glued to it at the exact centre, but you must take the greatest care to see that a firm joint is made. The special chuck may now be placed through the centres of the diaphragm and tensioning-piece and it should be tightened so that there is no possibility of slackness arising between the moving parts after the speaker has been used for a while.

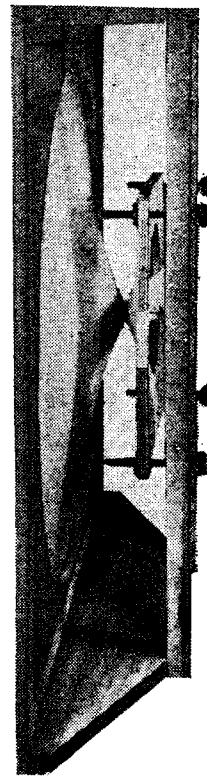
Assemble the woodwork, the diaphragm and tensioning-piece so that there is no actual tension between the cross-piece, and diaphragm and do not tighten up the screws of the back supports until you are quite sure that the two linen sections are mounted concentrically, so that there is no side strain.

If you have followed the various dimensions accurately from the blueprint, the whole job should assemble in a central fashion and there should be no difficulty in getting the diaphragm and cross-piece concentric.

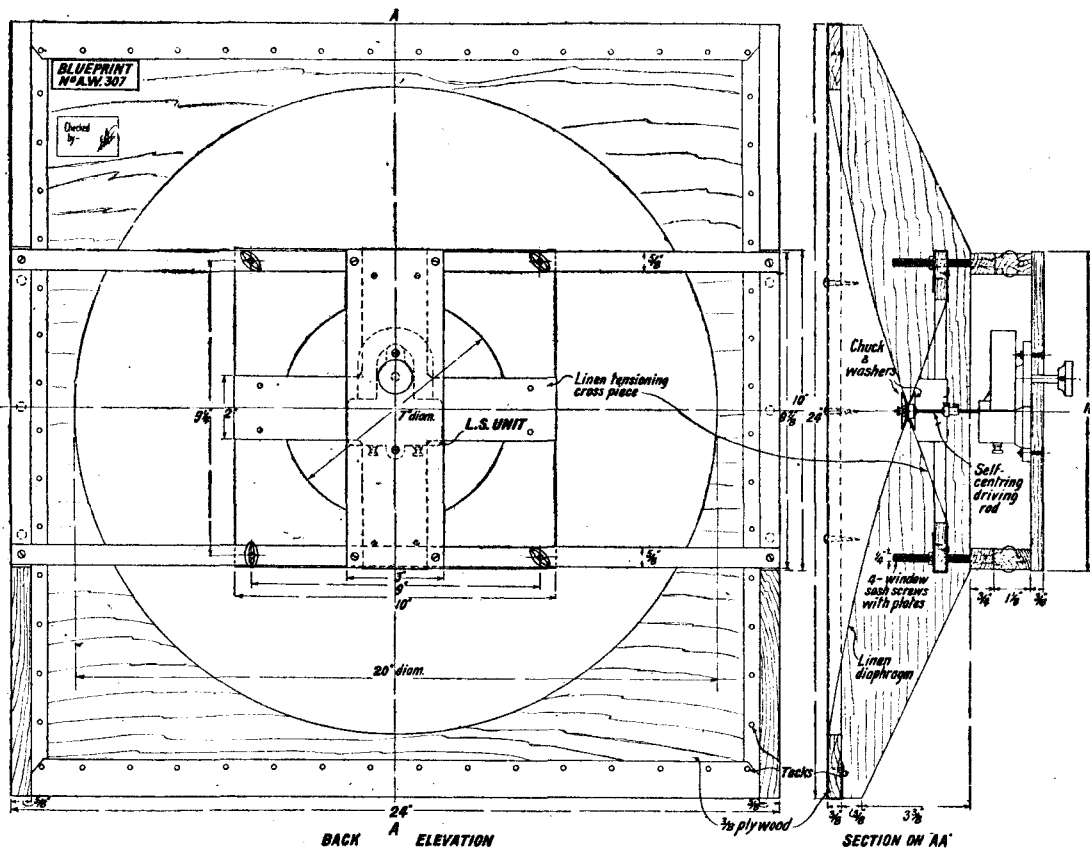
Now, with the main diaphragm set so that it emits a dull thud when tapped, but not tensioned enough to "ping," the doping may be done.

One coating of dope is sufficient with the specially prepared linen. As the dope dries it stretches the strands and a diaphragm which "thuds" before it is coated will emit a drum-like note after doping. Equal adjustment of each of the four thumbscrews may then be carried out, tuning the diaphragm to the natural period required to suit the speaker unit.

A unit having a natural low tone requires the diaphragm to be stretched more to a higher tone, and vice versa. The method of securing the unit to the back piece depends on the type chosen. In any case make a firm job of securing the driving rod to the universal joint in the chuck piece.



This side view shows the assembly of the framework



Working drawings of the "Amateur's Linen Speaker." A full-size blueprint which will be helpful in construction is available, price 1/-

The Fourth National Radio Exhibition, organised by the Radio Manufacturers' Association, opens on Friday, September 18, until September 26. The increased size of the present exhibition is evidence of the remarkable progress that has been made in the science of wireless during the past twelve months and the flourishing state of the trade.

This issue of AMATEUR WIRELESS contains a Complete Guide to the Show, including Floor Plans of the three

Exhibition Halls, a Pictorial Diagram of their situations, Alphabetical List of Exhibitors and a Fully Illustrated Complete Review of the Exhibits. Readers who are unable to visit the Exhibition will find it an invaluable record of the latest developments. The next issue of AMATEUR WIRELESS will be the SECOND SPECIAL SHOW NUMBER and will contain, in addition to many interesting features, detailed descriptions of exhibits of special novelty and notes on the trend of design.

Stand 1. William Dibben & Sons, Ltd., St. Mary's Road, Southampton.

Here you will find the full range of Monarch and Cromwell table-model sets and radio gramophones. The range has been considerably extended since last year and you should make a point of seeing the ganged circuits incorporated in the very fine console models.

Stand 2. S. G. Brown, Ltd., Western Avenue, N. Acton, W.3.

Do not let your examination of the new Brown speakers take up so much time that you cannot inspect the other Brown parts—useful pick-ups for gramo-radio outfits and units for home-constructed speakers. See, too, the Microbox—a special type of pick-up, which does not need an amplifier.

Stand 3. Electrical & Radio Products, Ltd., Empire Works, Salfords, Redhill, Surrey.

The new A.C.-driven sets should be seen here, the A355 table model and the A365 pedestal model. These are six-valvers, including the rectifier. There are three screen-grid valves, one S.G. stage being the detector. A local station switch is a good feature and a metal chassis in American style is used throughout. This same chassis is fitted in the type M455 radio gramophone. Among the portables are the P264, a four-valver with two screen-grid stages; the P274; and the P225, a five-valver, with two choke-coupled H.F. stages and two transformer-coupled low-frequency stages.

Stand 4. Marconiphone Co., Ltd., 210 Tottenham Court Road, W.1.

The extensive range of Marconiphone sets must not be missed. These include receivers of practically every type, from small battery-driven table models, to large all-electric consoles. Marconiphone speakers, too, are worthy of inspection. All-electric models have been specialised in this year and some of the latest sets represent the very zenith of 1932 perfec-

tion. One-knob control is a feature of most sets.

Stand 5. L. McMichael, Ltd., Wexham Road, Slough, Bucks.

McMichael portables, console-type sets and radio-gramophones should be seen. The new station indicators fitted to most sets are an outstanding feature. The new radio gramophone is well worth seeing and incorporates many features which will make a particular appeal to technical enthusiasts, while the ease of control of the various ganged circuits is a technical feature which will appeal to non-technical users.

Stand 6 and 93. Ready Radio (R.R.) Ltd., 159 Borough High Street, S.E.1.

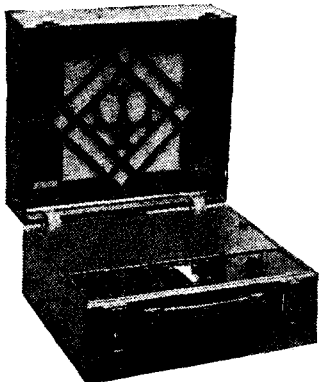
Ready Radio specialise in supplying complete Read-Rad kits of parts for home constructors and the service offered is fully demonstrated on this Stand. There are several interesting components of Read-Rad manufacture which must be seen. Ready Radio, Ltd., have been pioneers in the supply of kits of parts for super-hets,

such as the "Century Super," and this firm also specialises in the manufacture of special components for super-het users, the Read-Rad frame aerial and coil and valve assembly strip being well known. Several interesting new components have been produced for 1932, such as the tapped output choke, a Test Report of which was given last week.

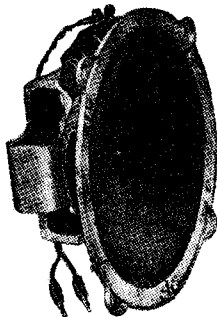
Stand 7. Columbia Graphophone Co., Ltd., 92 Clerkenwell Road, E.C.1.

Two new radio-gramophones 602 and 603 respectively, have been produced. The 602 is a three-valve all-electric combination and the 603 is a four-valve A.C. job with two

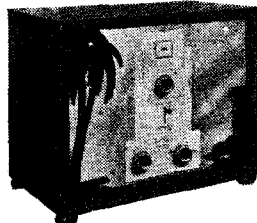
SHOW REPORT
Continued on page 394



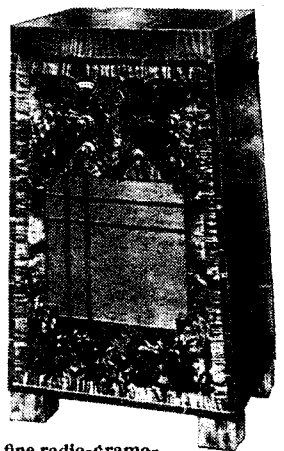
An Eldeco suitcase portable set.



One of the Harlie permanent-magnet speakers



One form of cabinet available for the Six-Sixty chassikit



A fine radio-gramophone by R.I.

PILOT KITS

VITAL DECISION dictates 1932 POLICY

CONSTRUCTORS! Build "Authors" Sets with 100% SUCCESS

START NOW
WITH THE

OLYMPIAN 3



P.S.

Of course! Customers wishing to depart from the Author's Kit may depend on the co-operation and advice of my technical staff in the choice of approved substitutes. Again, we shall be pleased to supply separately any part for the sets described whether specified or substitutes.

Send for Peto-Scott Radio Bulletin containing detailed price list of Pilot Author's Kits for all 'A.W.' Sets.

- Kit A** Author's Kit less valves, cabinet and stool. **CASH or C.O.D. £6-1-11**
or 12 monthly payments of 11/2
- Kit B** Author's Kit with valves, less cabinet and stool. **CASH or C.O.D. £8-0-11**
or 12 monthly payments of 14/9
- Kit C** Author's Kit, complete with valves, cabinet and stool. **CASH or C.O.D. £11-15-11**
or 12 monthly payments of 21/7

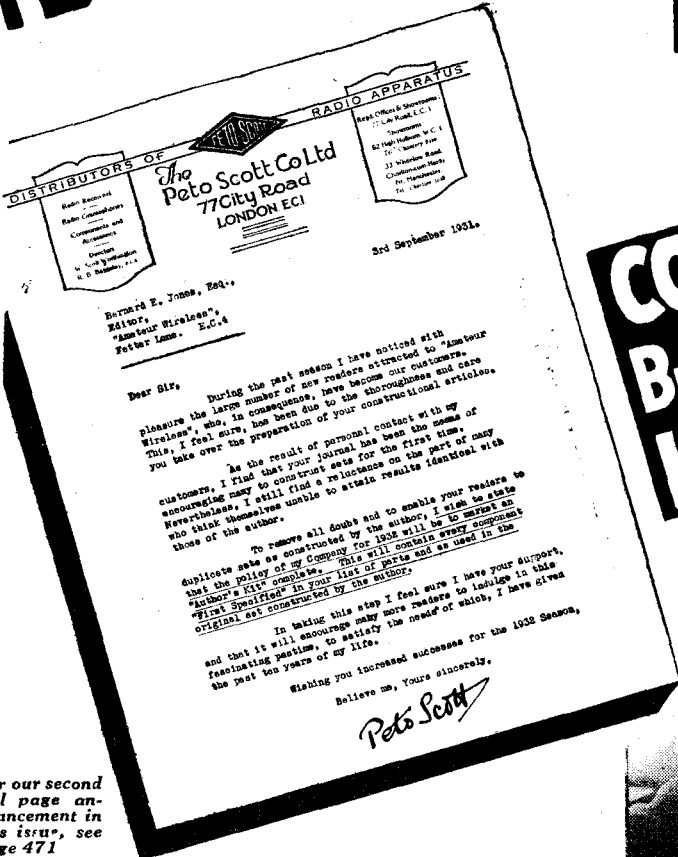
Any parts supplied separately. Sent C.O.D. We pay post charges on all orders over 10/-

SEE AUTHORS' KITS BUILT AT OLYMPIA—STAND 179, EMPIRE HALL (1st Floor)

PETO-SCOTT

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.

You will Help Yourself and Help Us by Mentioning "A.W." to Advertisers



For our second full page announcement in this issue, see page 471

PILOT AUTHOR'S KIT FOR THIS NEW SET

CHECK this list of parts with the Author's specifications, photographs and diagrams on pages 428-429. £ s. d.

- Three-ply wood panel 16" x 8", and 7-ply baseboard, 16" x 10" ... 2 6
- 1 J.B., 0005-mfd. triple-gang condenser with slow-motion dial ... 1 9 6
- 1 Lotus 0003-mfd. reaction condenser ... 4 0
- 1 Sovereign 50,000-ohm potentiometer ... 4 6
- 1 Varley Dual-range Square Peak Aerial Coil, and Dual-range H.F. Intervolve Coil ... 1 3 6
- 1 Dubilier .04-mfd. fixed condenser ... 2 0
- 1 Peto-Scott S.G. valve screen ... 2 6
- 1 Telsen binocular H.F. choke ... 5 0
- 3 Lissen .0002-mfd. fixed condensers ... 3 0
- 1 Ready Radio grid-leak holder ... 6
- 1 Dubilier 2-meg. grid leak ... 1 9
- 1 Busco filament switch ... 1 3
- 1 Ready Radio high-frequency choke ... 4 6
- 1 Telsen low-frequency transformer, ratio 7-1 ... 8 6
- 1 Formo condenser bank comprising two 2-mfd. and two 1-mfd. fixed condensers ... 9 6
- 2 Lewcos 10,000-ohm, two 20,000-ohm and one 30,000-ohm spaghetti resistances ... 7 6
- 1 Bulgin fuse and holder ... 1 3
- 1 Lotus JK5 gramophone jack ... 3 0
- 7 Clix wander plugs (marked) ... 10
- 2 Clix marked spade terminals ... 4
- 4 Belling-Lee marked terminals ... 1 0
- 1 Belling-Lee anode connector ... 6
- 2 Sovereign terminal blocks ... 1 0
- 1 Siemens 9-volt G.B. cell ... 1 0
- 4 Yards Lewcoflex, Lewcos connecting wire and Lewcos sleeving, screws, etc. ... 3 0

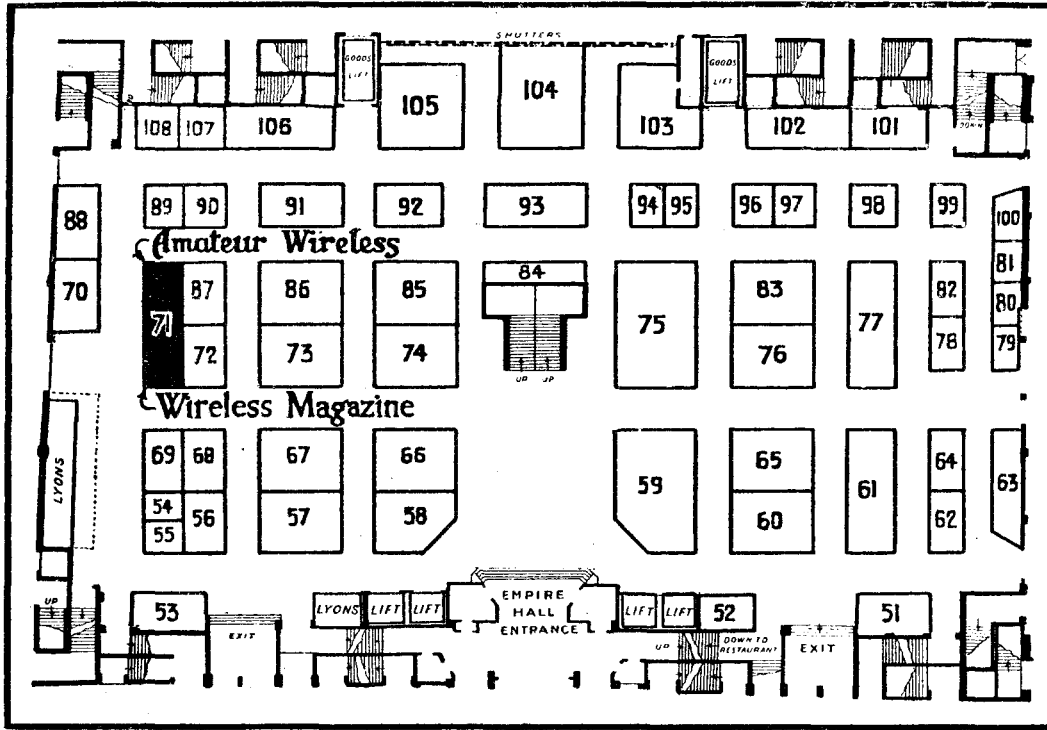
KIT "A," Cash or C.O.D. 6 1 11

- ACCESSORIES**
- 1 Camco cabinet (Windsor Model) ... 2 5 0
 - 1 Camco stool for cabinet ... 1 10 0
 - SG215, HL210, P220, or PM12, PM11L, PM2 Valves ... 1 19 0

**C.O.D
CASH
H.P.
as usual**

COMPLETE GUIDE TO SHOW

STAND Nos. 8-14



PLAN OF STANDS ON GROUND FLOOR, EMPIRE HALL

Among the speakers are the Ultra, Imp. Minor 95, and Major. These are obtainable in chassis form or complete with cabinet. New productions are the "Ultra Tiger Three" table model all-electric set, with mains aerial, a control calibrated in wave-lengths and with two S.G. and pentode A.C. valves, and the "Twin Cub," a similar outfit with A.C. detector and pentode valves. The "Panther Four" is a three-valve screen-grid and pentode job.

Stand 11. Radio Gramophone Development Co., Ltd., 18 Frederick Street, Birmingham.

New R.G.D. models produced include the short-wave adaptor for A.C. or D.C. mains and for battery working, the R.G.D. popular radio-gram and the R.G.D. super de-luxe, and the eight-valve super-hct. radio-gramophone.

Stand 12. Bullphone, Ltd., 38 Holywell Lane, E.C.2.

See here the full range of Bull-phone sets, the S.G. 3 kit and the all bakelite 20 m.a. output eliminator.

Stand 13. Belling & Lee, Ltd., Queensway Works, Ponders End, Middlesex.

All set-constructors will find something to interest them here in the wide range of Belling-Lec terminals, connectors, fuse holders, battery cords and many other gadgets for improving the details of a set. Make

Reference to this List and the Plans will enable you to locate any Exhibitor!

Table with 4 columns: Name, Stand No., Name, Stand No., Name, Stand No., Name, Stand No. Lists exhibitors and their stand numbers, including Adie & Co., Amalgamated Press, Arding & Hobbs, Atlanta, Audiovisor, Auto Electric Devices, Automatic Coil Winder, B. & S. Electrical, Baird Television, Bakers Selhurst Radio, Belling & Lee, Benjamin Jones, Bernard Jones Publications, Beta Electric Motors, Bird, Sydney S. & Sons, Birkbys, British Blue Spot, British Broadcasting Corporation, British Ebonite, British General Manufacturing, British Hard Rubber, British Radiophone, "Broadcaster", Brooks, Brown Brothers, Brown, S. G., Brownie Wireless Co. of Great Britain, Bulgina, Bullphone, Burton, Catesby, Celestion, Chloride Electrical Storage, Churchmans, Clarke, Cimax Radio Electric, Colassion, Cole, Columbia Graphophone, Colver, Concorde Electric Wire, Cosnar, Crauford Wireless, Crypto Electrical, Danipad Rubber, Darwins, Dayrite, De La Rue, Thos. & Co., Dew, Dibben, Donotone, Downing, Dubilier Condenser, Dulcetto-Polyphon, Dyson, East London Rubber, Eastick, Econsign, Edison Bell, Edison Swan Electric, Electric Gramophones, Electrical Devices, Electrical & Radio Products, Electro-Dynamic Construction, Ensign, Epoch Radio Manufacturing, Ever Ready, Falk Stadelmann, Fauleis, Fay Home Recorders, Ferranti, Findlers, Formo, Francke, Fuller Accumulator, Fulton Gramophones, Gamage, Garratt Stores, Garratt Engineering & Manuf-acturing, General Electric, Goodman, Graham, R. F. & Co., Graham Amplion, Graham Farish, Greatrex, Gripco, Grosvenor Electric Batteries, Gutter Percha, Hacker, H. & Sons, Haiyoon Wireless, Harlie Brothers, Heayberd, Henderson Wireless & Electrical Service, Hillman Brothers, Hobday Brothers, Hunt, A. H., Hunton, Hustler, Simpson & Webb, Ikranic Electric, Iliffe, Ionia Gramophones, Jackson Brothers, Jewel Pen, Johnson Talking Machine, Junit Manufacturing, Kalisk, Kolster-Brandes, L.E.S. Distributors, Lamplugh, Lacro-Linx, Lissen, Lithanode, Lock, London Electric Wire Co. & Smiths, Lotze, Lotze Radio, Magnavox, Mains Power Radio, Mains Radio Gramophones, Manufacturers Accessories, Marconiphone, McMichael, Montague Radio Inventions & Development, Mullard Radio Valve, Murphy Radio, National Accumulator, New London Electron Works, Oldham, Oliver Pell Control, Ormond Engineering, Osborn, Oram Valves, Overseas Trading Corporation, Park Royal Engineering, Paroussi, Partridge & Mee, Partridge, Wilson, Pegasus, Pertrix, Peto Scott, Pioneer Manufacturing, P.R. Products, Priestly & Forl, Primus Manufacturing, Pritchard & Simpson, Pye Radio, R.C. Radio Electric, Radio Gramophone Development, Radio Instruments, Radio Society of Great Britain, Radio Trade Review, Ready Radio, Rees Mace Manufacturing, Reifern's Rubber Works, Repeantone, Rolls Caydon, Rooke Brothers, Sel-Ezi Wireless Supply, Selectors, Selfridge & Co., Shapland & Pettier, Siemens Electric Lamps & Supplies, Six-Sixty Radio, Smartheite, Sovereign Products, Standard Battery, Stratton, Sun Electrical, Swain, Charles, Swift Lovick & Sons, Synchronophone, Tanny Products, Taylor, Henry E., Telegraph Condenser, Telsen Electric, Thompson, Diamond & Butcher, Tones, Turner & Co., Ultra Electric, Umello, Vandervell, Voltrow Electric, Walmel Wireless, Westinghouse Brake & Saxby Signal Co., Whiteley Electrical Radio, Whiteley, William, Whittingham, Smith & Co., Wilkins & Wright, Wingrove & Rogers, Wireless Retailers Association, "Wireless Trader", Wright & Weare, Yagerphone.

(Continued from page 392)

screen-grid stages and pentode output. There are four new radio sets, 351, 350, 352 and 333, and a complete range of Columbia speakers embodying the new Columbia moving-coil unit.

Stand 8. Chloride Electrical Storage Co., Ltd., Clifton Junction, Manchester.

On this Stand is the whole range of Exide accumulators and dry batteries. Make sure you see the Drydex H.T. batteries in the Red Triangle, Green Triangle, and Orange Triangle ranges, and also the special portable set

batteries. There are some fine high-tension accumulators here, too, and detail improvements have been made to the popular W. H. and W. J. 10-volt units.

Stand 9. Pye Radio, Ltd., Radio Works, Cambridge.

The new Pye mains-driven transportable sets are of outstanding interest and technical enthusiasts gather here to discuss the many interesting points of design in the new Pye lines. This firm, too, specialises in the production of mains parts and all mains users will find much to interest them in the 1932 range.

The "Q" type portable, a four-valve screen-grid outfit, with pentode output, single dial operation of the twin-gang condensers, matched by hand adjustment over the whole range, must be seen. This has a low milliamper consumption and gives three times the volume previously obtained on battery-operated portables.

Stand 10. Ultra Electric, Ltd., Erskine Road, N.W.3.

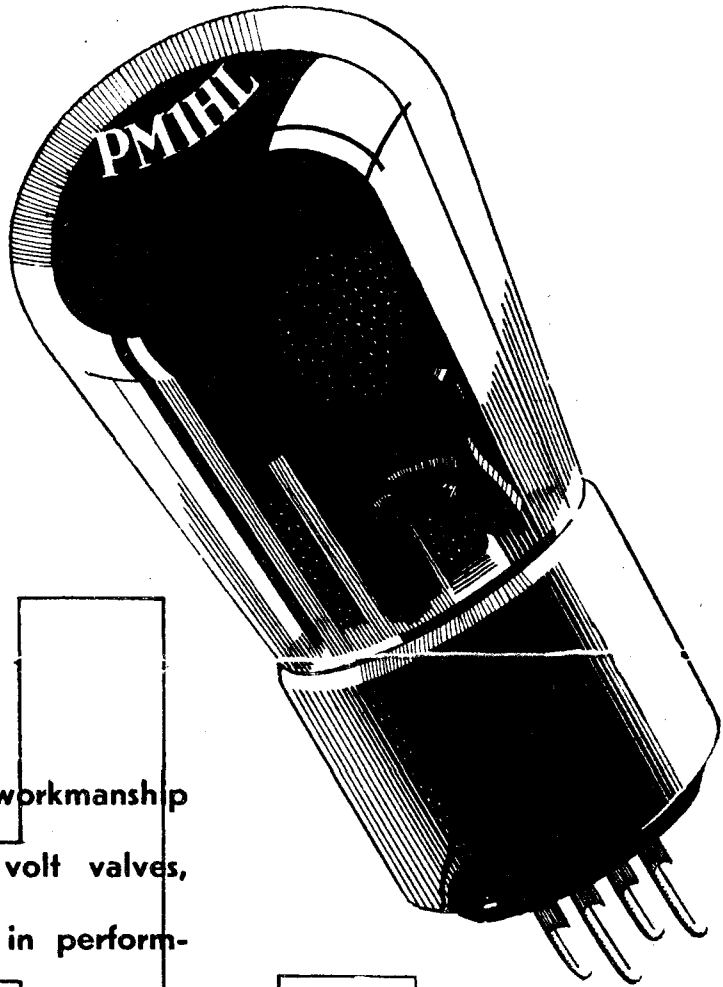
This firm specialises in loud-speakers, and all lovers of good reproduction should make a point of seeing the new lines.

a point of seeing the types H, R, M, B, and Q terminals.

Stand 14. The Telegraph Condenser Co., Ltd., Wales Farm Road, North Acton, W.3.

Interest here centres largely on the new electric electrolytic condensers which can be had in capacities from 4,000 microfarads down to 2 microfarads. There are some fine moulded-in types micro-condensers and a range of non-inductive paper

SHOW REPORT Continued on page 396



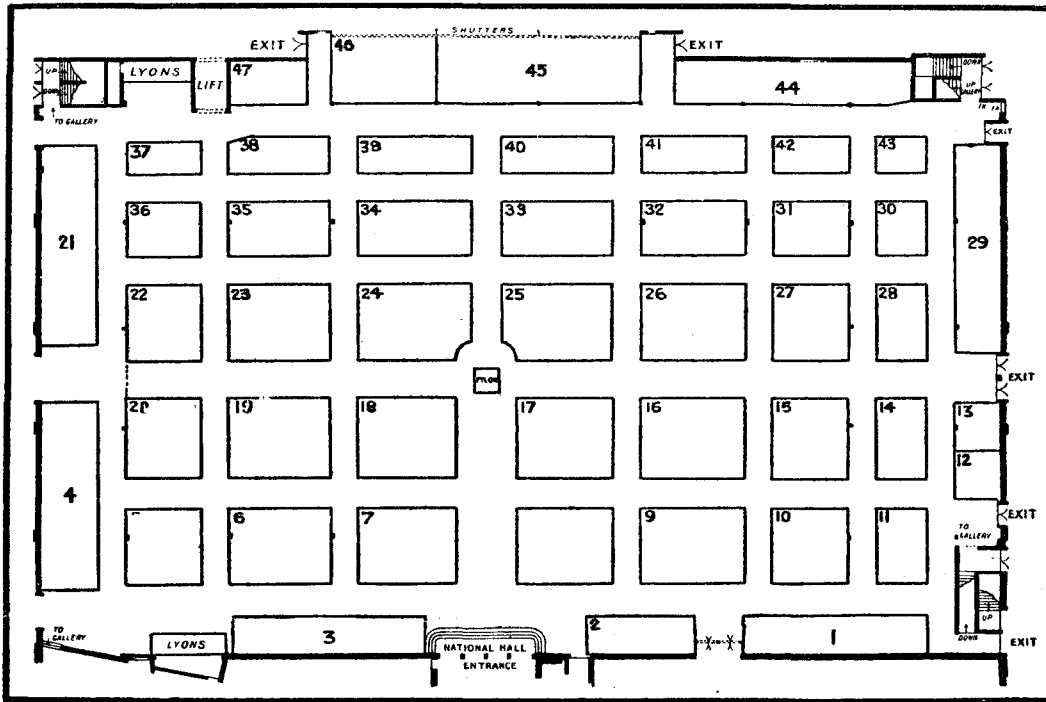
Mullard research, and Mullard workmanship have produced a range of 2 volt valves, flawless in construction, supreme in performance. The P.M.1.HL is a general purpose valve from the 2-volt range. It is primarily designed for use as a high frequency amplifier in sets not employing a screened grid valve, but it will also give excellent results as a detector or low frequency amplifier. Buy one today from your dealer.

Price 8/6

Mullard
THE · MASTER · VALVE

Advt. The Mullard Wireless Service Co. Ltd., Mullard House, Charing Cross Road, London, W.C.2

COMPLETE GUIDE TO SHOW STAND Nos. 15-20



PLAN OF STANDS ON GROUND FLOOR, NATIONAL HALL.

(Continued from page 394)

condensers. Sub-divided block condensers will also interest set-builders.

Stand 15. National Accumulator Co., Ltd., 50 Grosvenor Gardens, S.W.1.

Most of the H.T. and L.T. accumulators here are fitted with the well-known National Tell-Tale device which shows the state of charge. There are now in the range some new jelly-acid accumulators.

Stand 16. A. C. Cossor, Ltd., Cossor House, Highbury Grove, N.5.

See here the new mains Melody Maker, the Empire Melody Maker and the new Cossor loud-speakers, pick-up and volume control. A full range of Cossor valves is on show. These well deserve inspection. Several new types have been produced and the general characteristic of the new lines is vastly increased magnification with lower inter-electrode capacity. In the screen-grid valve range this, combined with a high mutual inductance, results in a greater reflected magnification. It will well repay technical enthusiasts to see the characteristic curves of the new screen grids and power valves, which are particularly notable in the range.

Stand 17. Lissen, Ltd., Worpole Road, Isleworth, Middlesex.

Lissen, Ltd., have long had a name for marketing parts of interest to every set builder and this reputation is well borne out by the wide display of apparatus on this stand. Lissen, Ltd. have produced several new parts for 1932 and in the range of low-loss condensers, Torex transformers, resistances, fixed condensers and other components, set builders will find all they need.

Standard type Lissen H.T. batteries are available in 60-, 100-, and 120-volt ranges. There are 60- and 100-volt super-power batteries and 99- and 60-volt portable type batteries. Grid-bias batteries are available in 4½-, 9-, 16-, and 36-volt sizes.

Stands 18, 80, 199, and 221. Mul-

lard Radio Valve Co., Ltd., Mullard House, Charing Cross Road, W.C.2.

On the stands you find the full range of Mullard valves, many new

types of several battery models is adequate tribute to the work of the Mullard Research Department. There are on show, too, the "Radio for the

COME TO STAND 71 AND SEE THE EXHIBITION SET DESCRIBED IN THIS ISSUE

types of which have been brought out to cope with modern set demands. The range of mains valves is very complete and the better characteris-

Million" outfits and plans for the construction of sets.

Mullard has also just brought out a multi-valve known as the type

MM4V, and many modern A.C. sets will be fitted with this new indirectly heated valve. The idea of it is that by a simple change of the operating conditions the effective amplification of the valve can be varied. It has a mutual conductance of 3 milliamperes per volt (grid volts, zero) and .01 milliamperes per volt (grid volts, 40). This MM4V valve is only one of the new productions for 1932.

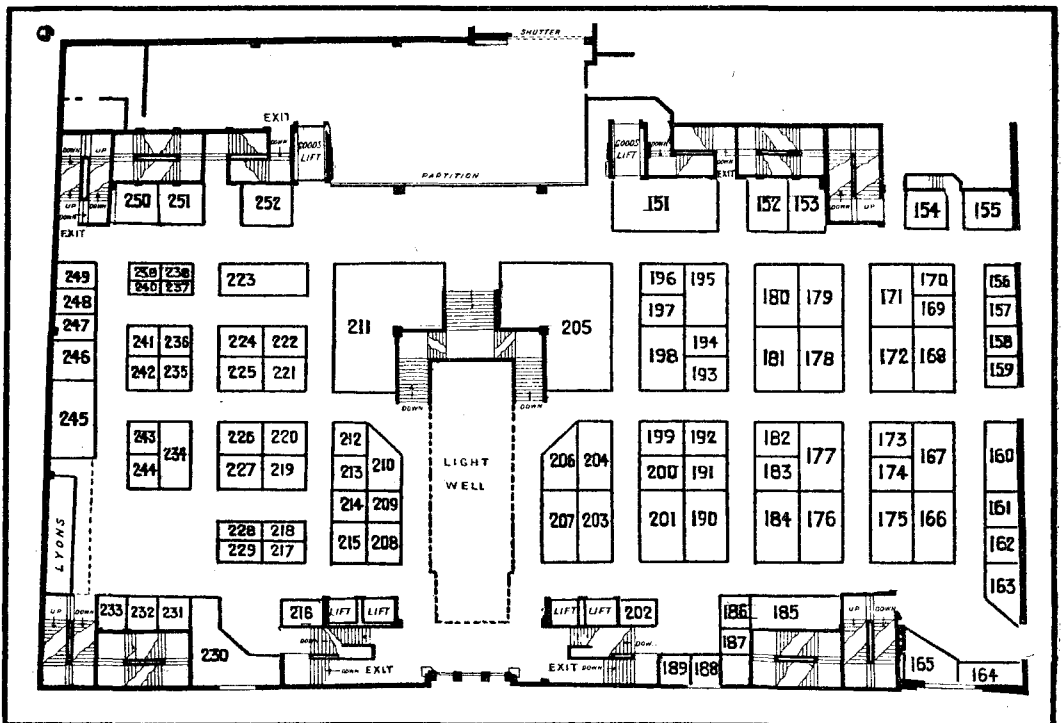
Stands 19 and 213. Telsen Electric Co., Ltd., Thomas Street, Aston, Birmingham.

On these stands there is a wealth of constructional apparatus of the greatest use to those who build their own sets. Telsen have been pioneers in gigantic price reductions for the new season and the value now offered in many components is really extraordinary. Visitors to the stand will be able to see for themselves how excellent quality has been maintained concurrent with the lowering of price. In the wide assortment of transformers, chokes, coils, valve holders, condensers, resistances, and so on there is something of interest for everybody.

Stand 20. Six-Sixty Radio Co., Ltd., 17-18 Rathbone Place, W.1.

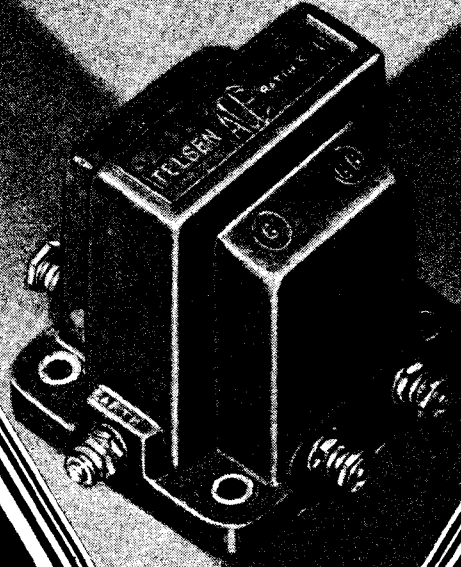
Here there is a comprehensive range of the well-known Six-Sixty products and several new lines have been brought out specially for this purpose. The Six-Sixty Chassikit must be seen and the battery model is of particular interest. This is a useful idea enabling amateurs to build up their own sets on a complete metal chassis which is provided and can be housed in several types of cabinet, either table model or console type. There is an A.C. three-valve edition fitted with indirectly heated S.G. and detector valves and an S.S. 415 P.P. output valve.

SHOW REPORT
Continued on page 400



PLAN OF STANDS ON FIRST FLOOR, EMPIRE HALL

Telsen's first claim to fame



**TELSEN
L.F. TRANSFORMERS**

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

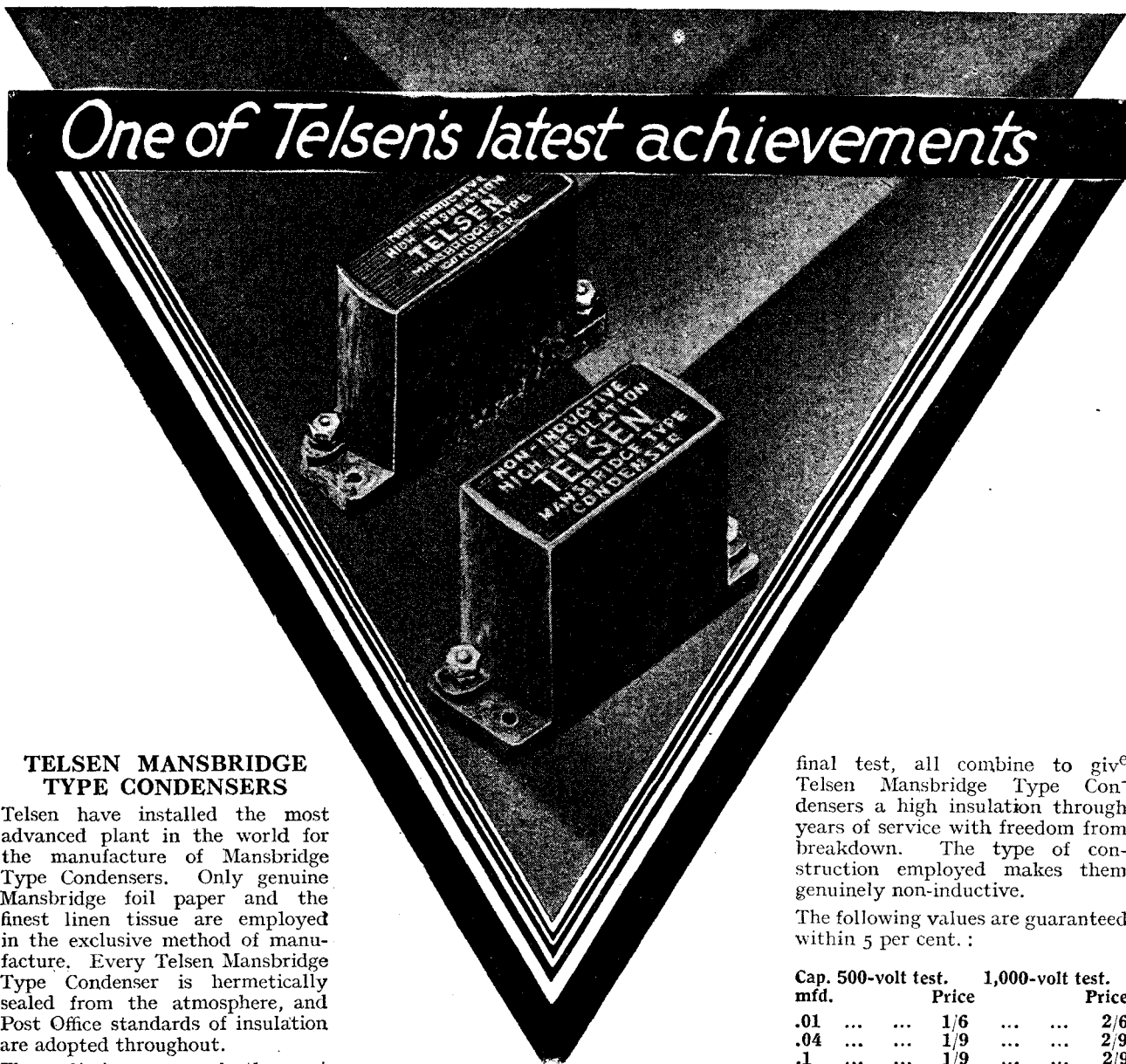
- Telsen "Ace" Transformer,
Ratios 3-1, 5-1. Price ... 5/6
- Telsen "Radiogrand" Trans-
former, Ratios 3-1, 5-1. Price 8/6
- Telsen "Radiogrand" 7-1 Super-
Ratio Transformer. Price ... 12/6
- Telsen Intervolve Transformer,
Ratio 1.75-1. Price ... 12/6

TELSEN

THE SECRET OF PERFECT
RADIO RECEPTION

OLYMPIA
NATIONAL HALL
GROUND FLOOR
STAND 19

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention



TELSEN MANSBRIDGE TYPE CONDENSERS

Telsen have installed the most advanced plant in the world for the manufacture of Mansbridge Type Condensers. Only genuine Mansbridge foil paper and the finest linen tissue are employed in the exclusive method of manufacture. Every Telsen Mansbridge Type Condenser is hermetically sealed from the atmosphere, and Post Office standards of insulation are adopted throughout.

The preliminary research, the most modern plant in the world, the finest raw materials, the latest methods of manufacture and the

final test, all combine to give Telsen Mansbridge Type Condensers a high insulation through years of service with freedom from breakdown. The type of construction employed makes them genuinely non-inductive.

