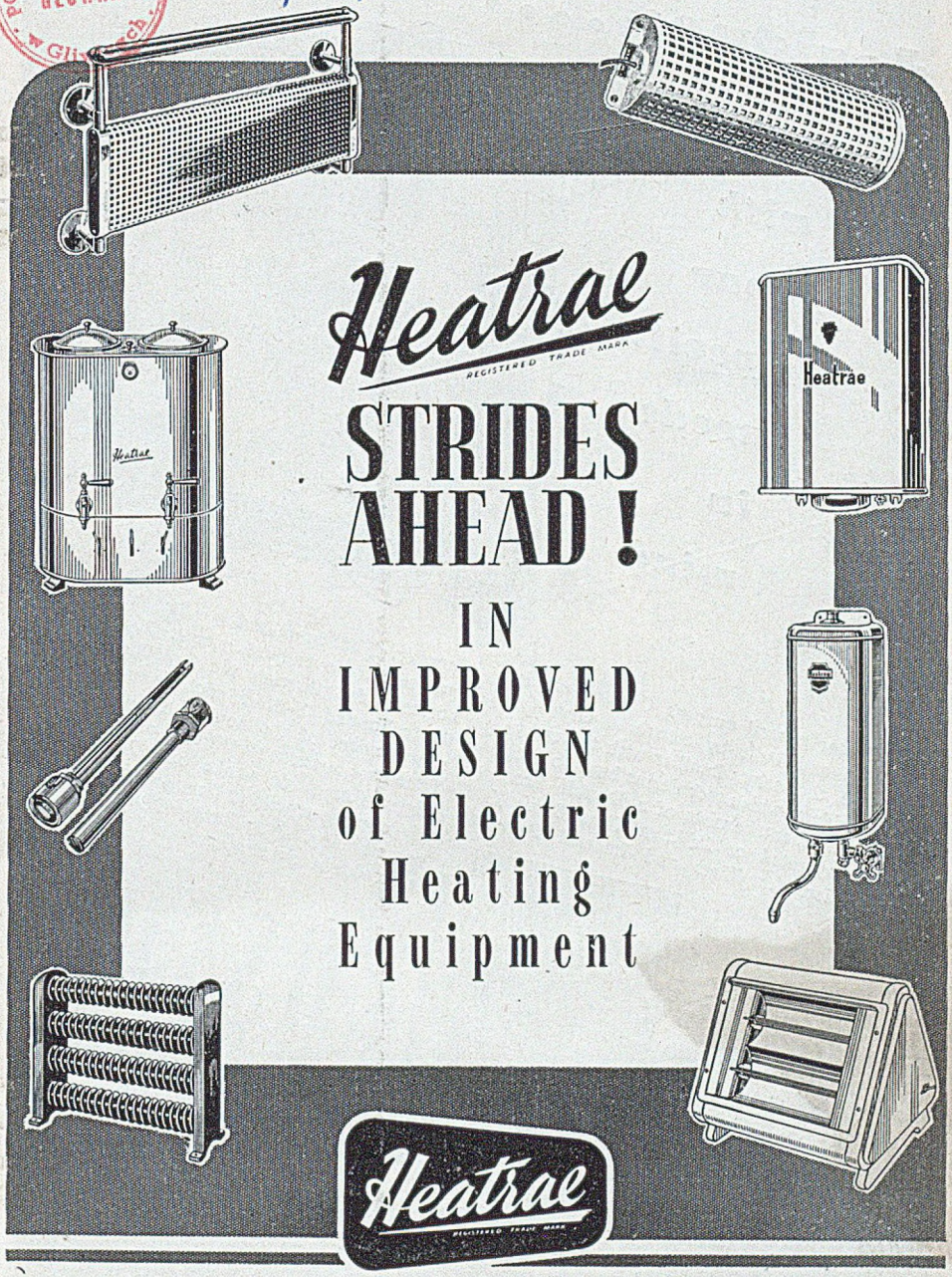
# ELECTRICAL REVIEW

ONE SHILLING 26th MAY, 1950




HEATRAE LIMITED · NORWICH · NORFOLK

# designed....

*with your specific needs in mind*


The Cossor general purpose Oscillograph is designed and built by electronic engineers who are themselves familiar with the everyday problems which technicians have to face. The instrument consists of a Double Beam Tube operated at 2kV., a Time Base, Y Deflection Amplifiers and Internal Power Supplies. The 90 mm. screen is flat, and traces are presented over the full area. Signals are normally fed through the Amplifiers, and the calibrated Y-Shift controls provide a measurement of the applied voltages. The Time Base operates repetitively, or by external trigger (for single stroke operation), or at trigger pulse repetition frequency for continuous scanning. A calibrated X-Shift Control is provided for the measurement of Time.

**Model 1428 CAMERA**

Specially developed for use with Cossor Oscillographs, it provides the simplest means of recording stationary or non-recurrent waveforms and slow transients by the moving film method on standard perforated 35 mm. film or paper. Of robust construction, it has provision for power drive by the Cossor Three-Speed Motor Attachment, Model 1429.

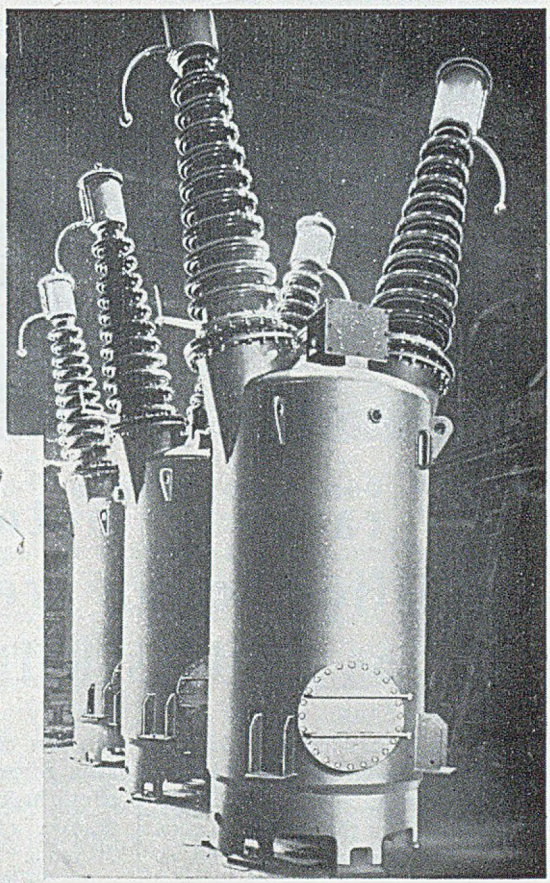
# COSSOR

## Double Beam OSCILLOGRAPH

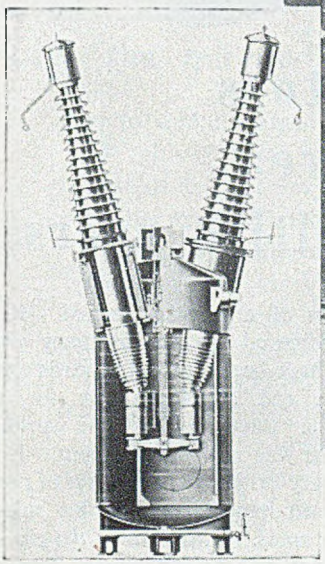
*Further details obtainable on application to :—*

**A. C. COSSOR LTD., INSTRUMENT DIVISION, HIGHBURY, LONDON, N.5**

# Hydro-electric Equipment



132 kV., 3,500 MVA "Shuntarc" oil-break circuit breakers. Thirteen breakers of this class have been supplied to the New Zealand State Hydro-electric Department



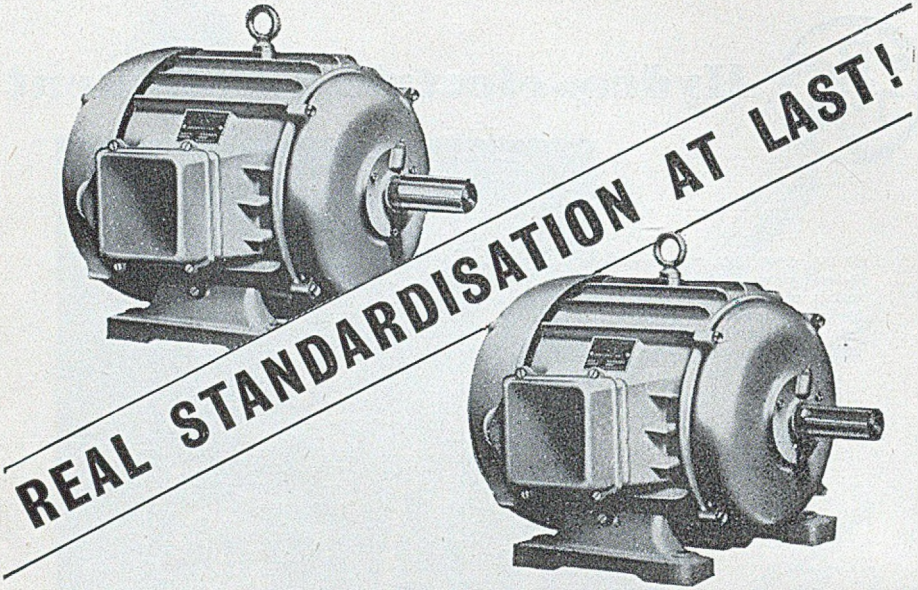
Sectional drawing through a single-pole unit showing resistor-shunted self-compensated arc-control chambers

For all plant required for Hydro-electric Power schemes
Consult BTH

**BRITISH THOMSON-HOUSTON**

THE BRITISH THOMSON-HOUSTON CO. LTD. WILLESDEN, ENGLAND

A 3877




# New range of motors satisfies dollar area as well as British users

The new range of Crompton Parkinson standard frame motors are made to American standards. That in itself is important news. But the new range goes further. Each frame will be available in two electrical designs. One design has the American rating and can be used on all machines bound for dollar areas. The other is more highly rated for British users.

Here is a workable solution to the problem of a world standard. It has been achieved by the Company whose efforts have been directed towards simplification and standardisation for over 30 years. Buyers all over the world will welcome this new development. It will help every British manufacturer of power-driven equipment increase his sales in dollar areas. *These new designs are additional to the Crompton Parkinson existing comprehensive range.*

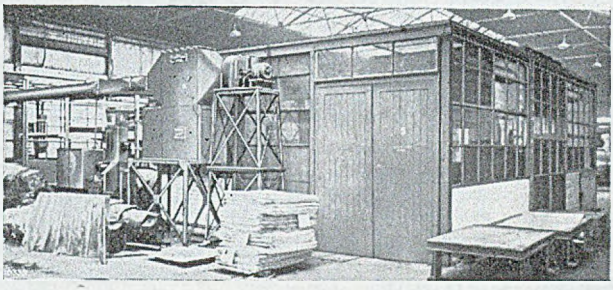
**Crompton Parkinson** LIMITED

CROMPTON HOUSE, ALDWYCH, LONDON, W.C.2

# Precipitron

REG. TRADE MARK

## ELECTROSTATIC AIR FILTER



**ensures the mirror-like finish on rolled metal sheets**

To make certain that the finest quality non-ferrous sheets have the perfect finish so essential it is absolutely necessary for even the smallest speck of dust to be excluded from the finish rolling room. In the illustration is shown such a room with a PRECIPITRON Electrostatic Air Filter fitted to the air intake of the ventilating plant.

Before the installation of this unit, despite precautions taken to exclude dust, rejects were common. Now, since the fitting of the PRECIPITRON, rejects have been completely eliminated **as this filter arrests up to 99% of ALL solid impurities in the air stream.** ***No other commercial air filter can approach this efficiency.***

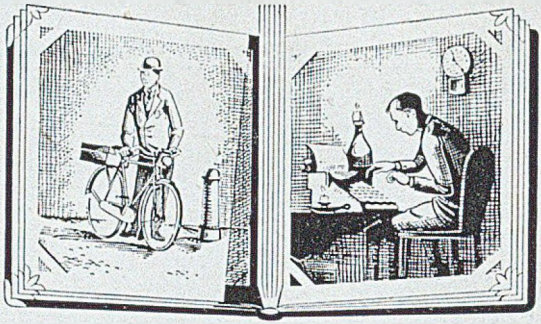
There may be a need for a completely dust free air supply in your factory. May we send details of PRECIPITRON Electrostatic Air Filter? *Ask for our publication* U.7102.

**STURTEVANT ENGINEERING CO., LTD.**

**SOUTHERN HOUSE, CANNON ST., LONDON, E.C.4.**

TELEPHONE: MANSION HOUSE 0533

1912



1950

## *The Story of* BELLING & *Company Ltd.* No. 5

Unfortunately I can't remember and cannot trace who our first customer was, but I should think it lay between the Westminster Electric, The Barnes, The Marylebone Electric. However, in those days there were a number of ".5'ers" who were all on the lookout for appliances to consume electricity. Our fires absolutely "filled the bill," taking as they did 3 kws. when full on. The fire was strong, simple, practical and very effective and any engineer could see there was very little to go wrong.

I called on most ".5'ers," started advertising in the trade papers and in a very short time orders came rolling in. These took us over the winter of 1912/13.

Up to now we were still carrying on at "The Hop Poles" Garage, Enfield, my day consisting of morning in the works, afternoon out travelling, evening at home typing invoices and letters. Also I wrote all our adverts, and perhaps I might add I was doing all this personally, having no office staff at all. I used to sleep on Sunday afternoons!!

During the spring of 1913 orders still kept coming in well, and we had to look for larger premises which we were fortunate in finding at Derby Road, Edmonton. We were able to commence moving over during summer of 1913.

For the winter season, 1913/14, I got out a new catalogue, fires only this time—as these kept us so busy we had to drop, for the time being, the other appliances shown in our first catalogue. We had a dozen designs, including our "Standard," "Office," "Portable," and some nice ones in sheet metal, which we had made for us in Birmingham.

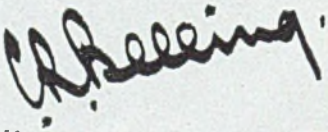
We had a good season and in 1914 produced our first balance sheet. This showed we had sold about £11,000 of fires and made a profit of about £3,500. This we allocated between us, according to our arrangements and we each of us left the money in the business. I see from the trading account our advertising and posters for the first year came to £390. This was more than my wages and the foreman's put together!! Travelling expenses were £49 for the year, so I must have used my bike quite a lot. Applications for patents came to £47 so I must have had a crowd of ideas at £3 per provisional! However, I've always been keen on advertising and patents—must have taken out hundreds of the latter during my life—and still doing it!

During the summer of 1914 rumours of war were already about, but Lloyd George's message to the nation was "Business as usual," so we carried on steadily, building reasonable stocks. For winter 1914 I produced a bolder catalogue with coloured frontpiece and listing about 24 designs.

War started in August but we were able to sell most of our stock and we commenced doing war work for the Admiralty. Our balance sheet for March 1915 showed a considerably increased turnover and a good profit, which was ploughed back again as before.

At our Annual Meeting the question of the general position of our venture arose. Mr. Arnold had joined the army, Mr. How had become absorbed in his various Hotels and as the future of our partnership seemed uncertain I undertook to try to buy my two partners out. From that date I became sole proprietor of the business.

The next chapter deals with the war years and how we progressed.

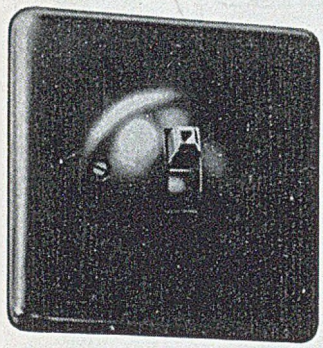


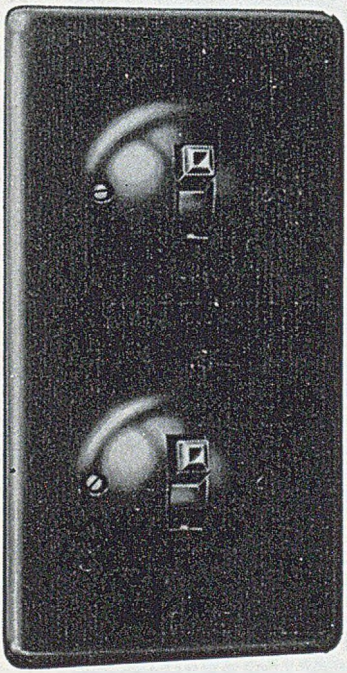
*Belling & Co. Ltd., Bridge Works, Enfield, Middx. Tel: Howard 1212*

CRCS

# Tenby Pilot

# FRIGATE FLUSH ASSEMBLIES





## A New Tenby Pilot Switch

*Just Tenby Quality at its very best*

THE "FRIGATE" combines all the labour-saving features of the TENBY PILOT Range of Accessories; a heavy Moulded Box, Plaster Depth to reduce installation costs; special Easy Wiring Terminals and a Cover of exceptional strength and graceful appearance. In short an extremely robust assembly at a price which enables you to install TENBY quality in the most competitive schemes. We'll be pleased to send you details.

MANUFACTURED BY

## S·O·BOWKER LTD

19-21 WARSTONE LANE, BIRMINGHAM 18. CENtral 3701

LONDON Office and Store:
54/56 Oxford Street
(Corner of Rathbone Place)
London, W.1
Telephone: Museum 4695

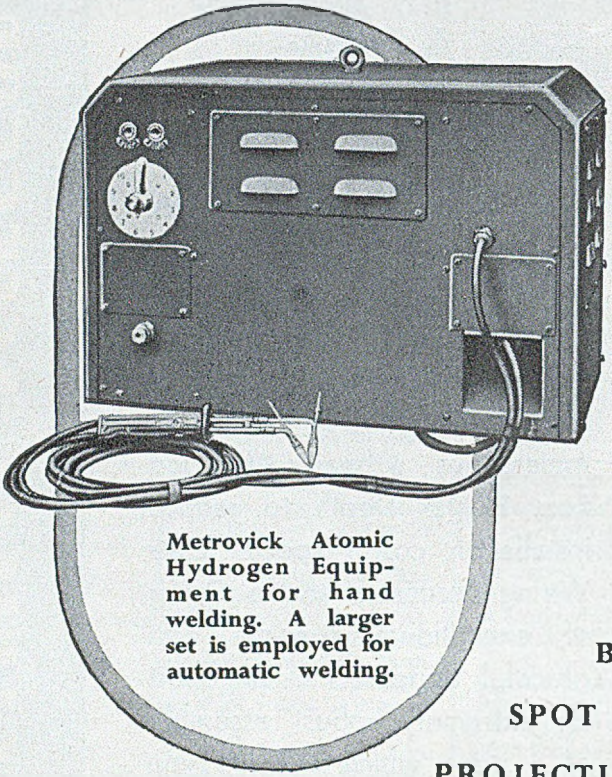
MANCHESTER Office and Store:
85 Mosley Street
Manchester 1
Telephone: Central 0051

Leeds Office and Store:
Somalac Sales Ltd.
5 Park Place, Leeds
Yorks
Telephone: Leeds 51608 & 30347

Tenby ELECTRICAL ACCESSORIES

# Metrovick Welding Equipment

## ATOMIC HYDROGEN WELDING...



Metrovick Atomic Hydrogen Equipment for hand welding. A larger set is employed for automatic welding.

*also*

BUTT WELDERS

SPOT WELDERS

PROJECTION WELDERS

ARC WELDING MACHINES

FLASH BUTT WELDERS

SEAM WELDERS

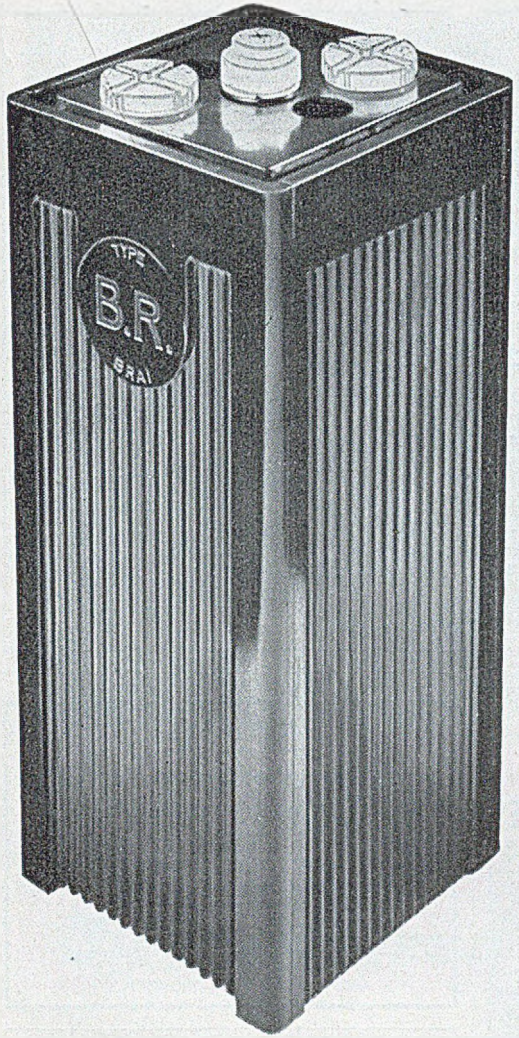
and Arc Welding Electrodes

METROPOLITAN-VICKERS ELECTRICAL CO. LTD.

*TRAFFORD PARK, MANCHESTER 17*

J/E906

BM132

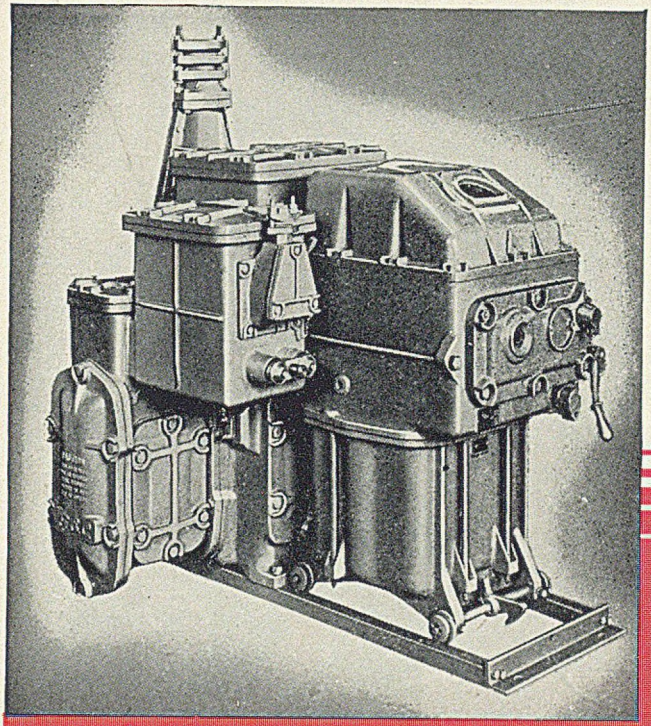



# British Railways use 'TELENDURON'

This is the large Battery Container, 17½" high, for British Railways train lighting sets, made by British Moulded Plastics Ltd. Container and lid are made from "Telenduron" Bitumen Asbestos Compound, float gland and two vent plugs are injection moulded from polystyrene — proving once more the tough serviceability of moulded plastics chosen with skill for an important use.

**BRITISH MOULDED PLASTICS LTD.**
AVENUE WORKS • WALTHAMSTOW AVENUE • LONDON • E·4

*Sole Distributors for Scotland & N. Ireland* — CALEDONIAN PLASTICS LTD., 12 RENFIELD ST., GLASGOW, C.2



# Flameproof Oil-immersed Switchgear

★ Complies fully with the recommendations in the Report of the Royal Commission on "Safety in Coal Mines."

★ Covered by Buxton Certificates, Groups 1 and 2.

★ Approved breaking capacity of 25 MVA at 3.3 kv in accordance with British Standard Specification No. 116.

★ Detachable cable box simplifies cable jointing.

★ Available in single and multiple units.

★ Lighting Transformers, up to 5 kVA, can be mounted on the unit.

Full particulars are given in Technical Description No. 380.

by

G.E.C.

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2





A†

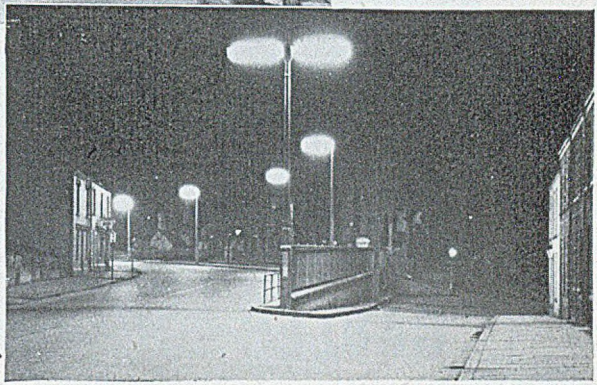
# THE LISBURN STORY....

The biggest Fluorescent Lighting Scheme in Northern Ireland

NEW STREET LIGHTING WITH

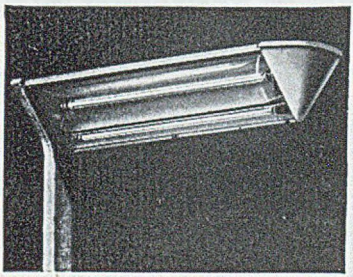
SIEMENS

SIERAY



## FLUORESCENT LAMPS

### AND LIGHTING EQUIPMENT



The Wilton-Sieray

The installation comprises 170 Wilton-Sieray lanterns each with three 80-watt Sieray Fluorescent Lamps.

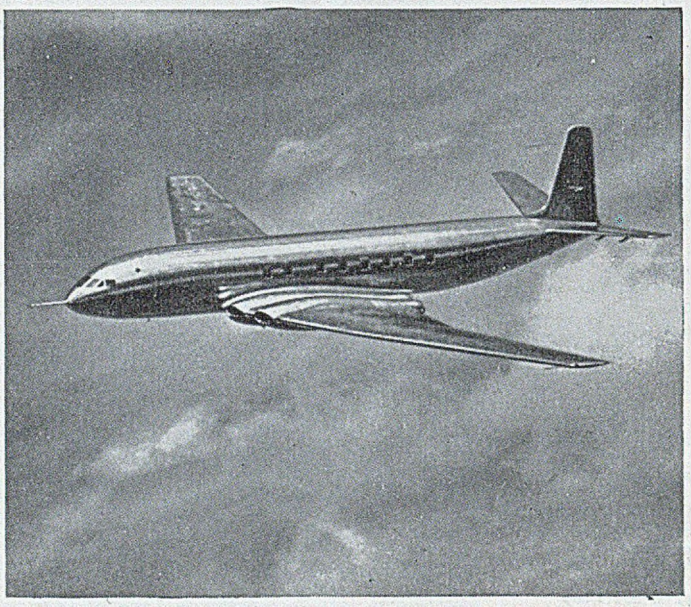
Each lantern is mounted on a concrete column of special design approved by the Royal Fine Art Commission.

The scheme is regarded as the most modern in the British Isles and the only one of its kind in Northern Ireland.

SIERAY *is the answer to YOUR lighting problem!*

**SIEMENS ELECTRIC LAMPS AND SUPPLIES LIMITED, 38/39 Upper Thames Street, London, E.C.4**

*Belfast, Birmingham, Bristol, Cardiff, Dublin, Glasgow, Leeds, Liverpool, Manchester, Newcastle, Nottingham, Sheffield*



# CABLES AND COMETS

The DE HAVILLAND COMET — an epoch making production and as such demanding the finest fittings and accessories obtainable. For this reason the Comet is fitted throughout with C.M.A. cables, the last word in scientific cable construction.