The following values are guaranteed within 5 per cent. :

Cap. 500-volt test.		1,000-volt test.	
mfd.	Price	Price	Price
.01	1/6	...	2/6
.04	1/9	...	2/9
.1	1/9	...	2/9
.25	2/-	...	3/-
.5	2/3	...	3/3
1.0	2/3	...	3/6
2.0	3/-	...	5/-

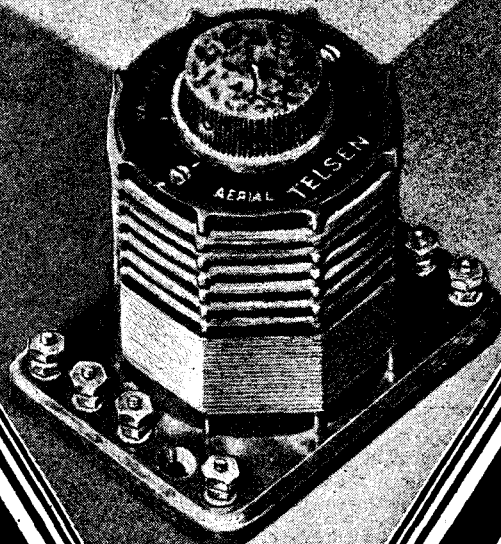
TELSEN

THE SECRET OF PERFECT RADIO RECEPTION

SEE YOU ON STAND 19

Advertisers Appreciate Mention of "A.W." with Your Order

Another Telsen achievement



**TELSEN DUAL-RANGE
AERIAL COIL**

The Telsen Aerial Coil is the very 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, whatever reception conditions may be. It has been tested in various parts of the country, and down to distances of five miles from Regional stations, a single tuned circuit will definitely separate the Regional programmes. This adjustment also acts as an excellent volume control and is equally effective on long and short waves. The waveband change is effected by means of a three-point switch. A reaction winding is provided and the primary and secondary windings are separated so that the aerial circuit can be isolated in mains driven or screened grid receivers.

Telsen Aerial Coil with Variable Series Condenser incorporated .. Price 7/6

**TELSEN
H.F. TRANSFORMER
AND AERIAL COIL**

This Coil is primarily designed for H.F. amplification in conjunction with screened-grid valves. It is arranged so that it can be connected as a tuned-grid or tuned-anode coil, or alternatively as an H.F. Transformer.

It also makes a highly efficient aerial coil where the adjustable selectivity feature is not required. A reaction winding is incorporated. When used as an H.F. Transformer the wave-change is effected by means of a two-pole (four point) switch. When connected otherwise a three-point switch should be used.

Telsen H.F. Transformer and Aerial Coil. Price 5/6

TELSEN

**ALL BRITISH
RADIO COMPONENTS**

**OUR REPUTATION
STANDS ON
STAND 19**

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention

COMPLETE GUIDE TO SHOW

STAND Nos. 21-30

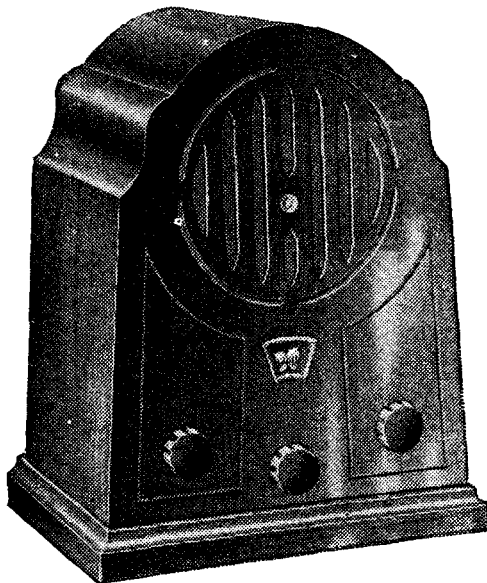
(Continued from page 396)

Stand 21. Edison Swan Electric Co., Ltd., 123-5 Queen Victoria Street, E.C.4.

The new range of Mazda valves, which includes many new valves with remarkable characteristics, attract all set users to this stand. The new R.K. speakers, including the low-priced permanent-magnet models, are shown, and the new B.T.H. pick-ups and gramophone motors will interest radio-gram users.

Stand 22. Regentone Ltd., 21 Bartlett's Buildings, Holborn Circus, E.C.4.

Regentone are pioneers in mains-drive apparatus and here you will find mains units suitable for every set need and for A.C. and D.C. mains. An introduction is a two-valve complete set for A.C. mains working. This sells at a remarkably low price and it is well worth inspection by any amateur who appreciates fine technical features. This is housed in a moulded bakelite cabinet and a



Typical modern set practice, the Dominion Grand S.G.3, a one-knob control outfit with a high-efficiency screen-grid circuit

special cutting and tracking devices, and the microphone and speech amplifier gear available for making music records at home are highly interesting and differ from other home recorders on the market. The standard Ekco home recorder plugs straight into any ordinary two, three, or four-valve set, and without any additional apparatus one can make records of broadcast items.

Stand 27. London Electric Wire Co. and Smiths, Ltd., Church Road, Leyton, E.10.

Lewcos super-het components are among the new lines which must be inspected. Coils, coil assemblies, and frame aerials are of interest and, of course, there is Lewcos wire of every description.

Among the parts for super-het enthusiasts will be found the new super-het coil box, a fine idea, which incorporates three super-het. coils, and the associate valve holders. The Lewcos frame aerial is fine for coupling up to a super-het or to any type of receiver with at least one S.G. stage and, therefore, sensitive enough to make use of the fine directional properties possessed by Lewcos frames, owing to the low self capacity between the turns.

Stand 28. Igranie Electric Co., Ltd., 147 Queen Victoria Street, E.C.4.

There are several new lines in the Igranie range and home constructors will find a wealth of material here of outstanding interest.

Plug-in coils, short-wave coils, H.F. chokes, square-law condensers, micro condensers, pre-sets, mica-dielectric fixed condensers, differentials, and gramophone pick-ups are among the new parts.

Stand 29. Radio Instruments, Ltd., Purley Way, Croydon.

Among the complete sets of outstanding interest are the Stenode super-het and the Madrigal band-pass receiver. The R.I. Stenode incorporates the new ultra-selectivity principle. There are several new transformers for valve and metal rectification among the new R.I. components and the Unigrad volume control and Dux and Parafed transformers must be seen.

Study the chassis of the new mains sets. All-metal construction, completely screened condensers and valves, metal sub-panel and ganged control make them very up-to-date.

Stand 30. British General Manufacturing Co., Ltd., Brockley Works, Brockley, S.E.4.

On this stand you must see the new British General tuner and the full range of B.G. small parts such as low-frequency and output transformers. Several new lines have been produced, and the workmanship and general design of these parts well deserve detailed inspection.



A useful variable resistance control by Sovereign

notable feature is the mounting of the mains parts underneath a metal chassis with complete screening for the power components, such as transformer and choke.

Stand 23. Lotus Radio, Ltd., Lotus Works, Mill Lane, Old Swan, Liverpool.

New design is evident in the Lotus assemblies for 1932, and the range of component parts, too, is particularly complete. There is a fine new set in a table type cabinet, incorporating a moving-coil speaker and selling at a price which creates a new landmark for three-valvers of this type. It is all A.C. operated. Among the new parts you must make a point of seeing the new Lotus three-gang condenser with rectangular metal screens between each section. Special provision is made for trimming and a condenser of this type is ideal in any bandpass set.

Stand 24. General Electric Co., Ltd., Magnet House Kingsway, W.C.2.

The new Music Magnet, the Osram Four, is an attraction here, and is the latest model of the well-known kit sets which may be built for battery or all-mains operation. The all-power unit, all-electric S.G. three, console-type screen-grid four-valver, and all the other sets in the comprehensive G.E.C. range must be seen. The technical details of the Geco-

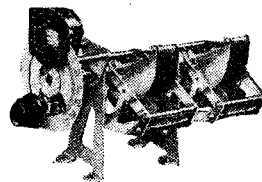
a high-performance three-valver for battery or mains operation. Among the small sets the K.B. Pup range of receivers, battery and mains operated, are bound to be popular.

Stand 26. E. K. Cole, Ltd., Ekco Works, Southend-on-Sea.

The new Ekco sets form a striking exhibit on this stand and the excellent technical features of these and of the new mains units will be



Three types of Bulgin safety fuse



The type U20 J.B. gang condenser



Two useful condensers, (above) Goltone and (below) T.C.C.

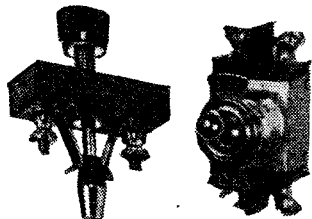


phone inductor dynamic speaker will interest loud-speaker fans, who should also see the Junior Plaque and Stork instruments.

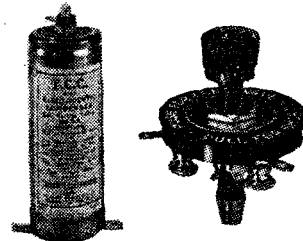
Stand 25. Kolster Brandes, Ltd., Cray Works, Sidcup, Kent.

New K.B. sets include a six-valve super-het, A.C. mains operated, a three-valve radio gramophone, and

appreciated by enthusiasts. See the new Ekco radio-gram and the special tuning dial which is a feature of all these sets. There are mains units for all types of receiver, of course. Ekco are also marketing a fine home recorder which has several technical features deserving of special attention by enthusiasts in the field of gramophone-record-making at home. The



Two useful switches (left) Goltone, (right) Bulgin



(Left) T.C.C. electrolytic condenser, and (right) Goltone switch

COME TO THE "A.W." STAND 71 AND HAVE YOUR RADIO PROBLEMS SOLVED

COMPLETE GUIDE TO SHOW

STAND Nos. 31-55

Stand 31. C. F. & H. Burton, Progress Works, Bernard Street, Walsall.

There are many new parts in the Burton range and this stand is bound to attract set-constructors.

The new Burton condensers, suitable for use in many "A.W." sets, must be seen on this Stand.

Stand 32. Graham Farish, Ltd., Masons Hill, Bromley, Kent.

Make sure to see this exhibit which comprises many most interesting new lines. Differential condensers, volume controls, new low-frequency transformers, gramophone pick-ups, H.F. chokes, fixed condensers, and loud-speakers are among the new productions.

Stand 33. H. Clarke & Co. (Manchester) Ltd., Eastnor Street, Old Trafford, Manchester.

The whole range of Atlas mains units and parts for the home constructor of H.T. and L.T. rectifiers can be seen. Several improvements have been made to the H.T. units, and there are models suitable for every set supply need.

There are some fine speaker and pentode output chokes in the Atlas range and these are available with various primary and secondary winding tappings to match up impedances. See, too, the new power chokes for fitting in your home-built inductor.

Stand 34. Ormond Engineering Co., Ltd., Ormond House, Rosebery Avenue, E.C.1.

There is a fine selection of parts here for home constructors and a number of portable and transportable sets. Ormond condensers should be seen, of course, and the new Ormond loud-speakers.

Among the new speakers are some fine moving-coil jobs built up on a sturdy chassis and with integral input transformers.

Stand 35. The New London Electron Works, Ltd., East Ham, London.

Make a point of seeing the Electron screen aerial which sells at only 15s. The ever-popular Electron standard aerials are also shown.

Stand 36. Fuller Accumulator Co. (1926) Ltd., Woodland Works, Chadwell Heath, Essex.

Here is a wide range of accumulators and high-tension batteries. The Fuller range of dry batteries is now complete and it will be recalled that these have been specified for use in connection with many "Amateur Wireless" sets.

Stand 37. Brownie Wireless Co., of G.B. Ltd., Nelson Street Works, Mornington Crescent.

There are some fine very low-priced complete sets for inspection here from the Baby Grand two-valve battery model to the Dominion Grand mains

S.G. Three. Among small parts are crystal detectors, transformers, wave-trap and Dominion dials.

Stand 38. Colvern, Ltd., Mawneys Road, Romford, Essex.

Colvern coils are available for practically every type of set and the new coils are available in matched sets for ganging, as is necessary in many modern outfits.

Stand 39. Pertrix, Ltd., 233 Shaftesbury Avenue, W.C.2.

Pertrix accumulators and high-tension batteries are to be seen here. The accumulators have an incor-

on show here. There are some new permanent-magnet models and the Celestion W5 pick-up will interest radio-gramophone builders. The type M speaker chassis and the R.P.M. 12B cabinet speaker must not be missed.

The type W5 pick-up has a special needle release device which enables needles to be changed within two seconds. The needle mounting, too, is of the low damping variety, so that record wear is cut down to a minimum.

Stand 41. Edison Bell, Ltd., Edison Bell Works, Glengall Road, S.E.15.

The complete sets on this stand will

Road, Leicester.

Stand 44. Westinghouse Brake and Saxby Signal Co., Ltd., 82 York Road, King's Cross, N.1.

There is, of course, a full range here of metal rectifiers for A.C. units. The new model HT8, which gives a D.C. output of 250 volts, 60-milli-amperes, after smoothing, is an outstanding rectifier among the H.T. jobs. There is, too, a range of complete battery chargers.

Stand 45. Ferranti, Ltd., Hollinwood, Lancashire.

No Ferranti lines are being discontinued and all the old favourites should be examined. There is a new range of H.T. supply units and among the sets a new Console type receiver known as the Ferranti Inductor Console.

Stand 46. The Whiteley Electrical Radio Co., Ltd., Nottingham Road, Mansfield, Notts.

W.B. speakers must be seen here. The new permanent-magnet model is guaranteed in respect of the permanency of its magnetism and the special method of mounting the speech coil must be seen. The performance of these speakers is remarkable, as can be seen from characteristic curves available for inspection. Among the small parts for set users are W. and B. valve holders.

Stand 47. Montague Radio Inventions & Development Co., Ltd., Beethoven Works, Great College Street, N.W.1.

The Beethoven Minor screen-grid four is the main exhibit here, and this low-priced portable set embodies many points of interest to show goers.

Stand 51. Carrington Mfg. Co., Ltd., 24 Hatton Garden, E.C.1.

A fine display of Camco cabinets can be seen here. These range from the big Monarch and Westminster models, down to small carrier portable-set cabinets and Melodee cabinet for loud-speakers.

Stand 52. Swift Levrick & Sons, Ltd., Clarence Steel Works, Sheffield.

Stand 53. Mains Radio Gramophones, Ltd., Vaughan Street, Bradford

An S.G. Three pedestal type set, with band-pass tuning, a *de luxe* type super-het, and the M.R.G. Regionogram are interesting features.

Stand 54. John S. Downing & Sons, Ltd., Commercial Street, Birmingham.

Stand 55. "Wireless Trader," St.

EUROPE'S BEST STATIONS

THE KEY TO THE CIRCUIT DIAGRAM

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Wireless Magazine

FREE: STATION FINDER & LOG ALSO KEY TO SYMBOLS

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porated carrying device and are in glass boxes. There is, of course, a wide range of high-tension batteries embodying the Pertrix patented super-life chemical principle. Grid-bias batteries are available in 9, 12, 15, 18, and 30-volt sizes, and large set-owners should make a point of seeing the 100- and 120-volt ultra-capacity H.T. batteries.

Stand 40. Celestion, Ltd., London Road, Kingston-on-Thames.

Celestion speakers of all types are

interest listeners, and several new types have been produced for the 1932 season.

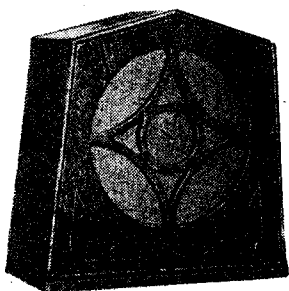
Stand 42. Climax Radio Electric, Ltd., Haverstock Works, Parkhill Road, Hampstead, N.W.3.

Be sure to see the complete Climax mains-driven sets on show here, together with a range of power components for home construction of mains-drive units.

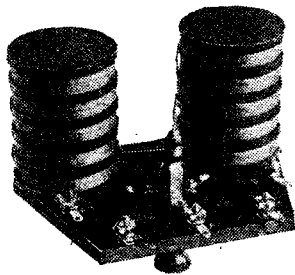
Stand 43. Partridge, Wilson & Co., Davenset Works, Evington Valley

SHOW REPORT

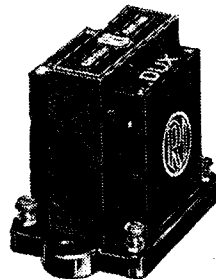
Continued on page 406



The Blue Spot model 44R Speaker.



Wearite Dual-range Coil.

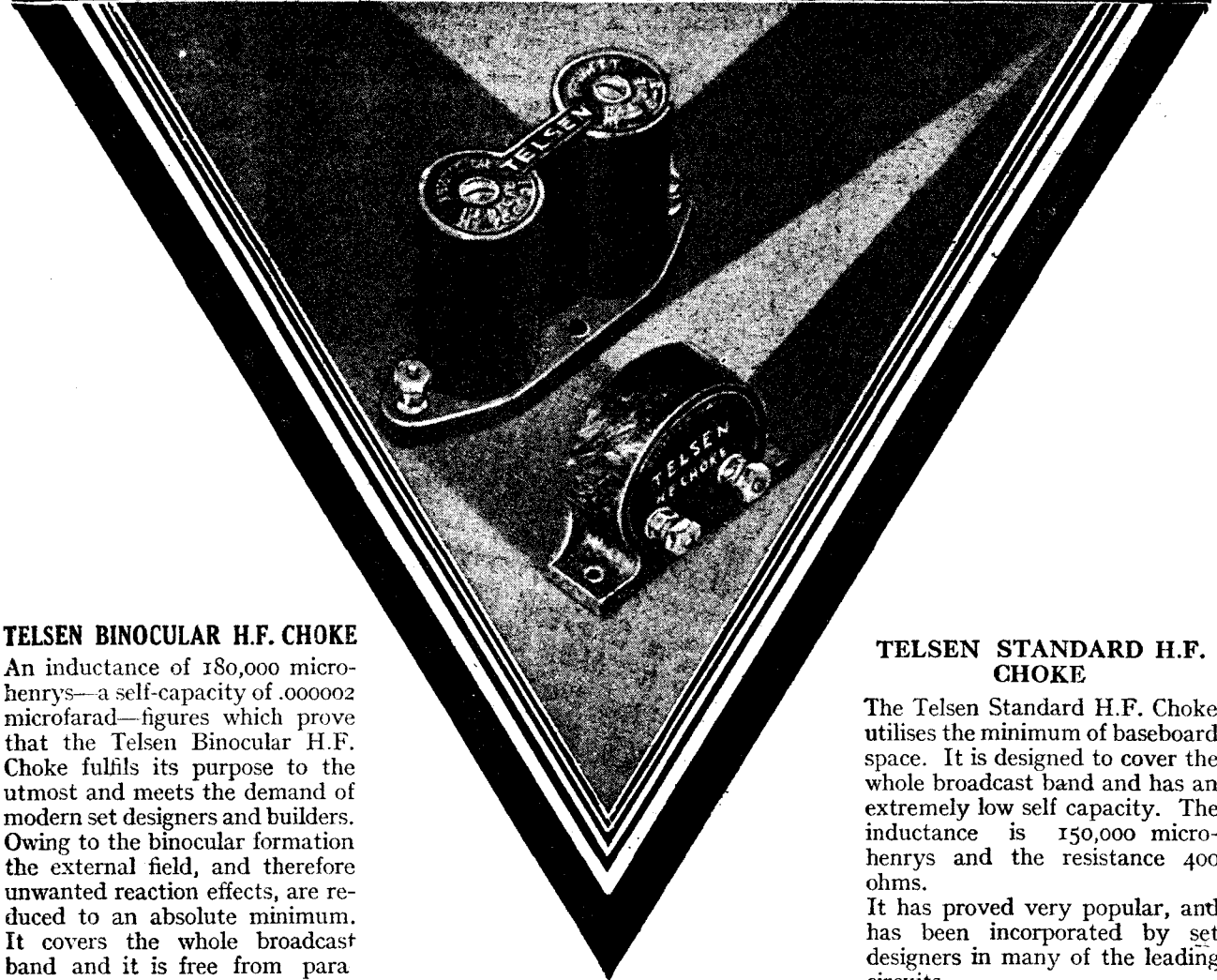


R.I. Dux Transformer.



Graham Farish Loud-speaker.

They build better on Telsen



TELSEN BINOCULAR H.F. CHOKE

An inductance of 180,000 microhenrys—a self-capacity of .000002 microfarad—figures which prove that the Telsen Binocular H.F. Choke fulfils its purpose to the utmost and meets the demand of modern set designers and builders. Owing to the binocular formation the external field, and therefore unwanted reaction effects, are reduced to an absolute minimum. It covers the whole broadcast band and it is free from parasitic resonances. Resistance 750 ohms.

Telsen Binocular H.F. Choke,
Price 5/-

TELSEN STANDARD H.F. CHOKE

The Telsen Standard H.F. Choke utilises the minimum of baseboard space. It is designed to cover the whole broadcast band and has an extremely low self capacity. The inductance is 150,000 microhenrys and the resistance 400 ohms.

It has proved very popular, and has been incorporated by set designers in many of the leading circuits.

Telsen Standard H.F. Choke,
Price 2/-

TELSEN

THE SECRET OF PERFECT
RADIO RECEPTION

YOU'VE AN
APPOINTMENT
ON STAND 19

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention

Telsen for better reproduction



TELSEN LOUD-SPEAKER UNIT

The Telsen Loud-speaker Unit is pleasing to the most sensitive ear. The deep notes of the bass, the brilliance of the soprano, and the crispness of diction are clearly reproduced without any distortion. It employs cobalt steel magnets, and the 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

TELSEN LOUD-SPEAKER CHASSIS

The fully floating cone, mounted on a flexible felt surround, renders the Telsen Loud-speaker Chassis very sensitive, giving perfect balance of tone. It is unaffected by damp conditions, because the cone material is practically non-hygroscopic. The Telsen Loud-speaker Chassis is substantially made and it is light in weight.

Holes are provided for easy attachment to most of the popular makes of loud-speaker units. The Chassis may be readily fixed to a baffle-board or cabinet by three or more wood screws.

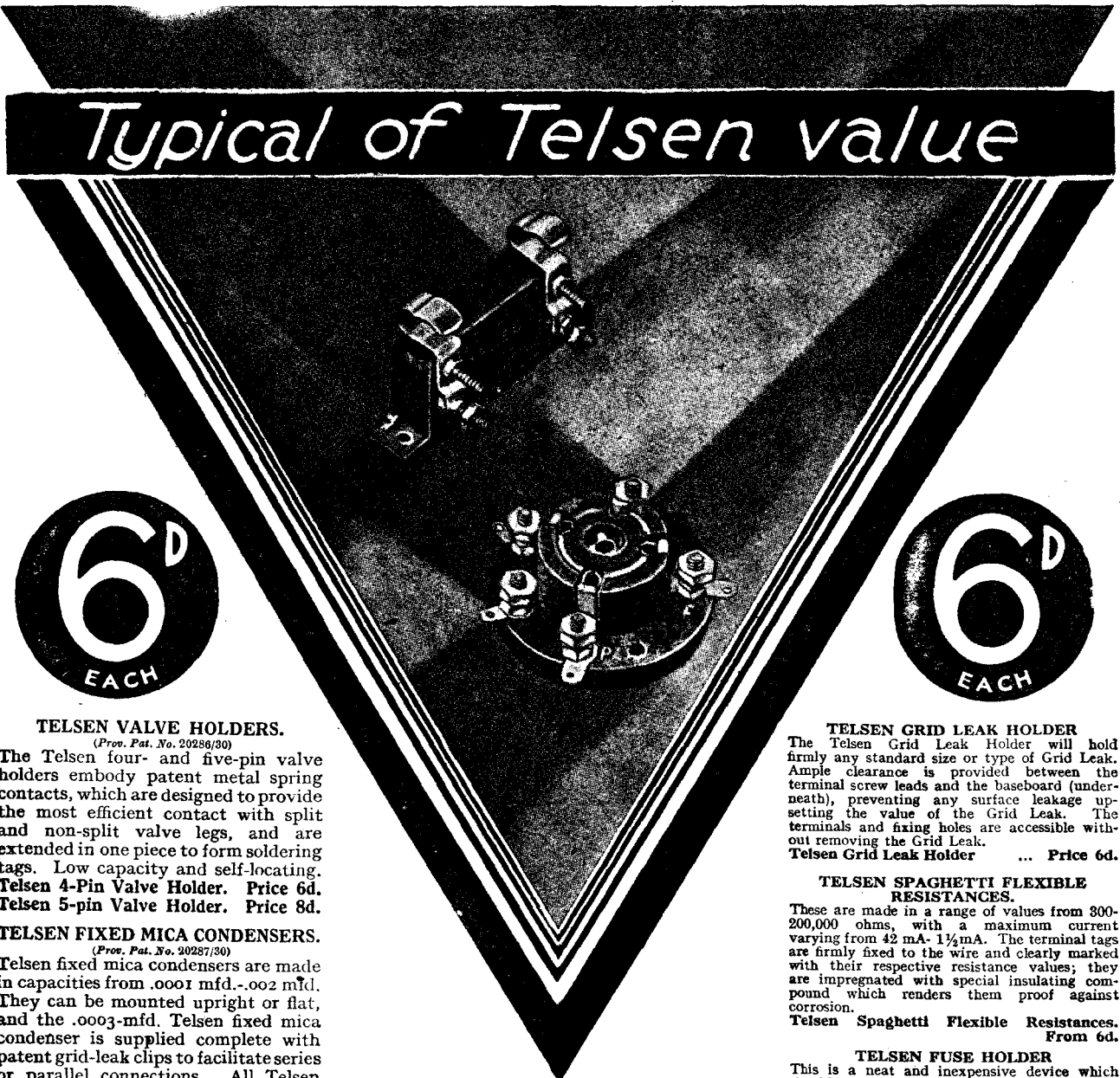
Telsen Loud-speaker Chassis
Price 5/6

TELSEN

**ALL-BRITISH
RADIO COMPONENTS**

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NUMBER
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You will Help Yourself and Help Us by Mentioning "A.W." to Advertisers



6^d
EACH

6^d
EACH

TELSEN VALVE HOLDERS.

(Proc. Pat. No. 20286/30)

The Telsen four- and five-pin valve holders embody patent metal spring contacts, which are designed to provide the most efficient contact with split and non-split valve legs, and are extended in one piece to form soldering tags. Low capacity and self-locating. Telsen 4-Pin Valve Holder. Price 6d. Telsen 5-pin Valve Holder. Price 8d.

TELSEN FIXED MICA CONDENSERS.

(Proc. Pat. No. 20287/30)

Telsen fixed mica condensers are made in capacities from .0001 mfd.-.002 mfd. They can be mounted upright or flat, and the .0003-mfd. Telsen fixed mica condenser is supplied complete with patent grid-leak clips to facilitate series or parallel connections. All Telsen fixed mica condensers are tested at 500 volts.

Telsen Fixed Mica Condensers. Price 6d.

TELSEN GRID LEAK HOLDER

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

Telsen Grid Leak Holder ... Price 6d.

TELSEN SPAGHETTI FLEXIBLE RESISTANCES.

These are made in a range of values from 300-200,000 ohms, with a maximum current varying from 42 mA-1½mA. The terminal tags are firmly fixed to the wire and clearly marked with their respective resistance values; they are impregnated with special insulating compound which renders them proof against corrosion.

Telsen Spaghetti Flexible Resistances. From 6d.

TELSEN FUSE HOLDER

This is a neat and inexpensive device which should be incorporated in every set as a precaution against burnt-out valves.

The Telsen Fuse Holder firmly grips the standard radio fuse giving a perfect contact.

Telsen Radio Fuse Holder ... Price 6d.

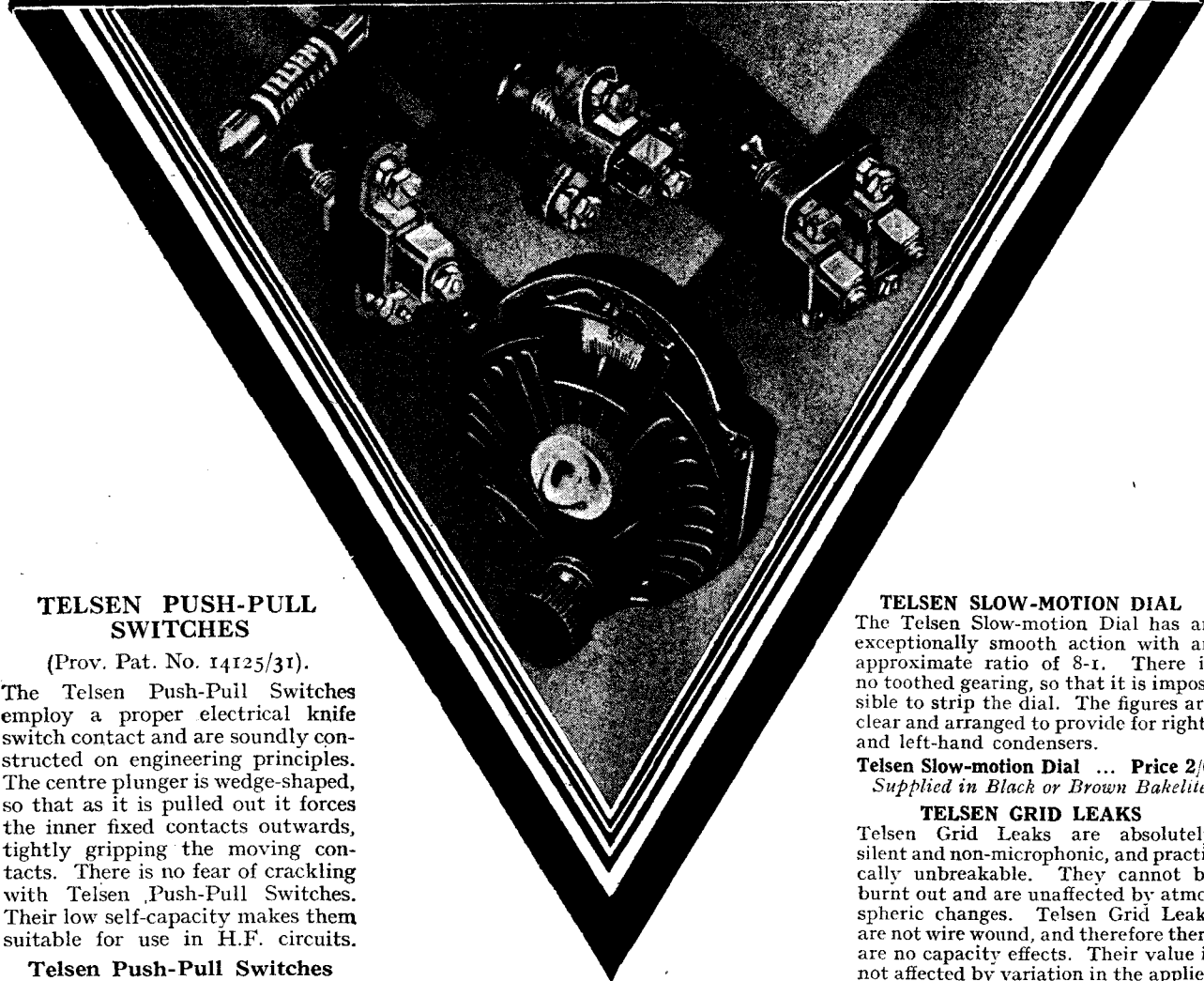
TELSEN

THE SECRET OF PERFECT RADIO RECEPTION

YOU CAN'T AFFORD TO MISS STAND 19

Advertisers Appreciate Mention of "A.W." with Your Order

Switch over to Telsen



TELSEN PUSH-PULL SWITCHES

(Prov. Pat. No. 14125/31).

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

Telsen Push-Pull Switches

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

TELSEN SLOW-MOTION DIAL

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

Telsen Slow-motion Dial ... Price 2/6
Supplied in Black or Brown Bakelite.

TELSEN GRID LEAKS

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

Telsen Grid Leak Price 9d.

TELSEN

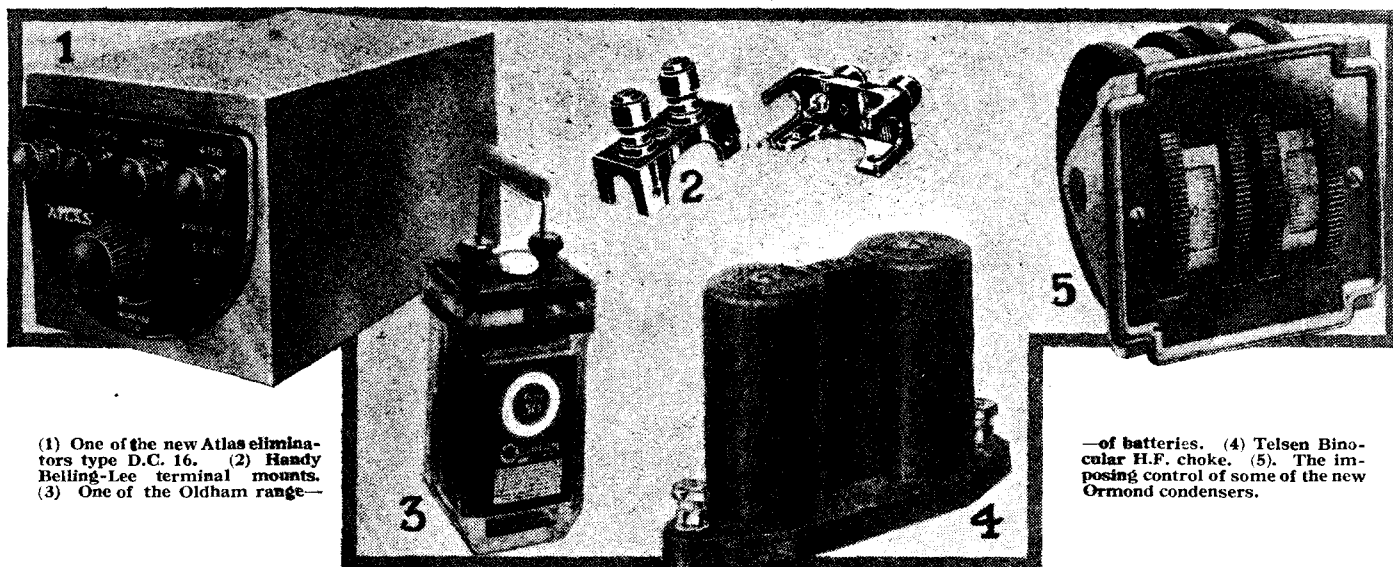
ALL-BRITISH
 RADIO COMPONENTS

YOU'LL FIND IT
 ON
 STAND 19

Please mention "A.W." when Corresponding with Advertisers

COMPLETE GUIDE TO SHOW

STAND Nos. 56-65



(1) One of the new Atlas eliminators type D.C. 16. (2) Handy Beiling-Lee terminal mounts. (3) One of the Oldham range—

—of batteries. (4) Telsen Bino-color H.F. choke. (5) The imposing control of some of the new Ormond condensers.

(Continued from page 401)

Bride's House, Salisbury Square, E.C.4.

Stand 56. Rolls Caydon, Ltd., 77 Rochester Row S.W.1.

Rolls-Caydon portable sets are on show here. Simplicity of control is a feature which has been specialised in for 1932 and considering the high-performance type of circuit incorporated, the ease of handling is really remarkable.

Stand 57. Hiffe & Sons, Ltd., Dorset House, Tudor Street, E.C.4.

Stand 58. Oliver Pell Control, Ltd., 103 Kingsway, W.C.2.

A number of interesting new Varley parts have been produced during the last few months and attract the attention of set builders here. Among the newcomers are the Square Peak Coil, H.F. intervalve coil, Niclet and Nichoke II, and many new resistances of the wirewound and spaghetti types. The mains chokes and transformers which can be seen

in a wide range here form interesting material for mains users.

Stand 59. Murphy Radio Ltd., Broadwater Road, Welwyn Garden City, Herts.

See here the popular Murphy Radio transportable sets.

You will like the way in which the controls of the chassis are brought out to a sloping panel at the top. A special type of speaker is included in the cabinet beneath the main set chassis.

Stand 60. Wlgrave & Rogers, Ltd., Mill Lane, Old Swan, Liverpool.

There are several entirely new Polar condensers on show, including differential reaction condensers, the Compax, and the new models 2 and 4 condensers which are somewhat similar in construction to the Ideal and style 3 condensers, but are smaller and have aluminium vanes.

Stand 61. Formo Co., 23 Golden Square, W.1.

The new Formo parts for 1932 include a triple-ganged condenser, a

slow-motion mid-log condenser, and complete ranges of mains condensers and special coils. The well-known Formo transformer, reaction and differential condensers and other small parts are also on show.

Stand 62. Jackson Bros., Ltd., 72 St. Thomas Street, S.E.1.

Band-pass and super-het set enthusiasts will find special condensers for their needs on this Stand and it is definitely stated that super-het popularity has made a big demand for the J.B. J.L.2 slow-motion condensers. Among small parts are the air-spaced differential condenser, baseboard drum dial and coupling devices.

Stand 63. Tannoy Products, 1-7 Dalton Street, W. Norwood, S.E.27.

Here you can see the only mains unit incorporating independent grid-bias with the exception, of course, of those manufactured under special Tannoy licence. The G.B.1 and G.B.3 units both incorporate this special grid bias arrangement and

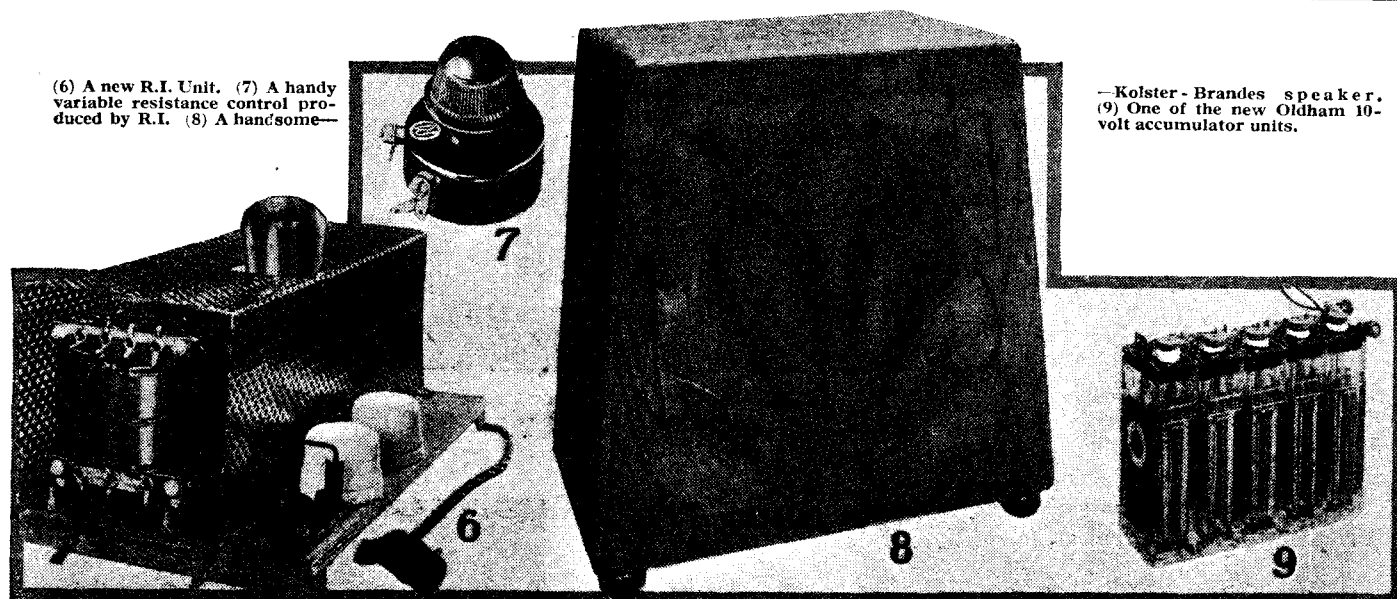
have 2, 4, and 6-volt trickle-charging tappings. Other units for A.C. and D.C. mains are available and a new feature of outstanding interest is the Tannoy Midget super-het complete receiver.

Stand 64. Sovereign Products, Ltd., Rosebery Avenue, E.C.1.

Compression-type condensers, H.F. chokes, wavetraps, spaghetti resistances, dual-range coils and L.F. transformers are among the small parts of interest to set builders. There is, too, a three-valve transportable set with built-in speaker.

Stand 65. British Blue Spot Co., Ltd., 94-6 Rosoman Street, E.C.1.

Blue Spot speakers—the ever-popular 66K, 66P, and 66R among them—will interest lovers of good reproduction. The new pick-up with incorporated volume control will appeal to users of an electric gramophone and a new line is the Blue Spot disturbance eliminator which is useful for mains users.



(6) A new R.I. Unit. (7) A handy variable resistance control produced by R.I. (8) A handsome—

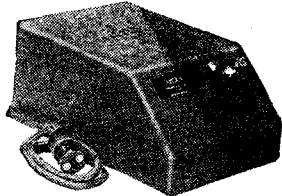
—Kolster-Brandes speaker. (9) One of the new Oldham 10-volt accumulator units.

COMPLETE GUIDE TO SHOW

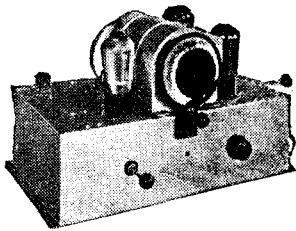
STAND Nos. 66-90

Stand 66. Oldham & Son, Ltd., Denton, Manchester.

L.T. and H.T. accumulators and H.T. dry batteries should be seen here. A new range of dry H.T. and grid-bias batteries has been produced in 9 and 16½ volts for grid-bias and 66, 99, 108, and 120 volts for standard capacity H.T. batteries. Triple-capacity batteries are also available. The special slow-discharge L.T.



A typical Atlas high-tension unit, the A.C. 244, which gives a fine output.



The chassis of one of the new R.I. sets.

accumulators are also worthy of inspection.

Stand 67. Amalgamated Press, Ltd., Fleetway House, Farringdon Street, E.C.4.

Stand 68. F. C. Heayberd & Co., 10 Finsbury Street, E.C.2.

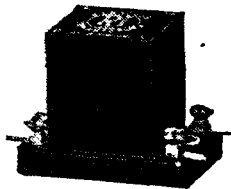
Heayberd mains units are now issued with a signed three-year guarantee, and the sound technical construction of these complete units and kits is obvious on inspection. There are kits of parts available for the home construction of high-tension and low-tension mains units.

Stand 69. Priestly & Ford, 3-11 Carrs Lane, Birmingham.

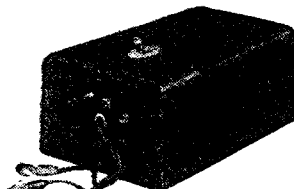
Stand 70. Danipad Rubber Co., Ltd., 5-7 Market Street, E.C.2.

Stand 72. Grosvenor Electric Batteries, Ltd., 2-3 White Street, Moorgate, E.C.2.

New prices have recently come into force in connection with Grosvenor batteries and the value offered is truly remarkable. Be sure to see the popular Red, Brown, and Blue line batteries in standard and super capacities.



A newoomer in low-frequency transformers, the R.I. Parafeed.



One of the new Tannoy H.T. Units, the C.B.1 which gives grid bias as well as high tension and a low-tension trickle charging supply.

Stand 73. Umello, Ltd., 55 Great Marlborough Street, W.1.

Stand 74. Siemens Electric Lamps and Supplies, Ltd., 88-89 Upper Thames Street, E.C.4.

Here are the Full O'Power high-tension batteries in a complete range. There are two new standard sizes which you must see, namely the 120-volt type V8 power battery, and the 100-volt type V7 battery. Certain reductions in prices have been made and you should inquire about these.

Stand 75. Graham Amplion, Ltd., St. Andrews Works, Slough, Bucks.