**MAINS CABLE MANUFACTURERS ASSOCIATION**

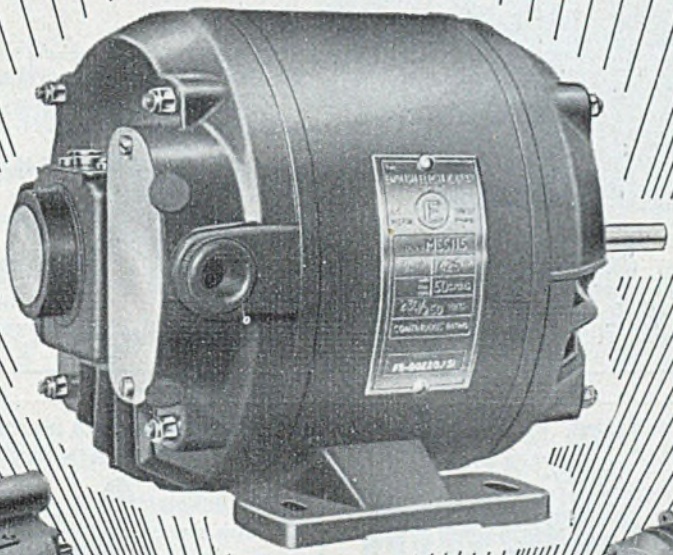
**RUBBER & THERMOPLASTIC CABLE MANUFACTURERS ASSOCIATION**

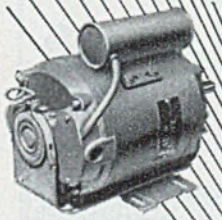
Affiliated to

**CABLE MAKERS ASSOCIATION**

52-54 High Holborn, London, W.C.1. Tel: Holborn 7633

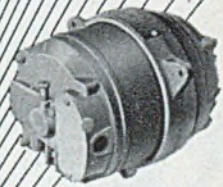
# For outstanding reliability···specify
# ENGLISH ELECTRIC
## Fractional Horse-power Motors



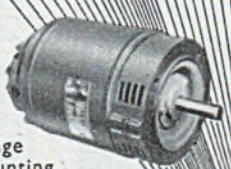


Single phase, capacitor-start induction run ; Resilient base.

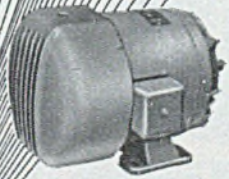
There is an "English Electric" Motor for every type of drive, and certain sizes are ex-stock.



Lug mounting.



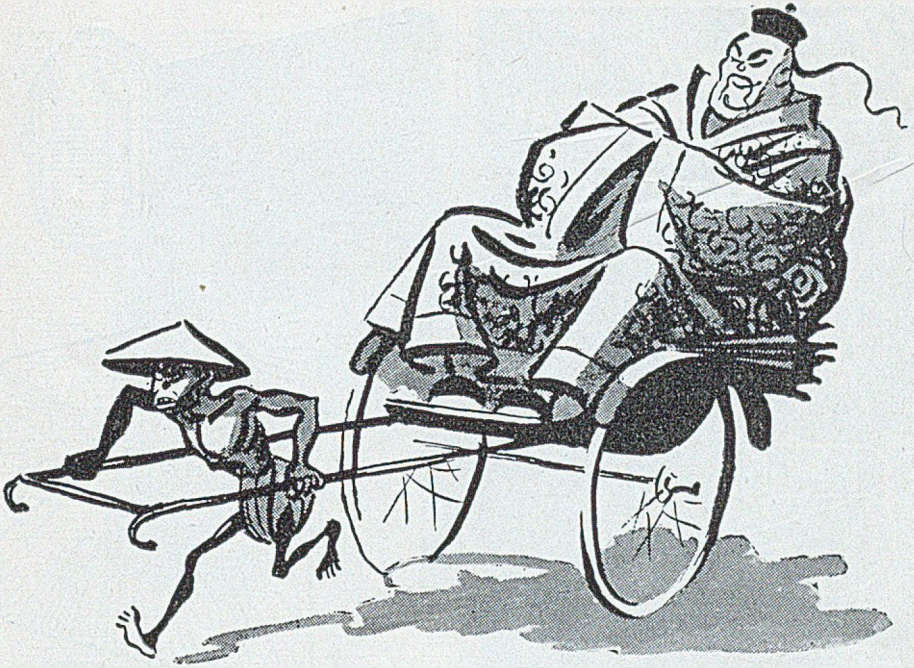
Flange mounting.



Totally-enclosed, Fan-cooled, Rigid base

**The ENGLISH ELECTRIC Company Ltd.**
**FRACTIONAL HORSE-POWER MOTOR DEPT · BRADFORD**
**WORKS: STAFFORD · PRESTON · RUGBY · BRADFORD · LIVERPOOL**

*See also 'English Electric' Ignitrons advertisement, page 53*



**. . . but in the case of volts and amps,**

when dependability and efficiency matter most

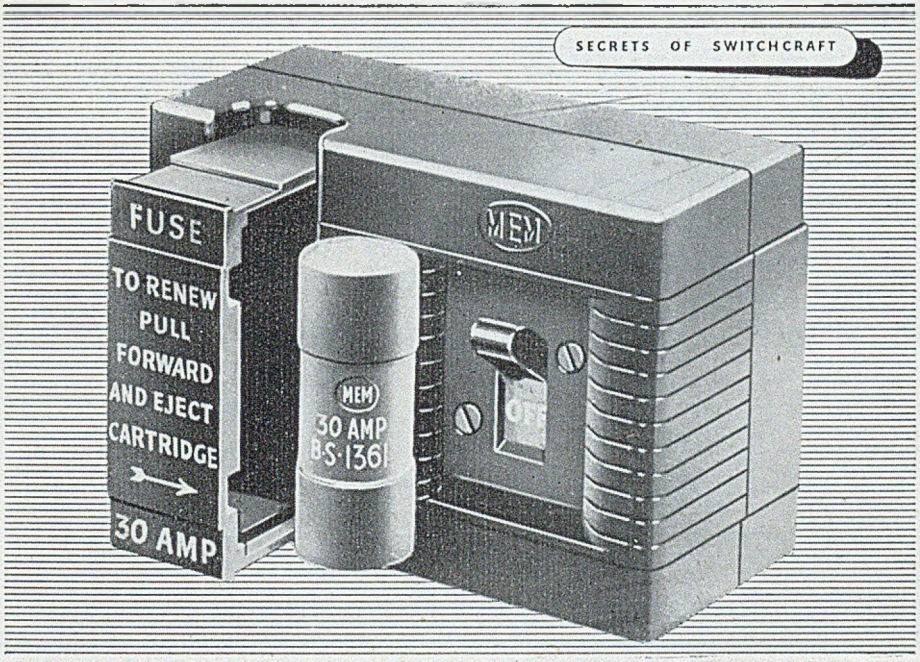
**Britannic Cables carry the load . . .**

Britannic Cables for power, for mining and heavy industrial use, and for the domestic field, are available in a wide range of sizes and specifications at fully competitive prices — Britannic is independent. Send your enquiries through your usual wholesaler or to us direct.

# Britannic Cables

● BRITANNIC ELECTRIC CABLE & CONSTRUCTION CO LTD · IVER · BUCKS

**An independent company**




# The most advanced switch-fuse—now available for *early* delivery

Quick delivery is the new plus point of the Mem-ac—the MEM all-insulated switch and switch-fuse units. Mem-ac brings you strength with amazing compactness—the 60 amp. slow break A.C. switch is less than half the size of most conventional units. The ingenious fuse holder for H.R.C. cartridge fuse requires no tools and is absolutely safe in use. Its many other features include silver contacts, double break per pole, breaking capacity and temperature rise in accordance with BS 861/1939 and BS 816/1938 and H.R.C. fuses to BS 1361/1947. Spare fuses available to meet all needs.

**Full information on Mem-ac switch and switch-fuse units for 30 and 60 amps. 250 volts is given in folder No. 288.**

MEM — Switch, fuse and motor control gear, electric fires and localised lighting equipment

**MIDLAND ELECTRIC MANUFACTURING CO. LTD., BIRMINGHAM, 11**

Branches in London and Manchester

# Eversheds Roll Chart Recorders aid development and research

*Eversheds Recorder used in conjunction with Infra-red spectrometer.*

## *Astronomy, Plant Disease and Radio Waves*

Although Eversheds Roll Chart Recorders are more widely known for their uses in factories, workshops and power stations, they have interesting functions in the fields of development and research.

In one research establishment, for instance, an Eversheds Recorder is used in connection with the development and production of Geiger Counters. For each counter a plot has to be made of the plateau characteristic, which is a feature of the curve "rate of count/applied voltage". With the use of an Eversheds Recorder the complete plateau curve is plotted automatically over a period of about 10 to 15 minutes, depending on the length of the plateau.

Automatic recording, compared with point-by-point plotting, reduces the effect of statistical variation inherent in radio-active disintegration, and of course effects a saving in man-hours.

The Scottish Raspberry Investigation at University College, Dundee, employed Eversheds Recorders to help determine the association between light intensity and the expression of disease systems in virus infected raspberries. Fluctuations in incident light were detected by selenium cells, their current being amplified and recorded, it being reported that the Eversheds Recorders showed themselves remarkably sensitive to very slight variations.

In work carried out for the Signals Research and Development Establishment of the Ministry of Supply, Eversheds Recorders have been employed in experiments on the propogation of very short radio waves. The instruments were employed to make automatic records of signal strengths at receiving stations for periods of between two and three years.

The University of Cambridge Department of Physics, at the Cavendish Laboratory also uses Eversheds Recorders to record the intensity of radio waves — this time emitted from the sun and the stars. Records are also being made of the propagation of radio waves of long and very long wavelengths, and the results are being applied to a study of the electrical properties of the earth's upper atmosphere.

*For details of Eversheds Roll Chart Recorders, send for Publication No.* D222.

## *Eversheds Recorder an "Invaluable Asset"*

An Eversheds Recorder is used in a Sub-Area of the National Coal Board for checking the loading of cables and switchgear. Every cable in the distribution system is examined twice a year and a study of the recorder charts reveals any increases in load which might exceed the capacity of the apparatus, and enables appropriate action to be taken.

Recordings were recently taken on an electric winder operating on sinking duty which, being unbalanced work, made an interesting study and even pointed out the differences in operation of the men working the winder.

"Generally speaking", says the Sub-Area Chief Electrical Engineer, "we regard the Eversheds Recorder as an invaluable asset, and an essential part of our equipment."

*For details of Eversheds Recorders, send for Publication No.* D222.

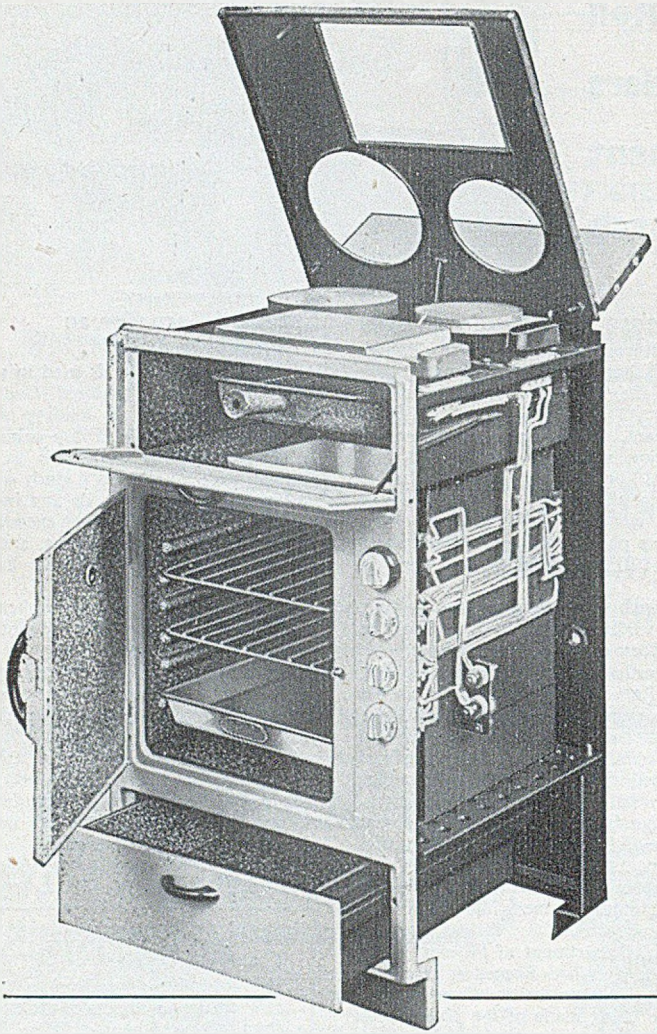
### *New The 'Noflote' Control Story*

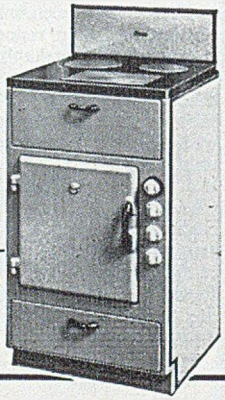
Eversheds have produced a new edition of the 'Noflote' Pump Control booklet. This contains, for the first time complete details of the new sensitive pattern relay units, which are used for operation in connection with relatively clean water. The standard pattern electrodes used for drainage and sewage purposes are also described. *Send for your copy — Publication No.* D234.

EVERSHED

PROCESS CONTROLLERS
INDICATORS & RECORDERS
REMOTE CONTROLLERS
**MEGGER** TESTERS

EVERSHED & VIGNOLES LTD *ACTON LANE WORKS, CHISWICK, LONDON, W4*
*Telephone: Chiswick 3670* *Telegrams: Megger, Chisk, London.* *Cables: Megger, London*
5/156





**CARRON 'H.3' ELECTRIC COOKER**

Hob structures to E.D.A. Specification • Extra large oven, thermostatically controlled • Self-indicating reciprocating switches • Easy access to fuses • Modern clean design • Strongly constructed of cast iron and sheet steel, finished in vitreous enamel. Write for full technical details and prices.

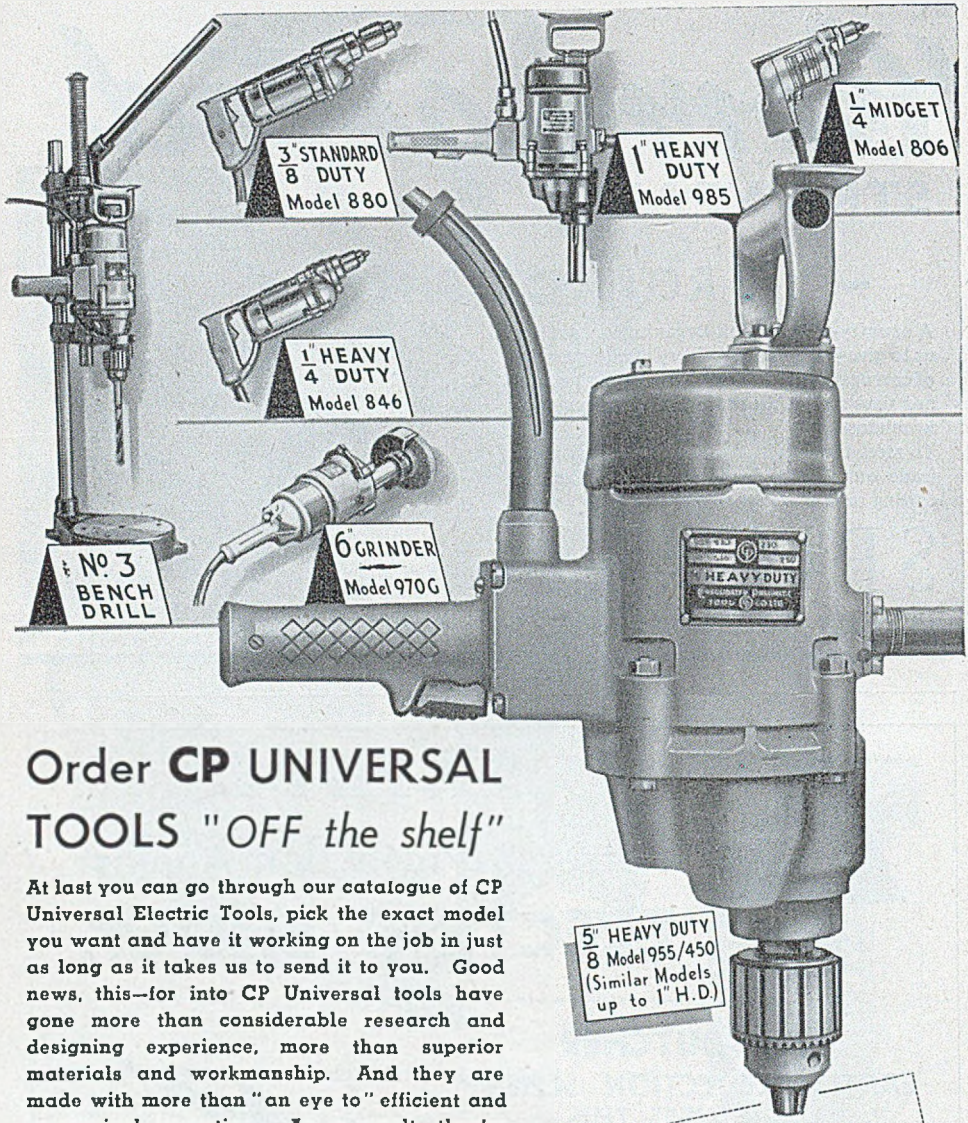
This is a Carron product made by modern Carron processes embodying the Carron tradition for fine workmanship begun in 1759.

CARRON

**CARRON COMPANY · CARRON · FALKIRK · SCOTLAND**

*Showrooms and Offices: 15 Upper Thames Street, London, E.C.4; 22-26 Rodcross Street Liverpool 1; 125 Buchanan Street, Glasgow, C.1. Office: 14 Ridgefield, Manchester 2.*

B2




# Order **CP** UNIVERSAL TOOLS *"OFF the shelf"*

**At last you can go through our catalogue of CP Universal Electric Tools, pick the exact model you want and have it working on the job in just as long as it takes us to send it to you. Good news, this—for into CP Universal tools have gone more than considerable research and designing experience, more than superior materials and workmanship. And they are made with more than "an eye to" efficient and economical operation. As a result, they're better tools than most. Stocks available at all branch offices.**

**SEND TODAY** FOR YOUR COPY OF THE LATEST CP UNIVERSAL ELECTRIC TOOLS CATALOGUE

CP87

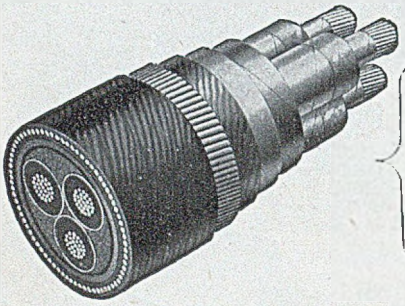
**CONSOLIDATED PNEUMATIC TOOL COMPANY LIMITED**

232 Dawes Road, London, S.W.6

Offices at London, Glasgow, Newcastle, Manchester, Birmingham, Leeds, Bridgend, Belfast, Dublin, Johannesburg, Bombay, Melbourne, and principal cities throughout the world

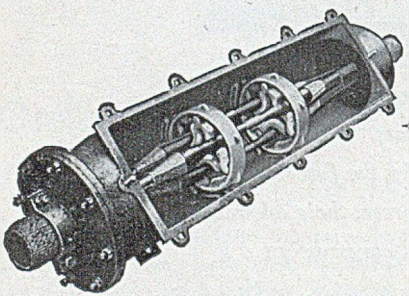
# GLOVERS SOLID TYPE

## SUPER-TENSION CABLE AND JOINTS



① IMPREGNATED WITH COMPOUNDS WHICH ARE SOLID UP TO 65°C.

② NO EXCESSIVE PRESSURE OR VACUUM IN SERVICE.



JOINT READY FOR FILLING WITH COMPOUND.

① SOLID COMPOUND INSULATED, PORCELAIN SPACED, JOINTS.

② NO COMPOUND MIGRATION FROM JOINTS.

③ BARRIER JOINTS UNNECESSARY AND NEVER USED.

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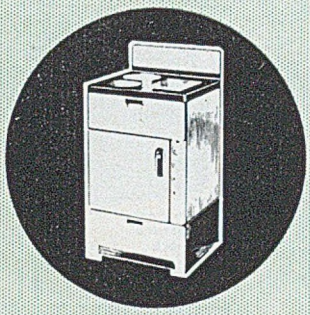
TRAFFORD PARK MANCHESTER 17



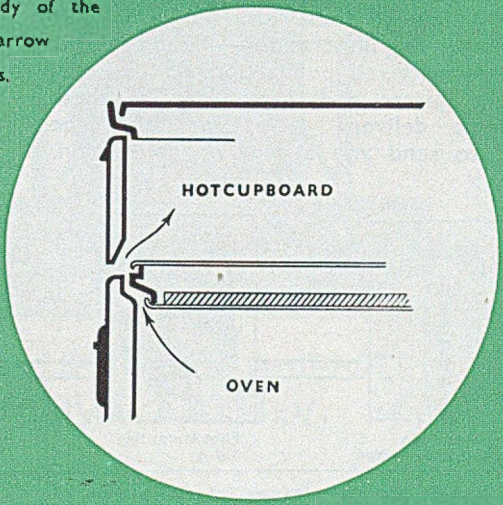
## *What's in the air?*

**Steam and cooking fumes from the oven are dissipated harmlessly by the unique Parnall system of oven ventilation**

PARNALL POINTS OF PERFECTION

# Oven Ventilation

is necessary to prevent build-up of pressure, but the steam and fatty vapours produced during cooking should not be directed on the exterior surface of the cooker or against a wall — the brown stains created are difficult to remove. In the Parnall cooker the problem is solved by leaving a slight gap between the top edge of the door and the body of the cooker. Through this narrow opening the steam emerges, but instead of flowing upwards over the outer face of the hotcupboard door it is directed through another channel into the hotcupboard and is there dispersed unobtrusively and harmlessly.

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ELECTRIC
IGRANIC
CO. LTD.

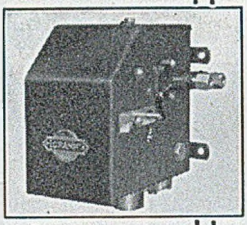
# MOTOR CONTROL GEAR

## AVAILABLE FROM STOCK OR ON SHORT DELIVERY

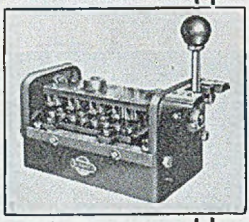
DESPITE continuing heavy demands, increased production enables us to offer you a number of standard starters and auxiliary switches from stock or within two to three weeks.

These include certain types of small contactor type across-the-line starters, A.C. and D.C. hand-operated starters, float switches, pressure switches, limit switches, plugging reversing switches, push-buttons and low-voltage lighting equipment.

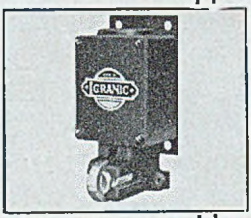
A few of these are shown in the accompanying illustrations. If you have not already received publication Z5 (Issue 1) giving prices and particulars of these prompt delivery items we shall be glad to send you a copy on application.



Pressure Switch

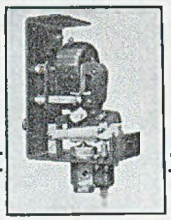


Pole-Changing Speed Controller



Shunt Limit Switch

Miniature Type Pendant Push-button



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Float Switch

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*Send for Catalague V549 To-day.*


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ELECTRICAL AND RADIO LABORATORY APPARATUS ETC.

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and 76 Oldhall Street, Liverpool 3, Lancs

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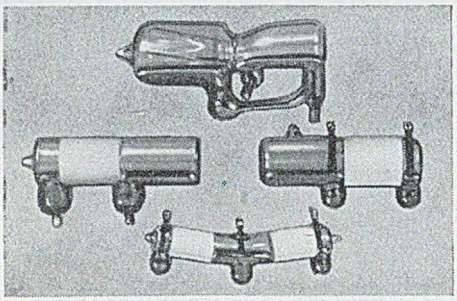

We manufacture all types of mercury switches up to 100 amps. and any specified delay-action types up to 2 minutes. Special consideration given to individual requirements

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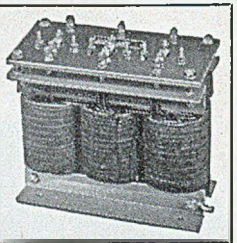
**TRANSFORMERS**
*for*
**LIGHTING, POWER, NEON AND COLD CATHODE ILLUMINATION**
**and all INDUSTRIAL REQUIREMENTS**
**up to 20 kVA**
*Single and 3-Phase*



**STEWART TRANSFORMERS LTD.**
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USE **"GUNFIRE"**
TRADE MARK
**Time Switches**
AND
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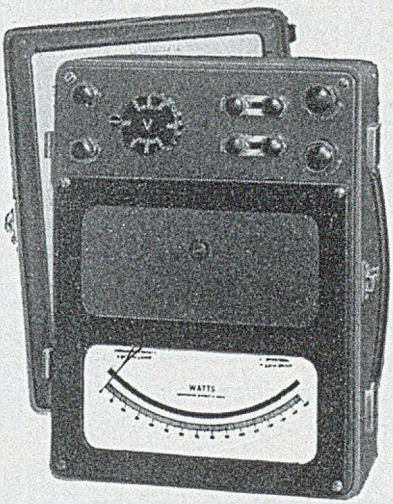
FOR SATISFACTION
AUTOMATIC LIGHT CONTROLLING CO. LTD.
BOURNEMOUTH
Established over Fifty Years

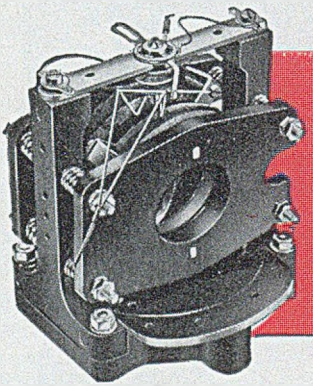
FEATURES OF WESTON SUPERIORITY

# *Weston*

## DYNAMOMETER SUB-STANDARD INSTRUMENTS




This latest development of the well-known 'Weston' sub-standard Wattmeter is made in three models, each of high-grade dynamometer type, designed for a wide range of precision measurements. The standard series is particularly suitable for meter standardisation and for use as a transfer standard between A.C. and D.C. circuits. Type 2 is recommended for low power factor circuits and Type 3 for higher power frequencies. Similar in size and design, each is housed in a lightweight Bakelite case, with easy reading 6″ scale, knife-edge pointer and anti-parallax mirror. The moving element is fitted with spring-loaded jewels, double magnetic shielding is employed and each instrument carries a certificate of individual performance and guarantee of accuracy to 0.25%. Ample voltage and current ranges are available by simple switching which can be safely applied when the instrument is on load. Model S67 (as illustrated). Size 11″ × 9½″ × 6⅞″. Weight 10 lbs. (approx.)



EXTREME RIGIDITY. An unique feature of these 'Weston' models is the self-contained assembly independent of the casing, thus ensuring extreme rigidity. The whole instrument is housed as one complete unit in an attractive Bakelite case with leather carrying strap and detachable cover. Ample shielding and the absence of metal parts eliminate errors due to external magnetic fields and eddy currents.

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ENFIELD, MIDDLESEX. Telephone : Enfield 3434 (6 lines) & 1242 (4 lines) Grams : "Sanwest, Enfield"

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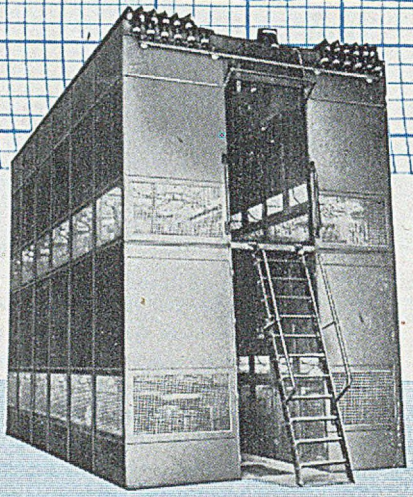
HEWITTIC Rectifiers have proved the ideal converting plant for the arduous conditions of electrolytic supply; an application in which converting plant is required to operate continuously at full load for long periods, and where continuity of supply is of high importance — emphasising once more the supreme reliability of HEWITTIC rectifiers.