Among the many interesting exhibits on this stand is the new Amplion moving-coil speaker which is bound to attract attention.

The M.C.6 unit is a new model for 1932 and is a moving-coil job fitted with an integral transformer on top of

Stand 77. Osram Valves, Magnet House, Kingsway, W.C.2.

A number of new types of Osram valves have been produced during the past season and these are shown here, together with all the old favourites. The new types will be of particular interest to mains users, but a general characteristic of many valves in the range is an increase of amplification factor, combined with a high mutual inductance.

Stand 78. J. Dyson & Co. (Works), Ltd., 5 Godwin Street, Bradford.

Godwinex A.C. and D.C. eliminators are shown. Several new types have been produced and the A.C. units have a very generous power output.

Stand 79. Rooke Brothers, Ltd., 32 Queensway, Ponders End, Middlesex.

THE EXHIBITION SET DESCRIBED IN THIS ISSUE IS ON OUR STAND 71

the permanent magnet tapped for use with a power, super-power, or pentode valve. The M.C.9 unit is a slightly more powerful edition of the M.C.6. Both models are available, either in chassis form or in oak or in walnut cabinets. The type E.M.644 is a new energised model for direct current mains—either 100-110 or 200-240. This can be obtained either with or without an input matching transformer. It can, if desired, be worked off A.C. mains, and details of alternative methods of operation are supplied with each model.

Stand 76. The Ever Ready Co. (Great Britain), Ltd., Hercules Place, Holloway, N.7.

Glass, celluloid, and ebonite-cased accumulators for high-tension, low-tension, and grid-bias attract your attention here, together with the well-known Ever Ready dry batteries. No new lines have been produced, but the recent reductions in prices make the Ever Ready value all the more remarkable.

A number of new parts have been produced and set constructors will be interested in a new inductively coupled type of bandpass tuner.

Stand 81. Gripso Co., 32 Victoria Street, S.W.1.

Stand 82. Turner & Co., 54 Station Road, London, N.11.

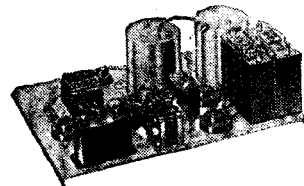
See here the new Tunewell coils and mains components. Six-pin plug-in and panel mounting coils are available for aerial and anode positions and have been used in many "A.W." sets. Among the mains components you will find several types of low-frequency and power smoothing chokes. There are, too, mains transformers, for use with several types of rectifier and if you are making up a mains set or unit, then you should certainly see the new Tunewell power transformers, which are made up on very solidly built aluminium chassis.

Stand 83. Selectors (1931), Ltd., "Servis" Works, Albion Road, Stoke Newington, N.16.

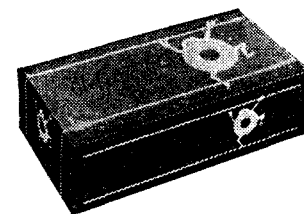
A new radio gramophone known as the Selector-Vox should be seen, together with the Selector all-mains transportable.

Stand 84. Harlie Bros. (Edmonton) Ltd., Balham Road, Edmonton, N.9.

A gram-radio enthusiast should not miss this Stand for the models 36, 38, and 40 pick-ups are well



Here is the mains edition of the Cossor-Melody Maker in course of construction



One of the range of Lively "O" Oldham high-tension batteries.

worth seeing. There is a fine permanent magnet dynamic speaker.

Stand 85. Ensign Ltd., 88-89 High Holborn, W.C.1.

Stand 86. Hustler Simpson & Webb Ltd. 55-57 Tanner Street S.E.1.

Stand 87. Falk Stadelmann & Co., Ltd., 83-93 Farringdon Road, E.C.1.

Puravox cone speakers and Efes-cabone complete sets are being shown here.

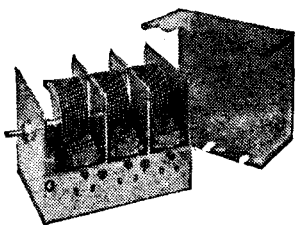
Stand 88. L. E. S. Distributors, Ltd., 9 St. Martin's Street, W.C.2.

Stand 89. Electric Gramophones, Ltd., The Quadrant, Winchmore Hill, N.21.

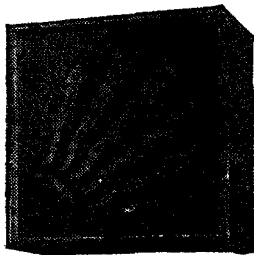
Stand 90. Wilkins & Wright, Ltd., Utility Works, Holyhead Road, Birmingham.

Utility components are always popular with set-builders and the new bakelite switches, differential condensers and screened-ganged condensers are bound to make a wide appeal. Anti-capacity switches and

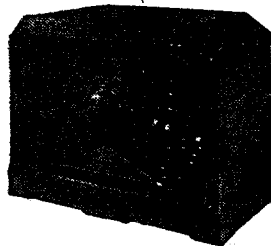
SHOW REPORT
Continued on page 416



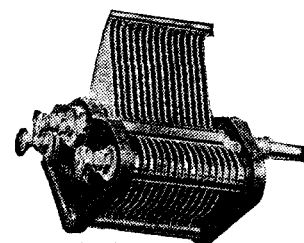
The new Utility three-ganged condenser with the cover removed to show the internal arrangement.



The ever popular Ormond cone speaker.

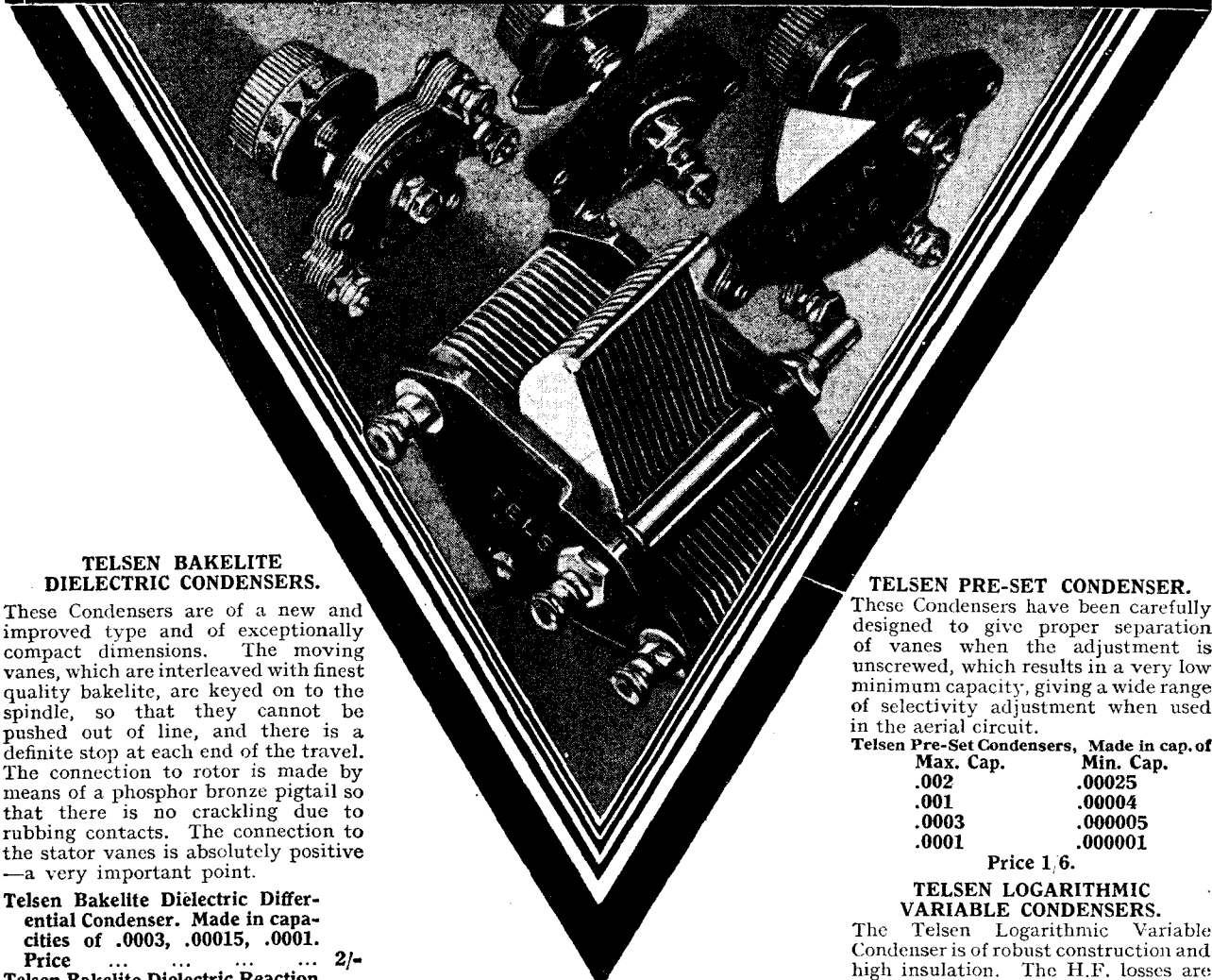


The new Regentone all-mains two-valve housed in a moulded bakelite case.



A Telsen logarithmic variable condenser.

The choice of experts



TELSEN BAKELITE DIELECTRIC CONDENSERS.

These Condensers are of a new and improved type and of exceptionally compact dimensions. The moving vanes, which are interleaved with finest quality bakelite, are keyed on to the spindle, so that they cannot be pushed out of line, and there is a definite stop at each end of the travel. The connection to rotor is made by means of a phosphor bronze pigtail so that there is no crackling due to rubbing contacts. The connection to the stator vanes is absolutely positive—a very important point.

- Telsens Bakelite Dielectric Differential Condenser. Made in capacities of .0003, .00015, .0001. Price ... 2/-
- Telsens Bakelite Dielectric Reaction Condenser. Made in capacities of .0003, .00015, .0001. Price... 2/-
- Ditto .00075, .0005. Price ... 2/6
- Telsens Bakelite Dielectric Tuning Condenser. Made in capacities of .0005, .00035. Price ... 2/-

TELSEN PRE-SET CONDENSER.

These Condensers have been carefully designed to give proper separation of vanes when the adjustment is unscrewed, which results in a very low minimum capacity, giving a wide range of selectivity adjustment when used in the aerial circuit.

Telsens Pre-Set Condensers, Made in cap. of

Max. Cap.	Min. Cap.
.002	.00025
.001	.00004
.0003	.000005
.0001	.000001

Price 1/6.

TELSEN LOGARITHMIC VARIABLE CONDENSERS.

The Telsens Logarithmic Variable Condenser is of robust construction and high insulation. The H.F. losses are very low and the frame is braced at three points, so that the possibility of distortion and short-circuiting is negligible. Substantial terminals are provided with alternative connection to the stator.

Telsens Logarithmic Variable Condenser. Made in capacities of .005, .00025, .00035. Price ... 4/6

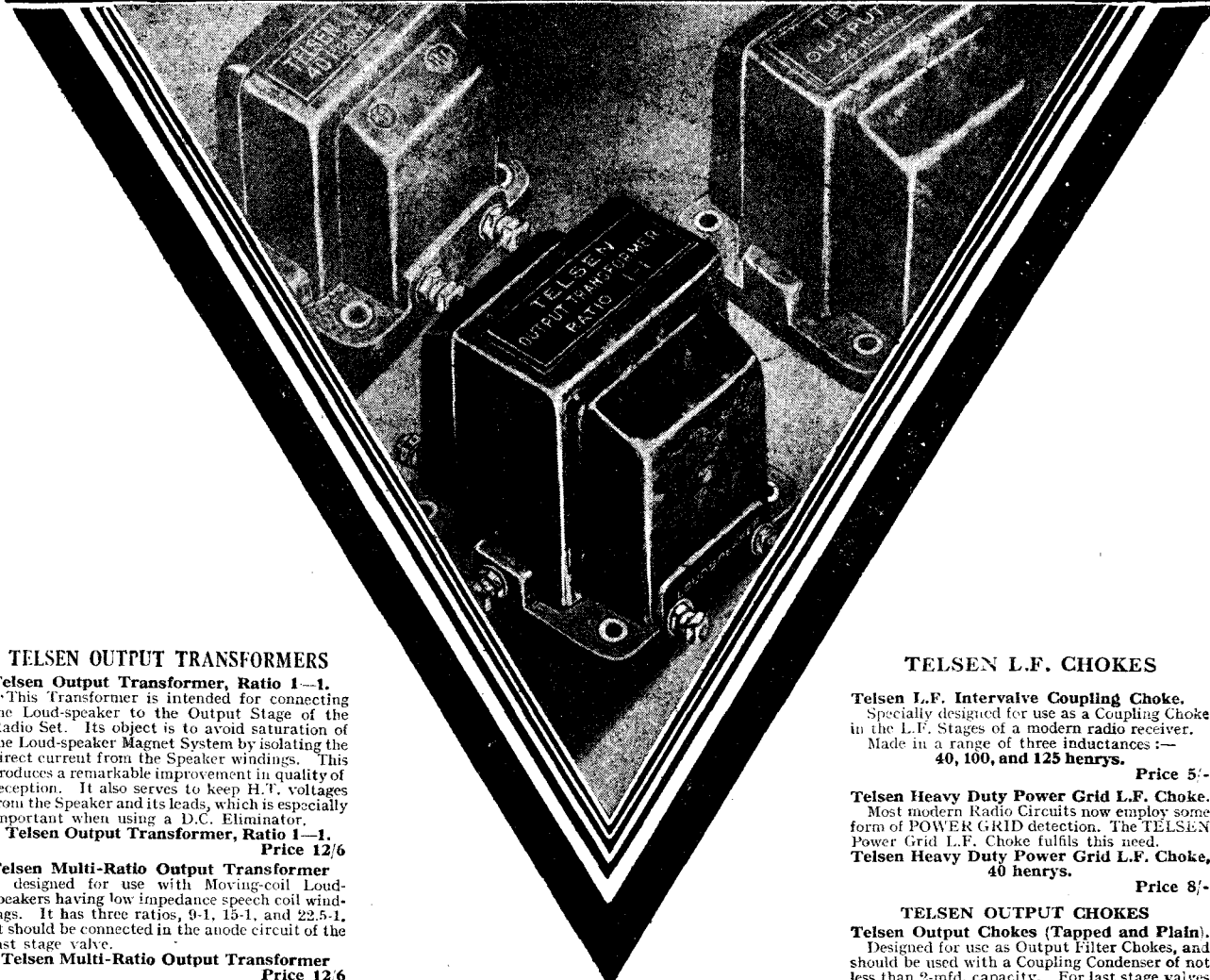
TELSEN

THE SECRET OF PERFECT RADIO RECEPTION

DON'T FORGET STAND 19

Advertisers Appreciate Mention of "A.W." with Your Order

Telsen for better reception



TELSEN OUTPUT TRANSFORMERS

Telsen Output Transformer, Ratio 1-1.
 This Transformer is intended for connecting the Loud-speaker to the Output Stage of the Radio Set. Its object is to avoid saturation of the Loud-speaker Magnet System by isolating the direct current from the Speaker windings. This produces a remarkable improvement in quality of reception. It also serves to keep H.T. voltages from the Speaker and its leads, which is especially important when using a D.C. Eliminator.

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

Telsen Multi-Ratio Output Transformer
 is designed for use with Moving-coil Loud-speakers having low impedance speech coil windings. It has three ratios, 9-1, 15-1, and 22.5-1. It should be connected in the anode circuit of the last stage valve.

Telsen Multi-Ratio Output Transformer
 Price 12/6

The Telsen Pentode Output Transformer
 is designed for use in the anode circuit of a Pentode Valve used as the Output Valve of a receiver or amplifier. Its purpose is to prevent direct current from passing through the Loud-speaker, and also to match the Speaker to the Pentode Valve, which is essential for good quality reproduction.

Telsen Pentode Output Transformer. Price 12/6

TELSEN L.F. CHOKES

Telsen L.F. Intervalve Coupling Choke.
 Specially designed for use as a Coupling Choke in the L.F. Stages of a modern radio receiver. Made in a range of three inductances:—
 40, 100, and 125 henrys.

Price 5/-

Telsen Heavy Duty Power Grid L.F. Choke.
 Most modern Radio Circuits now employ some form of POWER GRID detection. The TELSEN Power Grid L.F. Choke fulfils this need.
Telsen Heavy Duty Power Grid L.F. Choke,
 40 henrys.

Price 8/-

TELSEN OUTPUT CHOKES

Telsen Output Chokes (Tapped and Plain).
 Designed for use as Output Filter Chokes, and should be used with a Coupling Condenser of not less than 2-mfd. capacity. For last stage valves of 3,000 ohms or less the plain Choke should be used with all Loud-speakers having impedances of about 3,000 ohms.

Telsen Output Choke, 20 henrys. Price 8/-
Telsen Tapped Output Choke, 20 henrys. Price 8/6

TELSEN

**ALL BRITISH
 RADIO COMPONENTS**

**OLYMPIA
 NATIONAL HALL
 GROUND FLOOR
 STAND 19**

Mfrs. of Telsen Electric Co., Ltd., Birmingham

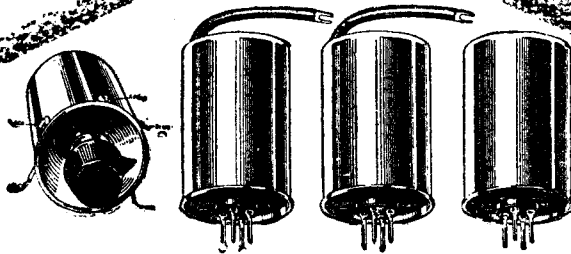
CVS-47

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THE FINEST COMPONENTS YOU CAN BUY —

You cannot do better than fit "Wearite" if you want the best results.

All "Wearite" Components are scientifically constructed with the finest materials and workmanship obtainable.



These coils which were introduced by Wright & Weaire, Ltd., enabled the Amateur Wireless technical staff to introduce the now well-known "Century Super," "Super 60" and kindred sets. Follow their example and use "Wearite" when building a Super Het. Price, complete set of 4, 50/-.

SEE OUR SPECIAL announcement in "Wireless Magazine," October.



H.F. CHOKE

A first-class component with a very fine performance, the superiority of this choke is superior without question. It covers efficiently the remarkable range from 10 to 2,000 metres without any marked resonances, while the self-capacity is extremely low. Type H.F.O. Price 6/6



WEARITE DUAL RANGE FRAME AERIAL

A dual range frame aerial entirely new in design. The windings are of Litzendraht wire, carefully wound at even tension, centre tapped. The Frame Aerial rotates through 180 degrees on a polished mahogany base.

Price 42/-

Write for FREE illustrated list. WRIGHT & WEAIRE, LTD., 740 High Rd., Tottenham, N.17 Phone: Tottenham 3847, 8/9

Have you seen the new "Wearite" Chassis? Used with the Super-Het coils in the Super Senior, "Wireless Magazine," October Price 4/6

WEARITE COMPONENTS

STAND No. 152. RADIO EXHIBITION, OLYMPIA

Don't Forget to Say That You Saw it in "A.W."

PERFECT PAIR WAY
TO PERFECT RADIO



Wander plugs in the PERTRIX H.T.? PERTRIX L.T. connected up all right? Then switch on. You never realised radio could be so good, did you? That's the best of getting the Perfect Pair—they work in perfect harmony with each other and with your set, giving you just Perfect Radio. And they last longer, too . . . infinitely longer.

Made by *BRITANNIA BATTERIES, Limited*
at Redditch who also make:

Batteries for Central Stations • Batteries for Country House Lighting • Emergency and Stand-by Lighting Batteries for Theatres, Cinemas, Hospitals, etc. • Batteries for the Starting and Lighting, and Lighting and Ignition of Motor Cars, Motor Cycles, Buses and Coaches • Batteries for Electric Vehicles, Trucks, Locomotives, Ships and Yachts • The only Nickel-Iron Alkaline Battery on sale in Britain that is entirely made in this country.

PERTRIX
SUPER LIFE
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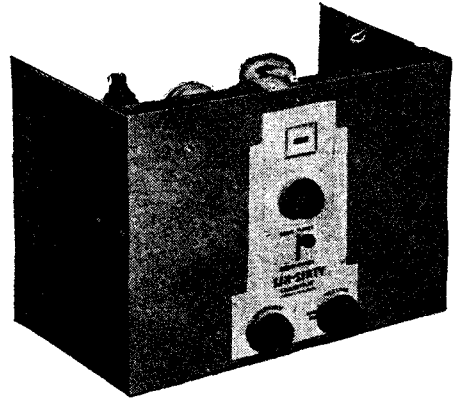
THE PERFECT PAIR FOR PERFECT RADIO

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The NEWEST in RADIO

Have you examined yet the new Chassikit principle of construction? Write NOW for the big beautifully illustrated folder. Intensely interesting—telling you how simply and without possibility of error you can build the complete all-metal chassis of the most modern 3-Valve S.G. Pentode Receiver. With these:—Pre-Selector band-pass tuning (*the most successful solution of selectivity problems*) . . . Multistat COMBINED Switch and radio and gramophone volume control (*also entirely new*) . . . Triple ganged tuning with ONE KNOB . . . latest metallised S.G. and Det. valves, and PENTODE output valve.



Examine also the wonderful scope it gives you to express your own individuality in housing it, your batteries or eliminator and loudspeaker. A simple table radio receiver may expand gradually, on small occasional outlay, up to a magnificent ALL-ELECTRIC Radio-Gramophone. There's the thrill of building without the risk! *All uncertainties eliminated.* The Six-Sixty Chassikit is "Radio-built"—really better than a completely factory-built four-valver. By all means SEND FOR THE FREE FOLDER TO-DAY.

The SIX-SIXTY Chassikit comprises three factory-built units—condenser assembly, coil assembly and the valve unit accommodating the remaining essentials. Screening is COMPLETE. Result an all-metal Chassis of the most advanced type. Each unit factory-tested. A variety of beautiful cabinets from 10/6 to 12 gns. Or incorporate it in cabinet of your own design. There is great adaptability.

Made by the makers of the renowned SIX-SIXTY (B.V.A.) Valves.

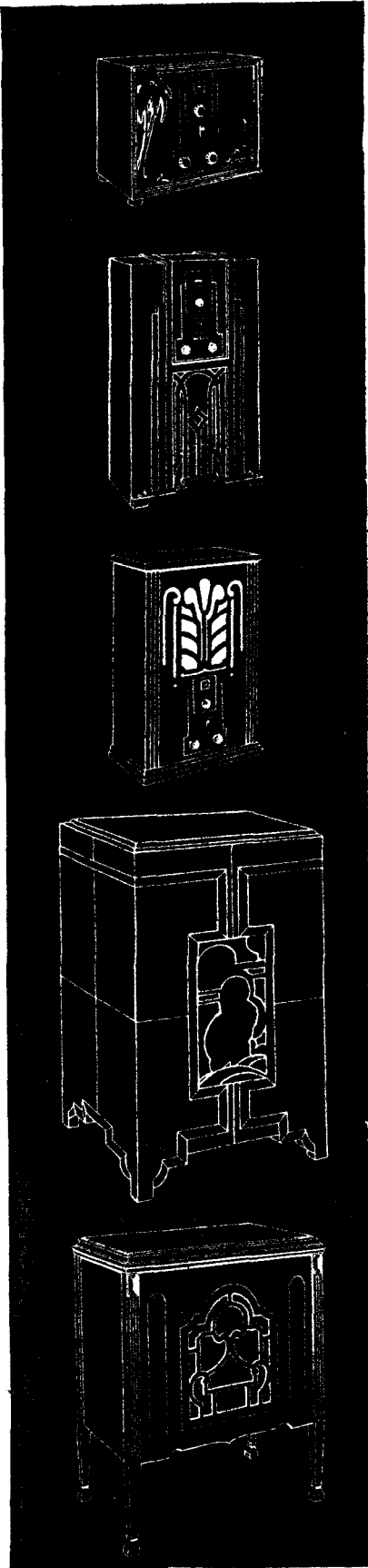
OLYMPIA STAND NO. 20

SIX-SIXTY CHASSIKIT

£6-17-6

Complete Chassikit, 3 Gang band-pass tuning-S.G.-Det.-PENTODE. Ornamental Oak Cabinet, 10/6 extra.

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Please send me FREE and POST FREE the Chassikit illustrated and descriptive Folder.

NAME _____
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A.W.

Don't Forget to Say That You Saw it in "A.W."

Oh Your Wireless!

HERE WE ARE AGAIN

WELL, here we are once more at the opening of the Wireless Exhibition, and once again it is the biggest and the best ever. I've said that of the Exhibition year after year; and it has always been true, for such has been the progress of wireless, both as a science and as the greatest of hobbies, that ever since the first one, each succeeding exhibition has been larger and more packed with interest than all that went before. With a whole new floor added, the 1931 Show has that of 1930 beaten hollow in point of size. And there is some marvelous stuff to be seen on the stands. In former years we seem to have seen the simplification of receiving sets taken to its very limits. Sets generally are no simpler than those of yester-year, since you can't very well reduce the number of tuning knobs to less than one! There is, though, a wonderful "Entertainment Cabinet" for the lazy man. It contains both a receiving set and a gramophone, and you can make it do what you like without so much as getting out of that favourite arm-chair of yours by the fireside. A neat little remote-control arrangement enables everything to be done at a distance.

TAKING A LOOK ROUND

SINCE the show is so huge, you will be well advised to plan out your visit roughly, in case you are able to go only once to Olympia whilst it is in its wireless glory. Not a bad idea is to think out what you most want to see and to visit first of all the stands where you are most likely to find it. Are you in quest of a new set? Very well here's a suggestion. Decide what price you want to pay and then visit the stands of those who deal in complete sets; the advertisement pages of "A.W." will help you here. Don't imagine that the amount you have settled on will necessarily limit you to the number of valves that would have been the case last year. There have been some astonishing reductions in prices, and if you look round carefully you may find that you can afford a far bigger set than you expected. The Exhibition is, of course, confined to British-made goods; so that low prices don't mean dumped or cheap-jack stuff. They have been made possible partly by mass-production methods and partly by the simplification of the components needed in many modern circuits. It will not take you long to narrow your choice down to two or three models, and then you can make a final selection after more careful examination, accompanied, probably, by a demonstration.

LOUD-SPEAKERS

WHETHER you intend to buy or to build your new set, you will certainly want to have the best available loud-speaker to go with it. Or, if you're not investing in a new set, you may feel that a 1932 loud-speaker would improve the performances of your old friend. It would;

for this year's loud-speakers are a very fine vintage. Many of the balanced-armature types have been improved out of recognition. They have been made more sensitive as well as capable of handling larger outputs without chattering or "zizzing." The overall response, too, of such units is now absolutely remarkable. In past years some makes have dealt wonderfully well with the bass, but have rather pinched the treble; others have been rather treble "specialists"; others, again, have been at their best when dealing with the middle portion of the musical register. You'll find many this year that give a good account of themselves in every part of the register, supplying plenty of bass and a really brilliant treble.

One of the best tests of a loud-speaker is to see that it will reproduce speech and music equally well. A "boomy" instrument may give mellow (how I hate that word!) music, but speech sounds throaty. Again, an instrument whose reproduction of speech is "edgy" will probably make music seem thin and reedy. None of these faults appears in the reproduction of to-day's best B.A. units.

MOVING COILS

THERE have been great advances in moving-coil loud-speakers. These, again, have become more sensitive and much attention has been paid to another very important point. The great fault of loud-speakers of this kind some time ago was that their reproduction was often poor unless the volume was far greater than was pleasant in the average living-room. There are heaps of small M.C.'s this year that work beautifully under the moderate loads that most of us need for the most pleasing volume. You'll be specially interested in the permanent-magnet instruments if you have not electric light at home. Their reproduction is magnificent and they cost nothing at all to run, since they need no field current. Look round and you will find moving-coil units, complete with coil and chassis, at astonishingly low prices. With one of these you can make your own loud-speaker in an hour or two, for the only job to be done is to cut out a baffle board and to screw or bolt the unit down to a suitable base.

THE HOME CONSTRUCTOR

THE home constructor who intends to make his own set or to bring his old one up to date will find himself in clover at the Exhibition. If he's wise, he will not fail to visit the AMATEUR WIRELESS and *Wireless Magazine* stands pretty soon after he puts his nose inside Olympia. Elsewhere in this issue you'll see an account of the sets that are on view there, and you can take my word for it that they are worth seeing—and making. On other stands you will be interested in the many fine kit sets that are to be seen. Some of these really are "the goods," and I know that months and months of

research and laboratory work have gone into their designs. There are so many good sets waiting to be made up that a choice is not easy. However, you can feel about the 1931 constructor's sets very much as did the ardent fisherman who said, "There's *good* fishing and *better* fishing, but there's no such thing as *bad* fishing." Make up your mind what you want the set to do, and you won't have much difficulty in selecting something that will do it.

BITS AND PIECES

THIS year's components are a very fine lot, and you are sure to spend much time in admiring their beauties. I strongly recommend a critical tour of the valve stands. You may be surprised to find what advances have been made by sound, quiet work during the past year. We now have valves with mutual-conductance figures that are simply staggering. The mutual-conductance figure is an indication of the "goodness" of the valve. If you are hazy on the point a demonstrator will soon make it clear. Notice the metallised valves (which screen themselves), the newest four-electrode patterns (which are really two valves in one), and the wonderful ranges of output valves suitable for all needs. Fascinating are the latest tuning coils with their almost uncanny selectivity. The newest ganged and screened variable condensers, and the up-to-date low-frequency transformers and chokes.

YOU MUST COME

YES, it's indeed a wonderful Show; and you simply must come to it, if you possibly can. If you are a prospective purchaser of wireless equipment, this is the finest of all chances of seeing the complete stock of Britain's radio industry before making your choice. Nowhere else and at no other time is everything wireless collected together under one vast roof. There are no such chances of examining sets and components, and of talking to the men who design and make them, as there are at Olympia. Even if you don't intend to buy so much as a grid leak or a terminal, come all the same. It's the best way of keeping in touch with the forward march of wireless, and I'll guarantee that you enjoy every minute of your visit.

REGIONAL CHANGES

RECENTLY I made a motor trip into southern Devonshire, taking with me a four-valve portable—S.G., detector, and two L.F. I was particularly interested to note how the home high-powered stations came in at long range. The Daventry National was always good, never failing to provide fine loud-speaker reception. But results with the medium-wave B.B.C. stations were very curious. The London National was almost useless whenever I tried it, owing to the terrific fading. The London Regional was better, though seldom very strong; ditto North National and Midland Regional on 301.5 and 398.9

:: :: **On Your Wavelength! (continued)** :: ::

metres respectively. By far the best of the home medium-wave stations was the North Regional on 479.2 metres. Though much farther away than Brookmans Park or Daventry, this station was always well received. There was no fading, and the quality was excellent. The moral, I suppose, is that it's the wavelengths above 400 metres that really do stay the course and provide good service areas.

FROM ABROAD

THE outstanding foreign station in those parts with the portable was Radio Paris, whose strength was almost that of 5 XX. On the medium waves the best stations by far were Toulouse, Langenburg, Rome, and Brussels. Barcelona was to be heard late in the evening, but Madrid was weak as a rule. On returning home, I found that conditions for foreign listening had greatly improved during even the few days that I was away. There is plenty to be heard now from the Continent, and we ought to have a wonderful time this winter. Do you know that the U.S.A. medium-wave stations are actually coming in *already*? I've heard WPG, KDKA, and WGY very well in the small hours. If they come in so well in August, what will they be like by Christmas? I'm quite sure that they will be as well heard as they were five or six years ago, when one valve often sufficed to bring them in at a range of 3,000 miles and more.

BAKELITE AND INSULATION

In these days when bakelite is used for almost everything except the wiring of a set we have come to look upon it as an insulator par excellence. As a matter of fact, this is very far from being the case, and I know one engineer who will never use bakelite in a high-frequency circuit. He always prefers to use good-quality ebonite, and it is significant that the best tuning condensers on the market at the present time have ebonite dielectric.

The fact of the matter is that bakelite can be very good if properly prepared, but it can also be very bad. Many readers probably do not realise that the beautiful glossy material of the finished product is formed from a fine powder rather like flour. This is put into a mould and is subjected to combined heat and pressure, under which influence it changes its state completely.

POSSIBLE VARIATION

NOW bakelite powder has been found to be very liable to absorb moisture. If the powder, therefore, is moist when inserted in the mould the internal structure of the bakelite still contains this moisture. It is the outer shell which hardens first, being nearest the hot mould, and once this shell has formed the internal moisture cannot get out.

Very few bakelite moulders take the trouble to keep their powder in sealed moisture-proof containers, so that all sorts of variations are possible, and two pieces made in the same way from the same mould may be quite different in their electrical characteristic. In the circumstances good

old-fashioned ebonite is a much more reliable proposition, for not only has it a smaller loss than bakelite, but material made in the same way gives consistent results.

SO SHY

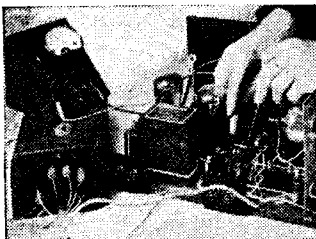
THE B.B.C. tells us that it finds the greatest difficulty in getting explorers to face the microphone. This is a thousand pities, for, of all talks, I always think that those given by travellers are amongst the most interesting. Nearly all of us have a desire to see the distant parts of the world, but most of us must be content to travel at second-hand by reading or hearing the experiences of others. Some explorers, of course, are only too willing to talk about the places that they have been to, and even of those that they haven't. But, taken as a whole, they are a strong, silent class, not given to rushes of words to the mouth. I remember once having as my next-door neighbour at a dinner a man who had just returned from a perfectly thrilling expedition to one of the world's most interesting odd corners. But his natural modesty made him almost completely dumb. I am not sure that most explorers wouldn't do better if their turns in front of the microphone took the form of dialogues. One of the B.B.C. people could ask the kind of questions that we all want to put, and the victim would jolly well then have to answer.

SAD, BUT TRUE

WE are a queer nation, and one of our little peculiarities is a rather pathetic belief that it is possible to get something for nothing. In my boyhood a firm of grocers, which had previously been selling tea at a shilling a pound, were dissatisfied with the amount of business that they were doing. Somebody had a brilliant idea. They raised the price to 1s. 6d. a pound, but offered a free half-pound with every pound purchased. Queues lined up outside the shops and a roaring trade was done.

TESTING THE H.T.

In order to get an accurate idea of the high-tension voltage from your mains eliminator, you must have a high-resistance voltmeter. An ordinary



cheap pocket meter will take too much current and upset the voltage readings. Insulated handles for the testing prods are an advantage.

Believe me or not, this is an absolute fact. Similarly we have the quaint idea that if two high-tension batteries are offered, one at four shillings and the other at eight shillings, it pays us to buy the cheaper one, since we can have two of them for the price

of the dearer. Of course, it really doesn't pay us at all, since the dearer battery will probably outlast three or four of the cheaper; but you can't convince the public of this. Not long ago a battery manufacturer said to me: "The British public would rather pay 7s. 6d. for a battery that lasts six weeks than 8s. 6d. for one that lasts six months."! This is a slight exaggeration, but it is very nearly true.

A LUCKY NUMBER

IN Germany, where broadcasting is making great strides just now, over 85 per cent. of the total number of listeners live in the larger cities. I hear that in Berlin alone the authorities are hoping to reach the million mark before the end of the year, and that in order to stimulate recruits, they are offering a "mystery" prize—of a substantial nature—to the lucky listener who first completes the round figure. I don't see why the B.B.C. shouldn't provide something along the same lines for us, too. A yearly ballot scheme, in which say a score or so licence-holders would find themselves presented with a fine super-het. set, would go a long way towards boosting up the programme funds. But I'm afraid this suggestion won't win official sanction!

THE BERLIN EXHIBITION

IN the recent exhibition in Berlin the radio industry combined forces both with the gramophone and talking-film interests, with the result that visitors were afforded unusual opportunities for amusement and recreation. One large gramophone firm erected a theatre in the show capable of seating over 1,000 people, in which a series of "marionette" operas were presented—the songs and music being supplied, of course, from gramophone records. The marionette figures were dressed to represent leading members of the famous Scala troupe, and the whole show was really most enjoyable. Another feature was the making of records by prominent actors and singers in person, followed almost immediately by reproduction from the completed record. This gave the public, as well as the artistes, a unique opportunity of following the whole process from beginning to end.

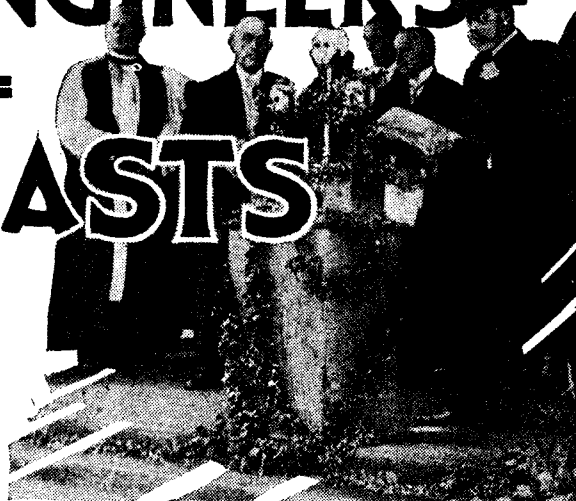
HOW THEY DO IT ABROAD

IT is interesting to see the way they tackle the man-made static problem in France. According to *Le Petit Radio*, a listener in Vichy took legal action against the proprietor of the local cinema on the ground that the electrical plant of the theatre caused intolerable interference with broadcast reception. The Court ordered an inquiry by experts into the following points: First, whether the wireless receiver of the complainant was normally efficient; secondly, whether the interference complained of coincided with the working of the cinema plant; thirdly, whether the interference was due to a preventable defect in the cinema plant. Whatever the result of the case may be, there is no doubt that they give the listener a sympathetic hearing over there, and are at least alive to his rights as an ordinary citizen to receive the broadcast programmes free from preventable interference.

THERMION.

WITH *the* O.B. ENGINEERS == *when the* == KING BROADCASTS

The B.B.C. "O.B." engineers have tackled many difficult problems in relaying programmes from outside the studios and here Kenneth Ullyett describes the arrangements which are used on special occasions when the King appears before the microphone



"WHAT arrangements do you make for the Royal microphone when the King broadcasts?" I asked an "O.B." official after a recent broadcast of H.M. the King, at Ilford.

"To tell you the truth," he said, "there is no B.B.C. 'Royal' microphone. We have about thirty-six microphones for Outside Broadcast work and nearly every one of them, at some time or other, has been used by Royalty. The microphone which is known as the 'King's' microphone is one used only for public address work and this, of course, often stands beside the

B.B.C. microphone when the King is broadcasting."

I asked if any special precautions are taken in connection with the amplifiers or other gear to prevent breakdown and I was told that, generally speaking, the present "O.B." factor of safety is so satisfactory that there is no need for special measures.

"Of course," said the official, "we have two amplifiers on any Outside Broadcast such as this, and within a few seconds we can change over from one set to the other. Also we sometimes have more than just the one Post Office line available. We generally ask for two, and sometimes prefer three. One is used for telephone communication with the Control Room and the other as the microphone line, but if it is possible to have an alternative microphone line then we do so: this is more general when music is to be relayed, but for ordinary speeches this additional complication is not always required.

Two in Charge

"There are two engineers in charge when the King broadcasts, but that again is general B.B.C. practice."

I asked if the King is regarded as a good broadcaster and was told that by the B.B.C., by the Public Address people and by the talking film engineers he is regarded as a first-class microphone personality. He has a steady style of elocution, regards the microphone with absolute coldness and does not drop his voice or indulge in too much accentuation—both of which faults in speakers make matters very difficult for the control engineers.

"Ours is not the only microphone when the King broadcasts," said the "O.B." man, "for the talking film engineers are generally on the spot, too. Our microphones stand side by side and are usually camouflaged by a few flowers, or by a reading

desk. We make arrangements with the Lord Chamberlain as to microphone position, and at the recent Ilford broadcast a cross was marked on the ground and it was explained to His Majesty he should stand in that position in order to be best heard by the millions of wireless listeners. And he did stand there!

The "Distance" Mat

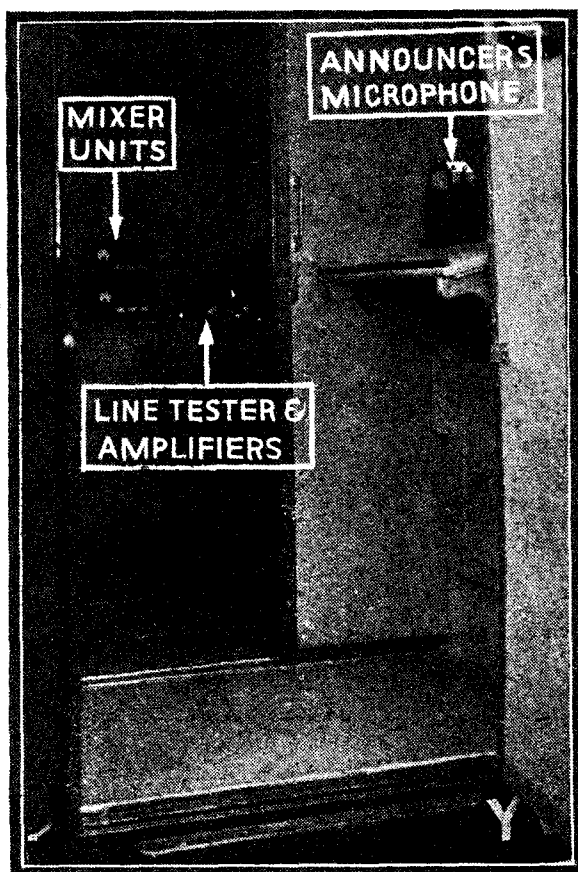
"On a previous occasion there was not time to make this arrangement and mats were put down at a suitable distance from the microphone, the engineers fervently hoping that he would stand on the mats when he spoke, when he would be at just the right distance from the microphone. But he disregarded the mats and the man at the controls had to keep a steady hand on the fader in case he should get too close."

Many of the King's broadcasts are from out-of-door events. Important indoor broadcasts have taken place: when he spoke from the Houses of Parliament at the Disarmament Conference, some time ago, and when he was present at the re-opening of St. Paul's Cathedral. The Prince of Wales shares honours with the King in possessing a steady broadcasting voice, which makes matters very easy for the men in charge of the "mikes."

OUR EXHIBITION SET

"THE Olympian Three" is a straight three-valver which is bound to make a big appeal because of its simplicity. It has a highly efficient S.G. stage in a special band-pass circuit. There is, of course, only one-knob control. A high overall gain and the fitting of a pre-detector volume control are two technical features of outstanding interest. Don't miss this fine new set! It is described on pages 428-430.

When an American broadcasting studio recently advertised the fact that four announcers were needed, 232 applications were received in the course of a few hours. A final choice was made of a Russian ex-Prince, an Italian Count, a Chinaman and an "East-side New Yorker"!