*The world's largest glass-bulb rectifier— an 8,750 kW. Hewittic installation supplying electrolytic plant.*

**OVER A MILLION kW. IN WORLD-WIDE SERVICE**

*A Hewittic Industrial rectifier of the patented group unit type (capacity 600 kW.).*

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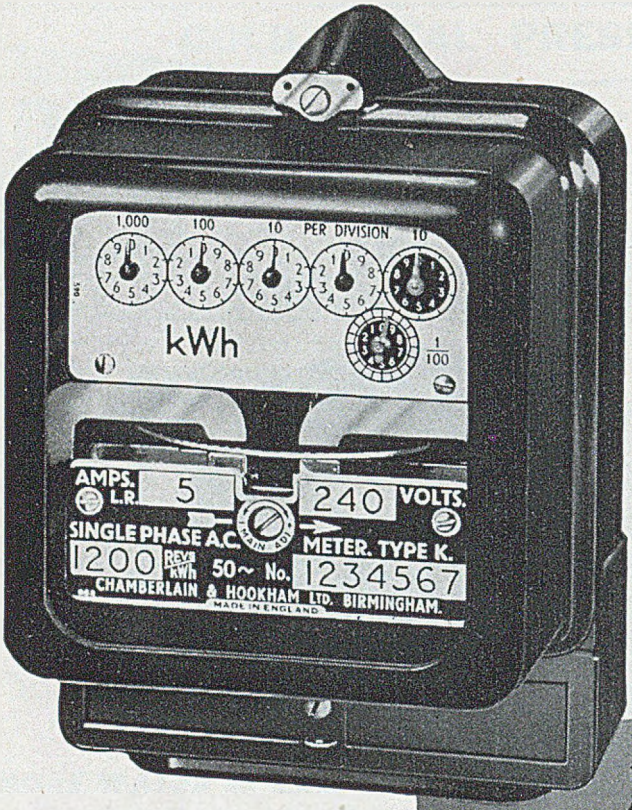


*The*

# C&H

## TYPE "K" SINGLE PHASE METER

CONFORMING TO OVERALL DIMENSIONS, NEW FIXING CENTRES AND TERMINAL SPACINGS AS LAID DOWN IN B.S.S. 37/1937 AMENDMENT NO. 1. JUNE 1946.

CHAMBERLAIN & HOOKHAM LTD.
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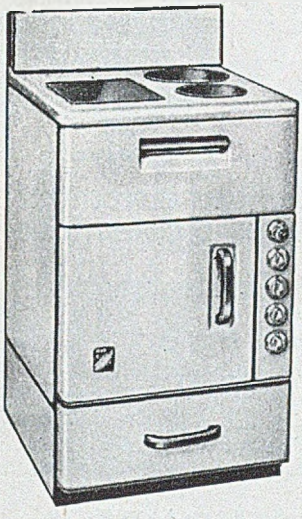
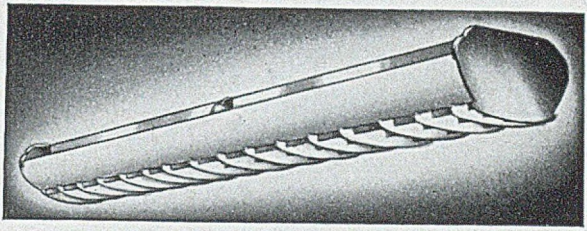
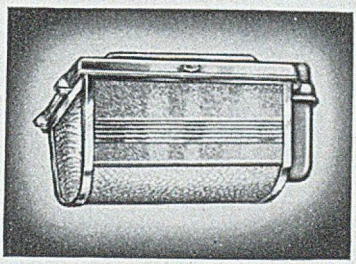


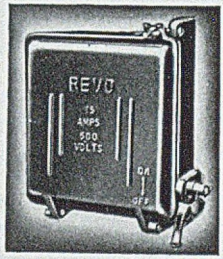
# Just a Selection

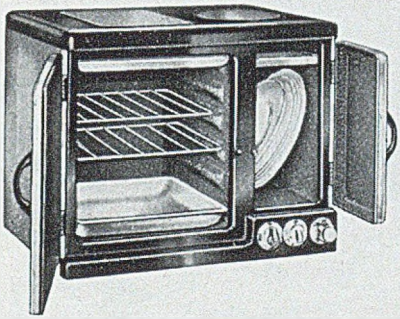
from the wide range of REVO Electrical Specialities.

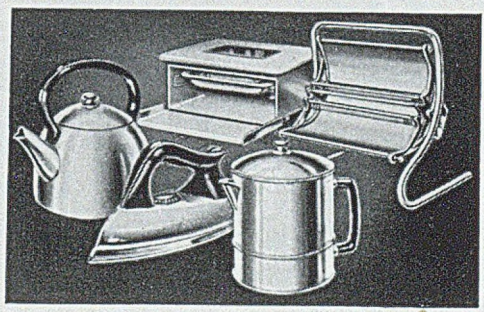
Other products include street lighting columns and brackets in cast iron, steel and concrete; the company also undertakes the installation and erection of this equipment.



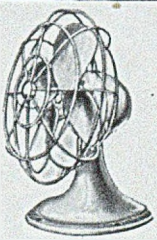






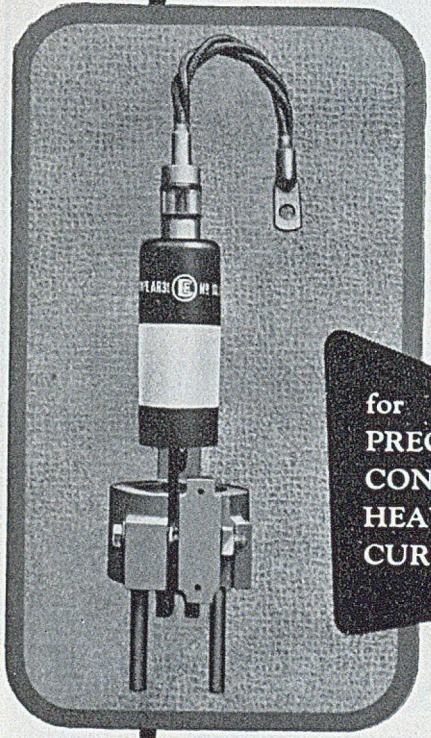
(*From left to right*)—Princess "464" Electric Cooker. One of a range of Decorative Lighting Fittings for fluorescent lamps. The "Silverblue" Street Lighting Fitting for mercury vapour discharge lamps. An example from the extensive range of Revo Switch and Fuse gear. The "Peerless" Electric Cooker for table use or with special stand. A group of Domestic Appliances. 8in. Electric Fan for desk or wall mounting.

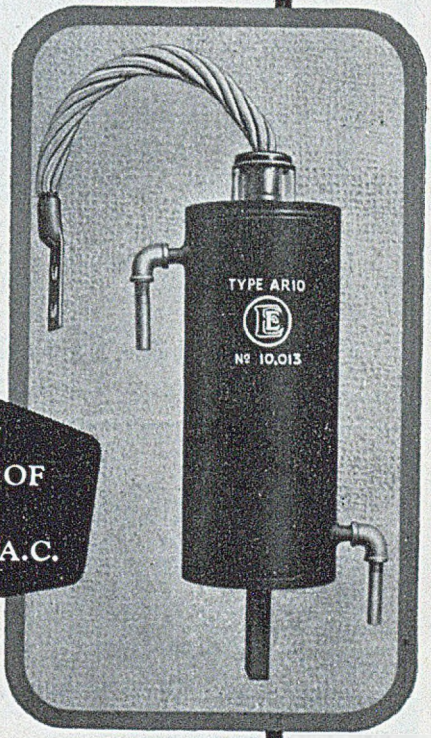


REVO
REGD.

**REVO ELECTRIC COMPANY LTD., TIPTON, STAFFS.**

# 'ENGLISH ELECTRIC' IGNITRONS






for PRECISION CONTROL OF HEAVY CURRENT A.C.

SIZE A
Type AR 31

SIZE C
Type AR 10

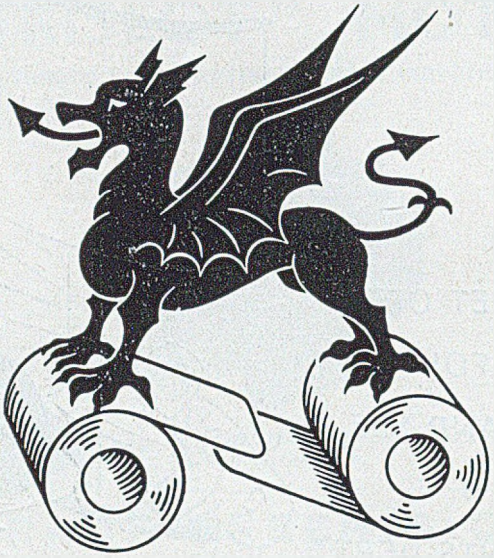
*Typical applications*

**SPOT, SEAM AND PROJECTION RESISTANCE WELDING EQUIPMENT**

**ENERGY STORAGE OR STRAIGHT A.C. WELDING EQUIPMENT**

The ENGLISH ELECTRIC Company Ltd.
RECTIFIER SUBSTATION DEPARTMENT · STAFFORD
WORKS: STAFFORD · PRESTON · RUGBY · BRADFORD · LIVERPOOL

*See also 'English Electric' Fractional H.P. Motors advertisement, page 23*



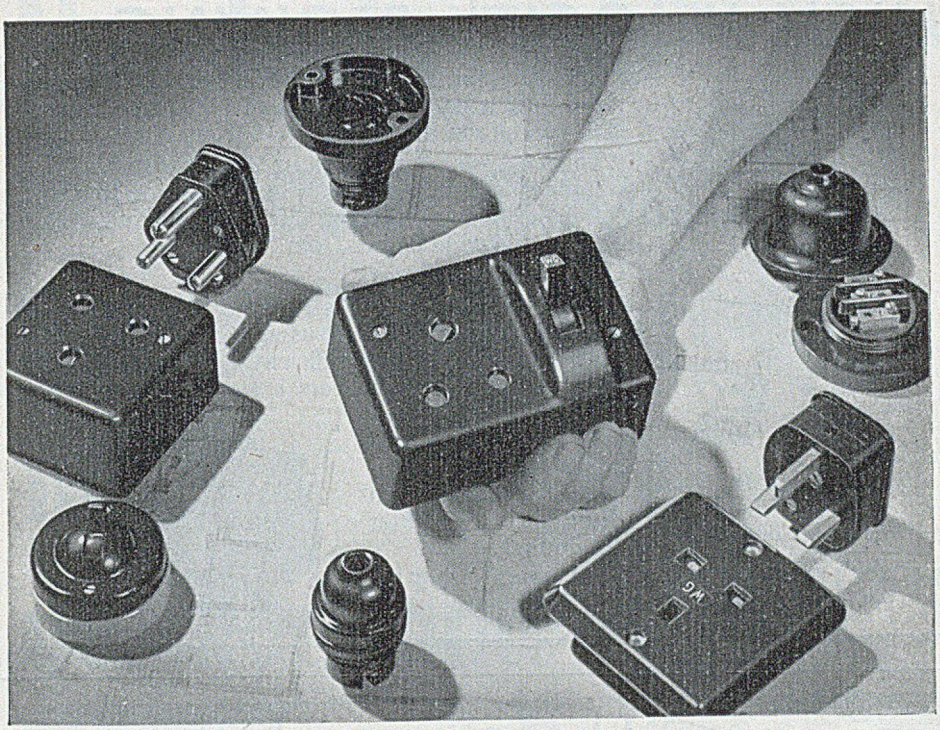
*THIS is the Trademark of The Steel Company of Wales Limited whose new plant will come into operation in 1951.*

*Products of the Company will be*

Hot Rolled and Cold Reduced Sheets and Coils up to 72" sheared width in qualities for auto-bodies, vitreous enamelling, extra deep drawing, etc. • Galvanized Flat and Corrugated Sheets • Electrical Sheets for Dynamos and Transformers • Stainless Steel Sheets • Blackplate • Hot and Cold Reduced Tinplate both hot dipped and electrolytically tinned • Plates up to 1" thick by 72" wide • Flange, Bullhead and Bridge Rails • Fishplates • Steel Railway Sleepers • Sections • Slabs • Basic Pig Iron • Coke and By-Products • Sized Limestone

**THE STEEL COMPANY OF WALES LIMITED**

ABBEY WORKS · PORT TALBOT



# And now.. INTERLOCKING SWITCH SOCKETS

15-AMP. CAPACITY, 250 VOLTS A.C.

To British Standard Specification 546

Patent Applied Registered Design

The interlocking screening mechanism (Pat. Applied) is so designed that neither the plug nor any instrument can be mischievously inserted until the switch is in the "off" position

CERAMIC INTERIOR · Extended dolly for hand or foot operation · Conveniently placed terminals for rapid wiring · Also available without switch · Supplied in surface and flush patterns

*Samples of Accessories supplied on request*

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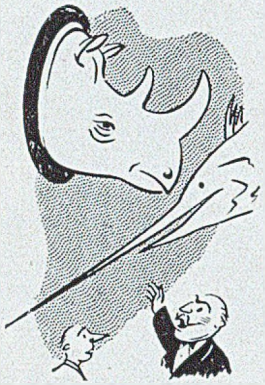
MANUFACTURERS OF ELECTRICAL PRODUCTS FOR 58 YEARS

**WARD & GOLDSTONE LTD.**

PENDLETON MANCHESTER 6 Established 1892

# HIGH VELOCITY BLOWING

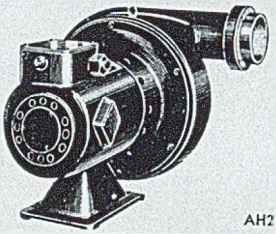


"In Kenya, Sir. During the hot weather of '29. Hardly more than a breath of wind and the temperature at 200° centigrade. Phew, hot! — I'll say it was."

"This one, yes. Timor Sea in '31. Don't know how we got that brute home, by Gad! Came on to blow a full gale. 290 miles per hour. Wonder where the Hell all the wind comes from."

Quite true, that remark.

It is a wonder where all the wind comes from especially when you are using a Secomak Statair Blower. It is the most efficient blower for its size manufactured, and delivers a steady flow of air at 120 c.f.m.—static pressure over 30 in. w.g. and at temperatures in excess of 200° C. when fitted with the heater attachment.