A glimpse inside the Outside Broadcast van which is generally used when the King is speaking at an outdoor event. Phone cables from the van are connected up to the nearest Post Office "pot head"

COMPLETE GUIDE TO SHOW

STAND Nos. 91-152

(Continued from page 407)

a number of similar small parts also attract attention.

Stand 91. C. A. Vandervell & Co., Ltd., 319 Regent Street, W.1.

C.A.V. accumulators are, of course, the exhibit of main interest here. New features have been incorporated in certain models for the 1931 season and battery-users will be well repaid by a visit to this stand.

Stand 92. Dubilier Condenser Co. (1925), Ltd., Duceon Works, Victoria Road, North Acton, W.3.

A number of changes have been made in the Dubilier range for 1932 and you should make a point of seeing the new paper dielectric and electrolytic condensers. The ever-popular Dubilier variable condenser and Dumetohm and Duwirohm leaks and resistances should be seen.

Stand 94. Standard Battery Co., 184 Shaftesbury Avenue, W.C.2.

Here you will find the well-known Standard batteries, Wates' pick-ups, gramophone motors, Star loudspeakers, testing meters, double cone chassis and so on. The small resistances and fixed condensers will attract the attention of set-builders.

Stand 95. H. Hacker & Sons, Perfecta Works, Ray Lea Road, Maidenhead.

The Dynatron universal radiogram is a feature well worth seeing on this stand.

VISIT THE "A.W." STAND FIRST — No. 71 —

Stand 96. The Halcyon Wireless Co., Ltd., 27a Pembridge Villas, Notting Hill Gate, W.11.

Here is a wide range of Halcyon outfits which should be seen by potential purchasers of complete sets.

Stand 97. Junit Mfg. Co., Ltd., 2 Ravenscourt Square, W.6.

See the new Junit eliminators, the A.C. range of which is particularly complete. There are parts for set builders, such as the new Junit power transformer, which has a special filament winding for A.C. valves. A feature of these mains transformers is the generous core provided.

Stand 98. Stratton & Co., Ltd., Balmoral Works, Bromsgrove Street, Birmingham.

A short-wave enthusiast will find much to interest him here and the 1932 Eddystone All-Wave Four will appeal to all set-users. There is a fine six-valve super-het. tuning from 12 to 440 metres, and set-builders will find interest in the small parts, such as H.F. chokes, variable condensers and valve holders.

Stand 99. The Benjamin Electric, Ltd., Tariff Road, Tottenham, N.17.

There are many Benjamin productions which are bound to attract your attention here. Make a point of seeing the new rotary switches, valve holders, and portable set turntables. The Benjamin Clearer-tone valve-holder is, of course, an old favourite with set-builders.

Stand 100. Watmel Wireless Co., Ltd., Imperial Works, High Street, Edgware, Middlesex.

Home constructors will be interested chiefly in the new small Watmel parts, tuners, slow-motion drum controls, yavetraps, chokes, pick-up arms, condensers, and so on. Wire-wound potentiometers and wire-wound fixed resistances at very low prices are bound to make a big appeal.

Stand 101. Darwins, Ltd., Fitzwilliam Works, Sheffield.

Stand 102. A. F. Bulgin & Co., Ltd., Abbey Road, Barking, Essex.

Every set-owner will find something of interest here, for in the Bulgin range there are components which improve the utility and performance of practically every outfit. A number of new parts have been added to the range for the 1932 season.

Stand 103. Whittingham Smith and Co., Portadyne Works, Gorst Road, North Acton, N.W.10.

Portadyne S.F. Four Atlantic and Portadyne transportable sets should be seen here. These have an aluminium chassis and, in the case of the transportable set, there is ganged tuning. The H.T. consumption is only 8 milliamperes.

Stand 104. A. J. Dew & Co., Ltd., 38 and 34 Rathbone Place, W.1.

Stand 105. Brown Bros., Ltd., 26 Great Eastern Street, E.C.2.

Stand 106. Epoch Radio Manufacturing Co., Ltd., 3 Farringdon Avenue, E.C.4.

Many moving-coil speakers, both of the energised and permanent-magnet types are shown, and these are fitted with input transformers. Hire-purchase scheme is applicable to all models. Several new large public-address type speakers have also been produced and the technical points of these will interest moving-coil speaker enthusiasts.

Stand 107. F. W. Smurthwaite, 15a Onslow Gardens, Wallington, Surrey.

Stand 108. Magnavox (G.B.), Ltd., 89 Kingsway, W.C.2.

Several types of Magnavox speaker are to be seen here, mostly of the energised moving-coil type. There is a range of tapped input transformers, so that these speakers can be connected directly to a set, without the need for further tone correction.

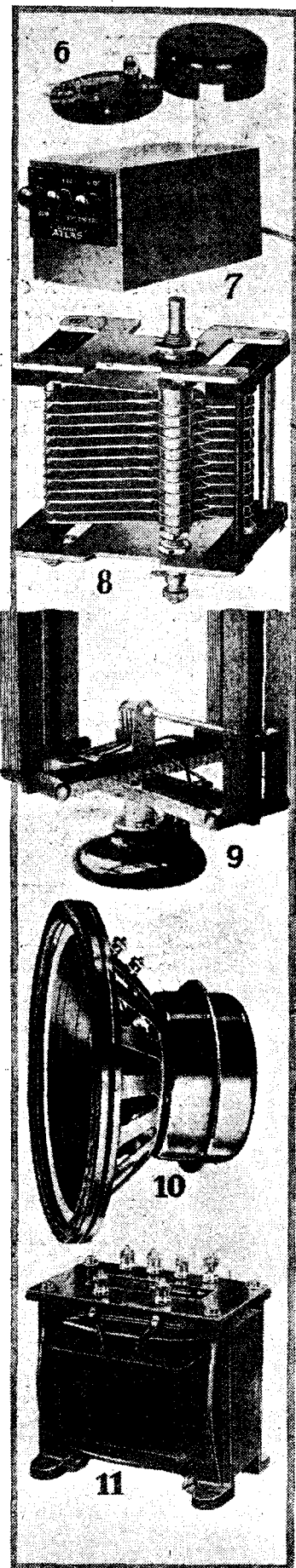
Stand 151. S. Kalsky (Aldgate), Ltd., 75 Aldgate High Street, E.C.3.

Here is a comprehensive range of sets and components of numerous manufacturers.

Stand 152. Wright & Weaire, Ltd., 740 High Road, N.17

Coils for super-hets. take pride of place here, of course, and will need no introduction to Century Super enthusiasts, but do not miss the other Wearite components. Talisman coils, frame aeriels, valve holders, earth tube fixings and many other parts should be seen.

(Continued on page 418)



(1) Ormond speaker unit and chassis. (2) Telsen speaker unit. (3) Telsen H. F. choke. (4) J. B. popular condenser. (5) Blue Spot permanent magnet speaker.

(6) Bulgin thermostatic switch. (7) New Atlas unit. (8) Ormond condenser. (9) Wearite frame aerial. (10) Celestion moving-coil chassis. (11) Transformer for Celestion speakers.

"What's this new electric gadget you've got for your radio?"

"Oh! it's a Regentone Mains Unit."

"What does it do?"

"Practically everything, and I take my hat off to the Regentone people who make it. I bought it about 4 months ago—it only cost me a couple of pounds and since then I've forgotten that such things as batteries or accumulators existed. Every evening I just pull down the switch and there you are—listen to it, isn't it great?"

"Did you have much trouble fixing it up?"

"No, it didn't take me two minutes. It's just as easy as putting in batteries."

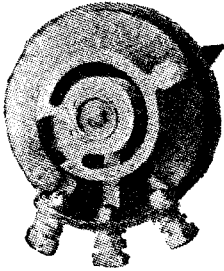
"There's a wireless shop on my way to the station—I must drop in and have a chat with them, or write to the Regentone people for one of their leaflets."

Write for Free Art Booklet to:—REGENTONE, LIMITED, Regentone House, 21 Bartlett's Buildings, E.C.4. Tel. Central 8745 (5 lines).

Irish Free State Distributors: Kelly & Shiel, Ltd., 47 Fleet Street, Dublin.

COMPLETE GUIDE TO SHOW

STAND Nos. 153-184



A useful potentiometer control produced by Wearite.

(Continued from page 416)

Stand 153. British Ebonite Co., Ltd., Nightingale Road, Hanwell, W.7.

Beacol panels and coil formers form the items of main interest here. The new Beacol panels will interest set-constructors. Beacol formers have a special low-loss moulding which ensures that a coil wound on one of these has a very low-dielectric loss.

Stand 154. The Broadcaster, 98 Long Acre, W.C.2.

Stand 155. British Radiophones, Ltd., Aldwych House, Aldwych, W.C.2

Stand 156. Jewel Pen Co., Ltd., 21 & 22 Great Sutton Street, E.C.1.

A special feature is made here of the ever-popular Red Diamond permanent-crystal detector. There are some fine switches, coil holders, lead-in tubes and other small parts.

Stand 157. Baird Television, Ltd., 133 Long Acre, W.C.2.

Here television enthusiasts will find publications and a small display to demonstrate the progress of television.

Stand 158. E. Paroussi, 10 Featherstone Buildings, W.C.1.

Parex parts for home constructors are of interest here and there are

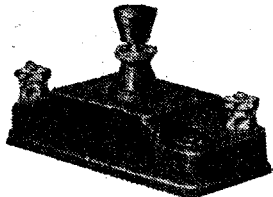
Stand 160. W. & T. Lock, Ltd., St. Peter's Works, Bath.

There are a number of fine new cabinets to be seen at the Lock stand this year. Beaufort, Moderne, Classic, and Clarionette are among the new lines, while the Utility gramophone and pick-up cabinet, with a record compartment combined, is bound to appeal to gramo-radio enthusiasts.

Stand 161. Donotone (Regd.) Loud-Speaker, 40 Furnival Street, E.C.2.

The new Donotone speaker for 1932 must be seen, and technical readers should make a point of inspecting the special patented features of the new Donotone model.

Stand 162. Radio Service (London),



One of the new Telsen pre-set condensers.

Ltd., 105a Torriano Avenue, N.W.5.

The battery-charging facilities offered by this service are fully demonstrated here.

Stand 163. Redfern's Rubber Works, Ltd., Hyde, Cheshire.

Here set-builders will find Ebonart and Bulwark panels and small ebonite parts. Redfern's Twoside type of panel is a new production which has one side black and the other side mahogany finished. Several new coil formers have been produced.

Stand 164. Thos. De La Rue & Co., Ltd., 90 Shernhall Street, Walthamstow, E.17.

In addition to a complete range of instruments manufactured by the Gramophone Co., and other leading makers, there are on show here the Concert reproducer and amplifier made by Arding & Hobbs, Ltd.

Stand 172. Sydney S. Bird & Sons, Ltd., Sarnesfield Road, Enfield Town, Middlesex.

The new Cyldon condensers for 1932 must be seen. Several new types have been introduced which not only give better control, but can easily be ganged, as is necessary in many modern circuits.

Stand 173. Overseas Trading Corporation, 18 Ganton Street, Regent Street, W.1.

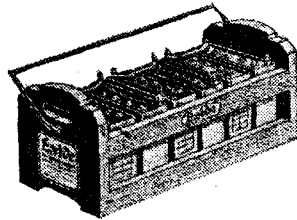
Stand 174. Wireless Retailers' Association of Great Britain, 1 Mitre Court, Fleet Street, E.C.4.

Stand 175. Hobday Bros., Ltd., 21 Great Eastern Street, E.C.2.

Stand 176. East London Rubber Co., Ltd., 29 Great Eastern Street, E.C.2.

Stand 177. Partridge & Mee, Ltd., 74 New Oxford Street, W.C.1.

Parmeko mains components are on show here in a comprehensive range. Power transformers and smoothing chokes should be seen.

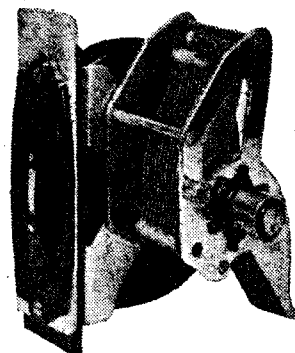


An Exide high-tension bank of 10-volt accumulators.

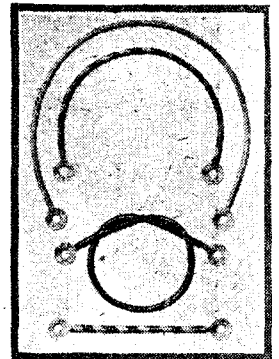
There are several new types of power transformer for use with valve and Westinghouse metal rectifiers and several models have special four-volt low-tension windings for A.C. valves.

Stand 178. Garrard Engineering and Manufacturing Co., Ltd., Newcastle Street, Swindon, Wilts.

Among the fine spring and electric-drive gramophone motors here you should see the model 202 induction-type gramophone motor, with full automatic starting and stopping switch. Every radio-gramophone enthusiast should consider the possi-



One of the new Dubilier variable condensers.



Four of the new spaghetti resistances produced by Telsen.

bilities of electric turntable drive and will find here models to suit every need.

Stand 179. Peto-Scott Co., Ltd., 77 City Road, E.C.1.

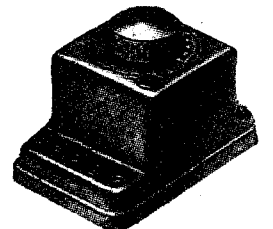
Kits of parts to make up the sets published in "A.W." are a big feature of this Stand. There are special points about Peto-Scott pilot kits which can be seen on examination by enthusiastic set-builders.

Stand 180. Johnson Talking Machine Co., Ltd., 96 Clerkenwell Road, E.C.1.

Academy radio-gramophones for battery and mains drive are shown here, together with moving-coil speakers. One of these is a permanent-magnet type and the other of the mains-excited variety.

Stand 181. B. & S. Electrical Co., Ltd., 9 Brunswick Place, City Road, N.1.

Stand 182. British Hard Rubber Co., Ltd., Ponders End, Middlesex.



The Blue Spot rejector wavetrap.

Permeol non-discolouring ebonite is shown here in various finishes for panels of sets. There are a number of coil formers, rods, tubes and switch blocks, cut pieces and extruded work.

Stand 184. R. Cadisch & Sons, 5 and 6 Red Lion Square, W.C.1.

SHOW REPORT
Continued on page 420



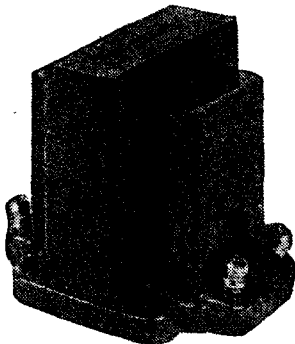
This is the mains edition of the model 235 Cossor Melody Maker.

"AMATEUR WIRELESS," FIRST IN RADIO AND STAND No. 71 AT THE SHOW

several new lines which greatly facilitate set-building.

Stand 159. Auto Electrical Devices, Ltd., Diamond Works, Brighton, Sussex.

Components for radio-gramophone users should be seen here, including the new A.E.D. pick-up.



A new Sovereign low-frequency transformer.

Stand 165. Beaver Electrical Supply Co., 5 Great Chapel Street, W.1.

Stand 166. Hillman Bros., Ltd., 123 and 125 Albion Street, Leeds.

Stand 167. Itonia Gramophone Ltd., 58 City Road, E.C.1.

See here the Itonia model 505 all-electric radio-gramophone. This is a most satisfactory production at a very low cost and has all the features that one expects to find in a modern outfit.

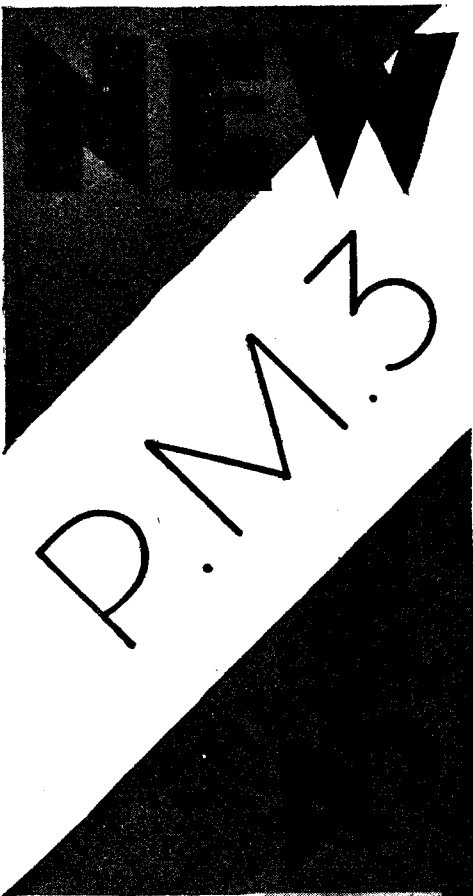
Stand 168. S. A. Lamplugh, Ltd., 89 Little Park Street, Coventry.

The Silver Ghost inductor dynamic speaker has been considerably improved for this year. It is more sensitive and has a brilliancy which has not interfered with the inductor response. The Silver Ghost speaker coupling unit is an interesting component.

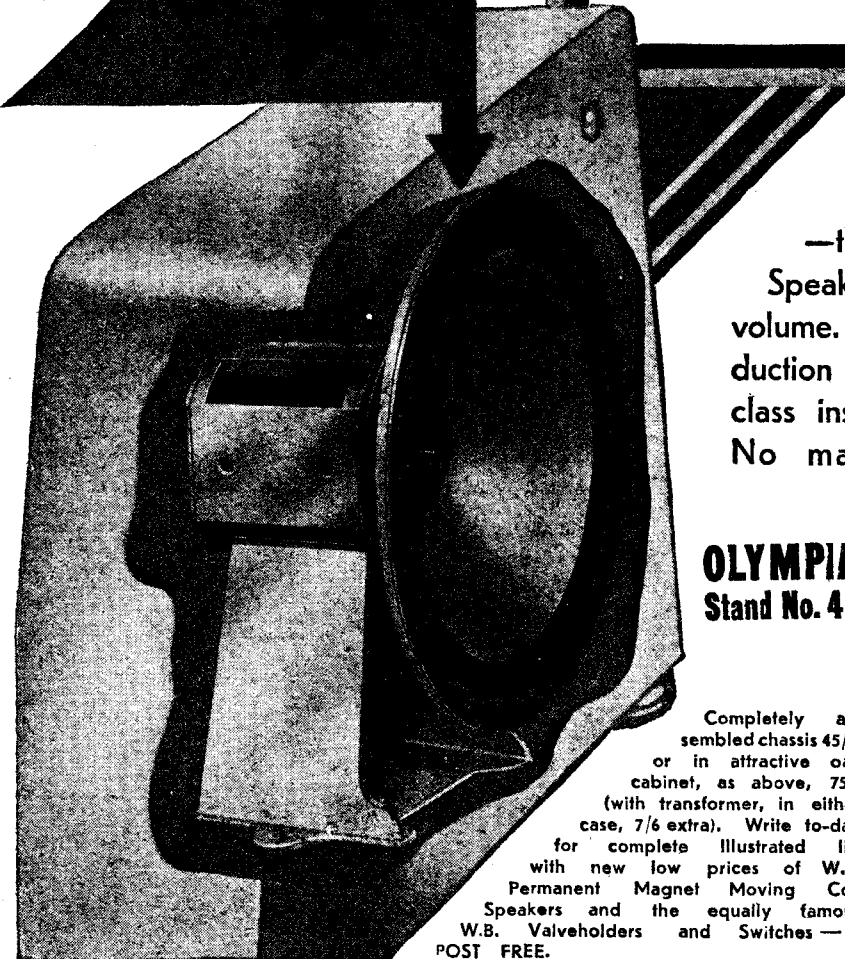
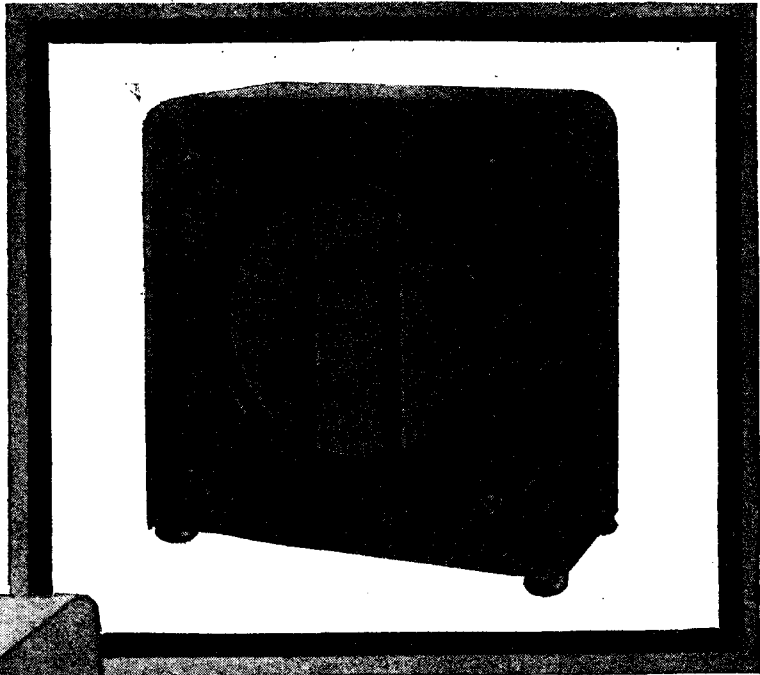
Stand 169. Adie & Co., Ltd., 2 Aldermanbury Avenue, E.C.2.

Stand 170. Henderson Wireless and Electrical Service, 54 Queens Road, Brighton.

Stand 171. Arding & Hobbs, Ltd., 315 Lavender Hill, S.W.11.



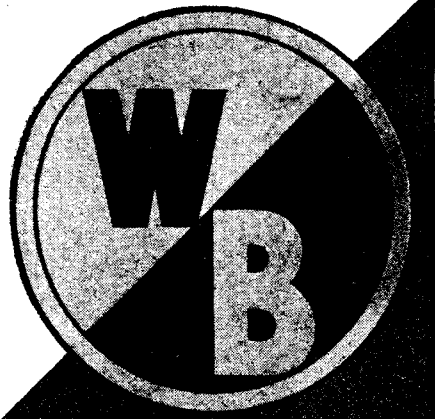
PERMANENT MAGNET MOVING COIL SPEAKER



The most astonishing value ever offered. Made by "W.B." —the pioneers in Permanent Magnet Speakers. Very sensitive — large volume. Gives true moving-coil reproduction from any 2 or 3 valve set. A class instrument despite the low price. No mains or batteries needed.

**OLYMPIA
Stand No. 46**

Completely assembled chassis 45/-, or in attractive oak cabinet, as above, 75/- (with transformer, in either case, 7/6 extra). Write to-day for complete illustrated list with new low prices of W.B. Permanent Magnet Moving Coil Speakers and the equally famous W.B. Valveholders and Switches — POST FREE.

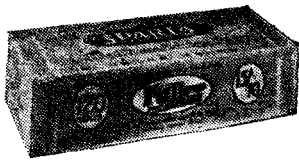


Whiteley Electrical Radio Co. Ltd., Radio Works, Nottingham Road, Mansfield, Notts.

You Will Help Yourself and Help Us by Mentioning "A.W." to Advertisers

COMPLETE GUIDE TO SHOW

STAND Nos. 185-209



A Sparta 120-volt H.T. battery

(Continued from page 418)

Stand 185. Electrical Devices Co., 12 Great James Street, Bedford Row, W.C.1.

The 1932 model of the Eldeco S.G. Four portable set with single dial tuning should be seen here with the six-valve supersonic portable.

Stand 186. Manufacturers Acces-

House, 14 Newgate Street, E.C.

There are many new parts in the 1932 P.R. range and these will interest all set-users.

Stand 188. Pioneer Mfg. Co., Ltd., Cromwell House, Fulwood Place, W.C.

There are several parts in the Pioneer range which must be seen by set builders. Several of the new parts for 1932 have been tested recently in our "We Test For You" feature and these parts can be seen on this stand.

Stand 189. R. F. Graham & Co., 45-6 Cambridge Road, Kingston-on-Thames.

Stand 190. Sel-Ezi Wireless Supply Co., Ltd., 1 Soho Square, W.1.

Stand 191. Atalanta, 1-3 Brixton Road, S.W.9.

Set builders will find here a number of interesting gadgets which are a great aid in construction.

panel and which has a very high factor of resistance for full-scale deflection.

Stand 195. A. W. Gamage, Ltd., Holborn, E.C.1.

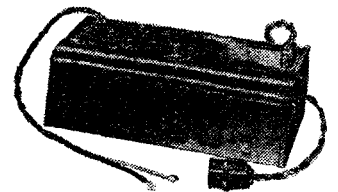
A wide range of well-known makes of components and complete sets is to be found here, together with the new Gamage Compact two- and three-valve sets. These are battery operated receivers and are produced at a remarkably low price.

Stand 196. Gutta Percha Co., Wharf Road, City Road, N.1.

Radiometal and Mumetal alloy for the construction of L.F. and power transformers and chokes are shown and will interest more technical listeners.

Stand 197. Greatrex & Co., 184 Regent Street, W.1.

Stand 198. William Whiteley, Ltd., Westbourne Grove, W.2.

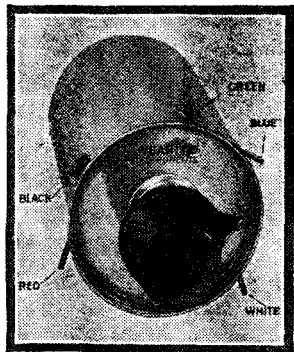


One of the Regentone A.C. units

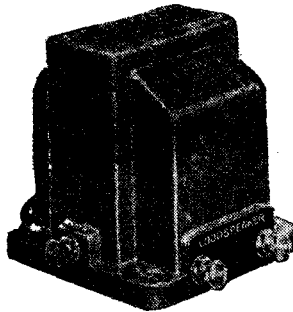
Stand 205. Chas. A. Osborn. Regent Works, Arlington Street, N.1.

Ready-to-assemble, part-assembled and completely assembled cabinets are the feature here. There are cabinets for most sets on the market and for all the latest loud-speakers.

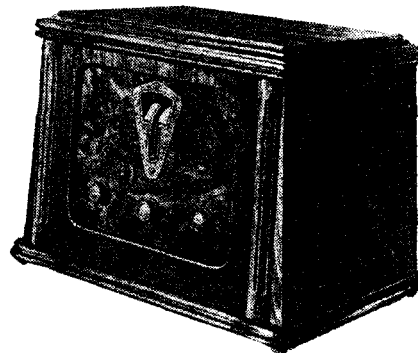
Stand 206. Birkbys, Ltd., Liverpool, Yorks.



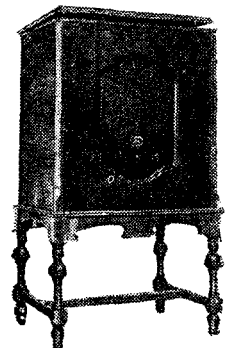
A Wearite coil for use in a super-het such as the "Century Super"



A Telsen speaker output transformer



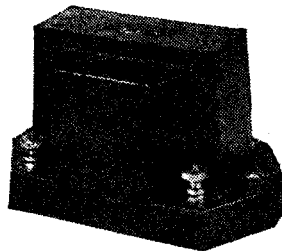
The Varley Square-peak mains 4-valver



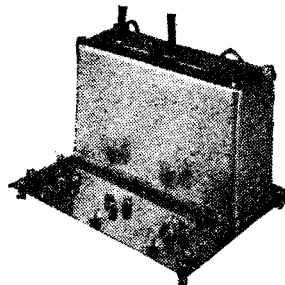
One of the new Tannoy radiograms



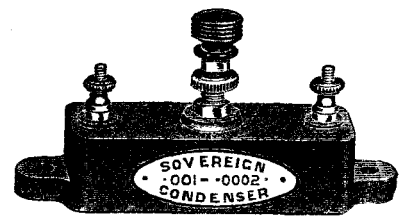
One of the Full-O'-Power range of high-tension batteries



A Lissen Torex transformer, one of the wide range of home-constructor parts



The new Lewcos super-het assembly

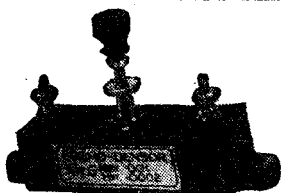


For many purposes in a set circuit, the Sovereign pre-set condenser

sories Co. (1928), Ltd., 85 Great Eastern Street, E.C.2.

Here you must make a point of seeing Maco accumulators and cabinets, together with a wide range of components, batteries and mains units. A special feature is a three-valve all-mains set at a popular price.

Stand 187. P. R. Products, P.R.



The Formo-densor type G pre-set condenser

Stand 192. Faudels, Ltd., 36-40 Newgate Street, E.C.4.

Stand 193. The Primus Mfg. Co., Primus House, Willow Street, E.C.2.

Here are special batteries for ordinary H.T. working and a new patented type of dry battery with rechargeable cells. A loud-speaker chassis with triple cone, and a permanent-magnet moving-coil speaker should also be seen.

Stand 194. Park Royal Engineering Co., Ltd., Cumberland Avenue, Park Royal, N.W.10.

Testing instruments of high grade are to be seen on this stand. In particular you should see the new high-voltage voltmeters which are a great asset in any set because they enable an accurate idea to be obtained of the working voltage on the anodes of the valves. There is a neat panel-mounting instrument just produced, which needs only a small hole in the

Here is a full range of the complete receivers and parts marketed by William Whiteley, Ltd.

Stand 200. Churchmans, Ltd., 79 Maidenburgh Street, Colchester.

Stand 201. Fullotone Gramophones (1929), Ltd., 73 Camden Road, N.W.1.

Two radio-gramophone models 202 and 203, attract attention here and there are several technical points in these Fullotone instruments which are well deserving of inspection.

Stand 202. Lectro-Linx, Ltd., 254 Vauxhall Bridge Road, S.W.1.

Clix plugs, sockets, accumulator connectors, terminals and other small accessories must be seen.

Stand 203. Sun Electrical Co., Ltd., 118 Charing Cross Road, W.C.2.

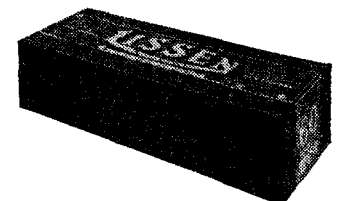
Stand 204. Flinders (Wholesale) Ltd., East Stockwell Street, Colchester.

Stands 207 and 208. Electrical Equipment Co., Ltd., Winder House, Douglas Street, S.W.1.

Apparatus for coil and transformer winding can be seen here.

Stand 209. Colassion, Ltd., Mark Lane Station Buildings, E.C.3.

SHOW REPORT
Continued on page 422

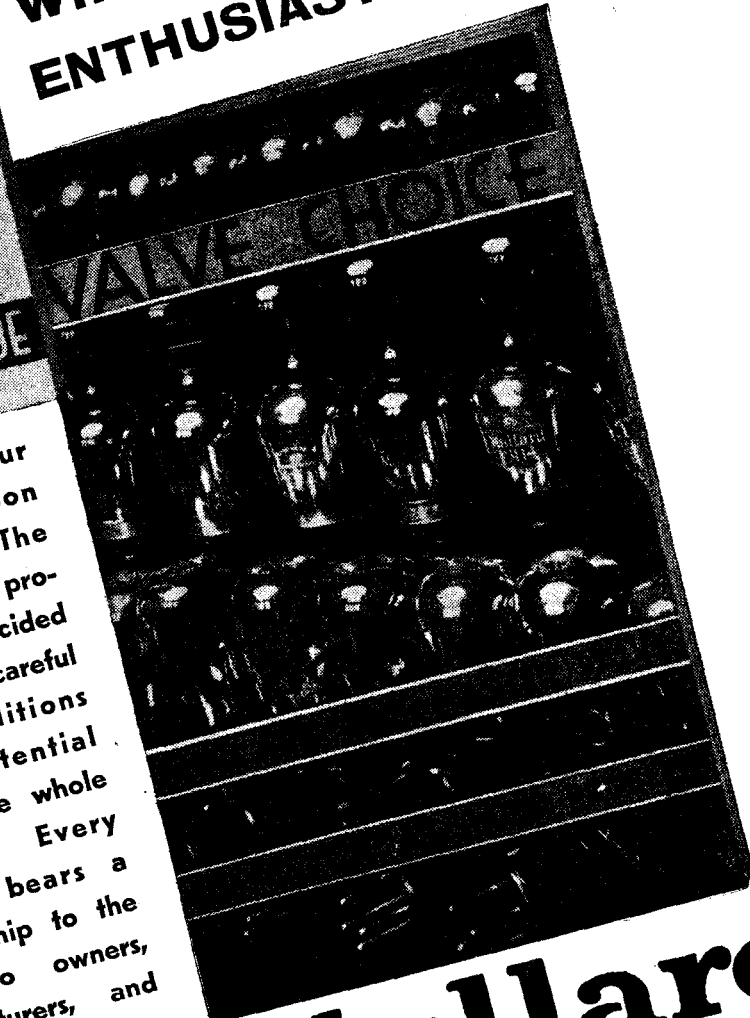


A Lissen 60-volt H.T. Battery

FREE TWO INVALUABLE BOOKS FOR EVERY WIRELESS ENTHUSIAST



The efficiency of your receiver depends upon valve efficiency. The Mullard 1932 valve production policy was decided only after a very careful study of the conditions governing the potential development of the whole radio industry. Every Mullard valve bears a definite relationship to the needs of radio owners, radio manufacturers, and broadcasting conditions.



Mullard THE MASTER VALVE

VISIT STAND No. 18—
THE MULLARD STAND at OLYMPIA

Obtainable from your own Radio dealer, or direct from the
MULLARD WIRELESS SERVICE CO., 111, CHARING CROSS ROAD, LONDON, W.C.2

You will Help Yourself and Help Us by Mentioning "A.W." to Advertisers

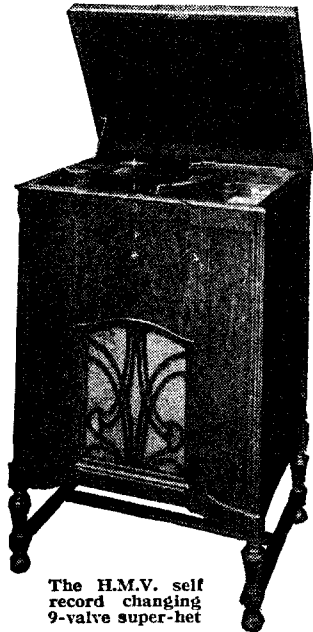
COMPLETE GUIDE TO SHOW

STAND Nos. 210-235

(Continued from page 420)

A special feature here is the Colasion Hyper speaker which is double the size of the standard model. This is an impressive exhibit, being made of gold and silver and placed in a special concave showcase.

Stand 210. Thompson, Diamond and Butcher, 34 Farringdon Road, E.C.1.



The H.M.V. self record changing 9-valve super-het

Stand 212. Henry E. Taylor, Ltd., 47 Mount Pleasant Road, S.E.13.

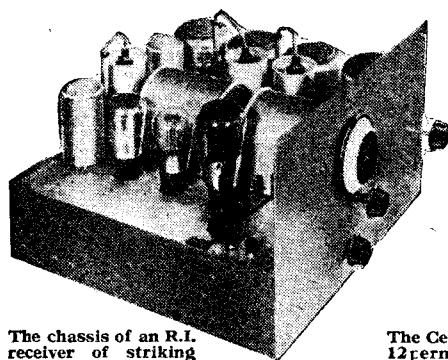
Stand 214. Ecco Radio Ltd., Ecco House, Princess Street, N.W.8.

Stand 215. Rees Mace Mfg. Co., Ltd., 39a Welbeck Street, W.1.

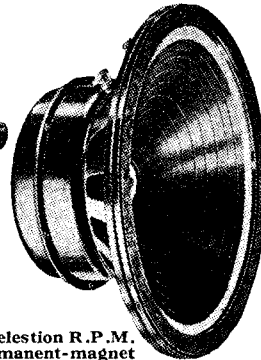
This firm specialises in the production of complete sets and the general finish of the new models for 1932 strikes a high note.

Stand 216. Bakers Selhurst Radio, 89 Selhurst Road, S. Norwood.

Here is a fine range of speakers of various types which have made the name of Selhurst Radio famous. The



The chassis of an R.I. receiver of striking design



The Celestion R.P.M. 12 permanent-magnet speaker

speakers for the new season incorporate many interesting technical features and the permanent-magnet models are of outstanding interest.

Stand 217. Shapland & Petter, Ltd., Raleigh Works, Barnstaple.

Stand 218. Betta Electric Motors, Ltd., 119-25 Finsbury Pavement, E.C.2.

Stand 220. Fay Home Recorders, Ltd., 121 Victoria Street, S.W.1.

Here is a demonstration of a new system of home recording by means of which you can make records of music or broadcast items.

Stand 224. F. Francke, 28 Blomfield Road, Maida Vale, W.

Stand 225. Kenneth Brooks, Ltd., 72-86 Oxford Street, W.1.

Stand 226. Audiovisor, Ltd., 28 Little Russell Street, W.C.1.

Stand 227. Voltron Electric, Ltd., Queens Works, Ponders End, Middlesex.

See the new Voltron parts and sets. The Voltron Hornet table type set is a popular attraction.

Stand 228. Electro-Dynamic Construction Co., Ltd., Devonshire Grove, Old Kent Road, S.E.

Stand 229. Mains Power Radio Co., Broadway House, South Street, Romford, Essex.

Parts of interest to users of mains-driven sets are on show here.

Stand 230. Dulcetto-Polyphon, Ltd., 2 and 3 Newman Street W.1.

Stand 231. Tonex Co., Walker Street, Blackpool.

Stand 232. A. H. Hunt, Ltd., H. A. H. Works, Tunstall Road, Croydon, Surrey.

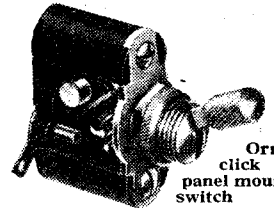
Here is a wide range of dry batteries for high-tension and low-tension purposes. The special chemical prin-

Stand 233. Hunton, Ltd., Fitzroy Court, Tottenham Court Road, W.1.

Small parts, such as eyelets, terminal tags, tubular rivets and the machines for fixing these.

Stand 234. Selfridge & Co., Ltd., Oxford Street, W.1.

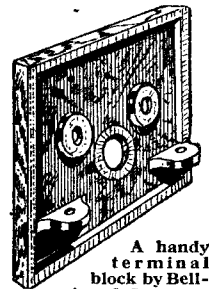
The Radio Department of Selfridge



Ormond click type panel mounting switch



One of the new handpass coils produced by Rooke Bros.



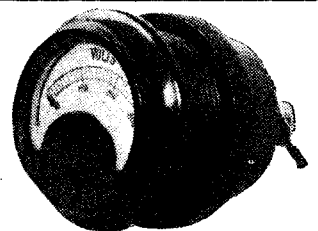
A handy terminal block by Belling & Lee

has organised a fine display on this stand and if you are contemplating purchasing any apparatus you should take advantage of the technical advice service offered by the department.

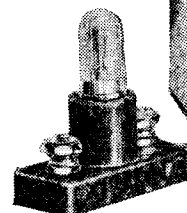
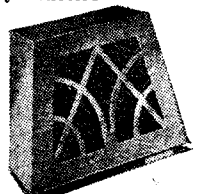
Stand 235. The Crypto Electrical Co., Ltd., Willesden, N.W.10.

Apart from rotary converters for

SHOW REPORT
Continued on page 432



One of the range of Park Royal meters

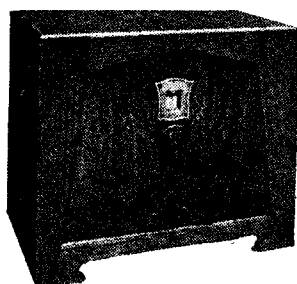


(Left) Telsen fuse and fuse holder. (Above) Lamp lug Minor cabinet speaker

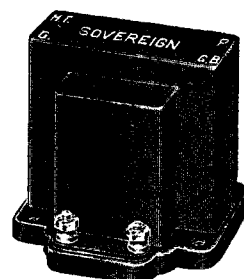
OUR STAND AT THE SHOW IS No. 71-SEE IT FIRST



The new table-type radio-gramophone by H.M.V.



The Kobra Junior, one of the new Kolster-Brandes sets



A neat Sovereign L.F. transformer

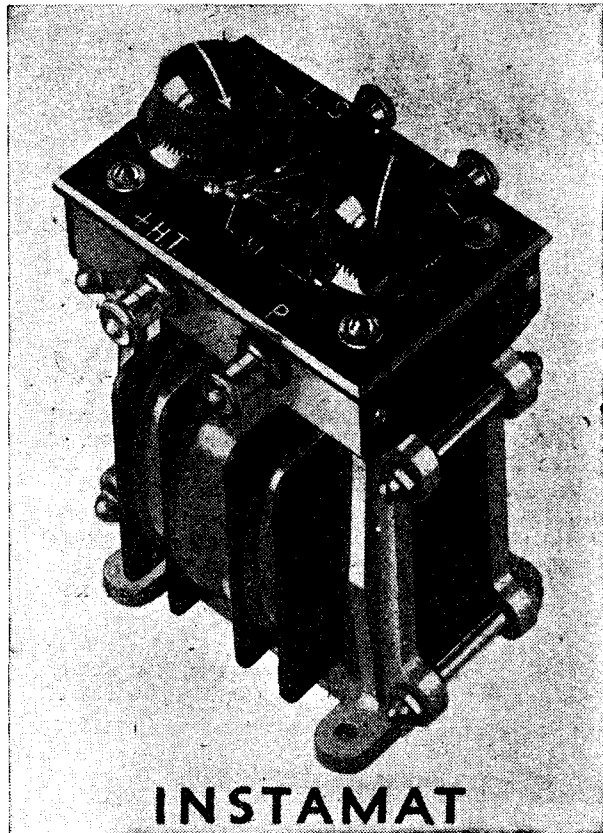
Stand 222. Yagerphone, Ltd., Charlotte Cabinet Works, Ponders End, Middlesex.

Stand 223. Synchrophone, Ltd., 24 Berners Street, W.1.

ciple employed in these cells ensures a minimum of polarisation and this makes them specially suitable for high-tension work where they stand up to heavy discharges over a long period.

QUALITY DEPENDS

on your OUTPUT STAGE



INSTAMAT

You can have the best set and the best loud-speaker that money can buy, but unless they are accurately matched, quality must suffer.

You need a good output transformer of the correct ratio. You need an INSTAMAT. No need for you to switch off the set or disconnect wires—just turn the switch knobs and hear the tone change. The INSTAMAT is the only output transformer capable of giving perfect quality by the turn of a switch.

So long as you have a radio set and loud-speaker you need an INSTAMAT. Without one you can never be sure you are getting the quality of which your outfit is capable. With one you can change your output valve or loud-speaker as often as you wish and know that in every case the valve and speaker can be accurately and instantly matched.