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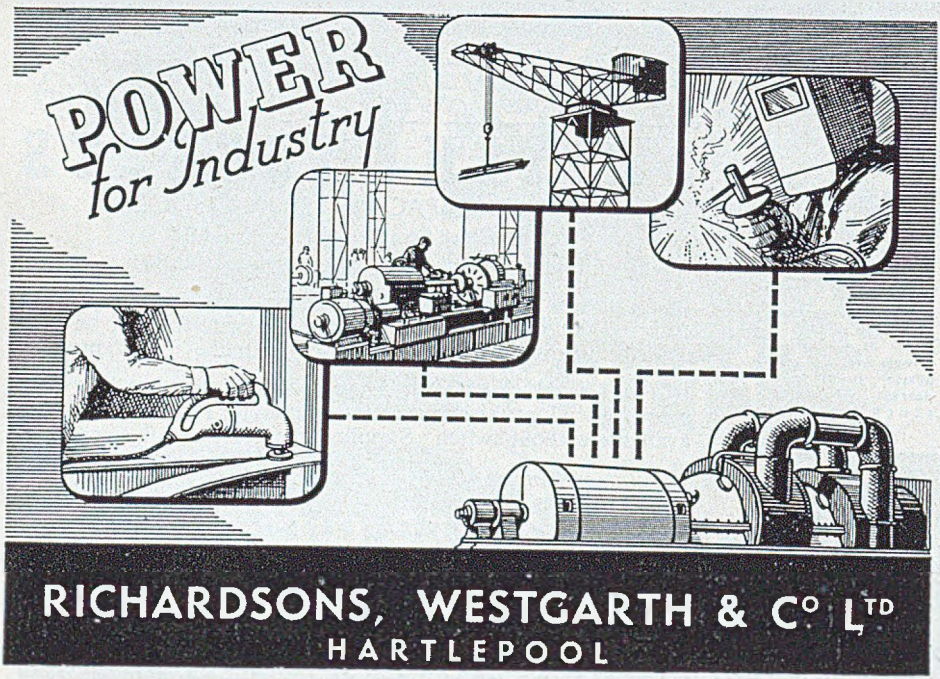
**SERVICE ELECTRIC CO. LTD.**

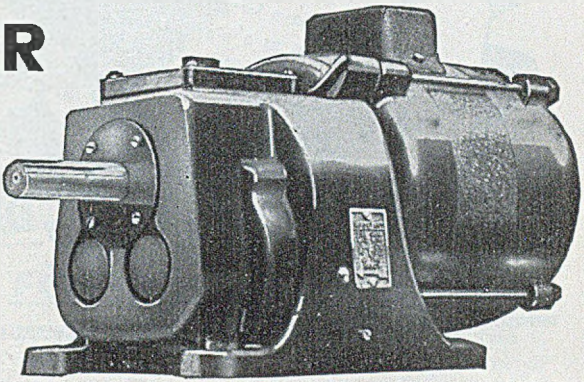
SECOMAK WORKS. HONEYPOT LANE, STANMORE, MIDDX.

*Telephone EDGware 8631/4*



# FOUR MEN'S WORK– FOR TWENTY QUID– FOR EVER

## Farm machine Drives



NECO

TRADE MARK

## A TYPE HD GEARED MOTOR

will drive all the light farm machinery that now takes a man from other work to turn a handle, churn, separator, pump, chaff cutter, even a milking machine, and innumerable other machines as well. It can be arranged to run at any single speed from 26 to 480 r.p.m. with a 1400 r.p.m. shaft as well, if you want it, in sizes from $\frac{1}{4}$ to $1\frac{1}{2}$ h.p.

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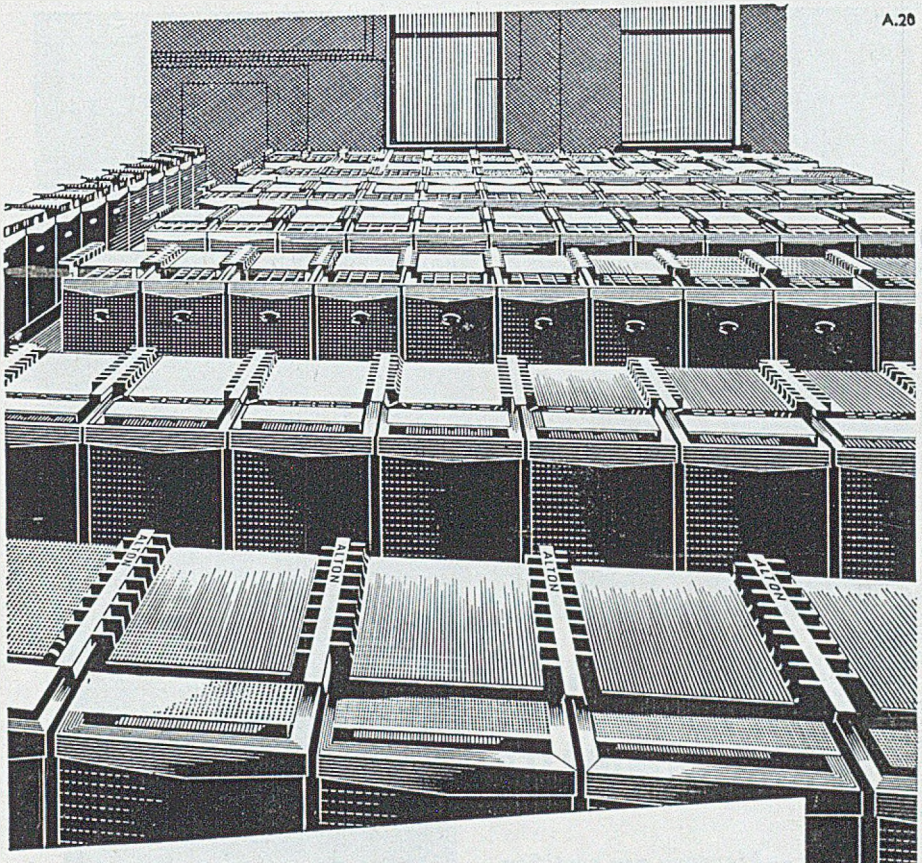
NORTH STREET · CLAPHAM COMMON · LONDON · S.W.4

TELEPHONE: MACAULAY 3211-2-3-4.




Alton has been exporting batteries for thirty years. In installations in sixty-five countries Alton Batteries, in capacities from 10 to 15,000 ampere-hours, are giving the service only good batteries can give. Alton, in any language, means good batteries and firm delivery dates.

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THE ALTON BATTERY COMPANY LTD
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*Alton can also supply renewal plates for all makes of battery, British & Continental*

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*No. 14 — Mercury arc rectifier built by the Hackbridge and Hewittic Electric Company Limited*

BAKELITE Laminated is used in the terminal panels of Hewittic mercury arc rectifiers. In addition to its outstanding electrical properties it has good mechanical strength and resists heat, oil and corrosion. It is, therefore, ideal for use in electrical equipment. It retains its good insulating properties even in adverse atmospheric conditions. BAKELITE Laminated can be machined with normal metal or woodworking tools and is readily punched. Sheets up to 4" thick and rods and tubes are available. Technical data will be sent on request.

TREFOIL

**BAKELITE PLASTICS**

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# ELECTRICAL REVIEW

Vol. CXLVI 26th MAY 1950 No. 3783



## IN THIS ISSUE



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ELECTRICAL REVIEW

Vol. CXLVI. No. 3783 26TH MAY, 1950

THE OLDEST ELECTRICAL PAPER • ESTABLISHED 1872

# Lighting Technique

## POINTS FROM THE I.E.S. BUXTON MEETING

THE second provincial summer meeting of members of the Illuminating Engineering Society and their ladies, at Buxton last week, although not so well attended or favoured with quite the same weather as the first meeting at Harrogate two years ago, made up in quality what it may have lacked in quantity.

Both meetings have been within the area of the Manchester Centre of the Society, conveniently enabling many of its thirteen Centres and some of the six Groups as well as the London headquarters to be represented. Visiting delegates came from America, Belgium, France and Norway.

### Experience in Sweden

This year's guest speaker was a prominent lighting authority from Sweden, who explained that problems now being encountered there do not greatly differ from those met with here. One of the principal reasons for the extensive electrification of Sweden is its geographical situation and the consequential need to make the fullest use of artificial light. Some 90 per cent of the population now uses electric light and 60 per cent of all lighting is in the home; most advance has been in the lighting of kitchens.

Nothing very new emerged from the technical sessions, but the skill with which elegant demonstration lectures were conducted in place of the formal reading of set papers was a delight to watch. The very vivid way in which known principles were applied to make ordinary things appear in unexpected ways showed that one can study vision for a very long time and go on learning.

Three of the six authors pleaded for a reduction of intensity in the floodlighting of exteriors, the illumination of shop windows and in stage lighting in the theatre. The object to be illuminated must not be "drowned" in light. The "flat" effect of high-intensity uniform frontal lighting can be avoided by directional illumination with the discreet introduction of colour, which is demonstrably more "dramatic" in the stereoscopic sense.

Good lighting should give features their proper expressions and impart shape to things one expects to see in three-dimensional form. Indeed properly controlled artificial light can be much superior to variable daylight in some respects and many instances, the exception being street lighting.

### Street Lighting Problems

In this branch of the art of illumination it is still not known how best to light side streets and residential roads, of which the total mileage is several times that of traffic routes. Again, more must be known about how to light really wide roads, such as those built abroad, if British manufacturers are to export equipment.

It would seem desirable, too, to study the possibilities of the higher power lamps now employed for floodlighting on

the Continent. While one would hesitate to advocate throws in 300 to 900ft (now becoming common in France) in the misty English atmosphere, more powerful sources would tend greatly to reduce the very considerable amount of equipment often necessitated by the smaller lamps customarily used in this country. Longer throws with more regard for the artistic merits of buildings chosen for floodlighting should help to avoid the mediocracy which might otherwise easily result.

## STRIKE BALLOT

There is no unanimity in the matter of the "strike or arbitration" ballot among the constituents of the Confederation of Shipbuilding and Engineering Unions. The Amalgamated Engineering Union is leaving the decision to its members, but the Electrical Trades Union Executive Council has advised its members to vote in favour of a strike to support the claim for a £1 a week increase. On the other hand members of the Transport and General Workers' Union and of the National Union of General and Municipal Workers are recommended to vote for arbitration. The Association of Scientific Workers and the Association of Engineering and Shipbuilding Draughtsmen have decided not to take part in the ballot.

## ELECTRICIANS' CLAIM

By its decision to proceed with a claim for an increase of 6d an hour in the wages of members employed in the electrical contracting industry the Electrical Trades Union is going against Government and T.U.C. policy. And although the union contends that this can be met out of profits no proof has been adduced to back up the argument. The fact is that the increase would merely add to installation costs. If the claim were accompanied by a determination to give better value for money it might be acceptable but in the apparent absence of any such intention the addition to costs can hardly be justified. Both sides of the industry seem to regard any sort of "incentive" scheme as virtually impossible and, indeed, it is difficult to imagine how work involving a high degree of craftsmanship and infinite variety can be the subject of payment by results.

## B.E.A. AND MUNICIPALITIES

We reported a short time ago that about thirty local authorities had received writs from the British Electricity Authority which claims the return of amounts said to have been contributed from electricity undertakings' funds for the relief of rates before nationalization. It was said at the time that the writs were issued merely to give the B.E.A. a standing and it did not follow that the matter would reach the courts. Last week a meeting took place between representatives of the B.E.A. and of the local authorities concerned. No statement was made afterwards, but the secretary of the Association of Municipal Corporations who attended is reported to have said that it was "a happy and successful meeting."

## SUSPICIOUS CONSUMERS

Many of the Electricity Boards are conducting surveys of the premises in their Areas as a preliminary to the introduction of a "stepped" block tariff based on the number of rooms. Everywhere their motives are questioned by suspicious consumers who profess to regard the inquiries as a prelude to higher charges. A typical letter in a local newspaper voices this suspicion but the writer goes on to suggest that the fairest methods of charge would be "(a) a flat rate for everyone; (b) a reduced rate after a certain amount had been used." Suggestion (b) indicates that the Board has not sufficiently or effectively explained what it is aiming at. We fully realize the difficulties, but we may ask whether all the Boards have done all that they might to tell the public what their surveys are designed to accomplish.

# Illuminating Engineers

## *Discussions at Buxton Conference*

ALL branches of the activities of the Illuminating Engineering Society were represented at the second provincial summer meeting at Buxton last week. Festoon illuminations and the floodlighting of prominent buildings enlivened the town during the week, due to the ready co-operation of the North-Western Electricity Board with the several manufacturing concerns which contributed materially also to the success of the very colourful demonstrations in the Playhouse where all the technical meetings were held.

The first of the six lectures (briefly referred to last week) was by Dr. L. A. Sayce on " Visual Deception," which was not discussed. He was followed by Mr. R. O. Ackerley on " Floodlighting."

M. Jean Chappat (France) regarded the paper as a stimulant to the old brigade of enthusiasts who carried out such fine installations in Europe between the two world wars. In Paris, after the war, owing to power shortage it was possible to carry out floodlighting only on rare and special occasions, but the situation was improving and French engineers were making their plans for a floodlighting revival. There was a vast amount to be done in the utilitarian and industrial fields.

It was true, as Mr. Ackerley said, that the key to floodlight distribution was the reflector and he wondered why more use had not been made of reflectors which provided an asymmetric distribution with a sharp cut-off, instead of symmetrical reflectors and glass lenses to change the beam pattern. Recently in France they had had great success with projectors of Swiss design in which multiple sectional reflectors were incorporated and which were elliptical or parabolic depending on the beam pattern required. The lamp was half silvered and the reflected light from it was controlled by the mirrors of the projector and directed on to the area to be floodlighted. They used either 2,000 or 3,000 W lamps and were made of pure aluminium polished and treated by the " Alzac " process which resisted corrosion even by sea air.