INSTAMAT OUTPUT TRANSFORMER

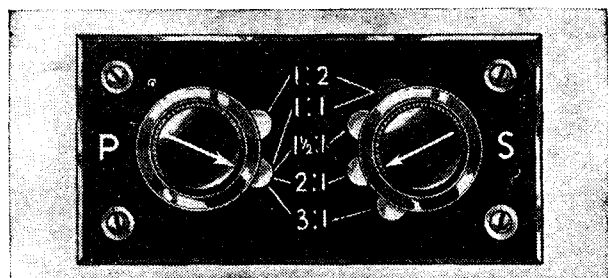
(Guaranteed for five years)

Connect between the last valve and loud-speaker (for all types except moving-coil speakers). Five different ratios all clearly marked. Extremely low D.C. resistances, very heavy current-carrying capacity, and particularly massive core of the most correct design.

PRICE 27/6

INSTAMAT MAJOR. For low-resistance moving-coil speakers. Six ratios: 10 to 1 up to 25 to 1. Current-carrying capacity up to 150 milliamperes without core saturation.

PRICE 37/6



INSTANT MATCHING SWITCHING
ON THE INSTAMAT

If unable to obtain from your local dealer, we will send you an INSTAMAT or INSTAMAT MAJOR direct upon receipt of cash with order. If you are not entirely satisfied with the INSTAMAT and return it to us undamaged within seven days, we will refund your money in full.

**BE SURE TO SEE THE INSTAMAT AT
OLYMPIA—STAND No. 6**

Now turn to pages 424 & 431

Ready Radio Ltd

**159 BOROUGH HIGH STREET
LONDON BRIDGE · S·E·1**

PHONE: NOP 3000 GRAMS: READRAD, SEDIST
HEAD OFFICE AND WORKS
EASTNOR HOUSE · BLACKHEATH
PHONE: LEE GREEN 5678



Tested & passed

G.P. Kendall
CHIEF ENGINEER
READY RADIO

As still further proof of our aim to maintain an unrivalled service, both before and after sales, we have now taken on the full-time services, as our Chief Engineer, of Mr. G. P. Kendall, B.Sc., for many years the well-known Chief of Research for "Popular Wireless" and "Modern Wireless."

★ When you buy Ready Radio Kit Components you are definitely assured that they are the finest possible for their particular job. Mr. Kendall is your surety. Every Ready Radio Kit Component is chosen by him only after submission to stringent laboratory and broadcast tests. And again before despatch, they are tested and passed under his personal direction.

★ Should you ever be in difficulties with your set you can avail yourself of his wide and experienced technical knowledge, FREE. Mr. Kendall controls the new Ready Radio Technical Department, formed mainly for the purpose of helping you out of your radio troubles.

OLYMPIAN THREE

KIT A	(Less Valves and Cabinet.)	£6:4:9	or 12 equal monthly instalments of	11/6
KIT B	(With Valves, less Cabinet.)	£8:3:9	or 12 equal monthly instalments of	15/3
KIT C	(With Valves and Cabinet.)	£10:8:9	or 12 equal monthly instalments of	19/3

RECOMMENDED ACCESSORIES

	£	s.	d.
1 Fuller 120-volt Super Capacity H.T. Battery	15 3
1 Fuller 9-volt G.B. Battery	1 0
1 Fuller 2-volt 30-amp. L.T. Accumulator	10 3
1 Blue Spot L/S Unit, 66K	1 5 0

TO INLAND CUSTOMERS—Your goods are despatched Post Free or Carriage Paid.

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

JIFFILINX

Wire every set you build with Jiffilinx. They eliminate soldering and give perfect contact.

Each packet contains 40 assorted lengths of insulated connecting wires fitted with gripfast ends. Ample to wire a large set. Easily shaped to any angle. Ideal for quick "hook-ups." Can be used over and over again.

Price 2/6 per packet

See also pages 423 and 431

Ready Radio Ltd

159 BOROUGH HIGH STREET
LONDON BRIDGE · S·E·1

PHONE: HOP 3000 GRAMS: READIRAD. SEDIST

HEAD OFFICE AND WORKS
EASTNOR HOUSE · BLACKHEATH
PHONE: LEE GREEN 5678

To Ensure Speedy Delivery, Mention "A.W." to Advertisers

PERFECT CONTROL BY PRECISION INSTRUMENTS

For J.B., years of specialisation have been years of progress. J.B. have gone on from success to success, making tuning still simpler and still more accurate.

J.B. design ensures electrical and mechanical perfection. J.B. precision results in un-failing accuracy and balance. J.B. workmanship and J.B. materials perfect a range of Precision Instruments scientifically designed by practical engineers.

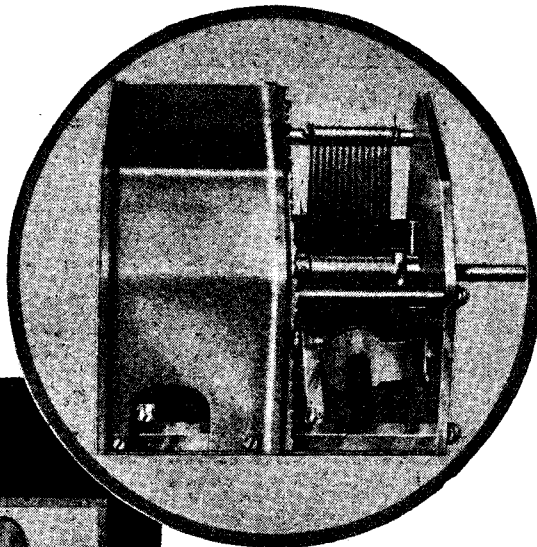
New products not illustrated on this page include a J.B. Extenser with many exclusive features, including switch contacts that are individually adjustable. Yet the price is only 14/6, complete with Illuminated Vernier Disc Drive. Then there are Air-spaced Differential Condensers at 4/3, Base-board Trimming Condensers at 1/-, etc., etc.

SEE THEM ALL AT

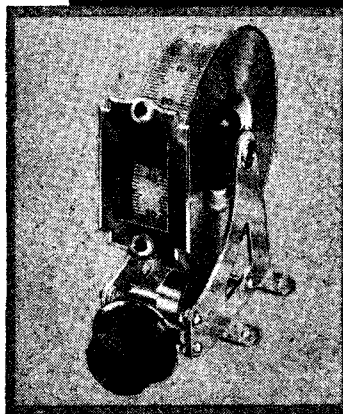
STAND 62
NATIONAL RADIO EXHIBITION, OLYMPIA



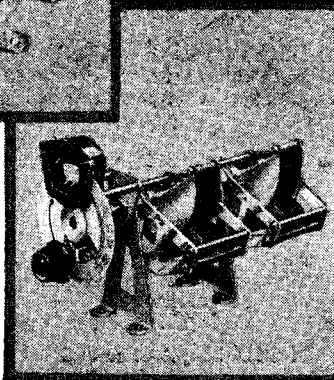
PRECISION INSTRUMENTS



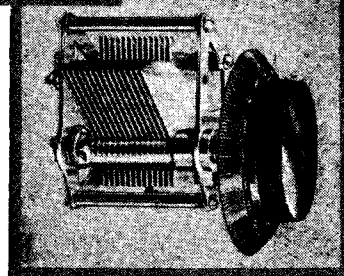
J.B. ENCLOSED GANG
(.0005). Extremely rigid. Totally enclosed. Units matched within 1% and fitted with .0001 "trimmers." Mounts on side or base.
2-Gang 20/- 3-Gang 29/6



**BASEBOARD
DRUM DIAL**
for use with above and all ganged condensers. 4-in. drum. Ratio 16-1. Oxidised silver or bronze panel plates 7/6



TYPE U.20.
2-GANG
for use with Varley "Square Peak" Colls. Complete with Illuminated Disc Drive calibrated in wavelengths 24/-
Type U.30. 3-Gang 34/6



POPULAR
Extra heavy gauge brass vanes. Nickel-plated frame. High-grade ebonite insulation.
SLOW-MOTION TYPE (35-1), as illustrated, with 3-in. dial .. 8/6
PLAIN TYPE 6/-
4-in. dial 1/6 extra.

Advertisement of Jackson Bros., 72 St. Thomas' Street, London, S.E.1. Telephone: Hop. 1837

Advertisers Appreciate Mention of "A.W." with Your Order

THE NEW STANDARD OF VALUE

LOTUS ALL-MAINS

LUXURY SET for £14.14.0

for A.C. & D.C. Mains

**MAGNAVOX MOVING
COIL SPEAKER - -
MAZDA VALVES - -
IRRISISTIBLE H.P. TERMS**

Never before have such outstanding features, such a luxurious cabinet, such magnificent reception been available at such a low price.

The new Lotus Table Console is made for both A.C. and D.C. Mains. It is conceived and designed by J. Sieger, the famous radio engineer, who is now a member of the Lotus Research Laboratories.

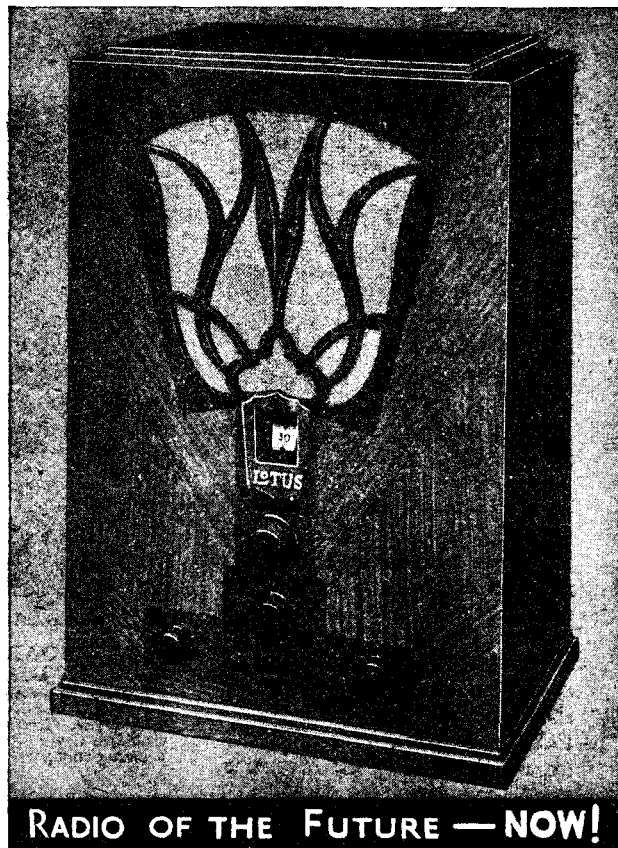
One-knob Tuning, and All-mains operation make for the acme of simplicity. The Magnavox Moving-coil Speaker, Mazda Valves, S.G., Detector and Power, make for unequalled reproduction. Guaranteed full strength, perfect reproduction of 12 European Stations.

The Lotus Table Console is entirely self-contained in a beautifully polished walnut cabinet of matchless proportions and finish.

**TRULY THE RADIO OF THE FUTURE—
NOW!**

The Hire-purchase Terms are irresistible—27/9 deposit secures this marvellous set, the balance being paid in 11 monthly instalments of 27/9 each. Ask your dealer for a demonstration.

Cash Price £14 14s., A.C. or D.C



RADIO OF THE FUTURE — NOW!

TABLE

CONSOLE



**THE WORLD'S KEENEST TUNING
KEENEST PRICED POWER SET** 

**ALL
BRITISH
MADE**



Advertisers Appreciate Mention of "A.W." with Your Order



LOTUS

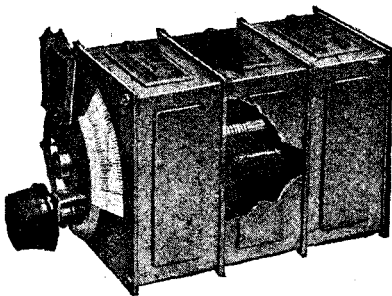
A complete range of new Components at keenly competitive prices by J. Sieger, the famous radio designer.

In addition to the new Lotus Components illustrated below, there are many new lines, including Gang Condensers, Transformers, Chokes, Switches, Slow-motion Drives, etc. You will be interested in the complete range, write to-day for full descriptive list.

SPECIFIED FOR THE "OLYMPIAN THREE"

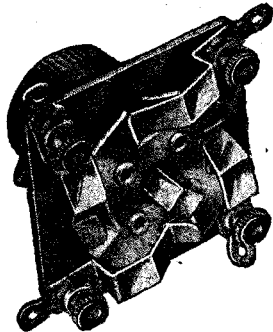
Lotus 3 Ganged Condenser; Lotus Reaction Condenser; Lotus Valve Holders; and the Lotus Jack JK5.

Famous from the earliest days of broadcasting, Lotus Components have always enjoyed the esteem of the radio constructor. This year many new lines have been born from the Lotus Research Laboratories. Designed by the genius of J. Sieger, and manufactured with the unequalled resources of the Lotus Works and experience, they are miracles of efficiency and value. In no case has quality been sacrificed for price. Nevertheless, through highly intensified production, they are within the reach of every pocket. All the leading set designers specify Lotus. They know that for reliability and efficiency they are absolutely dependable. Follow the expert's lead—insist on Lotus Components.



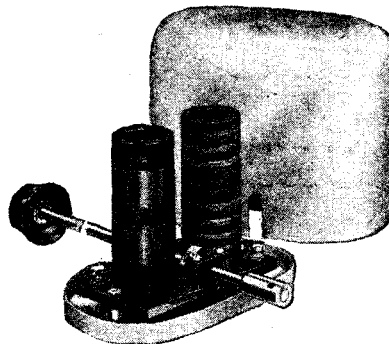
GANGED CONDENSERS.—Each unit is totally screened and precision matched, and sturdy construction ensures lasting accuracy. With Disc Drive, 5/- extra, or with Drum Drive, 7/6 extra.
3 Gang, 30/-
4 Gang, 40/-
(as illustrated)

2 GANG
20/-



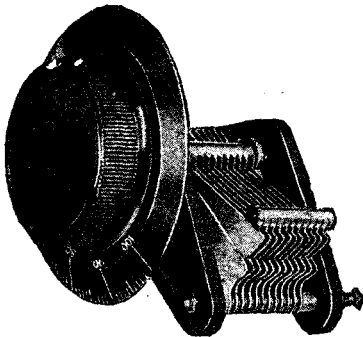
UNIVERSAL SWITCH.—A provisionally patented rotary switch with self-cleaning contacts. Easily ganged. For many types of switching arrangements.

1/6



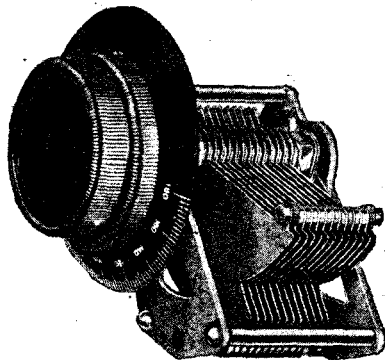
BINOCULAR DUAL-WAVE COIL.—Long and short wave windings on separate formers, silent wave-change switch. These coils are all matched and can be ganged. Completely and compactly screened. Designed by J. Sieger for hair-line selectivity.

10/6



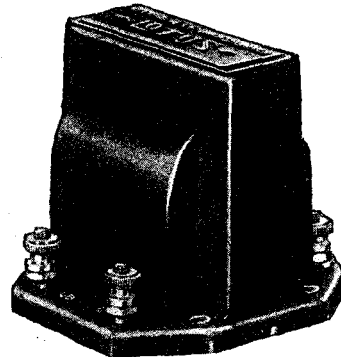
RIGID DRIVE LOG CONDENSER.—An inexpensive but reliable component for the home constructor. With knob-dial, .0003 and .0005 capacity.

3/6



SLOW-MOTION CONDENSER.—Stout construction with integral ball-bearing slow-motion device. Complete with knob-dial. Capacity, .0003 and .0005.

6/6



AUDIO TRANSFORMER No. 1. An inexpensive instrument for the home constructor. It is remarkably efficient and has a good straight-line amplification curve. Ratios, 3-1 and 5-1.

5/6

LOTUS RADIO LTD., MILL LANE, LIVERPOOL Ⓢ

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention



*See it on
Stand 44*

THE NEW

WESTINGHOUSE

METAL RECTIFIER

STYLE H.T.8.

which gives an output of
250 volts 60 milliamps *(after smoothing)*

*A complete range of all our other units will
also be on view.*

*Call at the Stand for a copy
of the 1932 "All Metal
Way," which gives full
details and circuits, etc.*

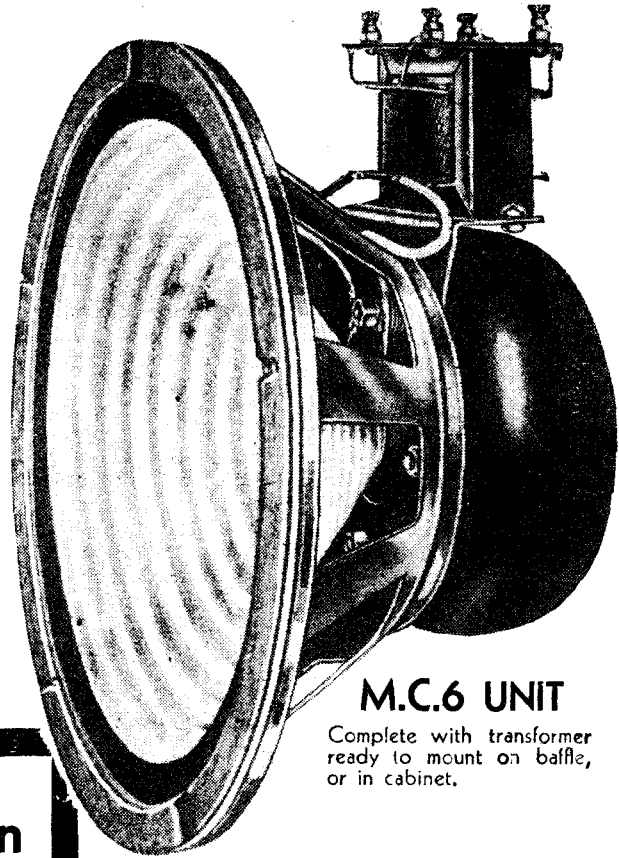
The Westinghouse Brake
& Saxby Signal Co., Ltd.,
82 York Road,
King's Cross, London, N.1

A MOVING COIL UNIT BY AMPLION

FOR 67'6

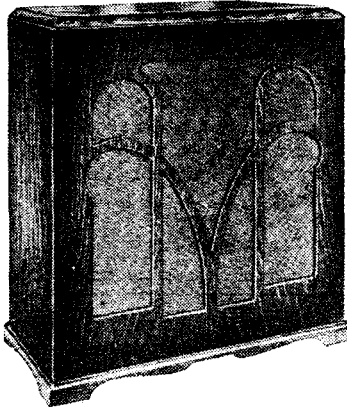
THE famous Amplion M.C.6 Unit is acknowledged as representing the best value and the greatest efficiency amongst small permanent magnet moving coil speakers. Its reproduction and sensitivity are really remarkable, and it will handle without distortion adequate volume for all normal requirements. It requires no external excitation and the universal transformer which is fitted, enables the speaker to be correctly matched to either Power, Super Power or Pentode output from standard British 2, 3, or 4 valve receivers.

Make a point of visiting the Amplion Stand No. 75 in the EMPIRE HALL, Olympia, during the Radio Exhibition, where all AMPLION Moving Coil Speakers will be working.



M.C.6 UNIT

Complete with transformer ready to mount on baffle, or in cabinet.



**Also in
Handsome
Cabinets**

(complete with transformer)

The M.C.6 Unit is also available in handsome cabinets of very modern and striking design. The oak model is illustrated here.

M.C.6 Oak £5-10-0

M.C.6 Walnut £5-19-6

Available on Deferred terms

Graham Amplion Ltd., 26, Savile Row, W.1

M.C.9 MODELS

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

M.C.9 UNIT ONLY £6 - 0 - 0

M.C.9 OAK - - £9 - 9 - 0

M.C.9 WALNUT £10-10-0

All M.C.9 models are available on deferred terms. Both the Cabinet Models are fitted with matching transformers.

D.C. ENERGISED MODEL

A most efficient unit for D.C. Voltages 100/110, 200/240, very suitable for A.C. sets. Unit only.

29'6 Unit with matching transformer **42'6**

Write for folder W.L.51, which gives full details.

royds

MAKING MOVING-COIL CONES

THE moving-coil loud-speaker is the best available at the present day, but many amateurs refrain from making one up themselves owing to the difficulty of constructing a suitable cone. For the balanced armature or reed speaker, the construction of the cone is a simple matter only requiring a suitable piece of paper and a glue pot. But the moving-coil cone with its attached speech coil appears on the face to be an entirely different proposition. However, a careful worker will experience no particular difficulty if he follows the following brief notes.

We may divide the component parts of a moving-coil cone as below:—

- 1.—The cone itself.
- 2.—The speech former.
- 3.—The speech coil.
- 4.—The leather suspension and ring.
- 5.—The spider suspension.

The paper for making the cone should be fairly stiff and about ten-thousandths of an inch in thickness; furthermore, it must not crackle when bent by the fingers. Some cartridge papers will serve well enough for the purpose providing they are not highly glazed.

Cutting the Cone

For amateur construction a cone having a major diameter of about 7 in. will be found very suitable and this is gaining popularity since it necessitates only a small field coil. A hole will have to be cut in the middle of the disc to accommodate the speech coil former which, with the cone size just mentioned, can be round about 1 in.

Before completing the cone cut-out, the former itself should be made. Take some ordinary adhesive paper such as is used for packing and after moistening, wrap tightly round a rod or circular cylinder of wood, having a diameter about $1/64$ -in. greater than the pole piece. The latter can con-

veniently be made from 1-in. diameter mild steel rod which may be obtained through local ironmongers. The size of the former will then work out to be $1\ 1/64$ in. Adhesive paper is usually about .006 in. in thickness and two, or at the most three layers, will be found adequate. The little paper cylinder should not be removed until it is thoroughly dry which will take twenty-four hours at least.

The length of this former must then be determined by a consideration of the dimensions of the basket and angle of the cone. Winding the speech coil is a delicate little operation, but need cause no particular difficulty. Generally speaking, 40-gauge enamel copper wire is employed and is wound in two or three layers so that the outside dimensions of the layer is about equal to the thickness of the side poles of the electro magnet. Between each layer a slip of thin tissue paper should be placed and held in position by shellac solution. The former, complete with speech coil, should now be thoroughly painted with a thin shellac solution, and afterwards baked in an oven for an hour. By the end of this time the thin cylinder will be perfectly rigid.

Reverting now to the cone we scribe the circle at the centre having a diameter equal to that of the outside of the speech coil former just prepared. Another circle is then drawn with a diameter of $3/8$ -in. less than the previous one and this circle is cut out. By nicking with a penknife, small tabs may be formed which, when turned down, will provide a means of attaching the cone to the speech coil former. The cone itself may now be drawn into position and stuck, preferably with a celluloid type of cement such as that now sold as Durafix.

In sticking the speech coil former to the cone the wooden plug used in winding the former should be employed so as to make the whole job rigid. The little tabs on the cone should be first moistened with the

cement previously mentioned and then tied in position by a small piece of copper wire which is removed so soon as the sticking is complete.

We now come to the leather suspension. Any sort of leather will serve providing it is soft enough. It should be emphasized, however, that ordinary wash-leather is far too thick. Four leather segments can conveniently be cut leaving no room for overlapping as this will probably cause trouble if attempted. It will be found quite easy to attach the leather segments to the cone by turning them inside the latter and using a celluloid cement. The outer diameter of the leather segments can next be trimmed and the cone is then ready for sticking to the base ring which can be cut from stiff cardboard, having a thickness of nearly $1/8$ in.

Making the Spider

The final and perhaps the most difficult item is the spider. Many loud-speakers on the market at the present time utilise a perforated disc stuck inside the cone, whilst others are supported from the outside. Probably the former is easier of construction for the amateur. Experience shows that the actual tone of the loud-speaker depends to a large extent upon this spider and thus the material should be chosen with care. A useful material for the purpose is known as vulcanised fibre and a piece $15/1000$ th in thickness will be found suitable. This may be cut to shape with a sharp penknife and attached inside by celluloid cement. In fixing the spider care should be taken that it does not bulge in either direction as this will most certainly affect the quality of reproduction.

Finally, a word of warning must be given relative to rattles. Every point of the speaker cone should be gummed very securely as a slight looseness, imperceptible to the eye, will be sufficient to mar the operation of the instrument.

COMPLETE GUIDE TO SHOW

(Continued from page 432)

Stand 251. Dayzite, Ltd., 17 Lisle Street, W.C.2.

Stand 252. J. J. Eastick & Sons, 118 Bunhill Row, E.C.1.

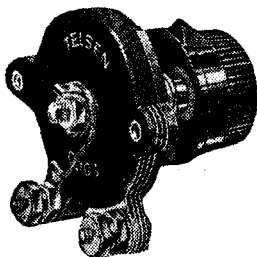
Eelex terminals, earth bowls, safety switches and testing prods

can be seen, together with Byldurone cabinets, and a comprehensive range of sets and speakers of various makes.

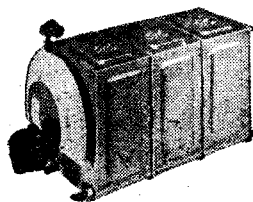
STAND Nos. 251—254

Stand 253. Department of Overseas Trade, 35 Old Queen Street, S.W.1.

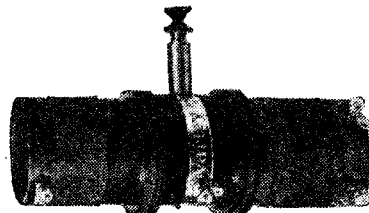
Stand 254. British "Wireless for the Blind" Fund, 226 Great Portland Street W.1.



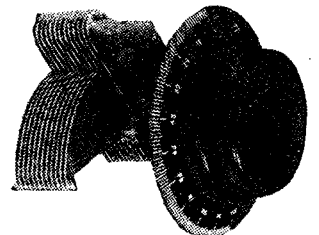
A handy solid di-electric .0003 mfd. condenser by Telsen.



Lotus triple-gang condenser



The Varley band-pass tuner which is used in our Exhibition set, "The Olympian Three,"



Formo panel-mounting condenser with plain knob and dial

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INDUCTOR DYNAMIC LOUDSPEAKER**

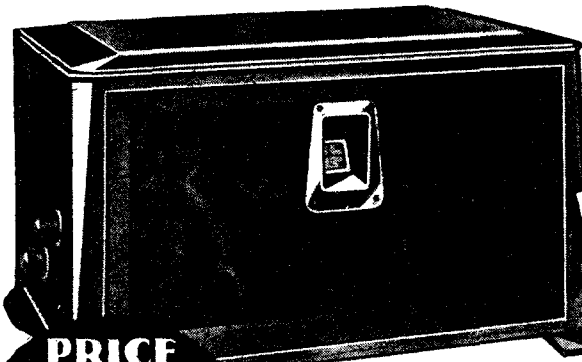
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GUINEAS**



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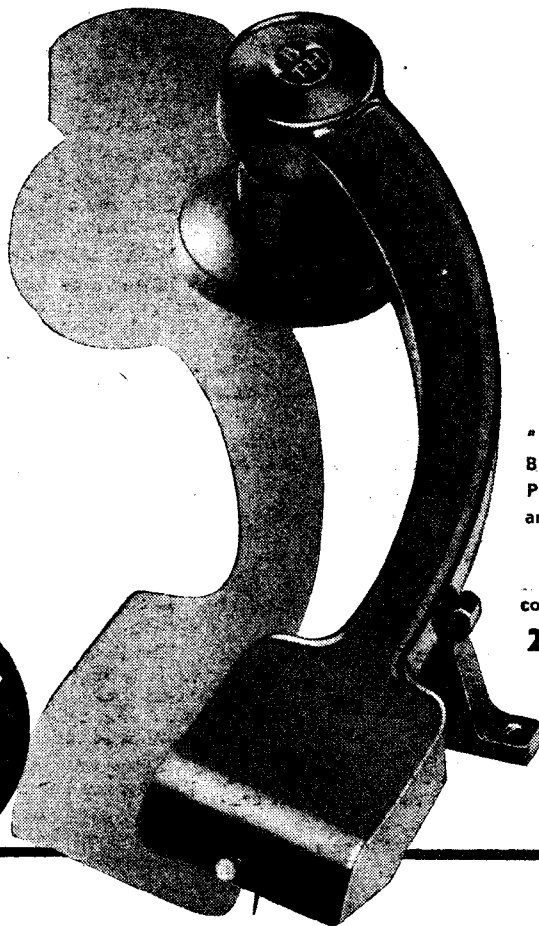
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and Tone Arm

PRICE

27/6



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A B.T.H. Pick-up and tone arm is the choice of leading radiogram experts—the choice of the enlightened home constructor—the pick-up that's chosen when a man "must have the best."

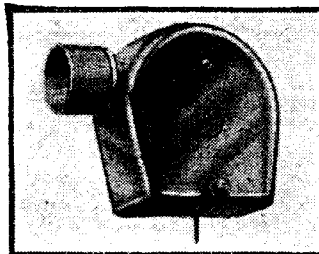
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W. 160

Do not Miss

The complete range of parts, from valve holders to tuning coils, on the Telsen Stands 19 and 213.

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Coils and assemblies for super-het. enthusiasts on the Lewcos Stand, London Electric Wire Co., & Smith's, Ltd., 97.

On Stand 4 the complete range of Marconi-phone pedestal and console model sets, incorporating the very latest receiver chassis.

Accumulators and a wide range of high-tension batteries, employing a new chemical principle on the Pertrix Stand 39.

The new speaker on the Ediswan Stand 21.

The latest Radio for the Million sets on the Mullard Stands 18, 80, 199, and 221, and Mullard valves, of course.

The new Varley coils as used in our Exhibition set on the Stand of Oliver Pell Control, Ltd., No. 58. Also the new Varley set constructor parts.

On the Bulgin Stand 102, the new switches, fuses, and literally hundreds of other home constructor parts.

Super-het. coils, super-het. assemblies, high-frequency chokes, and frame aerials on Stand No. 152 of Wright and Weaire, Ltd.

J.B. condensers which have special facilities for use in connection with bandpass tuning sets, because of the excellent ganging, on the Jackson Bros. Stand 62.

On Stand 7, all the new Columbia sets.

Extremely low-priced parts for set construction on the Graham-Farish Stand.

New sets and the 1932 range of mains eliminators on the Regentone Stand.

W.B. speakers and valve holders on Stand 46.

Eliminators for all sets and a number of output and mains chokes on the H. Clarke and Co. (Manchester), Ltd., Stand 33.

A new range of Utility condensers shown by Wilkins & Wright, Ltd., on Stand 90.

A cabinet to suit your new set shown by the Carrington Manufacturing Co., Ltd., on Stand 51.

On Stand 25 a fine super-het. just produced by Kolster Brandes, Ltd.

A complete range of home constructor parts on the Lissen Stand 17. And Lissen high-tension batteries, of course.

Readi-Rad parts and set kits on Stands 6 and 93.

The Senior permanent-magnet cone speaker with a high-grade cobalt-steel magnet and 10-in. corrugated cone on the Ediswan Stand. Also the mains-fed moving coils, the A.C. editions of which have Westinghouse rectifiers.

A four-valve kit set with two S.G. stages on the Osram Stand.

The new Mazda Pen 220, a fine pentode valve with remarkable characteristics, on the Ediswan Stand.

A selection of list of parts for the AMATEUR

WIRELESS "Century Super," together with many other famous "A.W." kits on the Peto-Scott Stand.

The Celestion type R.P.M. permanent-magnet moving-coil speaker on the Celestion Stand. Also the new type W.5 Celestion pick-up.

The several new moving-coil speakers fitted with integral input transformers on the Ormond Stand.

Ten-volt high-tension accumulator units on the Oldham Stand. These make up into full size accumulator H.T.'s of any desired voltage.

The very handsome Blue Spot type 44R cabinet speaker; also the new type 70R.

The new Readi-Rad tapped output transformers, the Instamat and Instamat Major.

On the Tannoy Stand a fine midget all-electric table-type set, complete with speaker mounted above the set chassis.

The Chassikit assembly for set-builders on the Six-Sixty Stand. On this you can make up many standard types of receiver.

New electrolytic condensers from 4,000 microfarads downwards on the T.C.C. Stand 14.

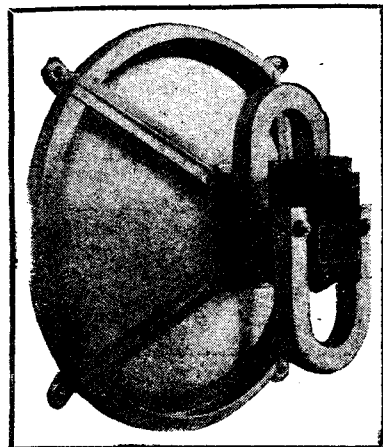
Handy connectors, terminal strips, and terminals on the Belling-Lee Stand 13.

On Stand 71 the Exhibition set described in this issue. A member of the "A.W." Constructional Staff will be there to show amateurs how easy set construction can be. Don't miss our Stand—

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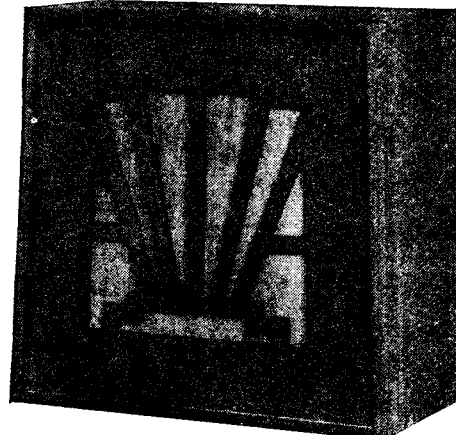


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AT THE OLYMPIA EXHIBITION



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Postcard Radio Literature

New H.M.V. Sets

THOSE who go to the special H.M.V. Demonstration running concurrently with the Olympia Show will see for themselves the new radio-grams, produced by the Gramophone Co. Those who cannot see this most interesting exhibit should write through my Free Catalogue Service for literature describing the whole range from the nine-valve radio-gram, down to the small table models. **356**

W.B. Speakers

The new W.B. speakers are well worth seeing. Take my tip and get a folder giving full technical details. **357**

New Condensers

I like the new Utility condensers. They suit many sets. Home constructors should have details of these on hand. **358**

Mullard Sets

The new Mullard kits are most inspiring and if you have not yet made the acquaintance of latest editions, such as the 1932 kit set described last week by "Set Tester," then write for the latest literature. **359**

For Mains Users

"An H.T. unit to suit every set," seems to be the slogan adopted by H. Clarke & Co. (Manchester), Ltd. If you want details of the new D.C. and A.C. jobs, get a catalogue just issued. **560**

Telsen Parts

I referred just recently to the well-illustrated catalogue available, giving details of all the parts in the Telsen range. There is a big demand for this and if you want a copy, then write before the edition is out of print. **561**

Ever Ready H.T. Batteries

Ever Ready have just sent me a folder describing the whole range of Ever Ready high-tension batteries from the popular portable up to the big 120-volt power types. Grid-bias batteries are also described in this catalogue and all battery users will find this handy for reference. **562**

New Varley Parts

All the new Varley parts, transformers, chokes, resistances, and so on, are described in the latest Varley folder. The new Varley slogan is "Quality at Popular Cost," and this certainly is borne out by these new parts. OBSERVER. **563**

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W.B. PERMANENT MAGNET MOVING-COIL SPEAKER, TYPE P.M.3. With 3-ratio input transformer. **5/10**
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THE HOW AND WHY OF TUNING-II

INDUCTANCE AND CAPACITY EXPLAINED

The second of a short series of articles on tuning, specially written for newcomers to Wireless. Here the first ideas about tuning are presented. In the articles that follow, "Hotspot" will deal with all the difficulties about tuning that the beginner is likely to meet

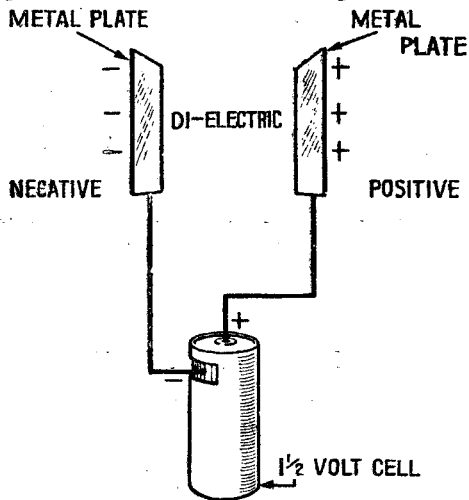
READERS who propose to keep me company in this series of simple articles on tuning must now learn something about each of the two ingredients of tuning, which are, as I explained last week, inductance and capacity. It is no use pretending that when we understand the nature of inductance and capacity we shall understand tuning. The truth is that tuning consists of oscillatory circuits. But since an oscillatory circuit acts by the aid of inductance and capacity, it is clear that a knowledge of these two ingredients will help us along.

Firstly, let us examine capacity. How is it formed? And when formed, what does it hold?

I expect these are two of the first questions that are asked. I know they occurred to me! Well, the capacity can be formed by any two conducting plates. That is, if we choose two flat pieces of copper or aluminium or some such metal, we can form a "voltage container" that will have a certain capacity for storing electrical energy. Which answers the second question, does it not?

Condenser Action

Suppose we start with a source of electricity, namely a 1½-volt cell. If we connect one of the two plates to the positive pole of the cell and the other plate to the



A simple diagram explaining condenser action

negative pole of the cell, the condenser action of the two plates is started. See the accompanying diagram.

The two plates shown by the diagram are supposed to be well separated. When the cell is first connected up, there is great activity among the electrons, which flow from the positive plate through the cell to plate marked negative. This is only a momentary action, for a state of equilibrium is soon established.

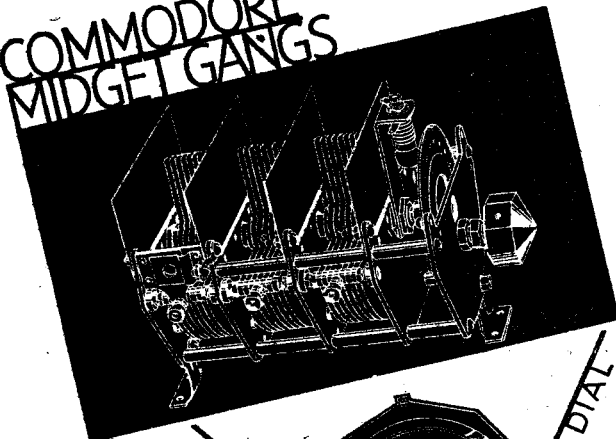
The electron movement or, as we ought to call it, the electric current, will cease as soon as the potential difference between the two plates is the same as that between the poles of the cell. This state will be when the plate connected to the negative pole is crowded with electrons and when the plate connected to the positive pole has lost enough electrons to enable the positive ions left to exert sufficient attraction on remaining electrons to prevent them from departing.

Now we must see what happens when the two plates are brought closer together. The effect of the positive charge on one of

(Continued on page 446)

SENSATIONAL NEW DEVELOPMENTS

COMMODORE MIDGET GANGS



1. CYLDON COMMODORE MIDGET GANGS

CYLDON Midget Gang Condensers for modern sets, particularly those incorporating the VARLEY SQUARE PEAK COIL. Rigid pillar construction, perfect insulation, accurately matched sections separated by massive polished end plates carrying extended interstage screening. Provision for mounting trimmers. A modern condenser embodying all the latest technical refinements. Fitted with wedge friction slow motion drive, if desired.

Single Condenser S.P.1	3 Gang S.P.3 Plain Type 25/6
Plain Type - - - - - 9/6	3 Gang S.P.3V
Single Condenser S.P.1V	Slow Motion 31/6
Slow Motion - - - - - 15/6	4 Gang S.P.4 Plain Type 33/6
2 Gang S.P.2 Plain Type 17/6	4 Gang S.P.4V
2 Gang S.P.2V Slow Motion 23/6	Slow Motion 39/6

Trimmers for above 1/6 each.

2. CYLDON SLOW MOTION DIAL

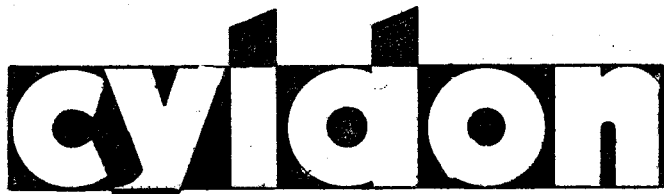
New wedge friction drive, CYLDON Duplex Illuminated Slow Motion Dial, 8:1 reduction, non-slip, rotation in same direction as condenser, illuminated scale, hair-line sight. Sector vision. CYLDON are proud of the first CYLDON Slow Motion Dial. Price 7/6

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- 3 Production of non-microphonic valves even under most exacting conditions of use.

THE NEW "WEMBLEY" FILAMENT MEANS MORE RELIABLE WIRELESS, PURER TONE AND MORE FOREIGN STATIONS.

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2-volt VALVE
FILAMENT
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EMISSION
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Valves
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Don't Forget to Say That You Saw it in "A.W."

"INDUCTANCE AND CAPACITY EXPLAINED" (Continued from page 444)

the plates is then to cancel out part of the electric field created by the negative charge on the other plate. The effect of the negative charge on one plate is also to cancel out part of the positive charge on the other. The net result of quickly bringing the plates together is therefore to lower the potentials on each of the plates. The equilibrium is, in fact, upset, and so there is another momentary flow of electrons, until the potential difference between the plates is again equal to that between the poles of the cell.

Since the charging up of the two plates creates a field of force around the plates, it is clear that the intervening medium between the plates must play an important part. We call the intervening medium the dielectric. This is an insulating substance, that is, a substance in which there are no freely roving electrons, since all are tightly bound up in the atoms that form the substance. In this, a di-electric differs from a conductor, such as the substance of the two condenser plates, copper or aluminium, where the electrons are sufficiently mobile in the atoms to be dislodged if a sufficient incentive is provided, such as an electromotive force from a cell.

The Condenser Dielectric

The dielectric of the condenser has a definite function in the action of the condenser. For when the density of the electric field created by the charged plates is increased, as by bringing the plates closer

together, the electrons in the atoms of the dielectric are *tending* to go towards the positive plate, although, due to their rigid cohesion, they cannot actually get away. So, although the constitution of the dielectric is not changed by the charging of the two plates, the electron strain is increased. We will return to dielectric strain in a moment.

Now we ought to see what happens when the voltage applied to the plates of the condenser is removed, that is when the cell connection to the plates is broken. We shall then leave the condenser in a charged state, that is with one plate the voltage of the cell positive with respect to the other. So if we then join the two plates, a momentary current will flow, for the electrons at the negative plate will rush round to the positive plate until a state of equilibrium is re-established.

The strain on the electrons of the dielectric will be released and the tendency of the electrons to move towards the positive plate will be stopped. If we imagine the dielectric strain at the beginning to be a slight movement of the electrons of the dielectric substance towards the positive plate, without any exchange of electrons, due to the rigidity of the electrons in the atoms of the dielectric, then the final connection of the charged plates and consequently the cessation of the dielectric strain is clearly a movement back of the electrons to their original position in the atoms.

Since a current is caused by the joining of the two plates after the battery or cell has been cut out, it is clear that the plates must together store electricity. Capacity is simply the ability of the plates to store or preserve electricity, as imparted to them by a cell, for example.

Certain general considerations will now be fairly easy to grasp. For example, the capacity depends on the area of the plates, on the distance apart of the plates, and on the type of dielectric material. Later we shall consider in detail these and other attributes of the condenser, but for the present it will be enough to have understood that when a condenser is said to be charged it is really storing electrical energy in the form of an electric field between the plates.

Inductance Explained

Now for inductance, that other ingredient of tuning we must know something about before we can begin on oscillatory circuits.

When a voltage is applied to a circuit, consisting of, say, a length of wire connected across a cell, the current does not immediately rise to the value determined by the voltage applied and the circuit resistance. A certain time is required for this to happen. What stops the immediate rise of the current? The answer is the E.M.F. of self-induction.

This is the voltage that is always induced when the current is *changing*, as from zero to its maximum. Lines of force emanate

(Concluded on page 448)

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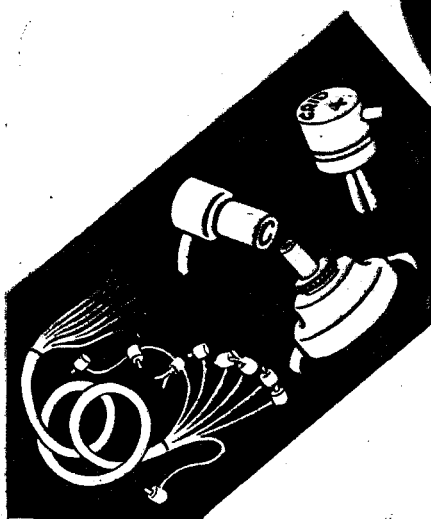
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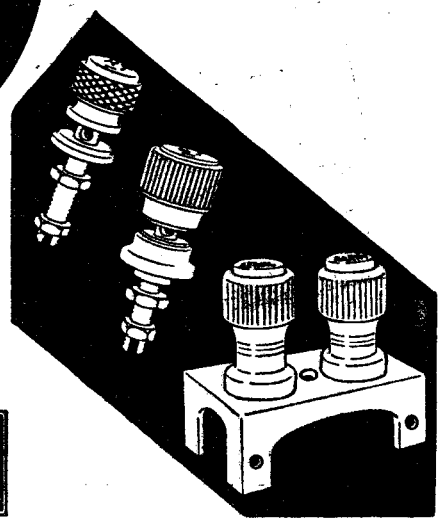
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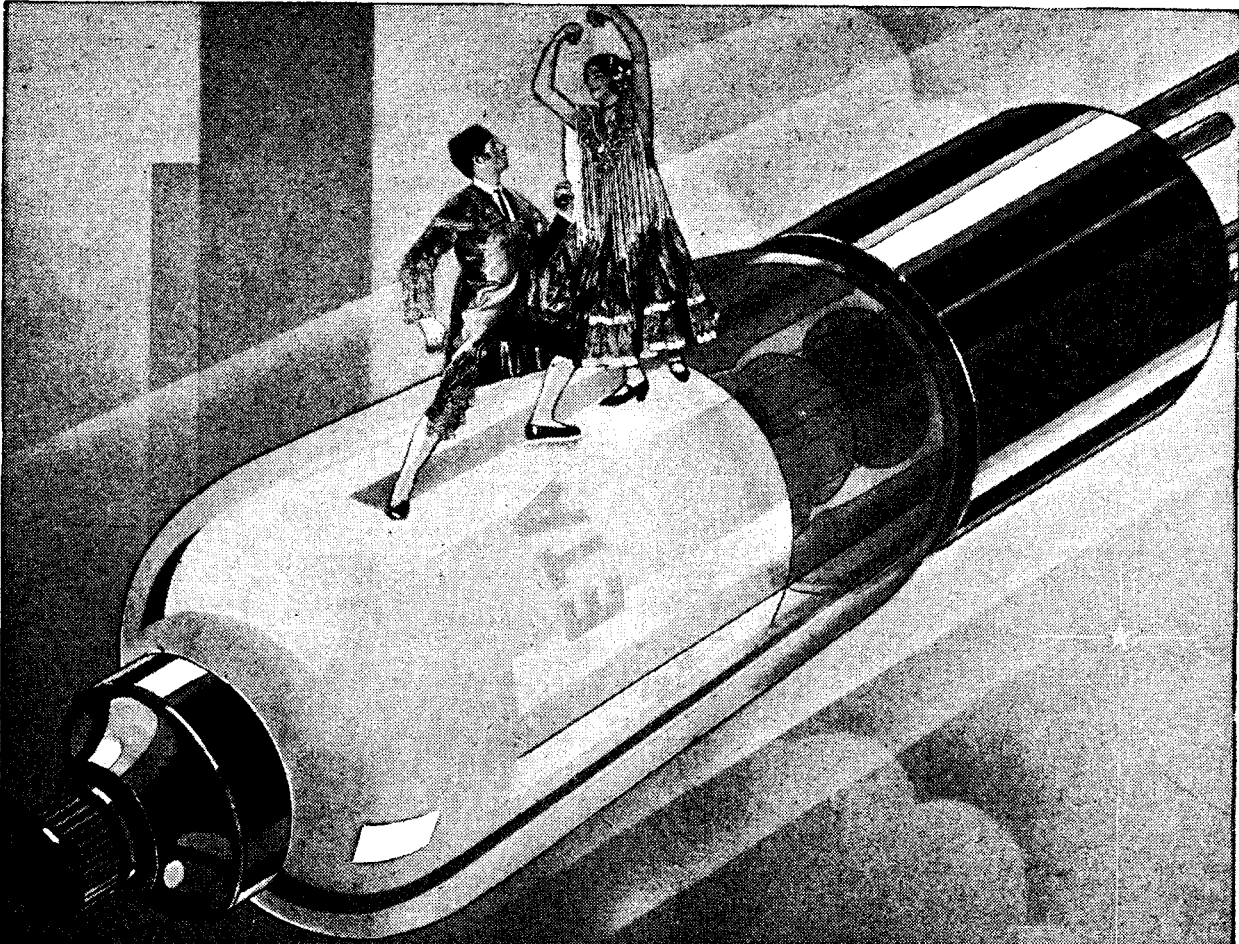
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"INDUCTANCE AND CAPACITY EXPLAINED"

(Continued from page 446)

from the centre of the conducting wire when the current is sent through it. These cut the conductor as they expand in concentric circles from the centre. Lenz's Law teaches us that this induced E.M.F. will always act in opposition to the E.M.F. causing the current flow.

The Opposing Current

Thus the effect of starting up a current round a conductor is to set up an opposition force that tends to delay the growth of the current. All the time the current is increasing, so are the lines of force forming this opposition. But as soon as the current has reached its maximum, the lines of force cease to increase and so the lines of force cease to cut the conductor. Consequently, the induced E.M.F. ceases.

From which we may gather that there is no E.M.F. of self-induction unless the current is changing in value. This is very important. In wireless we are dealing with currents of high frequency that are constantly changing in value, for they are alternating currents, waxing and waning in opposite directions many times a second.

Just as the current is delayed in its growth by the induced E.M.F., so is it sustained when the applied E.M.F. is cut off or reduced. Thus we see that this property of conductors of inducing an opposite E.M.F. is achieved whenever the current is changing in value, either increasing or decreasing. The effect is always to oppose

a change in the strength and also the direction of the current.

We can consider the action in another way for simplicity. The initial action of the current delay can be compared with the inertia of mechanical actions. In fact, this E.M.F. of self induction is electrical inertia. We also call it inductance.

Even a straight piece of wire has the property of inductance when a varying current is sent through it. The inductance value of a straight piece of wire is very small, but it can be greatly increased by coiling the wire, even though the actual length of wire is unaltered.

This week we have learned that one of the two ingredients of tuning, namely, capacity, is the property of a condenser of storing electrical energy; and that the other ingredient, which is inductance, is the property of opposing changes in current flowing through the wire or coil of wire.

There are several other facts that should be learned about inductance and capacity before the part they play in tuning can be really understood. Next week I will give these additional facts. **HOTSPOT.**

AN UNUSUAL ACCUMULATOR TROUBLE

AN unusual kind of accumulator trouble which recently came within the experience of the writer is worth recounting for the benefit of those readers who still use filament accumulators and who are in the habit of sending them to a local garage or charging station.

The incident concerned two two-volt

accumulators which were being used in series to provide filament current for four-volt valves. The cells, newly charged, were received from the charging station, but on being connected to the set in the usual way, failed to give any current at all. A voltmeter applied across the terminals gave no response at all, although a hydrometer test showed the specific gravity to be quite O.K. and all connections and terminals were absolutely free from corrosion.

As a last resort, they were separately tested for voltage. One cell read a perfectly good two volts on the meter, but when the meter was applied in the usual way to the other cell the needle merely kicked slightly backwards and returned to rest at the "0" on the scale.

This provided the clue to the mystery, and when it was found that the second cell gave a full two-volt reading by reversing the meter, (i.e., assuming that positive was negative and vice versa) the whole thing was clear.

The man who had handled the accumulators at the charging station had removed the red and black terminals, and when he replaced them, had inadvertently reversed them. On some cells this is not possible, because different sizes are used for the positive and negative terminals, but in this case they were the same size and the only indication of polarity, once both had been removed, was on the glass sides of the cells. Consequently, instead of being in series, the two cells were in opposition.

R. B.

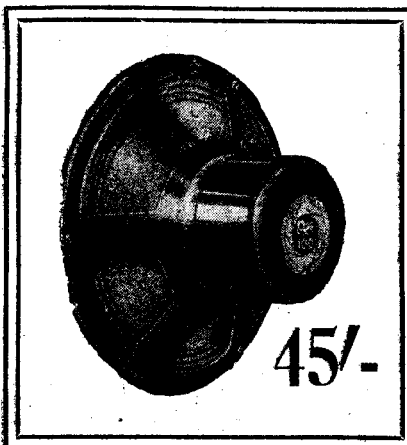
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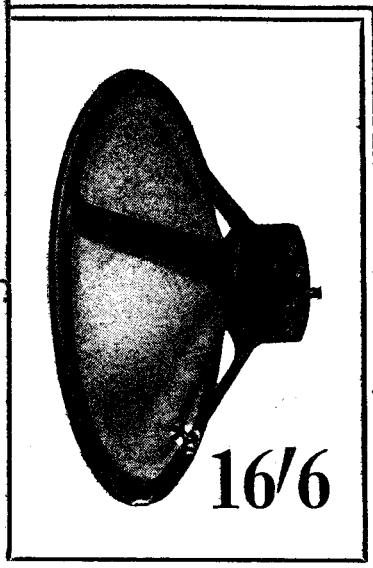
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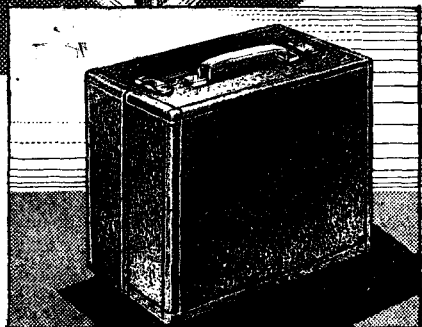
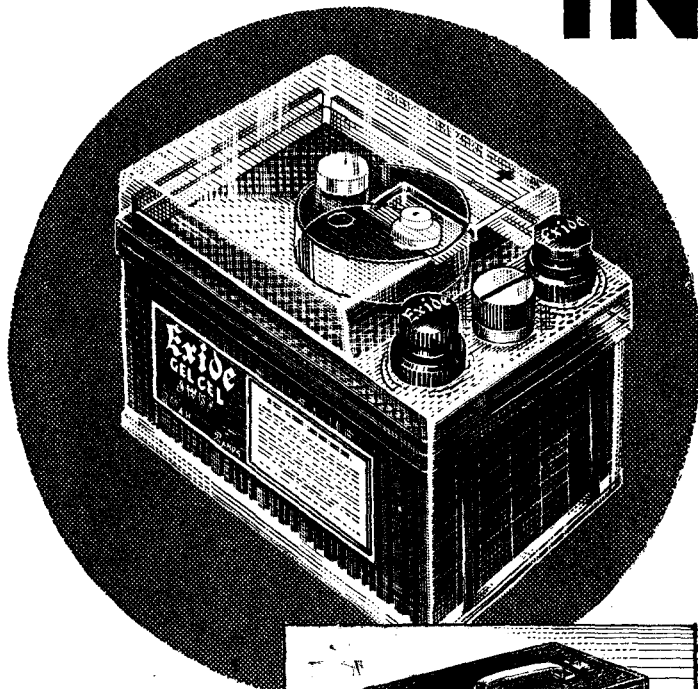
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IN MY WIRELESS DEN

Weekly Hints — THEORETICAL
CONSTRUCTIONAL & BY
W. JAMES

A Detector Matter

IN most sets the grid leak is taken between the grid of the detector valve and the positive side of the filament circuit.

Many detector valves work very well when the leak is connected in this way. But when it is essential that the greatest sensitivity be obtained, it is advisable to take the grid leak to a potentiometer joined across the positive and negative leads of the filament circuit.

When the contact of the potentiometer is moved the voltage of the grid changes a little and often a surprising difference in the results is obtained. Not only is the sensitivity varied, but the operation of the reaction circuit is affected and also the quality.

If the reaction is a bit "ploppy" when the grid leak is connected to the positive end, there is sure to be a point nearer the

negative side where this effect vanishes. Reception may sound a little better when the contact is about halfway instead of at the positive end of the potentiometer. In fact, the halfway position is often the most satisfactory. But it is easy enough to fit one and to find by experiment the most useful setting.

Humming Mains Units

Have you ever heard a hum from a mains unit? This is known as a mechanical hum and is due to vibration.

Transformers and chokes have cores composed of laminations. If one or two are loose and are, therefore, free to vibrate, they will do so under the influence of the magnetic field produced by the current flowing.

The humming may be stopped by tightening the core which is loose. A piece of wood may be driven between the bobbin and the

laminations to hold them, or they may be jammed and coated with wax or Chatterton's compound. Sometimes it is very difficult to stop the hum entirely, but there is usually no difficulty in reducing it to the point where it is not a nuisance.

Bolts used for holding the laminations should be tight. Fixing bolts must be tight, in fact, it is essential that parts such as chokes and transformers shall be well secured. The hum does not affect the set, and so will not be heard from the loud-speaker.

If you hear a hum and you are not quite sure whether it is a mechanical hum from the mains unit or a hum from the loud-speaker, short-circuit the loud-speaker terminals and listen to the unit. In this test the load upon the unit is not altered to any appreciable extent.

(Continued on page 452)

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(described in this issue)

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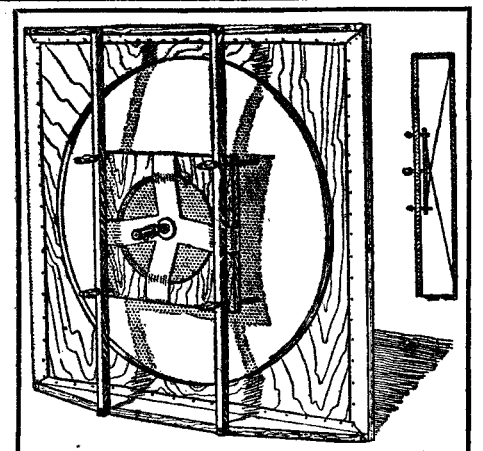
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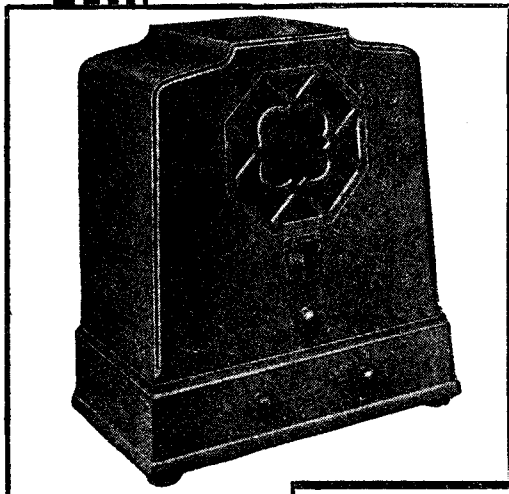
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"IN MY WIRELESS DEN"

(Continued from page 450)

Mind the Metal Screens

The effect of metal shields, metal parts such as tuning condensers, and even the metal electrodes of valves, upon tuning coils is most noticeable when ganging circuits.

You have, for example, a two-gang tuning condenser, the two parts having practically equal capacities in given positions. The two coils, too, may have equal inductances when they are tested.

But when an attempt is made to tune the circuits accurately, it is found that if they tune properly at a low wavelength they are out of balance at the top end of the range.

This may well be due to the fact that the inductance of one of the coils is being reduced owing to the proximity of metal. A piece of metal lying near a coil reduces its inductance. The extent of the reduction depends upon the state of the coil, as well as its size and the material, size, and position of the metal.

If you bring the metal nearer the coil the inductance falls off and the wavelength of the circuit is reduced. A few years ago there were sets tuned by altering the position of metal spades relative to the coils, so it will be understood that the tuning effect is considerable. The point is that coils should not be placed too near metal parts, particularly when matched coils are being used.

Stout-construction Cabinets

A cabinet used to house a set and speaker ought to be of stout construction.

The movement of the loud-speaker is likely to vibrate thin wood. This vibration is passed to the valves and the set generally, causing noises and poor results. The vibration may be sufficient to affect the detector valve so greatly that reception is impossible. Covering this valve sometimes helps, but as a rule the noise cannot be stopped without taking an amount of trouble.

In some designs the whole of the receiver is mounted upon rubber and the valves are shielded from air waves. The cabinet may be lined in order to deaden the vibration and pieces of wood may be fitted inside for the same reason.

It is usually necessary to have an open back, a few holes not being sufficient. It is surprising what trouble is caused by having the set and loud-speaker together in a cabinet of poor construction. Good thick wood ought to be used and the cabinet be strongly made.

A Good Test

A test that quickly shows how well the modern screen-grid valve is made is to connect a wire to the anode of the valve and to place it near the grid terminal of the valve holder.

You will find that the circuit will oscillate as the wire approaches the grid terminal. The wire must not be allowed to touch the grid circuit. I therefore use a covered wire.

When the screen-grid circuit is working normally it easily oscillates as the wire is placed close to the grid terminal. A reaction effect is obtained, but so little capacity is

needed that the length of wire is sufficient.

This test shows how important it is to screen the grid and anode circuits properly. Lack of sufficient shielding is often the reason for poor magnification and instability.

Complete screening is advisable in all cases, but where there is only one stage partial screening is sufficient, provided the parts are carefully placed. A compact arrangement is not likely to prove satisfactory unless the screening is good. The valves, too, ought to be shielded.

Tracking a Stray Noise

A noise, spoiling the reception, is a fairly common occurrence, but, fortunately, the fault is usually easily traced.

There are several methods of tracking the fault. One that is satisfactory in many instances consists in taking out all excepting the power valve. If the noise is still heard, it is probably due to a fault in the loud-speaker or its connecting cord, to the grid or high-tension circuits, or perhaps the valve itself is noisy.

Should there be no noise, put back the next valve, which is usually the detector. If the noise is now heard there is a fault in the detector circuit. Perhaps the valve is responsible, the coupling transformer, or the connection to the high-tension supply. Look over the detector circuit, including the grid condenser and leak.

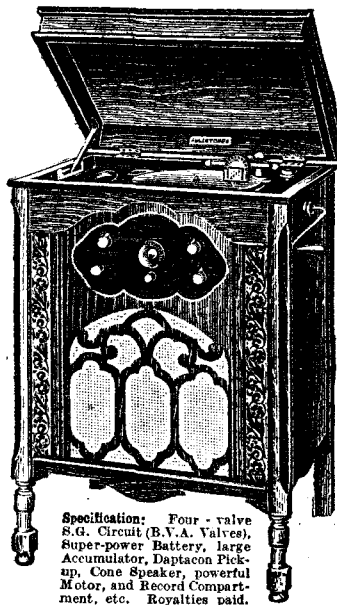
Finally, connect the screen-grid valve, if one is used, and if this brings on the noise the fault may be found in one of the tuning coils or condensers. Perhaps the valve is faulty or a by-pass condenser.

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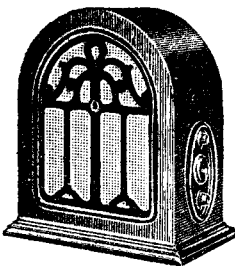
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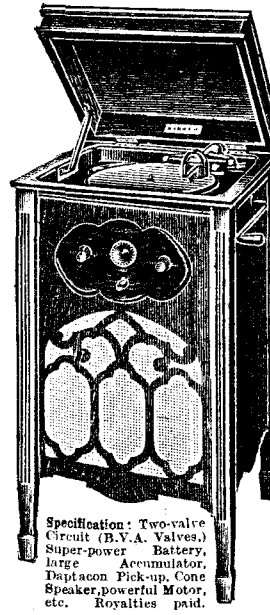
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OUR LISTENING POST

By JAY COOTE

IT is not often that a sleepless night brings its own compensation, but with me on August 29 last such was the case. On that evening at 9.36 p.m. the German dirigible *Graf Zeppelin* left Friedrichshafen on a non-stop flight to Pernambuco, Brazil. As it happened, towards 10 p.m. I happened to tune into Mühlacker, and from that station picked up an announcement which induced me to return to my wireless receiver after midnight. From the start the German station kept in touch with the airship, and in turn advised Radio Toulouse and Barcelona (EAJr) of the progress of the flight. Later, during the night, this duty devolved on the French transmitter. The *Graf Zeppelin* in return communicated with the stations and commented, amongst other things, on the excellence of the gramophone records which were being broadcast for the benefit of its passengers. Towards the early hours, as the dirigible approached Spain, Barcelona participated in the game, and from that moment from the three stations it was possible for any listener to keep in touch with the airship. On a previous flight a similar procedure had been adopted, but in the present instance the broadcasts were far more successful. Possibly you may have heard the dirigible, on the return trip to its home quarters, carrying out a similar programme.

Curiously enough, on that date I picked up also, via Kalundborg, the new Copenhagen interval signal. It is based on a very old Danish melody and sounds musical-box-ish, but I understand that it is produced by small felt-tipped hammers striking duralumin bars. It is very distinctive and pleasanter, by far, than the monotonous B.B.C. heart throb.

After several attempts on varying wavelengths in the vicinity of Rome's allotment, the Tallinn (Reval) station has definitely settled down on 445 metres (674 kilocycles). I am afraid, however, that the power of the Italian transmitter will prevent our hearing the Estonian broadcasts.

A Mystery Station

A new mystery station has cropped up in the ether; or is it only half a mystery? Almost on the top of Sottens and when this station has closed down you may hear on some evenings a Spanish transmitter. I cannot yet vouch

DO YOU KNOW?

THAT a hydrometer is the best way of testing the state of charge of an accumulator? On the instruction sheet of a battery you will generally find the acid's rated specific gravity and a hydrometer will enable you to keep this correct. Some hydrometers have coloured balls, which without bothering about the actual specific gravity figure, show the state of charge.

THAT where several baseboard-type fixed condensers are mounted close together you must take care that wires do not short between the terminals? In mains units it is sometimes usual to group smoothing condensers next to one another, and here double care must be taken because of the high voltage between the terminals.

for it, but I am told that Radio España, Madrid, has resumed its broadcasts. It had enjoyed a short life and had been closed for many months.

In the neighbourhood also of Huizen (298.8 metres) late on Saturday nights you will log broadcasts of gramophone records with frequent announcements in many languages, including English. Often when the latter is spoken a call is made to, "Mr. Macdonald, of California"—a peculiarly vague address. These transmissions usually take place after midnight and last until 2 or even 3 a.m. They emanate from Radio Idzerda, an experimental station at The Hague, Holland. The wavelength, as announced, is "about 300 metres." Not far below, on 291 metres, equally in the latish hours you will find Radio Lisboa, a privately owned transmitter at Lisbon working fairly regularly until midnight and sometimes until 2 a.m. The call: *Estação Radio Lisboa*, is repeated in Spanish, German, French, and English. The broadcast is S.B. on 42.19 metres on Mondays, Wednesdays, and Saturdays.

My reference to short waves prompts me to add that EAQ, Aranjuez, on 30.426 metres, can be heard on some evenings giving what seems to be a relay of the EAJ7 programme; on other nights the gramophone is brought into play. The call is EAQ (*Ay-ah-koh*) *Estación Español*, but in English it has been heard to describe itself as the Socialist Republican transmitter at Madrid. This is not an amateur effort, but an official station, Aranjuez (close to the Spanish capital), possessing several transmitters for short-wave communication with North and South America.

The Marseilles (France) station has definitely closed down. As already stated, most of it was burnt out, but there is no question of reconstruction. In its place the State authorities intend to put up their first high-power transmitter, possibly something in the neighbourhood of 25 kilowatts.

All Portable Sets need a spare -

Perfect
for all
Portables

C.A.V. Jelly Acid Cells are now offered at greatly reduced prices with still further improvements in design and additional types suitable for the latest popular sets. Buy a C.A.V. replacement cell for use whilst yours is being recharged and enjoy continuous reception. There is a C.A.V. type suitable for every Popular Portable.

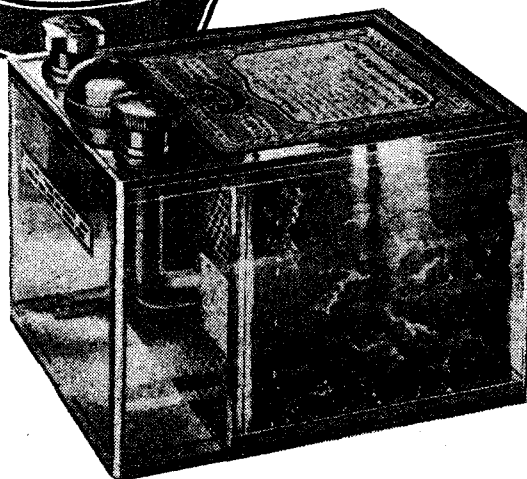
Examples of batteries for Popular Portables.

Pye Q and Marconiphone 55 - Type 2VN9/3 **12/6**
Pye Twintriple B4D - - Type 2VN11/1 **14/-**
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C.A.V. BATTERIES Ltd.,
WELL STREET, BIRMINGHAM.

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JELLY ACID



NON - SPILLABLE

BIG DEVELOPMENTS IN SCREENED CONDENSER DESIGN!



Realising the increasing importance of screened ganged condensers, "UTILITY" designers have produced this year a range of instruments which for construction and performance surpass all others. All the ingenuity of these experts has gone to the making and perfecting of these condensers. A new, high degree of matching has been achieved, and there are ingenious trimming devices to make any slight adjustment which might be necessary. Unlike most other ganged condensers "UTILITY" are so constructed that torsional stresses are impossible during tuning operations. This means that capacity remains balanced—the most important factor in securing correct tuning. The inclusion of a special feature, a ball-bearing centre spindle, provides an incredibly smooth action and dead accuracy of tuning.

SEMI-SCREENED	TOTALLY SCREENED
Cat. No.	Cat. No.
W.305/2 Two-gang 17/6	W.306/2 Two-gang ... 22/6
W.305/3 Three-gang (as illustrated) 22/6	W.306/3 Three-gang 27/6
Friction Dial 2/6 extra. (Prices of four-gang on application.)	

* Send a post-card for the new "Utility" Catalogue to:

WILKINS & WRIGHT LTD.
 UTILITY WORKS, HOLYHEAD RD., BIRMINGHAM

AGENTS—London: E. R. Morton, Ltd., 22 Bartlett's Buildings, Holborn Circus, E.C.1. Scottish: E. B. Hammond, 113 Vincent Street, Glasgow; Lancashire and Cheshire: J. R. Lister, 93 Old Road, Blackley, Manchester. Westmorland, Cumberland, Durham, Northumberland, Yorkshire and Derbyshire: H. C. Rawson, Ltd., 100 London Road, Sheffield.

Don't Forget to Say That You Saw it in "A.W."

NEW HIGH DEGREE OF MATCHING .. PERFECT SCREENING



STAND NO. 90

Belmont

THE B.B.C.'s STATION ON WHEELS

Our Special Correspondent describes the portable transmitter with which the B.B.C. tests its Regional sites

THE B.B.C. officially has seventeen stations, but at the Research Department at Clapham there is kept an eighteenth transmitter from which no listener has ever heard a note of music, and which does not feature in any broadcasting-station list!

It is the portable transmitter, as powerful as the old 2LO plant, which is used for testing Regional sites. No real broadcast from it has ever been logged because it transmits only C.W. test signals.

Testing Radiation

In the case of a projected station it is of importance to have an accurate idea of the radiation of the transmitter in the area it is intended to serve. Owing to a variety of causes, the absorption of the energy which is radiated may not be equal in all directions, or it may be that for some reason the transmitter radiates more strongly in one direction than in another. Often, also, both these effects are combined, so that the transmission in one particular direction may be weaker than in others unless precautions are taken.

When a site for a new station is being chosen the B.B.C. carries out site testing in order that an accurate idea of the suitability of the site may be formed, and the manner in which the aerials and masts should be put up can be ascertained. This enables

measures to be taken to ensure that radiation is as uniform as possible, having regard to the formation of the country surrounding the transmitting station. The B.B.C. uses a Marconi transmitter in a van.

A light van equipped with field-strength measuring apparatus cruises round the proposed site of the broadcasting station, where the mobile equipment is erected, at various different radii. At regular intervals measurement of the field strength of the signals in millivolts per metre is taken and plotted on a chart, and the result, the so-called "polar-diagram," shows the reception which may be expected around the transmitter if it is built on that site.

The mobile transmitting gear consists of a Marconi 6-kilowatt continuous-wave transmitter mounted in a spacious lorry on a Daimler chassis. This is provided with a special chain drive off the gear-box for running the 6-kilowatt alternator which supplies the power for the transmitting apparatus.

On the Broadcast Band

The transmitter can operate on any wave between 250 and 500 metres, and two 70-ft. masts are provided with three separate aerials, respectively 115, 210 and 230 ft. in length, to cover the waveband.

In site testing the strength of the carrier wave only is measured so that modulating

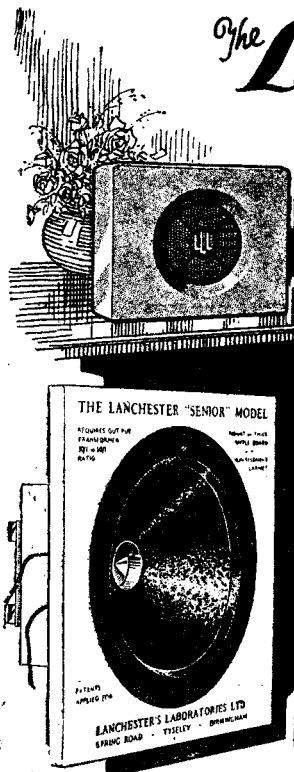
equipment is not fitted, and therefore no music or speech can be radiated. The transmitting equipment, as well as the masts and aerials, is carried inside the lorry. The power delivered to the aerial is approximately 2 kilowatts.

That Long Dash

A morse key operates an electromagnetically controlled signalling switch, which simultaneously interrupts the high-tension and low-tension supply. When opened the switch inserts a high resistance across the contacts in the high-tension circuit and a highly inductive choke is connected across the contacts in the low-tension circuit. This allows a small current to flow during spacing periods which ensures smooth keying. A special strap is fitted to the transmitting key which when closed causes the transmitter to emit a long dash until the strap is opened again.

Entering the lorry, on the right are fixed the H.F. tuning controls, the oscillation generator, the rectifying unit and control switchboard, below which are mounted the power transformer and smoothing choke. In the middle of the van against the back of the driver's seat is mounted the alternator, above which is a collapsible table. On the left are lockers carrying spare valves and accessories.

Although normally the lorry is only used for broadcasting, it may be desired to exchange signals between the lorry and other stations. For this purpose the van is fitted with a change-over switch, so that a receiver may be fitted, for which ample space is available.



The **Lanchester**

PERMANENT MAGNET MOVING-COIL SPEAKERS

You cannot afford to be without our 1932 CATALOGUE, beautifully illustrated, and containing full particulars and prices of our Season's products available from September 14 onwards.

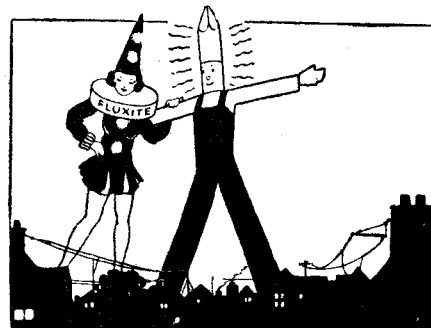
It contains in addition, a mine of useful information and is sent FREE and POST FREE.

Lanchester Speakers are sold direct to the public only, on 14 days' FREE TRIAL against cash with order or C.O.D.

We do not exhibit.

NEW MODELS.
HIGHER SENSITIVITY.
PRICES DEFY COMPETITION.

LANCHESTER'S LABORATORIES
TYSELEY LIMITED BIRMINGHAM



"We're Fluxite and Solder. The reliable pair. Famous for Soldering—Known everywhere! We've soldered all connections, And here's the reward—Good Programmes come clearly, From Home and Abroad!"

See that Fluxite and Solder are always by you—in the house, garage, workshop—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.

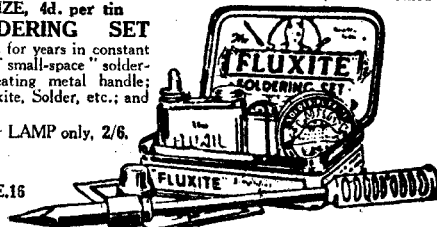
All Hardware and Ironmongery Stores sell Fluxite in tins, 8d., 1/4 and 2/8. ANOTHER USE FOR FLUXITE Hardening Tools and Case Hardening. Ask for Leaflet on improved method

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. 326)

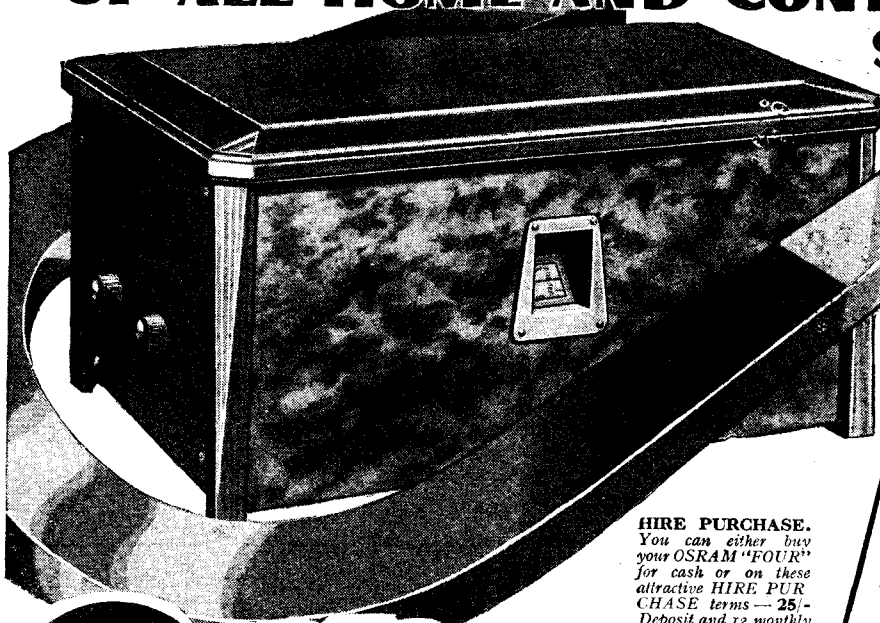
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ALL MECHANICS WILL HAVE
FLUXITE
IT SIMPLIFIES ALL SOLDERING

EVERYTHING **G.E.C.** ELECTRICAL

The MAGNET OF ALL HOME AND CONTINENTAL STATIONS



MADE IN ENGLAND.
Sold by all Wireless Dealers.

SPECIAL FEATURES

- 1 The two Screen Grid high frequency stages give extreme selectivity and sensitivity with an unrivalled range.
- 2 Enormous amplification with perfect stability is given by the complete shielding of H.F. Circuits.
- 3 Equal efficiency guaranteed on both wavelength bands.
- 4 Change of wavelength is effected by an external switch and the set need not therefore be opened.
- 5 Maximum ease in tuning with single knob controlling triple gang condenser.
- 6 Assembly is the essence of simplicity.
- 7 Volume control is provided not only to act as such, but to procure extreme selectivity.
- 8 Two terminals provided for connection to Gramophone Pickup.
- 9 Attractive Walnut Constructor's Cabinet of modern design with front panel to match.

POST FREE Instruction Chart

HIRE PURCHASE.
You can either buy your OSRAM "FOUR" for cash or on these attractive HIRE PURCHASE terms — 25/- Deposit and 12 monthly payments of 17/- . Your dealer will give you full particulars.

Osram "FOUR"

NEW MUSIC MAGNET

A high-class radio kit both in performance and appearance, with an established reputation Amazing range, power and tone Reliable GECOPHONE components and OSRAM VALVES Ease of assembly Simplicity of control Handsome polished walnut cabinet Low selling price of £10-15-0. These are the qualities that make the OSRAM "FOUR" another big Music Magnet success. The OSRAM "FOUR" introduces an entirely new and improved conception of home-assembled circuits.

The OSRAM "FOUR" can be built for A.C. All-mains operation by means of the new GECOPHONE A.C. All-Power Unit and Conversion parts. This Unit can also be used to convert last season's "Osram Music Magnet 4."

WRITE for the OSRAM "FOUR" Constructor's Instruction chart which will be sent you POST FREE. FILL IN THE COUPON BELOW. This chart gives simple and clear instructions how to assemble and wire the various parts, is crammed with useful hints and tips, and contains a rapid guide for getting, on the OSRAM "FOUR," practically all Home and Continental stations. Send for a copy TO-DAY.

If you are visiting the NATIONAL RADIO EXHIBITION do not fail to see the OSRAM "FOUR" on the G.E.C. Stands in the National Hall and in the Empire Hall.

PRICE
£10.15.0

Including OSRAM VALVES
GECOPHONE COMPONENTS
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CONSTRUCTOR'S CABINET

POST THIS COUPON

Please send me particulars of the OSRAM "FOUR" NEW MUSIC MAGNET

Name _____ Address _____

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Magnet House, Kingsway,
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A.W. Cut out and paste on postcard, or enclose in unsealed envelope, Halfpenny postage in either case.

SUPREMACY IN RADIO - G.E.C. RADIO

Advt. of The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2

Don't Forget to Say That You Saw it in "A.W."

THE H.M.V. MODERN HALL OF MUSIC

A fine display by the Gramophone Co. outside Olympia

THE Gramophone Company, Ltd., were unable to obtain enough space in the main Olympia halls for the National Radio Exhibition. They have therefore built a hall opposite Olympia which will be open from September 18 to 26, to which members of the public will be admitted free.

The frontage of the hall is of pleasing modern design and the raised lettering forms a striking contrast to the multi-coloured background.

The interior of the hall has been constructed to enable the various "His Master's Voice" instruments to be shown to the best advantage. Eleven alcoves, or open rooms, are situated round three of the sides of the hall.

In the centre of the hall is a specially constructed soundproof room in which may be seen the T.U. measuring instrument evolved and designed in the "His Master's Voice" research laboratories.

This apparatus measures and registers the actual volume of sound emitted by a radio set or the human voice direct in T.U. units.

This ingenious apparatus automatically converts electrical units into units of "loudness" (T.U. or transmission units), as appreciated by the human ear.

In order to demonstrate the T.U. meter to show how accurately it will register the slightest variation in volume of the human voice, H.M.V. are conducting a "Loudest

Shout Competition" during the period that the Modern Hall of Music is open.

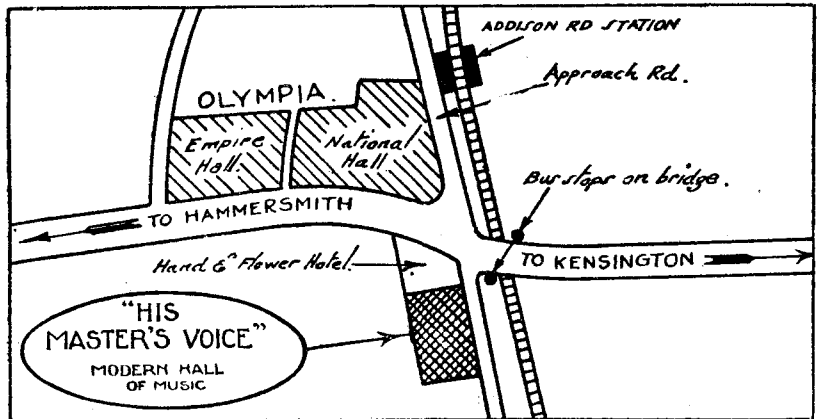
Among the sets shown will be the Standard acoustic gramophones, the Model 501 three-valve table radio gramophone, A.C. and D.C. models. This instrument incorporates band-pass tuning and a super-power pentode; the Model 116 playing desk; and the Model 435 three-valve radio receiver. The high-frequency stage is a screen-grid latest pattern high-efficiency Marconi

coil loud-speaker is mounted in the top of the walnut cabinet.

The Model 117 automatic record-changing cabinet playing desk is shown. This instrument will be of great interest to owners, for by connecting it to the input of any receiver capable of operating a speaker it converts it into an automatic record-changing radio gramophone.

There is, too, the Model 521 radio gramophone and Model 522 "His Master's Voice"

Plan showing the location of the H.M.V. Hall of Music

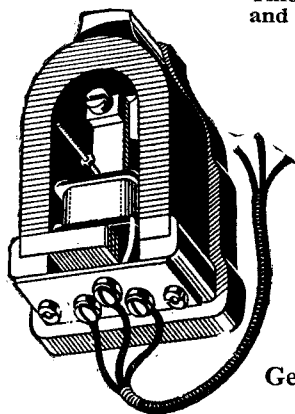


NEW HEGRA SPEAKERS

THE PERMANENT MAGNET MOVING COIL SPEAKER

A new and exceptionally sensitive speaker requiring no energising current. The magnet system possesses a very high degree of lasting magnetisation thanks to the patent Hegra method of magnetising steel. The Air gap is perfectly symmetrical and the coil is located so that chatter is impossible, yet there is no field leakage.

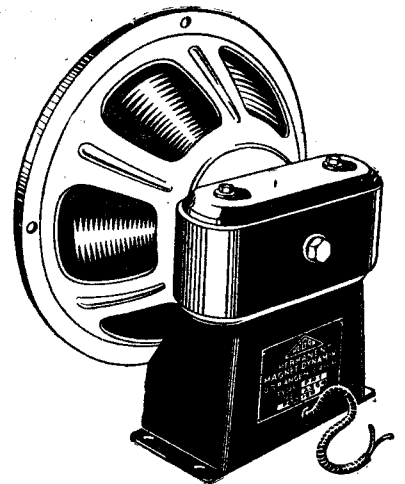
This speaker gives a high degree of purity and sensitiveness through the whole range. Type P M **55/-**



THE HEGRA MIDGET POWER UNIT

Is an extraordinarily neat and efficient balanced armature type instrument. Over-all dimensions (exclusive of spindle) are only 2 1/4" x 2" x 1 1/4", so that for portables and other sets where room is valuable this unit is now indispensable. Triple-tapped impedance enables satisfactory matching with output valves. Two-hole fixing makes assembly simple, while the beautiful finish and high efficiency of reproduction and ample volume are quite up to high Hegra standard.