These projectors were normally installed from 200 to 300ft from the target, but in some cases by the use of special reflectors excellent results had been obtained with the units placed at dis-

**The Mayor and Mayoress of Buxton (Councillor and Mrs. G. A. Williams), Mrs. Aldington, Dr. J. N. Aldington (I.E.S. president) and Mr. G. F. Cole (I.E.S. secretary).**

tances of 900 to 1,200ft. A smaller number was required than of the conventional types and satisfactory results were obtained with considerably less power consumption. For example, to illuminate Notre Dame Cathedral on the façade facing the River Seine, only eight 3,000 W special projectors were required instead of the eighty 1,000 W conventional projectors formerly employed and the lighting result was better. Similarly, for lighting the façade of the Chateau de Versailles ten 3,000 W special projectors did a better job than the ninety 1,000 W conventional units previously used.

Mr. J. G. Holmes (London) emphasized the importance of the choice of position for the fittings in determining the shadow values and the avoidance of a luminous atmosphere around the building. On misty nights from this point of view he hesitated to think what would be the result if "throws" of 300yd were used, as suggested by M. Chappat. It seemed to him that the levels of illumination for floodlighting were disproportionately high in comparison with those used where work had to be done.

## Co-operation with Architect

Mr. Greville Baines (Manchester), in some notes read by the president, as an architect urged much closer co-operation between the lighting engineer and the architect in designing floodlighting installations. Indeed, the lighting engineer, the architect and the film technician should be called together as a team when any large scheme was under consideration.

Mr. N. Boydell (Sussex) urged the need for getting away from the "battleship" size of equipment now used for floodlighting. Could not something lighter be designed, possibly by the use of plastics? He also suggested seasonal floodlighting in seaside resorts, to include even small boarding houses, which should interest the electricity supply industry as an off-peak demand.

Mr. J. S. McCulloch (Newcastle) criticized the author for concentrating so much on the spectacular side and so little on the utilitarian side of floodlighting. He referred to the opportunities in shipyards where the best results were to be obtained by lighting from above instead of from below. Experiments were now being carried out on Tyneside with five to ten 400 W mercury vapour lamps on platforms 70ft to 80ft high to increase output and save a great deal of wasted time.

Dr. J. W. T. Walsh (National Physical Laboratory) urged a greater use of floodlighting in gardens.

Mr. C. C. Smith (Liverpool) suggested that uniformity of illumination, recommended by the author, could be overdone.

Mr. J. A. Whittaker (Sheffield) thought it would be unfortunate if the conference were given the impression that a large number of installation difficulties could be solved by using a few light sources at a great distance.

## White or Coloured?

Mr. J. M. Waldram (London) asked for the author's views on the floodlighting of fountains and water with coloured light. He had seen Niagara Falls floodlit with white light and the effect was very marked, but with coloured light the result was likely to appear tawdry. He thought there was too much lily gilding in many floodlighting installations and that white light was the best.

Mr. H. E. Bellchambers (Birmingham) thought there was quite a field for colour or even the fluorescent lamp, in supplementary lighting.

Mr. Ackerley replied in some detail to the discussion. He agreed that the criterion of good floodlighting was not how much light could be used but how it was used. Floodlighting equipment had to withstand rougher treatment than street lighting equipment. It might be that the lamp makers would provide fluorescent lamps with the required colour characteristics, but whether they could give higher brightnesses he did not know. His experience of unventilated fittings had been satisfactory, provided they were a real engineering job. When illuminating water in its natural conditions the light should be white, but in the case of fountains treatment must depend on the circumstances and on taste.

Discussing the paper by Mr. H. Hewitt, on "Lighting of Fibre and Fabric," Mr. J. W. Howell (Leeds) said that whilst the author had illustrated modern factories there were many older ones which provided numerous obstacles to good

illumination. It was necessary to fit the lighting to the particular problem, and he paid a tribute to the co-operation of the textile industry with regard to the I.E.S. Code. Agreement had been reached in both the cotton and woollen industries as to the requirements and it was hoped to reach similar agreement in the garment industry.

## Stroboscopic "Bogy"

Mr. T. S. Jones (London) mentioned the difficulties arising with illumination under wet spinning conditions, and said that the intensity of illumination was not the important factor in laying out an installation. He regarded the stroboscopic effect of fluorescent lighting as an old bogy. With reference to the use of the hot cathode fluorescent lamp in the American textile industry, it was the custom there to adopt fairly high general illumination, and the Americans did not pay so much attention as we did in this country to directional lighting and background brightness, but they made considerable use of colour as an aid to visual comfort.

Dr. H. H. Ballin (London) said he had found that the standard stove enamel finish of lighting fittings was unsatisfactory under humid conditions and spoke of interesting experiments in the use of "Perspex."

Mr. J. A. Whittaker (Sheffield) said that a colour matching report would shortly be issued. The Americans still favoured the tungsten filament lamp with a daylight appearance for this purpose, and he felt there was something to be said for this. There should be investigation of the reaction of the fabric to small traces of near ultra-violet when using any form of mercury in the source, because it might seriously affect colour matching, particularly in the blue.

Mr. C. J. King (Glasgow) referred to a mill in which complaints of headache due to the lighting, actually turned out to be due to bad ventilation. Installations should be outside the control of the workers, at all events in textile factories.

Mr. F. Jamieson (Leicester) asked for more information on the financial side of textile lighting.

Mr. B. C. Robinson (Cardiff) spoke of the nylon industry in South Wales in which some problems were special ones. For instance, the first basic process was extrusion vertically downwards into the warm air. This, therefore, introduced the problem of casting the light on the vertical as distinct from the horizontal. For seeing upwards into the spindle they were using small tungsten lamps in swivelling reflectors to enable the operative to see that there were ten ends coming down and not nine. The annual load factor was 90 per cent, the factory running continuously for 8,600 hours a year, so the overall cost was 0.65d to 0.7d per kWh taken from the public supply. This low cost took into account expensive fluorescent lamp fittings, which cost some £10,000 more than a tungsten lamp installation would have done.

Mr. S. Anderson (London) did not think, as the result of experience, that the stroboscopic effect with fluorescent lighting was worth worrying about owing to the high speeds of the operations in the textile industry in spite of the fact that they were varying all the time.

Mr. Slater (Nottingham) said that during a business trip to America a short time ago he was told of two cases in which the fluorescent lamp was being replaced by tungsten lamps. In this country we did not seem to be able to make up our minds which was the right system to adopt.

## Author's Reply

Mr. Hewitt, in the course of his reply, said that the bogy of the stroboscopic effect of the fluorescent lamp should be buried so far as the textile industry was concerned. To cope with the humid conditions in mills he suggested the use of vitreous enamelled fittings, if the economics permitted. As to maintenance, he suggested a weekly brushing down and a thorough cleaning of fittings every two months. The adoption of a standard illuminant for colour matching in the textile industries required the co-operation of very many people and he hoped the learned societies in the industry were giving some thought to that matter. Something like 30 to 40 per cent of cotton mills had reasonable illumination at the present time and the majority of the remainder had already done something to improve their conditions.

Mr. Hewitt acknowledged the great assistance he had received from Tootal, Broadhurst, Lee & Co., Ltd., with regard to the stage demonstrations.

Mr. Ivar Folker, managing director of the Swedish Lighting Association, illustrated his address with lantern slides of typical installations and fittings. He had nothing new to present, since lighting had developed in Sweden as the result of international co-operation and especially in consequence of the work of many British pioneers. In the cities of Sweden, the whole of the population used electric lighting and 90 per cent used it in the country districts.

The next meeting of the International Commission on Illumination would be in Stockholm in June-July, 1951 and he extended a special welcome to illuminating engineers from this country.

## Stage Lighting

Following Mr. L. G. Applebee's paper on "Stage Lighting in the Post-War Theatre in Great Britain." Mr. Christopher Ede, actor and producer, discussed the subject from what he called the customer's point of view. No bad play had ever been made good by good lighting, although a few good plays had been made bad by bad lighting. Emphasizing the difficulties of the producer and the need for great flexibility in the lighting equipment, he made a plea for the prefocus cap for projector lamps. The producer was not interested in balance of phases, or heat losses. The most important development since the war was the electronic switchboard, for it enabled the right intensity of illumination to be provided just when and where it was required.

Mr. J. Hodgkinson, also an actor and producer said that it was important to get back to first principles and really to understand that the job of the stage electrician was to enable people to see what was going on. Stage lighting must emphasize that what was taking place had a certain architectural quality and a stereoscopic relationship. A further task of stage lighting was to give significance to the art that was being portrayed, but the technique of the thing hould not be visible at all. The smallers sheatres and small halls were not given enough attention by engineers.

Dr. L. duGarde Peach, who has his own theatre in which he carries out experiments, also spoke of the need for flexibility of equipment and emphasized the need for giving a three-dimensional effect and of angling the spotlights, thus giving "life" to the stage and avoiding a flat effect. He pleaded for the simplest possible kind of equipment and installation.

Mr. E. E. Faraday (Nottingham) said there was tremendous scope for manufacturers of stage lighting equipment to simplify their products, especially for small stages used for amateur productions. Lamp makers should also try to produce new sources of light.

Mr. C. T. Kingsley-Lark (Newcastle) remarked that the great technical advance of the electronic dimmer had rather overshadowed the potentialities of the d.c. saturated choke, the details of which circuit were well known, and he was indebted to the *Electrical Review* for describing it some two years ago. Initially the equipment was limited to auditorium lighting only, but recent developments in coloured lamps had greatly advanced the prospects of applying the method to stage lighting. A board was now available with dimmer levers on 1¼-in centres controlling either a 1kW or a 2kW choke with the minimum control energy required of 10 and 15 W respectively and a current full/dim ratio of 11 to 1, giving satisfactory dim-out at 50 per cent full load operation.

The president (Dr. J. N. Aldington), replying to some of the points, said there was a great body of research into stage lighting now going on, but it must be said that there was not even a remote chance in the immediate future of more intense light sources for use in the theatre world.

Dr. J. W. Strange asked if there had been any marked developments in the reliability of the thyratron control circuit. The questions of heat, consistency of control, colour, etc., in the case of the fluorescent lamp could be met to a considerable extent by the use of lightweight fittings.

Mr. Applebee, in his reply, reminded speakers that for the small hall he had devised a switchboard with dimmers which sold at from £35 to £50. Against

this, an equipment such as that at Stratford-on-Avon cost £2,000.

Equipment for small halls was available but those concerned had not the money to buy it, although the cost was low. Obviously, consoles were for the large theatres but they were not complicated to operate. He appreciated the difficulties of the lamp makers; the problem in stage lighting was the life of the lamps; the light output could be increased by suitable reflectors. In the case of the large theatres, the saturated choke had been dropped when electronic control came along.

## Street Lighting

The final paper was a historical review of "The Development of Street Lighting in Great Britain," by Mr. J. M. Waldram.

In the discussion Mr. F. C. Smith (London) said that no mention was made in the paper of the Westminster contracts placed for both electrical and gas installations prior to 1920, which specified requirements as regards both candle power and distribution. A driver was less worried by a system which might produce somewhat patchy effects on the road, but which was relatively free from glare, than by an installation which had fairly even road brightness but had excessive glare.

Dr. J. W. T. Walsh (National Physical Laboratory) appealed for more attention to be given to the lighting of residential roads which required a different method of approach than that for traffic routes.

Mr. N. Boydell (Sussex) asked for consideration to be given to the problem of colour distortion which did not matter on traffic routes, but was of great importance in shopping streets. On the question of road surfaces, he suggested that a joint meeting of illuminating engineers and road engineers should be held to discuss this problem. The 4ft housing of fluorescent lamps was very ugly from the point of view of daylight aesthetics and for shopping streets he urged a development of the 2ft fitting.

Mr. Greville Baines also urged co-operation between road and lighting engineers.

Mr. J. A. Whittaker (Sheffield) suggested that larger lanterns, although perhaps greater in capital cost, would have compensating advantages in use.

Mr. Waldram, replying to the discussion, agreed that there would be some advantages in larger size lanterns, but they would not be dramatic.

The aesthetic side was undoubtedly very important, but he did not mention it in the paper because not much work had been done on it. For shopping streets a combination of tungsten and fluorescent lighting had been quite successful.

## ANNUAL MEETING

At the annual general meeting with the president (Dr. J. N. Aldington) in the chair, the report of the Council for 1949 was unanimously adopted. In presenting it, the president pointed out that no applications had been received during the year for the silver jubilee commemoration award and he asked members to impress on their staffs that members under 25 years of age might submit papers which would be considered for the award. As regarded the Register of Lighting Engineers, due to the change in the Regulations, there had been a considerable influx of applications which were being dealt with as speedily as possible.

It was hoped that during the coming session it would be possible to have the inaugural Paterson Memorial Lecture. Consideration was being given as to the best use to be made of the Dow Legacy Fund.

There being no independent nominations, the Council's nominees were elected as follows: President: Mr. L. J. Davies; vice-presidents, Messrs. C. R. Bicknell J. G. Holmes and W. R. Stevens; members of the Council: Messrs. G. G. Baines, S. S. Beggs, Dr. W. R. Harper; A. G. Higgins, L. H. McDermott, A. G. Penny, Sir Henry Self and Mr. W. J. P. Watson; hon. treasurer: Mr. W. J. Jones; hon. secretary: Mr. H. C. Weston; and hon. editor: Mr. W. R. Stevens.

The president then presented Mr. Howard Long with his certificate of hon. membership and announced that hon. membership had been conferred on one of the Society's members in America, Mr. Ward Harrison. The certificate was being sent to the president of the American Illuminating Engineering Society for presentation on a suitable occasion.

# I.E.E. ACTIVITIES REVIEWED

## *Council's Report for* 1949-50

OUTSTANDING events of the 1949-50 session of the Institution of Electrical Engineers were the jubilee celebrations of three Centres—North-Western, Scottish and North-Eastern; completion of a twelfth edition of the Wiring Regulations, now published; a convention on electric railway traction; and a conference on advanced studies in electrical engineering.