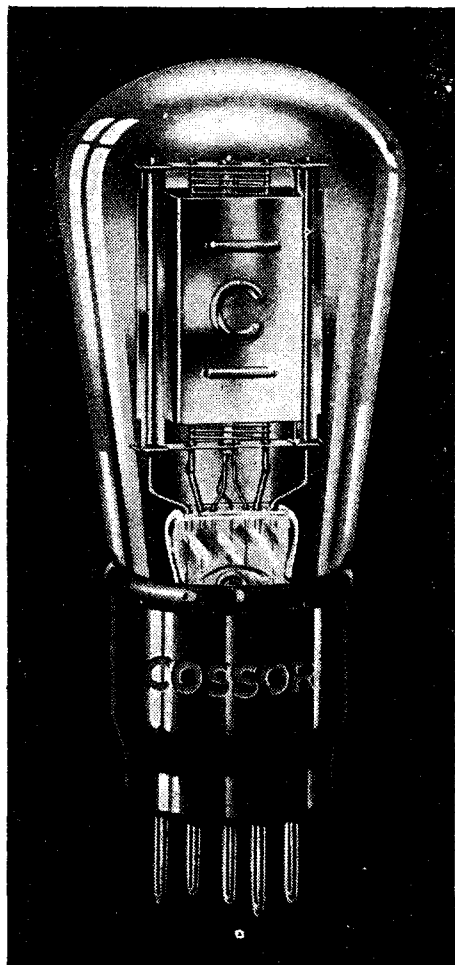
Type F, complete with cone clips and mounting screws **7/6**



Geo. Becker Ltd., 39 Grafton Street, Tottenham Court Road, W.1

"Insulated Bridge" Mounting

— ensures maximum performance and length of life



THE famous "Insulated Bridge" mounting which has been successfully employed in Cossor Valves for Battery operation is also used in the A.C. Mains types. This system of construction permits microscopic precision in the

mounting of the electrodes. As a result absolute uniformity is ensured. Each individual valve conforms accurately to its rated characteristics thus ensuring maximum performance from every type.

In addition the Cossor "Insulated Bridge" Construction imparts great mechanical strength. Rigidly locked in position top and bottom, the electrode system is proof against damage due to shock or blow. Thus

exceptionally long life is assured. Cossor A.C. Mains Valves are stocked by the best Retailers and are obtainable from all good Wireless Shops in types to suit every A.C. All-Electric Receiver.

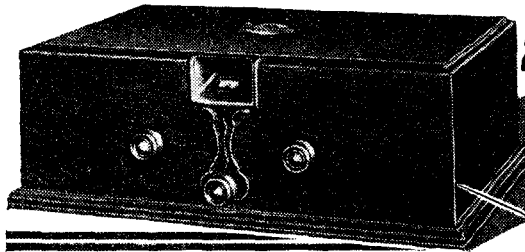
Folder No. L36 which gives full technical details of all types of Cossor A.C. Mains Valves will be forwarded post free on application.

COSSOR

A.C. MAINS VALVES

FOR ALL-ELECTRIC SETS

SETS OF DISTINCTION



MARCONIPHONE "SUPER-POWER TWO"

Makers: Marconiphone Company, Ltd.

Price: £11 10s.

I AM starting the new season's reviews with a type of set that the development of the Regional Scheme has made very popular, namely, a two-valver. Why has the Regional Scheme increased the demand for this type of set? I think the answer is that many listeners are quite content to limit their reception to the local centre now that an alternative programme is available. This applies especially to those wanting to restrict the outlay as much as possible consistent with good service.

Marconiphone Model 246 is a two-valver of high merit. It needs no batteries, for the set is worked entirely from the A.C. mains. As there are still so many different voltages of supply in this country, the makers have arranged a simple voltage tapping panel on the mains input transformer. This is quite easily adjusted by the set user. There are two plugs for this voltage adjustment, which can be varied from 95 to 164 or 190 to 260 volts. The periodicity may be from 50 to 100 cycles.

As a matter of fact, there are three valves in this set, but one is for converting the A.C. into direct current for the anodes of the two receiving valves, which comprise a detector and an output valve. The detector is a Marconi MH₄, which, as many readers will recall, is a high amplification 4-volt indirectly-heated valve. The output valve is the new Marconi MPT₄, a powerful 4-volt indirectly-heated pentode. The overall amplification of this combination, which obtains a constant high-tension voltage from the Marconi Uro rectifying valve, is so great that even with a small indoor aerial the signal strength of the local regional stations will be more than enough. In fact, with full reaction the volume is comparable with that of a three-valve battery set.

I would personally stress that the main use of this set, and all sets of its type, is for the reception of the locals and not the more distant foreign stations. This set will certainly bring in quite a number of the for-

eigners, but only by flattening the tuning to an extent that is likely to cause local-station swamping. Of course, not all listeners are situated within twenty miles of a powerful regional station. Those at greater distances than this would be able to get full loud-speaker results not only from the locals but from many of the more powerful foreign stations. My tests were done, as usual, in south-west London, some twenty miles from Brookmans Park.

During tests I had little difficulty in separating the National from the Regional. To do this with complete success I connected my 60-foot aerial to socket A₂ and plugged into C₂ of the selectivity control. This meant that sensitivity was reduced, and some reaction had to be applied to obtain full volume on the Marconi permanent-magnet moving-coil loud-speaker, which is, by the way, one of the best of the inexpensive reproducers I have so far tested.

The settings of the tuning dial depend
(Continued on page 462)

BUILD THIS NEWEST SCREENED 4

Once again VOLTRON leads the way with a kit set of startling originality and unique performance

Long-distance reception becomes a matter of commonplace occurrence to the owner of a VOLTRON SCREENED 4.

Go to your Dealer to-day and get particulars of the new system of Duplex Screening, the new unit coil chassis, the new control condenser chassis.

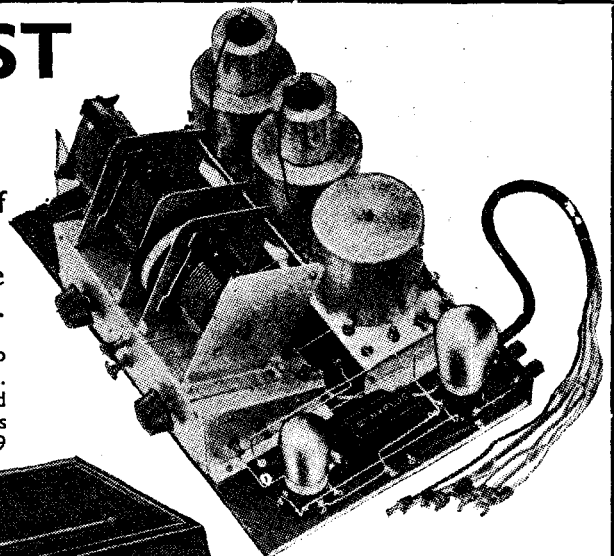
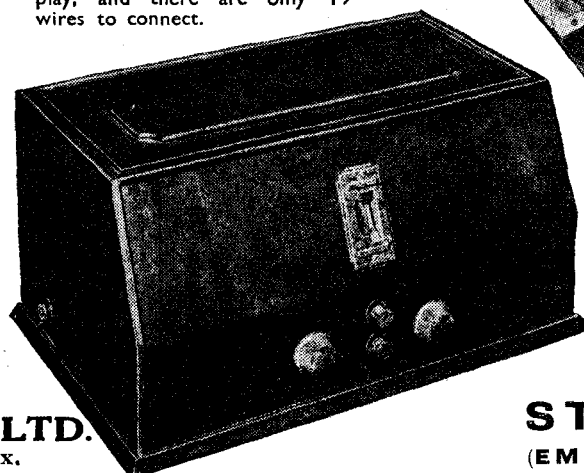
Find out how simple it is to assemble this wonderful set. Single dial control and ganged condensers make tuning child's play, and there are only 19 wires to connect.

SCREENED



Ask your dealer for a copy of the free constructional chart. In case of difficulty write direct to the manufacturers giving your local dealer's name and address.

VOLTRON ELECTRIC LTD.
Queensway, Ponders End, Middx.



COMPLETE KIT OF PARTS
EX VALVES

£5 : 17 : 6

COMPLETE KIT OF PARTS
INCLUDING
FACTORY BUILT CABINET
EX VALVES

£7 : 7 : 6

STAND No. 227
(EMPIRE HALL) OLYMPIA

The **NEW** LISSEN VARIABLE CONDENSER



DIECAST FRAME

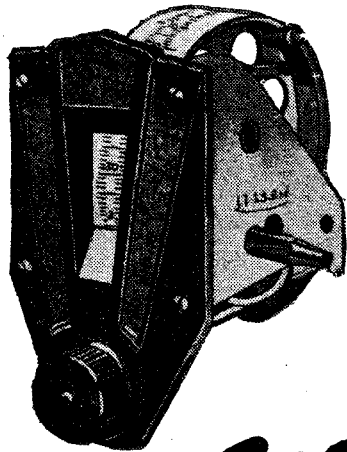
ONE PIECE SPINDLES

INSTANT GANGING

ABSOLUTELY RIGID

LABORATORY PRECISION

ALL VALUES - 4'6



LISSEN

8'6 ILLUMINATED DRUM DIAL

Fit this Lissen Illuminated Drum Dial to any set and at once you give it a new distinction . . . the real "professional" appearance which every keen constructor aims at. The mechanism is robustly built, and the drive is by tension gut, sure and pleasantly easy. Can be fitted easily to the new Lissen Variable Condenser and also to all other condensers singly or in gangs.

Constructors! You have only to handle this new Lissen Variable Condenser to make you desire it. The die-cast frame—the one-piece spindles into which the vanes are solidly riveted—the unshakeable rigidity of the whole construction, the clean-cut finish of the job—all these speak of new pleasure in building, new ease of tuning. And the new manufacturing methods used now for the first time by Lissen have enabled the Lissen Variable Condenser to be turned out to very fine standards of precision. You will not find anything like this new Lissen Condenser in anything but a luxury set. It enables you to GET A NEW STANDARD OF TUNING ACCURACY INTO EVERY SET YOU BUILD.

Every radio dealer will have stocks of this new Lissen Variable Condenser. Be sure to inspect it if wanting a new variable condenser.

ONE OF THE "BIGGER VALUE" LISSEN 1932 COMPONENTS

LISSEN LIMITED, WORPLE ROAD, ISLEWORTH, MIDDLESEX

To Ensure Speedy Delivery, Mention "A.W." to Advertisers

“THE MARCONIPHONE SUPER-POWER TWO” (Continued from page 460)

quite a lot on the particular aerial socket made use of—there are three alternative sockets. These are indispensable, for by their aid the right balance between signal strength and selectivity is obtained.

In my tests, National was logged at 27 degrees. The serious spreading of this signal was only from 24 to 32 degrees. Outside these limits the National could still be heard, but not loudly enough to interfere with the reception of other signals. As the main selectivity need in this type of set is only the separation of the two locals, I should mention that long before the Regional is reached at 56 degrees the National has entirely disappeared. The spread of the Regional was from 50 to 60 degrees, which I consider is very satisfactory, especially as the Midland Regional logged at 66 degrees was a good loud-speaker signal. This proves that selectivity is not obtained at too great an expense of sensitivity.

At 80 degrees was located North Regional, not very strong but quite satisfactory on the loud-speaker. With this adjustment of the selectivity the number of foreign stations was very small, but by changing to a less selective socket I was able to log five stations without any trickiness in adjusting the controls. The controls are well done. On the front of the set are three knobs, that in the centre working the tuning condenser and rotating an illuminated dial marked in degrees from 0 to 100.

Then on the right is an ingenious switch

knob working the wave-changing and gramophone radio circuits. As the knob is set to any particular position an illuminated indication of the circuit application is shown just below the tuning scale. This is really a worth-while improvement in control. On the left is the remaining control, a knob for reaction. This must be treated with a certain amount of care, otherwise the oscillation is apt to be violent. One soon comes to know the limit of reaction, and as the point of oscillation can be very closely approached without actual oscillation being caused, there is really nothing to complain about.

On the back of the cabinet are mounted the several sockets for aerial, earth, and loud-speaker connections. There also is the mains on-off switch, which few makers deem even necessary.

A full evening spent with this set enables me to say that it is one of the best in its class. The ratio of signal strength to selectivity has been skilfully worked out. This means in practice that even when the tuning is sharpened to separate stations, the signal strength is not cut down too badly. In no small degree must this satisfactory state of working be attributed to the two valves, more especially to the new MPT₄ pentode output valve. Before finally com-

mending this set to interested readers, I ought to mention that it makes a very satisfactory gramophone amplifier. Used with the new Marconiphone loud-speaker, the reproduction on this set is very realistic. What more could the listener ask? As with all Marconiphone sets, this two-valver is backed by an excellent service organisation. SET TESTER.

CUTTING OUT “STATIC”

THE method used by the A.E.G. concern to reduce local interference in their show-rooms in Berlin consists simply in enclosing the down-lead from the roof guttering to the receiver in a thin metal tube, the aerial wire being insulated from the tube by means of small wooden spacing blocks. Although the screening-tube increases the total earth capacity this is a matter of small importance in the case of an aperiodic aerial. It certainly had the desired effect of reducing local “static” to one-tenth the normal intensity, which allowed the local programme to be received free from any perceptible interference, with, of course, a corresponding improvement on more distant reception. M. B.

The B.B.C. is making good use of the town bands of Scotland for programme purposes in that country. The Corporation is finding that these organisations stimulate a taste for music in the most unexpected places.

OUR SECOND SHOW NUMBER NEXT WEEK

Here you have it *both* ways!



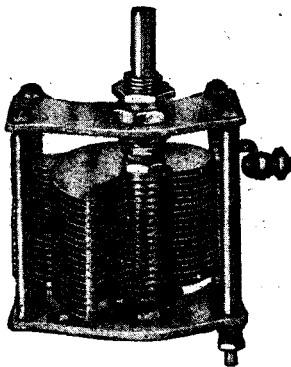
LOW PRICE ... yet
POLAR QUALITY



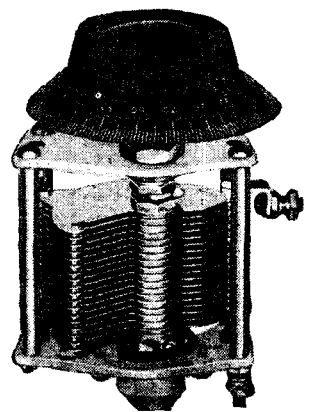
These two new condensers, popularly priced and maintaining the high efficiency of Polar design and construction, offer you the greatest condenser value obtainable.

Capacities for both models:
·0003, ·00035, ·0005

Obtainable from all dealers.
Catalogue free on request.



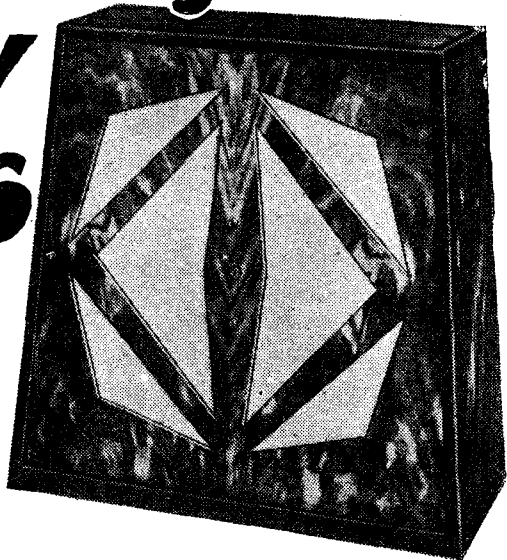
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STAND 60 OLYMPIA

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

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



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

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

- (1) Special Cone Paper printed to exact size ready for cutting out and gluing up to make a 14-in. cone.
- (2) Full Instruction Sheet with complete diagrams showing each operation in the building.
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- (4) The postal tube in which these gifts are packed, and which is also used in the construction.

Anybody can easily build this speaker—the essential parts are all provided for you at an all-in cost of 5/6. The other sundries such as gum you probably have at home already.

NOW YOU CANNOT FAIL TO MAKE A SPLENDID SPEAKER

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

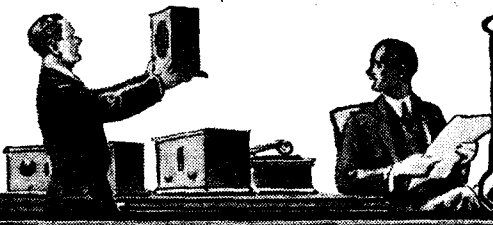
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NEW LISSEN SOLENOID CONE UNIT 5/6

LISSEN LIMITED, WORPLE ROAD, ISLEWORTH, MIDDLESEX

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention



The "Square-peak Three"
SIR,—I have built the "Square-peak Three" receiver and find results on the long waves quite good. The stations that are received on the medium waves come in very poorly, and the reaction has no strengthening effect. I realise there is some slight fault in the design of my receiver and should be glad to have any suggestions which may lead to a remedy.
 S. W. (Finchley).

From the context of your letter it would appear that you have either a break in the reaction circuit or you have somehow reversed the wiring to the coil holders and thus get a reverse reaction effect. If you obtain what appears to be a correct reaction effect on the long waves, you should merely reverse the connections to the medium-wave coil holder. If you do not get a proper reaction effect on the long waves, you may have a reverse reaction effect on both wavebands and this will mean reversing the connections to the reaction-coil holder instead of reversing the connections to the medium-wave coil holder.—
 Ed.

Improving the "£3 3s. Four"
SIR,—I have read about the improvements suggested for the "£3 3s. Four" receiver, but not being able to follow a

circuit diagram, I am afraid the information published does not assist me. I want to add the refinements so that I can use a mains unit and would be glad to know what wiring alterations have to be made to incorporate the refinements.
 F. B. (Cardiff).

A revised blueprint, incorporating the refinements which have been published in circuit form, will be available in a few days, and this can be obtained, price 1s. 6d. post free, from the Blueprint Department. The blueprint No. is AW303A.—Ed.

Gramo-radio Trouble

SIR,—I have fitted a gramophone switch-over arrangement to my two-valve all-mains receiver and have had some trouble. When receiving radio I experience a shrill whistle which cannot be cut out with any adjustment of tuning or reaction controls and the whistle develops into a howl as soon as I approach the switch for changing over to gramophone work. Can you advise me where I have gone wrong. The switch has been wired up correctly according to the information given by the makers of the special change-over switch.
 C. B. (Bath).

It appears that you have arranged your switch too far away from the first valve holder, with the consequence that the wiring between the switch and the valve is long. This accounts for your trouble. It is imperative that all wiring leads in the grid circuit of a valve be maintained as short as possible. If the switch is mounted on the panel and the first valve holder is at the rear of the baseboard, the valve holder should be moved nearer the panel or the switch should be arranged on a strip of ebonite at the back of the receiver near the valve holder. By following this advice you should be able to overcome your difficulty.
 —Ed.

Using a Frame Aerial

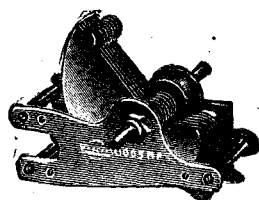
SIR,—I have a three-valve receiver which gets a surprising number of stations at good speaker strength. My only complaint is that the stations all appear to overlap each other. Having read of the selectivity to be obtained by the use of a frame aerial, I would like to modify my receiver so as to use one. Before doing so, however, would you explain to me why frame aerials are not more generally used. I am sure there must be some disadvantage offsetting the advantages known to me.
 F. L. (Worthing).

(Continued on page 466)

Interesting IGRANIC Price Reductions

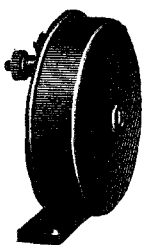
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Send for our Complete Catalogue D.154



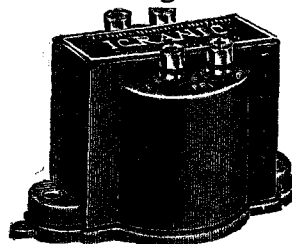
IGRANIC "LOKVANE" CONDENSERS

0005 mfd.	Price 5/9
.0003 mfd.	5/6
.00015 mfd.	5/-



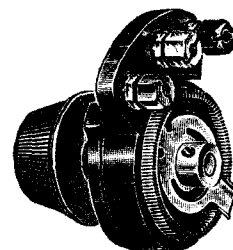
IGRANIC H.F. CHOKE

Price - - - 4/-



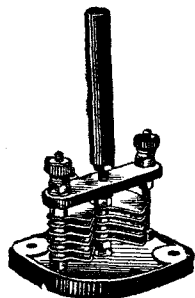
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Ratios 5-1 and 3-1
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IGRANIC MEGOSTAT

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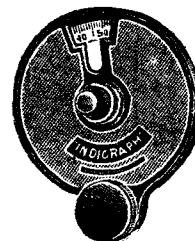
IGRANIC MICRO CONDENSER

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Single Open Jack	Price 1/9
Single Closed Jack	2/-
Double-Circuit Jack	2/3
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THE WORLD HAS EVER SEEN

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If you cannot get near enough
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Farringdon Road and Rosebery Avenue), **LONDON, E.C.1**
Telephone: Clerkenwell 6666 (4 lines)

"READERS' IDEAS and QUESTIONS"
(Continued from page 464)

A frame aerial is only about 15 per cent. as efficient as an ordinary outdoor aerial, and a receiver designed for use with an outdoor aerial would give but mediocre results when used with a frame. Most receivers, designed for use with frame aerials, possess at least one or more efficient stages of H.F. amplification to make up for the poor reception attendant upon the use of such aerials. If you alter your receiver to incorporate a frame aerial you will decrease the receiving range of your set. You are advised to consider the possibility of incorporating a band-pass aerial tuner in your receiver.—ED.

Inconstant Reception

SIR,—I wonder if you could explain the following inconstancy of reception. At times I am able to bring in such foreign stations as Toulouse at enormous volume; at other times I have great difficulty even in getting headphone reception of such stations. On numerous occasions I have suspected faults in my receiver, but tests on my part have proved my suspicions to be unfounded. Only by waiting for a day or so have I again been able to tune in these distant stations at good volume. None of my friends has been able to assist me and all complain of similar happenings.
R. A. (Sutton).

Your complaint is quite a common one and there is no explanation likely to be of benefit to you. Such changes in reception are due entirely to changes in atmospheric conditions and are much more noticeable in the tropics and places nearer the equator than around the coasts of Britain. When you experience difficulty in getting a distant station during one of these difficult periods, you should avoid

forcing your receiver in an endeavour to overcome the trouble. You will only create oscillation in your set by forcing it, and this will spoil reception for other listeners in your locality. As a point of interest it might be mentioned that when difficulty is being experienced in getting loud reception from a station in the south it is sometimes possible to get surprising volume from a station situated in the north or in any other opposite or nearly opposite direction to the receiver.—ED.

Output Filters and Speaker Transformers

SIR,—My receiver is fitted with an output-filter circuit. I have just purchased a moving-coil speaker which has its own input transformer. Is it essential that I retain the output-filter arrangement or is it immaterial? W. P. (Wallington).

If you have no wish to interfere with the internal wiring of your receiver, you may continue to use the existing output-filter circuit. Merely connect up the primary of your speaker-input transformer to the terminals of the filter circuit to which the ordinary speaker was originally connected. This arrangement will not be noticeably detrimental to results. Should you be able to make another use of the choke in your existing filter circuit, it will be an advantage for you to exclude the choke-filter circuit and to join the primary of your speaker-input transformer directly in the anode circuit of the last valve.—ED.

Cutting Out Pick-up from "Favourite Three"

SIR,—It is my intention to construct your latest "Britain's Favourite Three" receiver, but as I have no wish to use a pick-up, I want to dispense with the jack and wiring. Can this be omitted without detriment to the working of the receiver and

what wiring should be altered?
T. W. (London).
To omit the pick-up arrangement from this receiver, connect together wires No. 26 and 27 and dispense with wire No. 35. Then connect together wires No. 16, 17, and 18 and omit the pick-up jack from the panel. On no account should the volume control unit be omitted, as this is an essential component for the working of the wireless circuit.—ED.

I.F. Transformers

SIR,—Our attention has been drawn to "Thermion's" note on page 250 of "A.W." No. 481. May we point out that we have been manufacturing, since June last, an intermediate frequency transformer of the type mentioned, namely, provided with terminals and arranged for direct baseboard mounting.
Colvern, Ltd. (Romford).

SIR,—I have just been reading "Thermion's" remarks on I.F. coils. There is, after all, something to be said in favour of the plug-in type of I.F. coils. I have made up the "Century Super," which I am very pleased with, and having practically everything necessary *except the coils*, to make up a second set, I am thinking of making it up also in the portable form. If the coils were made with fixed bases I should have to buy a second complete set, whereas now I shall only have to purchase an extra oscillator coil.

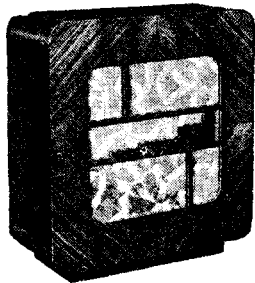
You might wonder why I want a portable as well as a table set. The reason is that I use a moving-coil speaker, 6-volt accumulator, and H.T. eliminator, which I could not very well carry out of the house with me or even from room to room!
C. A. (W.2.).

YOUR CHOICE WILL BE "WUFA"
after seeing and hearing all makes of Loud-speakers at Olympia.

READ THIS LETTER AND THEN
COME AND PASS YOUR OWN
JUDGMENT !!!

A Radio Society member says :

"At a test my 'WUFA' was found to be the winner out of 25 speakers of all makes, including two moving-coil speakers."



No. 50

"WUFA" CABINET SPEAKER

No. 50. The purity of reproduction and artistic design of this "Wufa" appeals to all looking for a most reasonably priced speaker. Fitted with the "Wufa" 60-pole Unit. Polished Walnut Cabinet.

50/-

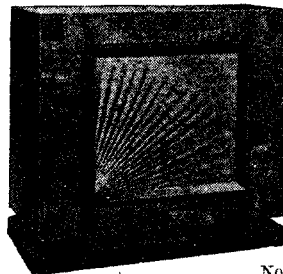
"WUFA" CABINET SPEAKER

No. 75. The fact that this speaker incorporates the famous "Wufa" 60-pole Unit guarantees the most perfect quality of tone.

Its classic appearance is in keeping with its perfect reproduction, and it is therefore an asset to every home.

Cabinet is of highly polished walnut.

75/-



No. 75

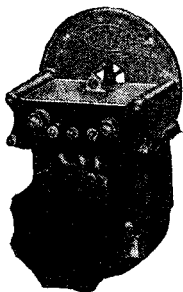
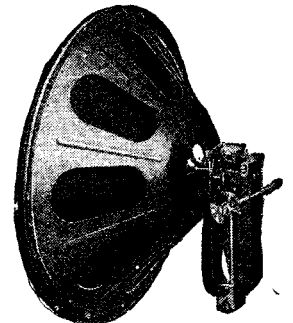
"WUFA" 60-POLE UNIT WITH CHASSIS

The combination which has received such remarkable praise from all sections of the Press and the public. Can be matched to power, super-power or pentode valves by resistances embodied. Handles huge volume without stress. Extremely sensitive to even weak signals. Price complete, 40/-; Unit only, 27/6.

"WUFA" 60-POLE UNIT WITH CHASSIS

Price complete 40/-

Unit only 27/6



"WUFA" ** UNIT

"WUFA" ** UNIT

A unit of compact design. Highly sensitive. Matches all types of output valves. Perfect reproduction. Wonderful volume.

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** UNIT 15/6

They're all going to hear-

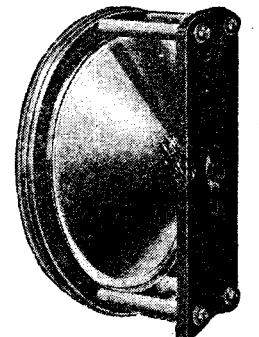
WUFA
(OPPOSITE OLYMPIA)
SEPT. 18-26

DEMONSTRATIONS ALL DAY AT 3 HAMMERSMITH ROAD

"WUFA" UNIVERSAL CHASSIS

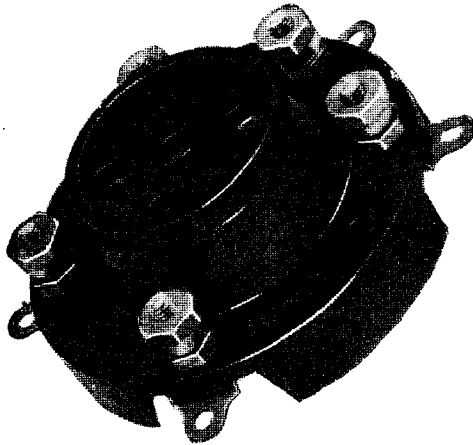
This chassis takes any type of unit. It is rigidly built. Any make of unit is easily mounted. Accurately designed 15-in. cone. No metal parts to cause resonances.

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"UNIVERSAL" CHASSIS

Quality tells! ■



THE Junit "Lolos" valve holder (4- or 5-pin) has proved so exactly suited to radio users' requirements that over a quarter of a million were sold during June, July and August alone!

Stability of circuits using this type of valve holder is enhanced by the fact that the moulding is of a special bakelite, having a very high dielectric strength. Sockets give a large area of firm contact. There are screw terminals *and* soldering tags in each holder, and the terminals are so arranged that the screw and socket cannot possibly move when the nut is being screwed or unscrewed. Terminals are easily accessible. The valve holder is simply and securely mounted by means of two-hole fixing.

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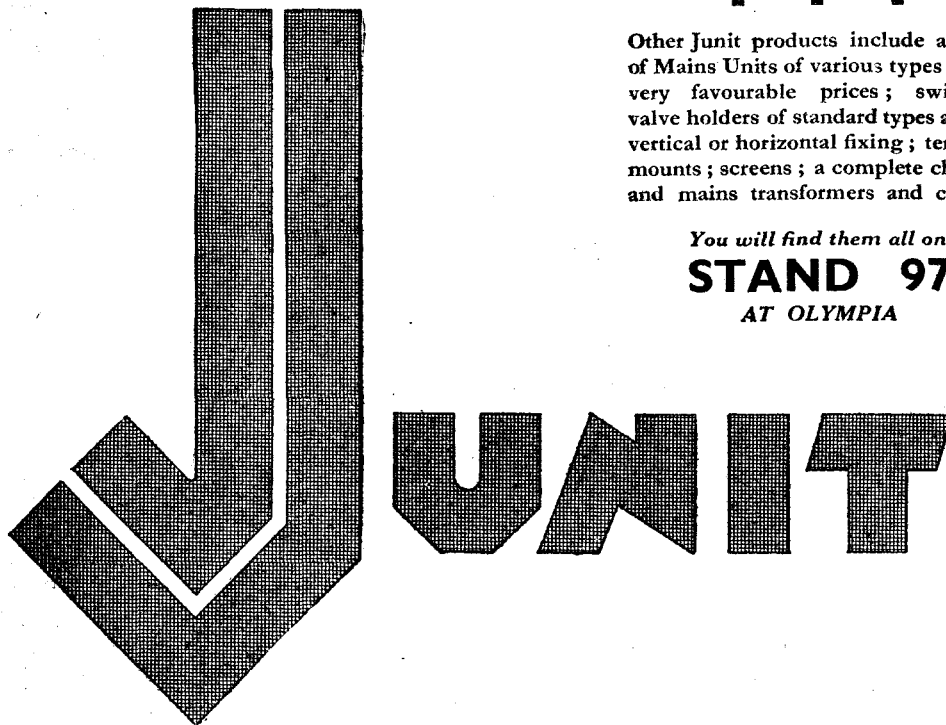
4-pin : 8d.

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■ ■ ■

Other Junit products include a range of Mains Units of various types and at very favourable prices; switches; valve holders of standard types and for vertical or horizontal fixing; terminal mounts; screens; a complete chassis; and mains transformers and chokes.

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STAND 97
AT OLYMPIA



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(M.C.130)

Advertisers Appreciate Mention of "A.W." with Your Order

PENTODE OR TRIODE - WHICH?

What about the output valve of your set? Are you considering the possibility of replacing this with an up-to-date type? In this article J. H. Reyner helps you to make the best selection

ASSUMING that you have not recently changed your output valve, you will find it worth your while to look into this matter, because the valves available nowadays are distinctly better than those which were on sale only a short time ago.

When one considers this matter, a question which naturally crops up is whether to use an ordinary three-electrode output valve or to change over to a pentode. The pentode valve, of course, is the screen-grid version of the output valve, and in some respects is as much an improvement over the ordinary output valve as the screen-grid H.F. valve is over the older forms of valve. The pros and cons of the case may be summed up very briefly in the following manner.

First of all, the pentode is distinctly more sensitive than the triode. Whereas, in order to obtain an output of 400 to 500 milliwatts with the average 2-volt output valve it is necessary to apply a grid swing of 22 or 24 volts, a pentode will give the same output with only 8 or 9 volts grid swing. Some of the more recent triodes will, perhaps, give the power output with a smaller grid swing; but for a fair comparison

they should be placed up against the latest forms of pentode, and the advantage is still in favour of the latter.

On the other hand, the pentode has a very high A.C. resistance. Many valves of this type have a resistance as high as 40,000 or 50,000 ohms, although the later types hover around the region of 20,000 ohms, and this may be considered as a value which is likely to remain stable for some time. A three-electrode output valve, on the other hand, has a resistance of a few thousand ohms only, and in consequence of this we are unable to obtain good response in the low frequencies. The upper frequencies fall off somewhat, but the ordinary cone speaker is more sensitive in this region, and the result is a very pleasant balance of tone.

With the pentode, however, the reverse is the case, and the power output is concentrated in the upper end of the musical scale, giving a very high-pitched and tinny quality. This may be overcome by connecting across the loud-speaker a .01 condenser with a resistance of about 15,000 ohms in series. This arrangement tends to by-pass the upper frequencies and prevent them from reaching the loud-speaker, whereas

the lower frequencies are not affected, and balance of tone is restored to some extent.

The old-fashioned idea that pentodes were expensive in anode current is exploded. True, the average pentode of a year or so ago takes from 10 to 15 milliamps. It will, however, give an output of 400 to 500 milliwatts, and an output valve of the three-electrode type capable of giving an output of this order takes much the same current. In fact, in some cases it takes more. Where the pentode has previously suffered is that many readers are content with a smaller power output of, say, 200 to 250 milliwatts only. There are available small power valves which fulfil this requirement excellently, but there were no pentodes of this class. This is no longer true, and there are several pentode valves on the market now consuming as little as 6 or 7 milliamps anode current only, and capable of giving from 200 to 250 milliwatts output.

Anode Current

Therefore, for the same anode current we can obtain the power output we require with perhaps one-third of the input, making
(Continued on page 470)

AUTHOR SPECIFIES SOVEREIGN OLYMPIAN 3



SPECIFIED 50,000-OHM CONTROL (type V.C.) in original design of "Olympian 3." No need for greater proof of Sovereign superiority—a quality component at a popular price. All values (with protecting cover), each

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SPECIFIED .0003 (MAX.) COMPRESSION CONDENSER, also in original design. This famous component now sets the standard for use in selectivity circuits. Highest quality—amazing new low-price level. All values (except H Type, 1/6)

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SOVEREIGN TWENTY-SHILLING SPEAKER Complete in solid oak cabinet of simple attractive design. Under test handled heaviest load without stress. Pure toned full volume. complete

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AT OLYMPIA STAND 64 EMPIRE HALL

SENSATIONAL LOW PRICE LEVEL FOR SPAGHETTIS Sovereign Superior Spaghetti Resistances reduced to amazing new low price level. Improved too, in design. All values from 600 ohms 4d. to 100,000 ohms 1/3.

ANOTHER SCORE FOR SOVEREIGN Now the Sovereign L.F. Transformer, housed in solid bakelite case. Tested to the usual Sovereign efficiency standards, it provides increased volume and greater tonal purity. Ratios, 5-1 and 3-1 ..

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The new RADIO WONDER

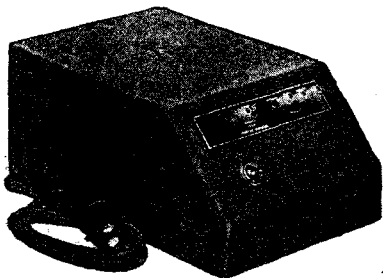


SPECIFICATION	CLARKE'S ATLAS
I Variable Tapping	0/100 V.
I " "	0/120 V.
I Fixed " "	150 V.
Output at 150 V.	25 m.A.
L.T. Trickle Charger	2, 4 & 6 V.
Charging Rate	0.5 A.
4 Grid Bias Tappings	1½, 3, 9, 16 V.
Guarantee	12 months
Price	£6-10-0
Yours for	10/- down

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COMPARE THESE
UNIQUE FEATURES
FOR YOURSELF

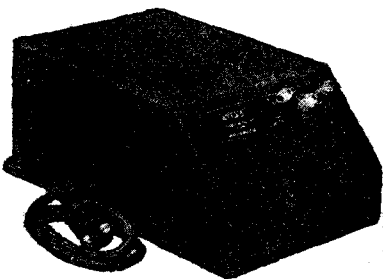
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4 OTHER NEW "ATLAS" UNITS



MODELS No. A.2. and A.K.22

"ATLAS" Model A.2.—H.T. Unit for 1-, 2-, and 3-valve sets. Three Tappings: 60/80 volts, 90/100 volts, and 120/150 volts respectively. Output: 12m/A.
 Price 52/6 cash or 10/- deposit and 6 monthly payments of 8/- each.
 "ATLAS" Model A.K.22.—All-mains Unit, has similar tappings but incorporates a L.T. Trickle Charger for 2-volt Accumulators at .3 amperes.
 Price 77/6 cash or 10/- deposit and 9 monthly payments of 8/6 each.



MODELS No. A.C. 244 and A.K. 260

"ATLAS" Model A.C.244.—H.T. Unit, 3 Tappings: 60/80 volts (maximum and minimum), 90/90 volts (maximum, medium and minimum), 120/150 volts respectively. Output 20m/A at 120 volts. Price 59/6 cash or 10/- deposit and 8 monthly payments of 7/- each.
 "ATLAS" Model A.K.260, All-mains Unit, has similar tappings but incorporates a L.T. Trickle Charger for 2-, 4-, and 6-volt Accumulators at .3 amperes.
 Price 90/- cash or 10/- deposit and 9 monthly payments of 10/- each.

CLARKE'S "ATLAS" MAINS UNITS

H. CLARKE & CO. (MANCHESTER) LTD.
ATLAS WORKS
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"PENTODE or TRIODE—WHICH?"
(Continued from page 468)

the set altogether much less sensitive. In point of actual fact, for a given anode current the pentode will give more power output. Owing to the construction of the valve, it makes a more effective use of the power it draws from the battery, although this difference in itself is not a very powerful argument unless considered in conjunction with the other good points.

The position may be summed up, therefore, by saying that the triode is cheaper, gives better quality under ordinary conditions, but requires more volts to drive it. The pentode, on the other hand, is very sensitive to a small input and is slightly more economical in running, but requires special output circuits in order to obtain good quality.

AT THE PROMS

JELLY D'ARANYI on Friday gave the vigorous, but subtle, rendering of the Beethoven violin concerto that is to be expected of her. The Fourth Symphony that followed was largely wasted on me—the concerto seemed to have exhausted my ability to concentrate. Possibly I was tired that night, but some of these Promenade programmes are very trying to the powers of concentration.

The concert did not finish with the symphony of course—that was merely the end of the first part. On Tuesday I stayed to the bitter end of the second part. This is seldom broadcast, but it is well worth staying. For one thing, half of the audience has gone, leaving only the kernel of the

special promenade crowd. There being no necessity to run the programme to time, the soloists, who almost always come on again in the second part, can be encored twice if it seems desirable. Sir Henry having retired for the night, Mr. Charles Woodhouse, the popular first violin, conducted on this occasion the Overture, *Fra Diavolo*, by Auber. The tinkling melody was brought out to perfection and was loudly applauded.

L. R. J.

A NEW "A.W." STATION IDENTIFICATION SERVICE

AMATEUR WIRELESS has organised a new service of the greatest importance to all listeners. This Station Identification Service is available for identifying stations from information supplied by readers, and will be conducted by J. Godchaux Abrahams in conjunction with "A.W." The fee is 6d. for identifying any one station, but if three identifications are required at a time the fee is only 1s. A stamped addressed envelope must be enclosed. Only stations giving a regular broadcast service can be dealt with.

Address your inquiry to Station Identification Service, "Amateur Wireless," 58-61 Fetter Lane, E.C.4, and give fullest possible details. State type of set used, date and time when station was heard, wavelength, call or interval signal, and details of any programme heard.

NORTH REGIONAL O.B.'s To Continue During the Winter:

THE outside broadcasts which have been so strong a feature of the North Regional programme this summer will undergo a change during the next few weeks, owing to the fact that many of the sources—such as seaside concert parties—will be drying up.

That will not mean an end to "O.B.'s" of this sort in the Northern programme, however. The orchestras at St. Anne's-on-the-Sea and at the Imperial Hotel, Blackpool, will continue to broadcast during the winter, and other entertainments may also be expected from Blackpool, including a relay from the circus there on September 19. Arrangements are being made for the regular relaying of variety turns from theatres in the north of England, and a big job for the "Flying Squad" of O.B. engineers in the north will be a broadcast of the tattoo at Belle Vue, Manchester, on October 1.

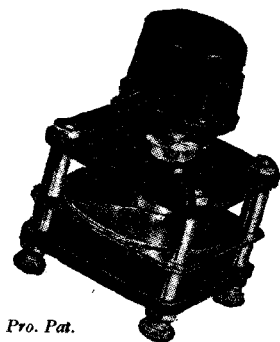
Pantomime broadcasts will again be a feature of the North Regional programme at Christmas-time.

A concert by the Choir of the Neath and District Choral Union will be relayed from the Gwyn Hall, Neath, for West Regional listeners on October 1.

Blue Spot Speakers.—On page 336 of "A.W." for September 5 the Blue Spot type 72 speaker was incorrectly described as the type 22. Also in the Blue Spot announcement on page 337 the price of the model 70R was given as £3 ros. This should be £3 15s.

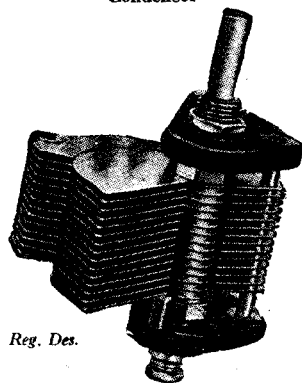


CONDENSERS AND DIALS FOR ACCURACY



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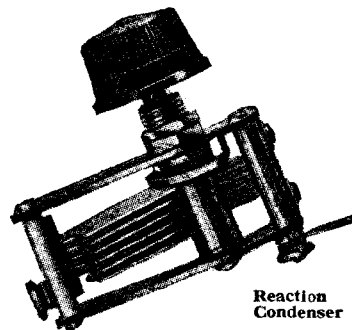
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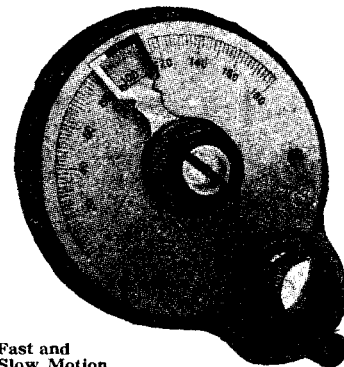
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See Page 393.

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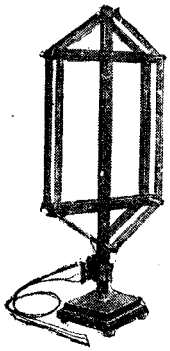
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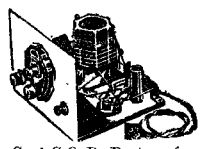


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COMMENT ON THE RUNNING COMMENTARIES

By F. D. MERRALLS

WE may wake up any morning now to find in the wireless menu for the day an eye-witness's account of the International Chess Congress (a moving affair), or a while-you-wait record of a day's shoot on the Scottish moors, complete with full details as to luncheon and individual "bags" and "braces." We may be regaled by a battle in China (weather and umbrella supplies permitting), or caustic comments on an actual day's work in the Mother of Parliaments, or civil servants in a government being economical.

Where there is opportunity for the spice of the wholly unexpected to be introduced, however, is in the matter of the commentator himself.

Many of us must have listened with some puzzlement to the broadcast of the Davis Cup match in Paris, where the French comments on the game were interpreted by an Englishman who was obviously unacquainted with the scoring system used in tennis.

We may remind ourselves that it was not the B.B.C. who first invented the running commentary. We are mindful of the most amusing one we ourselves have ever heard, and it occurred many years ago on the occasion of our taking Aunt Caroline to her first cricket match at Lord's, before ever the wireless became the popular means of

looking on at things. Her references to the "batters" and to the "retired dentists" (two rather decrepit umpires), her strictures upon the amount of walking about involved in the game, and her wild guesswork in the matter of names, supplied just that freshness of viewpoint which might be calculated to make the somnolent habitué wake up and stare and the confirmed barracker listen to other than his own words.

We have heard them at the theatre, at the cinema, and at the football match, these born running commentators (or should it be "commentors"?). Like Charley's Aunt come Christmas-tide, they are for ever running. And they have captured our attention and imagination more securely than the pronouncements of the most self-opinionated of professional critics.

We await, then, with no mean expectations, an impromptu description of a first night by someone in the gallery—some artiste in local colour who can present to us straight from "the gods" a first impression of a play or film as seen through the medium of the man in the street, or rather the woman in the seat.

Not that we would wish to belittle the expert critic or supersede him by these relay figures. But in this department of broadcasting we would have a reshuffle of experts; we would, for our own delectation,

have them bring their critical faculties to bear upon things outside their own pet themes.

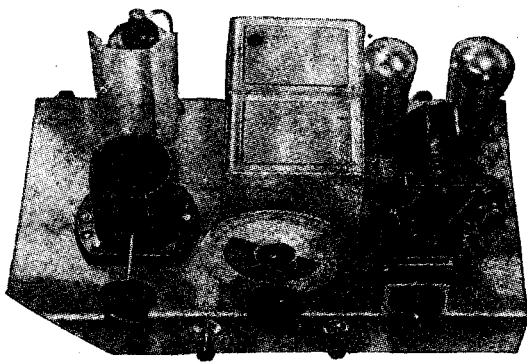
We would welcome, for example, Mr. James Agate's or Mr. St. John Ervine's treatment of a football cup final; we would delight in Mr. Bernard Shaw's "putting over" of the gourmandising at the Lord Mayor's banquet. Dean Inge might be induced to convey to us the cheery riot of Derby Day at Epsom or the fun from Blackpool's sands in August. A Covent Garden porter, instead of describing his night's work "while London sleeps," might be "taking you over now" from cabbages to kings, and devote his most colourful adjectives to the Royal box at Ascot, the opening of Parliament, or the Lord Mayor's procession.

As a surprise item, Mr. Thomas Handley (one scarcely recognises the name of ceremony) might at some future date bring us into close and improving touch with the Convocation of Bishops.

We throw out these suggestions for a new profession—that of, shall we say, "running commentator?"—for what they are worth.

Telsen Condenser Prices.—The prices of Telsen bakelite dielectric condensers were given incorrectly in one of the Telsen announcements in last week's issue. The differential reaction condensers .0001, .00015, and .0003 sell at 2s. The .00015 and .0003 bakelite dielectric reaction condensers sell at 2s., and the .0005 and .00075 at 2s. 6d. The plain bakelite dielectric tuning condenser .00035 and .0005 cost 2s. each.

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The V.3. Kit Set
complete with valves
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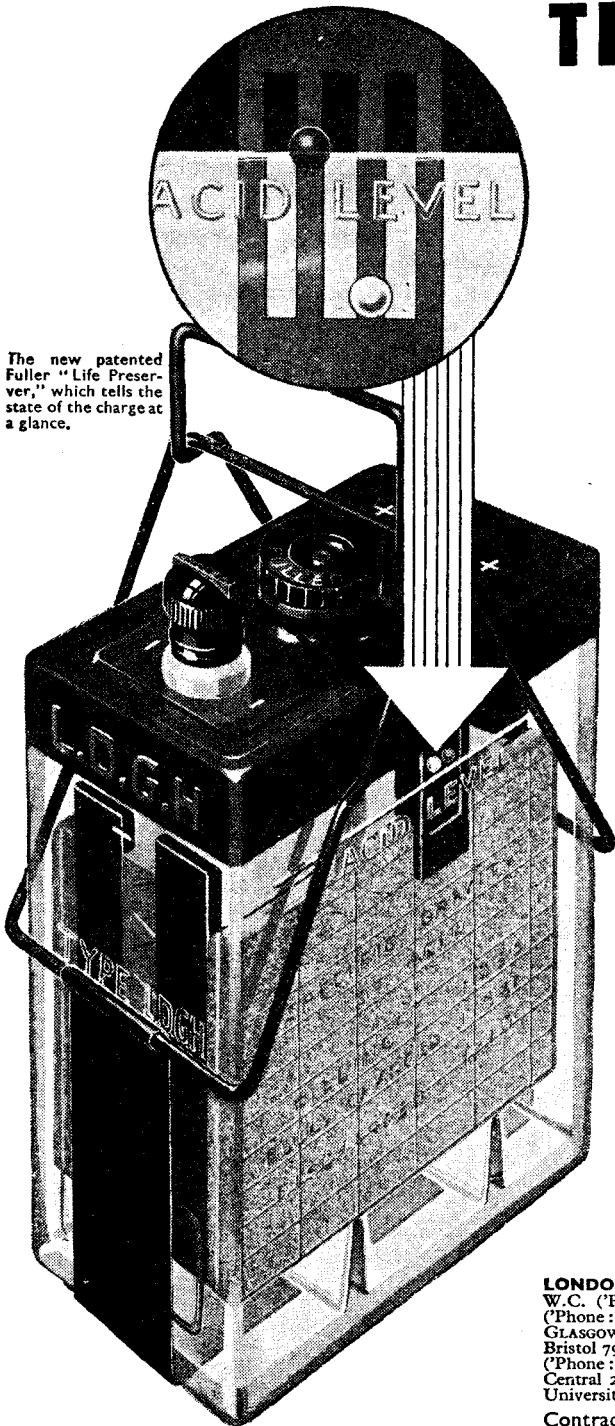
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All metal chassis—no soldering

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



Every Fuller L.T. Accumulator of the Free Acid Type in glass or celluloid box is now fitted with these simple but invaluable indicators. You can't mistake the message. When both indicators are at the top, the battery is fully charged. When the white indicator sinks to the bottom, half the charge has been used. When the red indicator sinks, the battery needs re-charging immediately. With this infallible guide, you need never find yourself without an active accumulator, doomed to a week-end of silence and boredom. More than this—the life of the battery will be lengthened. Nothing puts a battery out of action so quickly as allowing it to become completely discharged. This is just one more illustration of Fuller attention to details. Type L.D.G.H., L.T. Accumulator has other patent devices, exclusive to Fuller. Patented double grease-cup terminals, with moulded polarity signs, preventing corrosion by acid. Mammoth plates, with micro-porous paste. A patented non-slip metal carrying handle which folds out of the way when not in use. Ask your dealer to show you type L.D.G.H.-2v. 60 a.h. Price, 9/6. Dry charged—also other sizes for low intermittent current service.

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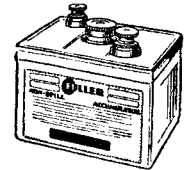
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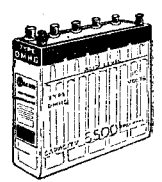
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Patent double grease-cup terminals eliminate risk of acid creep. Strong, durable ebonite container. Micro-porous paste. There is a type for every car and motor-cycle. Ask for lists.



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THE opening ceremony of the Faraday Centenary Exhibition will be relayed from the Albert Hall on September 23.

Lance Sieveking has adapted *Gulliver's Travels* as a radio play, which will be heard some time in November. The microphone version is to be called *Voyage to Lilliput* and the music is by Robert Chignell.

John Morel, the baritone who achieved fame in a single night when he sang at a Promenade Concert two years ago, will again be heard by National listeners in a light orchestral concert, conducted by Joseph Lewis on September 23.

E. M. Delafield is the author of a domestic comedy called *To See Ourselves*, which is to be produced by Val Gielgud in the National programme on September 14. This play was recently performed at the Ambassadors Theatre.

A recital of Schubert songs by Robert Maitland is the outstanding feature of Midland Regional programmes on September 27.

A running commentary on the launching of H.M.S. *Leander*, England's latest battleship, will be relayed from Devonport Dockyard in the National programme on September 24.

Edgar Wallace is to give a series of talks entitled "Stories for Broadcasting," the first of which will be heard on October 10.

The evening concert on September 20 for North Regional listeners is contributed by four artistes who have already made their names as capable broadcasters. They are Stanley Kaye, Harry Hopewell, Frank Park, and Lily Allen.

The recital to be given on September 21 by the 'cellist, Carl Fuchs, is the eleventh in a series of recitals which has established itself as a feature in the musical life of the North.

Short plays by F. A. Carter have become a feature of the Northern dramatic programmes. On September 25 a comedy in two scenes, entitled *More Ways Nor One*, will be staged. It will be performed at Leeds by the Yorkshire Comedy Players.

The first of the season's concerts by the Manchester Tuesday Midday Society will be broadcast on September 22. These concerts will be relayed weekly on the Regional wavelength and will be available to listeners over a much wider area than formerly.

Hayden Coffin, the musical comedy actor and singer, is to sing some of the songs that made him famous in a programme of "Musical Comedy Memories" to be conducted by Joseph Lewis on September 22 (Regional).

An all-star vaudeville programme will be heard by Regional listeners on September 19. Florence Marks and Wilfred Shine appear in *Washing Day*; Chick Farr will "address the meeting," assisted by Wells Farman; Max Miller, That Certain Trio, Gerald Kaye, and Jack Payne are also in the "bill."

Mr. Froom Tyler takes "John Locke" as the fifth subject in his series, "Wise Men of the West." This talk will be given for West Regional listeners from the Bristol studio on October 2.

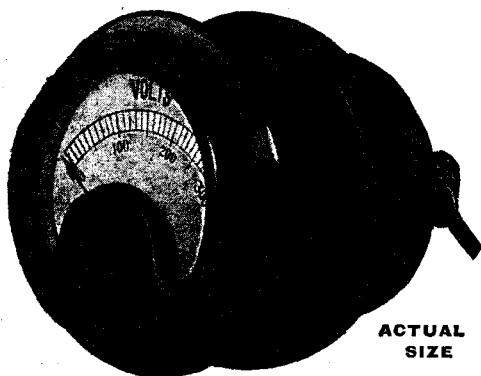
On September 20 an orchestral concert of special interest will be provided by the augmented Northern Studio Orchestra and Appleton Moore. Grieg's "Lyric Suite" and the Elégie and Waltz from Tchaikovsky's "Serenade" will be played.

A Nave Service will be relayed from the Cathedral, Bristol, on September 27, when the sermon will be given by the Dean of Bristol. This is the last of the special broadcasts arranged in connection with Bristol Radio Week.

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ONE HOLE
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PER VOLT	MILLI-AMMETERS
150v ... 32/3	250v ... 33/-
300v ... 33/9	30/-

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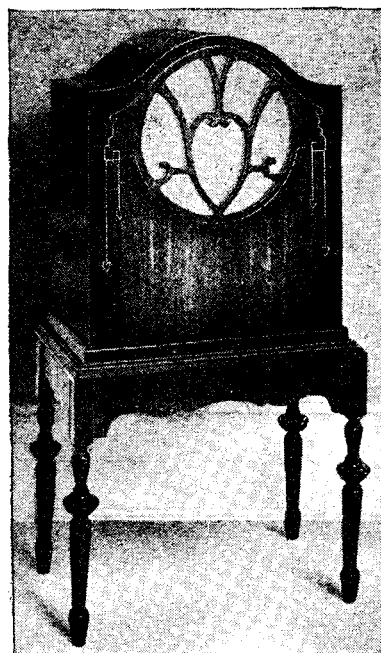
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TAKES COMMAND

R.I. OUTCLASS COMPETITION

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Place "DUX" in the field of universal competition to uphold British Radio Prestige and to protect the interests of the British Radio public who demand *low priced commodities with the efficiency to which they are entitled.*

LOW PRICE WITH EFFICIENCY

The transformer is the heart of the modern receiving set—its reliability must be certain despite low price and "DUX" the most modern of all transformers, is guaranteed to be absolutely dependable by its makers, who have been the pioneers in radio for over 30 years.

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"DUX" is already acclaimed by the Wireless Press as a "Leader"—its qualifications of low price and high efficiency are unchallenged.

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Full technical data and diagrams supplied.

Ratio 1 : 3½ (standard) or 1 : 4½ (auto-connection).
Weight, 11½ ozs. Dimensions: 2 × 3½ × 2½ in. high.

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Such is PERMCOLO, the Panel with the mirror-like surface. Black or Mahogany. Ask your Dealer, or direct, cash or C.O.D.

BRITISH MADE.

PERMCOLO MIRROR-POLISH $\frac{3}{16}$ " PANELS

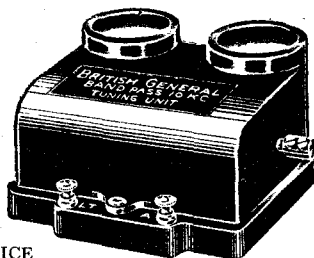
Size,	Black Polished.	Mahogany Finish.
7" x 14"	3/6	4/3
7" x 18"	4/6	5/6
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for **INCREDIBLE!**
selectivity



PRICE **14/6** including non-inductive coupling condenser.

BRITISH GENERAL MANUFACTURING CO. LTD.

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NEVER BEFORE ACHIEVED without loss of Sidebands.

A new development in Tuning Units which is unique in its scope. It overcomes the difficulty which is experienced in achieving separation of near stations without destroying the effective range of the Set. This new Band Pass Unit gives the separation of 10 Kilocycles as laid down by the International Radio Convention and yet covers the entire waveband between 230 to 550 and from 800 to 2,000 metres on one dial.

BRITISH GENERAL BAND PASS 10KC. TUNING UNIT

SEE US ON STAND **30** RADIO EXHIBITION



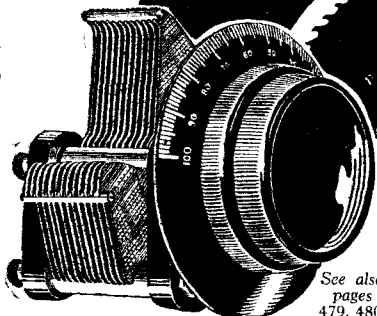
Silence those noisy neighbours!



SLOW-MOTION CONDENSERS

"STATION-CROWDING" is one of the greatest problems of modern set designers. A high degree of selectivity will permit the reception of close stations, but, even then, everything depends upon the fractional adjustment of the tuning condenser.

The new Formo Slow-Motion Condenser permits perfect control to the finest limits of movement. Fit one to your set and notice how easily neighbouring stations are cut out and how the chosen broadcast comes through with perfect tone and clarity.



See also pages 479, 480

PRICE **6/-**

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Complete Catalogue of all Formo Products from:-

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HERE IS THE RADIO GRAMOPHONE CABINET YOU ARE LOOKING FOR

INSTALL A "LANGMORE"

and have your Gramophone, Wireless Set, Loud-speaker and Batteries all in one cabinet.

These cabinets are very strongly constructed of selected Oak and Plywood. Size overall, 3 ft. 2 in. high by 21 in. wide by 15 in. deep.

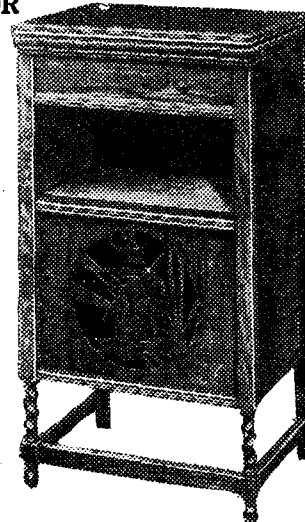
THE TOP SECTION. Size, 4½ in. high by 18 in. wide by 14 in. deep, gives ample accommodation for gramophone and pick-up

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

THE BOTTOM SECTION. Size, 14 in. high by 18 in. wide by 13½ in. deep, gives accommodation for Loud-speaker and Batteries.

Also supplied with Bottom (Speaker) Section 16" high inside, making overall height 3' 4" at 2/6 extra.

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



Price **49/6** each

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Trade Inquiries Invited.

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**B.B.C.
DEVELOPMENTS
IN SCOTLAND**

THE new Scottish Regional high-power transmitters of the B.B.C. at Falkirk are to be opened next year, and in a talk broadcast from Scottish stations on September 9 the Scottish Regional Director, Mr. Cleghorn Thomson, gave some interesting details of the B.B.C.'s plans.

Mr. Thomson said that there were some listeners who regarded the Regional programme policy with aversion and who were irritated on every occasion when a new Scottish feature was introduced because it must inevitably cut out something in the National programme which they preferred. He knew that there were a great many people who did not favour the efforts the B.B.C. had made in past years to bring to the microphone as much as ever they could find that was characteristic of Scottish genius and character. On the other hand, there was a great body of listeners who considered that the B.B.C. was not nearly active enough in the provision of Scottish fare and which resented the large proportion of programme time for Scottish listeners occupied by wireless programmes relayed from London.

Scarcity of Talent

To those who object to Scottish programmes, Mr. Thomson's reply was that the B.B.C. believes that Scotland has an artistic contribution to make to the general stock of wireless programmes. To the other listeners who complain that there are too few Scottish programmes he said:—

"We have simply got to face the fact that there is not sufficient Scots material or Scots talent of high order to justify our increasing to any great extent the space allotted to Scottish material in our programmes. Our plans for the coming year involve experiments which will increase the opportunities for broadcast talent to be found in rural districts."

The series of programmes relayed from country areas such as the Borders and Galloway in which an attempt was made to give the listener a picture of the characteristic life of the community, would be continued. There would also be some formal concerts for the fostering of local talent, to be held in such places as Inverness, Perth, Ayr, and Kirkcudbright. The B.B.C. would also relay excerpts from the concerts organised by the Glasgow Choral and Orchestral Union and the Reid Symphony Orchestra. In the sphere of drama the largest event to which they were looking forward was the production of a play about Prince Charlie by Compton Mackenzie in the first week of next month.

"Before I talk to you again next year," said Mr. Thomson, "our new transmitter at Falkirk will be completed, which hopes to reach out to more outlying districts than our present stations can attain. Until the establishment of this transmitter

(Continued overleaf)

TRANSFORMERS

Dario Transformers are made under a special process of wiring and insulating the different circuits. Notwithstanding their very low price they give marvellous results.

Ratios 1-3 and 1-5.

Constructor	4/6
Normal	5/-
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Also a available extensive range of mains transformers and Filter Chokes.

DARIO SILVER OXIDE CHARGER

the best in the world. Enables you to charge your accumulators in **17/6** your own home.

DARIO SETS

The Dario S.G.3 Battery Type Receiver now reduced to **£5 17s. 6d.** complete with Dario Valves, represents amazing value. Highly sensitive, gives wonderful volume. Renowned for its purity of reception.

The Dario Regional Straight 3 Transportable housed in an attractive modern oak cabinet complete with Dario valves and matched speaker. **£4 17s. 6d.**

Inside frame aerial 10/- extra

Made in one of the most modern factories in the world under a special secret process, Dario valves incorporate the new Radio Micro Dull Emitter Filament which ensures great sensitivity, unequalled performance and utmost current economy.

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etc., etc.

Also 4 volts and A.C. Mains type.

Write for illustrated folder giving full particulars.

"B.B.C. DEVELOPMENTS IN SCOTLAND"

(Continued from preceding page)

we will be passing through a transitional period in which we must ask our listeners to await the eventual fructifications of our plans. With regard to the problems of reception in the Highlands, and Galloway and the Borders, I can do no more than assure those who are concerned on this score that everything possible will be done to overcome the obstacles which geography, climate and the circumstances of international broadcasting have raised to keep one section of Scotsmen from the full enjoyment of Scottish wireless fare."

"Amateur Wireless and Radiovision." Price Threepence. Published on Thursdays and bearing the date of Saturday immediately following. Post free to any part of the world: 3 months, 4s. 6d.; 6 months, 8s. 9d.; 12 months, 17s. 6d. Postal Orders, Post Office Orders, or Cheques should be made payable to "Bernard Jones Publications, Ltd."

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

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

Communications should be addressed, according to their nature, to The Editor, The Advertisement Manager, or The Publisher, "Amateur Wireless," 58-61 Fetter Lane, London, E.C.4.

Investigations made by the E.I.A.R. at Rome, Milan and Turin regarding the causes of interference to the reception of the radio programmes by the tramway systems in those cities, have conclusively proved that much of the trouble was due to the electric signals given by conductors to drivers. These starting and stopping bells are to be replaced by whistles.

Murray Ashford's concert party, "The Bouquets," from Scarborough, will again be heard on September 22.

Professor T. H. Parry Williams, of University College of Wales, Aberystwyth, will read some of his own poems during the Welsh Interlude on September 28.

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War Office Economy Sale of Huge Parcel of New Headphones and Single Earpieces.

A wonderful opportunity of buying Headphones at a price below the wildest cut price ever imagined.

We guarantee these Headphones for 12 months.



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- H.W. Sullivan's Wireless Light Headphones new 120 ohms 3 6
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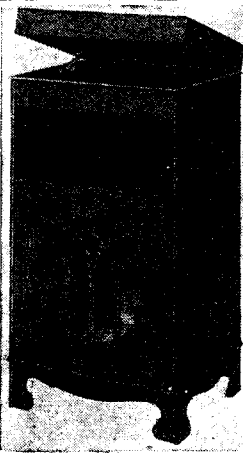
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This exceptionally low priced Cabinet is made to suit your special requirements. For Wireless only (Overall size, 32 in. high, 21 in. wide, 14 1/2 in. back to front, panel 20 in. x 8 in.) or for Radio-Gram (Overall size 36 in. high, 21 in. wide, 16 1/2 in. back to front, panel 20 in. x 8 in. Fret front, constructed from 9 m/m oak faced ply.

Prices	As Wireless Cabinet.	As Radio-gram Cabinet.
R.T.A. - - -	20/-	26/6
Assembled ready for Polishing - - -	27/-	34/-
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Cash with Order. Carriage Paid.

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High-Grade RADIO GRAMPHONE CABINET

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Figured Oak £5- 5-0
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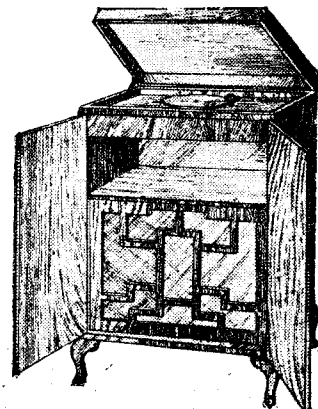
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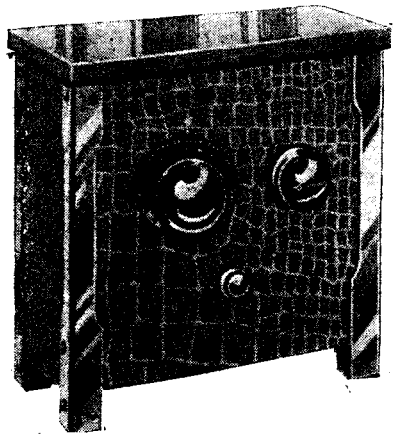
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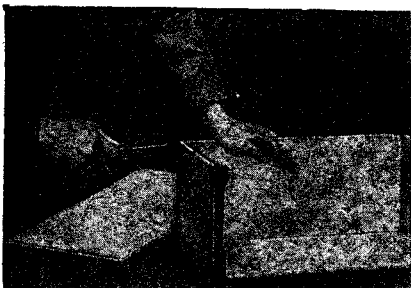


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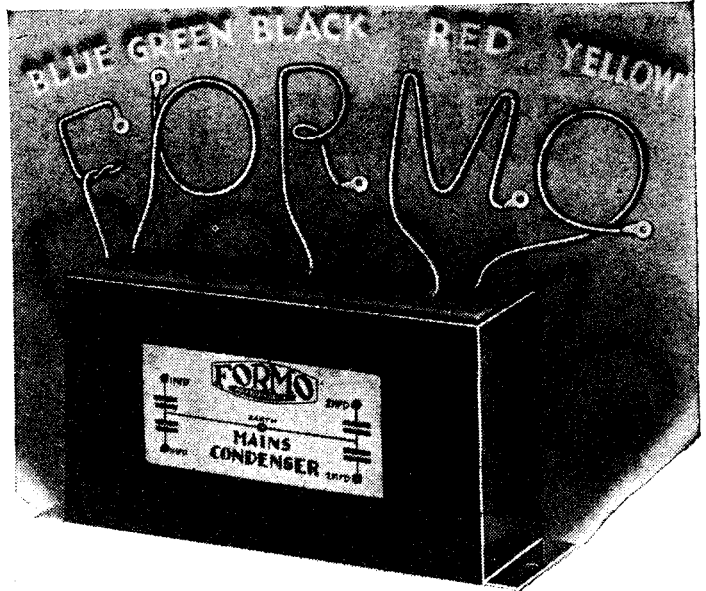
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The Formo Company have again pioneered the latest development in simplified set construction with a bank condenser fitted with coloured leads for easy fixing in the circuit.

The condenser illustrated above, embodies the Formo "Vacuum Process" condensers as specified in the "A.W." circuit and is specially designed for this super efficient set.

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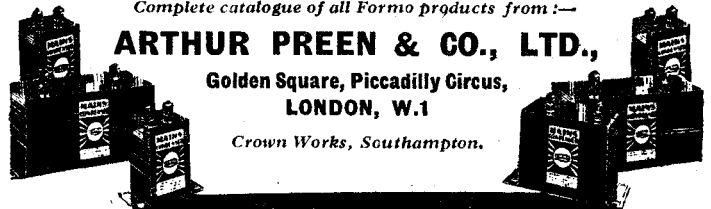
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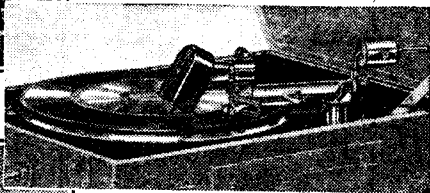
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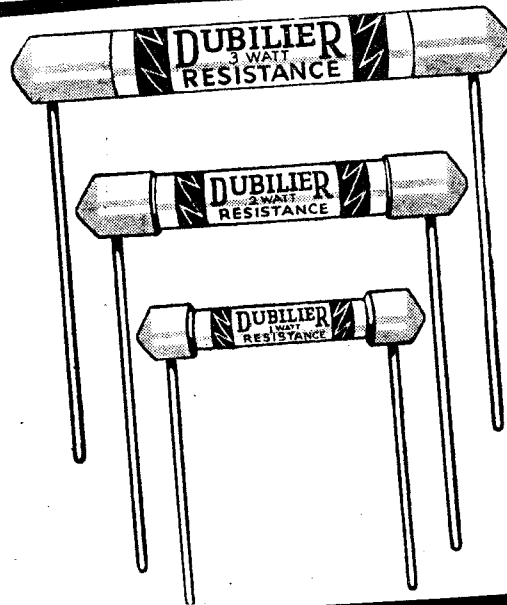
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RESISTANCE
with ALL the
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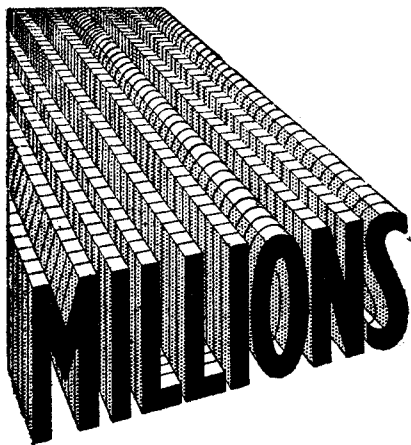
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GREAT BRITAIN						NORTH AFRICA		
25.53	11,751 Chelmsford		328.2	914 Grenoble (PTT)	3.0	303.4	825.3 Algiers (PTT)	13.0
242	1,238 Belfast (G5SW)	16.0	328.9	912 Poste Parisien	1.2	416	721 Radio Maroc	(Rabat) 10.0
261.3	1,148 London Nat.	68.0	345.2	869 Strasbourg (PTT)	15.0	NORWAY		
288.5	1,040 Newcastle	1.2	370.1	870 Radio LL (Paris)	0.5	235.8	1,219.9 Kristiansand	0.63
288.5	1,040 Swansea	0.18	384.1	781 Radio Toulouse	8.0	240.6	1,247 Stavanger	0.025
288.5	1,040 Plymouth	0.16	447.1	671 Paris (PTT)	2.0	304.1	824 Bergen	1.35
288.5	1,040 Edinburgh	0.4	460	644 Lyons (PTT)	2.3	307.6	816 Frederiksstad	0.8
288.5	1,040 Dundee	0.16	1,445.7	207.5 Eiffel Tower	15.0	453.2	662 Porsgrund	0.8
288.5	1,040 Bournemouth	1.2	1,724.1	774 Radio Paris	17.0	493.4	608 Trondheim	1.35
288.5	1,040 Aberdeen	1.2	1,724.1	774 " "	85.0	560	536 Hamar	0.9
301.5	995 Cardiff National	70.0	(testing)			1,083	277 Oslo	75.0
356.3	842 London Reg.	70.0	GERMANY					
376.4	797 Glasgow	70.0	31.38	9,560 Zeesen	15.0	POLAND		
398.9	752 Midland Reg.	38.0	217.1	1,382 Königsberg	1.7	214.2	1,400 Warsaw (2)	1.9
470.2	626 North Regional	70.0	218.5	1,373 Flensburg	0.6	234	1,283 Lodz	2.2
1,554.4	193 Davenport (Nat.)	35.0	227.4	1,319 Cologne	1.7	244.1	1,229 Wilno	21.0
AUSTRIA			227.4	1,319 Münster	0.6	312.8	959 Cracow	1.5
210	1,3697 Salzburg	0.6	227.4	1,319 Aachen	0.3	335	896 Poznan	1.9
246	1,220 Linz	0.6	232.2	1,293 Kiel	0.31	381	786 Lvov	21.0
283	1,059 Innsbruck	0.8	240	1,255 Nürnberg	2.3	408	734 Katowice	16.0
352	851 Graz	9.5	245.9	1,220 Cassel	0.3	1,411.8	212.5 Warsaw	153.0
453.2	656 Klagenfurt	0.6	253.4	1,184 Gleiwitz	5.6	PORTUGAL		
517.8	682 Vienna	20.0	259.3	1,157 Leipzig	2.3	290.5	1,033 Lisbon (CTIAA)	2.0
also testing on 1,235 m. from 8.0 p.m. (Mon. Wed. Sat.)			209.8	1,112 Bremen	0.2	also on 42.9 m.		
			276.5	1,085 Heilsberg	75.0	ROMANIA		
			283.6	1,053 Magdeburg	0.6	300.5	768.2 Bucharest	16.0
			283.6	1,058 Berlin (B)	0.6	RUSSIA		
			283.6	1,053 Stettin	0.6	427	702.5 Kharkov	25.0
			318.8	941 Dresden	0.3	497	603.5 Moscow	1.2
			325	923 Breslau	1.7	511	585 Archangel	1.2
			360.1	833 Mühlacker	75.0	720	416.6 Moscow (PTT)	20.0
			372.3	805 Hamburg	1.7	800	375 Kiev	20.0
			390	770 Frankfurt	1.7	840	357 Nijni Novgorod	1.8
			419	716 Berlin	1.7	937.5	300 Kharkov (RV20)	25.0
			453.2	662 Danzig	0.6	1,000	320 Leningrad	100.0
			472.4	635 Langenberg	17.0	1,060	283 Tiflis	10.0
			532.9	563 Munich	1.7	1,073	279.6 Rostov Don	4.0
			559.7	536 Kaiserslautern	1.7	1,103	272 Moscow Popoff	40.0
			559.7	536 Augsburg	0.3	1,304	230 Moscow (Trades Unions)	165.0
			566	530 Hanover	0.3	1,481	202.5 Moscow (Kom)	40.0
			569.3	527 Freiburg	0.3	SPAIN		
			1,620	185 Norddeich	10.0	252.3	1,189 Barcelona (EAJ15)	1.0
			1,634.9	183.5 Zeesen	75.0	268.5	1,125.4 Valencia (tests)	5.0
			2,525	119.3 Königswusterhausen	15.0	349	860 Barcelona (EAJ1)	8.0
			(press)			366.9	817.7 Seville (EAJ5)	1.5
			(press)			424	707 Madrid (EAJ7)	2.0
			(press)			450.1	666.5 San Sebastian (EAJ8)	0.9
			HOLLAND			SWEDEN		
			31.28	9,599 Eindhoven (PCJ)	30.0	230.3	1,304 Malmö	0.75
			298.8	1,004 Huizen	8.5	257.3	1,166 Hörby	15.0
			298.8	1,004 Radio Idzerda (The Hague)	3.0	306.9	977.2 Falun	0.6
			1,071.4	280 Scheveningen-Haven	10.0	322	932 Göteborg	15.05
			1,875	160 Hilversum	8.5	436	639 Stockholm	75.0
			HUNGARY			542	554 Sundsvall	15.0
			550	545 Budapest	23.0	770	389 Östersund	0.7
			ICELAND			1,229.5	244 Boden	0.75
			1,200	250 Reykjavik	16.0	1,352	221.9 Motala	40.0
			IRISH FREE STATE			SWITZERLAND		
			224.4	1,337 Cork (8CK)	1.5	241.1	1,229 Basle	0.65
			413	725 Dublin (2RN)	1.5	246	1,220 Berne	0.5
			ITALY			403.5	743 Sottens	32.0
			25.4	Rome (3RO)	9.0	459	653 Beromünster	75.0
			247.7	1,211 Trieste	15.0	760	395 Geneva	1.5
			296.4	1,012 Turin (Torino)	8.5	TURKEY		
			312.8	959 Genoa (Genova)	10.0	1,204.8	249 Istanbul	5.0
			332	905 Naples (Napoli)	1.7	1,538	193 Ankara	7.0
			441	680 Rome (Roma)	75.0	YUGOSLAVIA		
			453.2	662 Bolzano (IBZ)	0.2	308.3	973 Zagreb (Agram)	0.7
			501	599 Milan (Milano)	8.5	451.7	695 Belgrade	3.0
			542.5	553 Palermo	3.7	574.7	522 Ljubljana	2.8
			LATVIA					
			523	572 Riga	13.0			
			LITHUANIA					
			1,935	155 Kaunas	7.0			

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Please write concisely, giving essential particulars. A Fee of One Shilling (postal order), a stamped addressed envelope, and the coupon on the last page must accompany all letters. The following points should be noted.

Not more than two questions should be sent with any one letter.

The designing of apparatus or receivers cannot be undertaken.

Modifications of a straightforward nature can be made to blueprints, but we reserve to ourselves the right to determine the extent of an alteration to come within the scope of a query. Modifications

to proprietary receivers and designs published by contemporary journals cannot be undertaken.

Readers' sets and components cannot be tested at this office. Readers desiring specific information upon any problem should not ask for it to be published in a forthcoming issue, as only queries of general interest are published and these only at our discretion. Queries cannot be answered by telephone or personally.

Readers ordering blueprints and requiring technical information in addition, should address a separate letter to the Query Department and conform with the rules.

The "Olympian Three" Cabinet: It should be noted that the special "Windsor" cabinet used in the "Olympian Three" is the registered design No. 764138 of the Carrington Manufacturing Co. Further details of this fine set will be given next week.

Two short plays will be given on October 3. The first, *The Threshold*, by Harold Chapin, tells of a miner's daughter whose father is killed in a mining disaster. The second, *Sir Hubert is Deeply Touched*, is by H. C. G. Stevens.

CLIX

CONSTRUCTOR'S KIT

Saves you Time and Money

This kit contains an assortment of nineteen Clix fittings specially selected for the set builder.

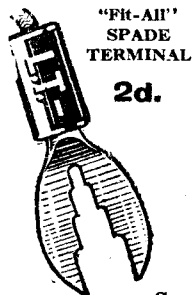
Buy a Clix Kit for your next set and save five pence.

Value 3/5

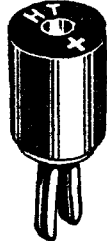
Price 3/-



Contents:—2 Spade Terminals engraved L.T.; 2 Plugs and Sockets (A and E); 7 Terminals, H.T., L.T., L.S., 6 Wander Plugs, H.T., and G.B.
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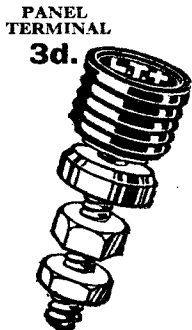
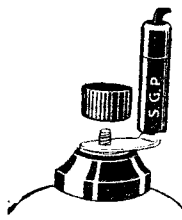


"FIT-ALL" SPADE TERMINAL
2d.



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1½d.

ANODE CONNECTOR
Horizontal or Vertical
3d.



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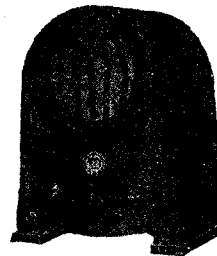
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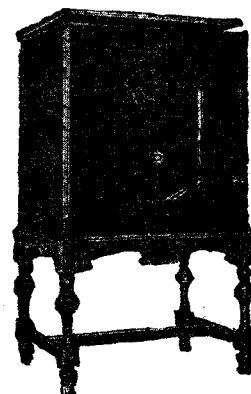
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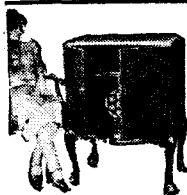
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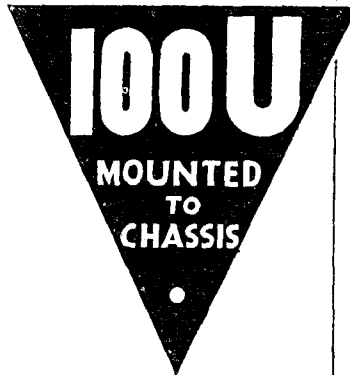
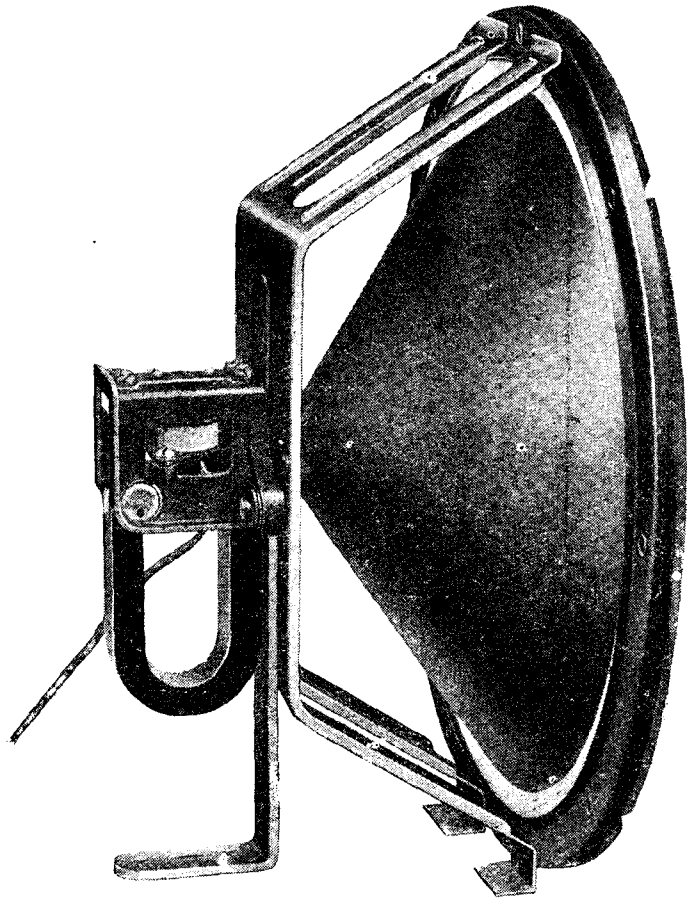
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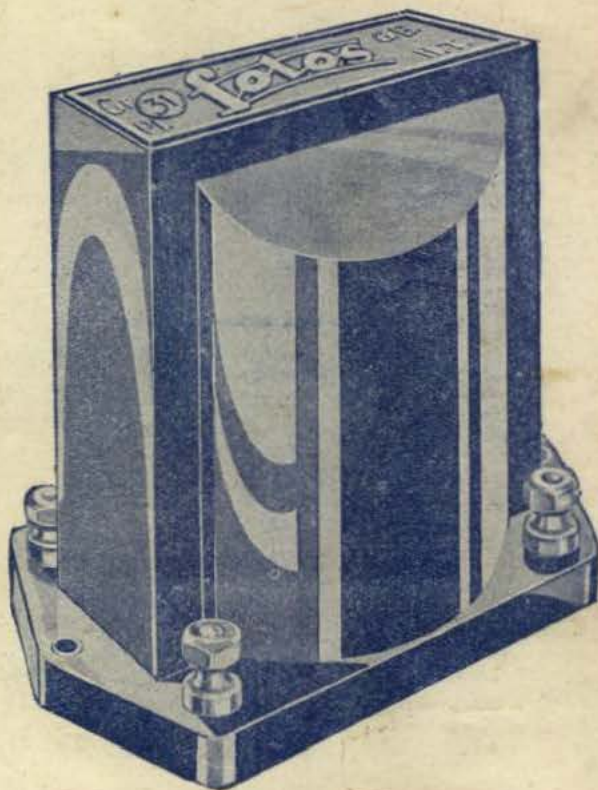
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