The Council's report, presented at the 78th annual general meeting last night, says that the rate of increase in membership has been well maintained, although the number of new members has not been so great as in the immediate post-war years. Fewer students have been elected each year since the introduction of the common preliminary examination four years ago, but ultimately fewer will fail to qualify for transfer to a higher class of membership. Details of membership are as follows:—

| Year | Corporate | Non-Corporate | Total |
|---|---|---|---|
| 1939–40 | 9,838 | 10,034 | 19,872 |
| 1948–49 | 16,027 | 18,344 | 34,371 |
| 1949–50 | 16,648 | 18,900 | 35,548 |

During the year 1,162 meetings of members, the Council and various committees were held in London and at local Centres. At the nine ordinary meetings in London the average attendance was 255 as compared with 305 in the previous year. The following are the average attendances at the Section meetings, with figures for 1948-49 in parentheses: Measurements (excluding symposium on ferromagnetic materials), 102 (102); Radio, 112 (128); Supply, 149 (136); and Utilization, 87 (115). A special committee appointed to investigate the decline in attendances at Students' Section meetings felt that it was the outcome of present-day conditions.

Abroad, the first of the joint overseas groups of the Institutions of Civil, Mechanical and Electrical Engineers has been established at Abadan, Persia, and the formation of other similar groups in Malaya and Singapore, and in Argentina, is under discussion at the present time.

A considerable amount of work has been carried out in the sphere of technical investigations. Thirteen electrical Codes of Practice for Buildings have now been promulgated in final form and in addition ten drafts have been issued for comment. Other Codes have dealt with such matters as radio interference, while three in the drafting stage are concerned with earthing, overhead power lines, and street lighting. Other matters receiving attention include the preparation of model forms of general conditions of contract and the study of basic design temperatures for space-heating installations.

In the field of education, the Council (jointly with the Councils of the Institutions of Civil and Mechanical Engineers) has recommended to the Minister of Education that works-based sandwich courses should be established. The main attention of the Education and Training Committee in recent months has been directed to the proposed establishment of a Royal Institute, or Society, of Technology.

The Examinations Committee met ten times during the year. A few amendments have been made to the examination regulations, an important change being that Students under 21 who have been elected without passing or gaining exemption from the common preliminary examination can no longer sit direct for Joint Section A of the associate membership examination before the age of 23.

Grants totalling £5,735 were made by the Incorporated Benevolent Fund to 91 beneficiaries during the year ended 30th June, 1949. Two £1,000 units of the National Corporation for the Care of Old People were taken up in respect of a property at West Worthing. The number of contributors to the Benevolent and Homes Funds increased slightly to 10,884 but the increase is not keeping pace with the growth in membership. The amount so far received for the Homes Fund is £20,863, with deeds of covenant aggregating £28,000. The first eight homes at "The Chesters" residential estate are expected to be ready soon.

# VIEWS on the NEWS

## By REFLECTOR

LAST week I mentioned the closing down of the small Powick water power station, Worcester. Now I see that another of these undertakings is in the news. The *Bournemouth Daily Echo* has given quite a "splash" to the Ringwood (Hants) installation which, it says, "lights and heats the houses for miles around, for the electricity they make at Ringwood is fed into the grid for all to use." This contribution may be very welcome to the B.E.A. in present circumstances, although I believe that the two generators at Ringwood are rated at only 35 kW each.

★ ★ ★

Definite action is called for by the North Western Electricity Consultative Council against landlords of flats who "retail" electricity to their tenants at exorbitant prices. The question is an old one but as the law stands the landlords can do as they like unless, as sometimes happens, they are brought before Rent Tribunals, when these charges come under consideration as being part of the rent. The Council says that Gas Boards are empowered to limit charges for the re-sale of gas; Electricity Boards should have the same power. I agree, for it seems ridiculous that the elaborate machinery for the protection of consumers should be so easily by-passed.

★ ★ ★

The North Western Electricity Board was involved a few months ago in a dispute over a fountain outside the electricity showrooms at Southport, but got out of it gracefully by presenting the fountain (which it had acquired with the electricity undertaking) to the town. Now it is in trouble at Salford because it is charging the Corporation £1,250 for certain street-lighting equipment taken over with the electricity undertaking and now required by the municipal street-lighting department. The Board was accused at the Council meeting of "downright impudence," but as it has assumed responsibility for the finances of the former electricity undertaking it seems to be acting quite correctly.

★ ★ ★

The many men in the electrical industry who knew Mr. A. S. E. Ackerman (of the Society of Engineers) and his book "Popular Fallacies," will be interested to know that a new edition has appeared. It was in 1907 that Mr. Ackerman first published his work; it must have involved much research and this has been continued and now, in the new edition (the fourth), 2,150 fallacies are exploded. How credulous we humans are!

★ ★ ★

There are still a number of districts in this country which are served by direct current but they are few and not extensive. My readers may think that in the United States d.c. is considered a matter of history but it is not so. Old England seems to be not very far behind New England in this respect, for the Boston Edison Company still has a large d.c. load (said to be 13 per cent of the total) in the "down-town" areas of the city. It is estimated that the cost of conversion to a.c. will be about $8 million and that with "customer co-operation" the change-over may be achieved between 1960 and 1965.

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It has been ruled by an Irish resident magistrate that electric torches are not "engines" within the meaning of the Game Act of 1787. Two men were charged with using "engines, namely flash lamps, for the purpose of catching rabbits." The R.M., somewhat inaccurately, held that "electricity was unheard of in 1787" and therefore flash lamps could not be considered as engines of destruction under the Act. He dismissed that charge, but fined the men for being in unlawful possession of the rabbits.

# PERSONAL and SOCIAL

## *News of Men and Women of the Industry*

LONDON TRANSPORT announces the appointment of **Mr. H. A. Wickham** as permanent way engineer (trams). Mr. Wickham joined the Tramways Department of the London County Council in 1915 and since 1924 has been an engineering assistant in charge on site of most of the principal new tramway construction works carried out in the London area by the L.C.C. and London Transport. During the periods 1938-42 and 1945-48 he was the permanent way engineering assistant in charge on site of the track construction in the new Highgate tube, the extension of the Bakerloo Line to Finchley Road and the eastern extension of the Central Line, including the initial stages of the construction of the Plessey underground war factory, and part of the final stages of the Central Line extension to Ruislip. In 1948 Mr. Wickham returned to the Tramways Department as chief assistant to the permanent way engineer (trams).

**Mr. R. P. Bell** and **Mr. J. Kirkpatrick** have been appointed to the board of directors of Berry Wiggins & Co., Ltd. Mr. Bell joined the company in 1931 as assistant to the director of research, and after war service rejoined the company in 1946 as technical adviser. Mr. Kirkpatrick joined the company in 1946 as personal assistant to Mr. R. C. Paterson, director. He served with the Petroleum Board during the war.

**Mr. F. Crush,** manager of the Ipswich branch of the General Electric Co., Ltd., for the past thirty-two years, is to retire at the end of June. Mr. Crush joined the G.E.C. in 1909, and worked at Queen Victoria Street under the late Mr. J. Y. Fletcher, a director of the company and manager of the Osram Lamp Department. In 1911 he was appointed manager of the lamp section of the trade counters, and two years later became responsible for the running and co-ordination of all the counters and showrooms. In 1918 he left the head office to open a sales office in Commercial Union Buildings, Ipswich, which in 1929 was given the status of a branch. The branch is now at Electric House, Lloyds Avenue, with additional premises at Brooks Hall Road.

Mr. F. Crush

**Mr. W. R. Allcock,** M.I.E.E., M.I.Mech.E., has recently retired from the position of site investigations engineer of the North Western Division, British Electricity Authority. Mr. Allcock has been in the electricity supply industry for forty years, thirty-eight of which were with the former Stockport Corporation Electricity Department, where he became chief engineer and manager in 1944. Upon the formation of the B.E.A. he was appointed executive officer for Stockport and later site investigations engineer for the North Western Division. Mr. Allcock took a major part in the recent extension at the Stockport generating station.

Mr. W. R. Allcock

**Mr. J. W. Donovan,** B.Sc., M.I.E.E., joint managing director of the Donovan Electrical Co., Ltd., has had the honorary associateship of the Birmingham Central Technical College conferred upon him. He initiated classes in switchgear in the College and has served for the past two years on the Advisory Committee of the Department of Industrial Administration.

At the same time, **Mr. P. E. Bamford,** M.I.E.E., was made an elective associate of the College, in which he is assistant head of the Department of Electrical Engineering.

**Mr. J. W. Davis,** late of Benjamin Electric, Ltd., and more recently with the British Thomson-Houston Co., Ltd., Newcastle, has been appointed lighting engineer for Crompton Parkinson, Ltd., in the Northern Counties, and has taken up his duties at the Newcastle branch.

**Mr. A. T. Wilford,** B.Sc., has been appointed director of research with London Transport. Mr. Wilford was educated at Wilson's Grammar School, Camberwell, and the Royal College of Science. He entered

the service of the former Underground Companies in 1920 as chemist with the London General Omnibus Co., becoming chief chemist in 1926, a post which he continued to occupy under the London Passenger Transport Board. From 1st January, 1949, he was appointed superintendent of laboratories in charge of the central laboratory at Chiswick and the three generating station laboratories. He is a member of the Council of the Institute of Petroleum, and is a Crompton-Lanchester Medallist of the Institution of Mechanical Engineers.

**Mr. S. Baxter** has been appointed works manager with the Carter Electrical Co., Ltd., Romford, Essex.

**Mr. R. T. Wilson,** an old Sunco employee and late of Crompton Parkinson, Ltd., has returned to the Sun Electrical Co., Ltd., as sales representative and is taking over the South-west London and East Surrey areas in the place of Mr. E. V. N. Bell.

**Mr. H. Young** has resigned from the cable section of the Supplies Division of Crompton Parkinson, Ltd., Aldwych, London, and will commence business on 1st June at St. James' Street, Brighton, as H. Young & Co., manufacturers' agents for all types of electric conductors.

**Dr. L. W. Brown** has been appointed chief engineer of the Radio Department of the Metropolitan-Vickers Electrical Co., Ltd., the appointment to date from the 1st June. Dr. Brown has been with the B.T.H. Co. since 1943, where in the Electronics Engineering Department, he has been responsible for radar development. Previous to that he was with 60 Group of the R.A.F. and later scientific officer with the Telecommunications Research Establishment. He received his scientific education at King's College, University of London, where he graduated with special honours in Physics in 1934. In 1936 he received the Ph.D. degree for work under Professor Appleton on radio pulse investigations of the upper atmosphere. He succeeds in his new appointment **Mr. A. K. Nuttall,** who recently transferred to Newton Victor, Ltd., the X-Ray subsidiary of Metropolitan-Vickers.

Dr. L. W. Brown.

**Mr. H. L. Dowsett,** chairman and managing director of the companies in the Dowsett Group, left London for Australia in the P. and O. liner *Strathmore* on 10th May to visit Dowsett Engineering (Australia) Pty., Ltd., the Australian subsidiary company in connection with the further development of business in Australia. Mr. Dowsett is expected to return to England in the latter half of July.

Consequent upon the recent death of Mr. T. D. Sutcliffe, joint managing director of Richard Sutcliffe, Ltd., **Mr. W. F. G. Sutcliffe** has been appointed joint managing director, and **Mr. J. D. Sutcliffe** has been appointed sales director.

We are glad to report that **Mr. Felix Rogers,** Director of Appliances and Installation Equipment, B.E.A.M.A., will be back at his office next week. Mr. Rogers thanks all those who have made inquiries about him during his illness.

The Ekco Players (**E. K. Cole, Ltd.**), presented "The Man in Dark Glasses," from 15th to 20th May in the works canteen, Southend-on-Sea. Once again it was, with the exception of the script, an all-Ekco show—cast, staging and orchestra.

For the first time in its history the **Brush Electrical Engineering Co., Ltd.,** Loughborough, on 13th May, opened its works to the public. More than 7,500 visitors toured the works during the day, comprising not only the employees of the company with their relatives and friends, but visitors from Leicester, Birmingham, Derby and many other places in the Midlands. Route cards were provided and one hundred and thirty stewards were on duty to answer questions. Light refreshments were provided in the canteen. Despite the official five-day week more than 1,500 of the 4,200 employees were engaged on production work, and visitors saw these workers taking part in the export drive.

The **General Electric Co., Ltd.,** held a Drama Festival on the Wembley estate on 4th, 5th and 6th May, when ten teams representing the company's various works competed. The adjudicator was Mr. Christopher Ede. The winners were the G.E.C. Witton O.A.D.S. for their rendering of the play "Non Nobis" by Lake Aske. The Witton society received the cup presented by the late Sir Clifford Paterson, when he was director of the Wembley Research Laboratories. The Chelioti Cup awarded only for entries from the six Wembley works was won by the Osram G.E.C. Lamp Works with an extract from Act 2 of "Major Barbara," by George Bernard Shaw. Mr. G. C. Chelioti, a director of the company, proposed a vote of thanks to the adjudicator, organizers and officials.

A dinner and concert were given by **Longmore Brothers,** Darlaston, at the Town Hall, Wednesbury, to 250 employees, and during the function gold watches were presented to six employees with twenty-

five years' or more continuous service. The inscribed, and the presentations were made by Mrs. C. Longmore, wife of Mr. C. Longmore, sole surviving partner of the firm.

## OBITUARY

**Mr. W. J. H. Penman,** transport manager with Darlington Corporation for thirteen years, who died recently, began his career in transport with Edinburgh Corporation. He was manager of Perth transport system for six years and later transport manager at Lancaster.

**Mr. C. C. W. Stoodley.**—The death occurred on 13th May at the age of fifty of Mr. Cecil Charles William Stoodley, general works manager of the Hotpoint Electric Appliance Co., Ltd. Mr. Stoodley served his apprenticeship with Laurence, Scott & Electromotors, and subsequently specialized in the design, manufacture and servicing of tools with several well-known engineering concerns in this country and overseas. In 1932 he joined the British Thomson-Houston Co., Rugby, as operation planner, and from 1939 to 1945 was general manager of the B.T.H. airframe factories and tool departments at Celta Mills, Peterborough. From 1945 until his appointment with the Hotpoint Co. in December last he was general superintendent of the B.T.H. Rugby Works and sub-factories, during which the Celta Mills were extended and equipment for the manufacture of B.T.H. and Hotpoint domestic appliances.

The late Mr. C. C. W. Stoodley

**Mr. D. Wilson.**—The death is announced of Mr. David Wilson, O.B.E., A.M.I.E.E., which occurred on 19th May at Wimborne, Dorset, at the age of seventy-six. Mr. Wilson was superintendent at the Bankside power station of the City of London Electric Lighting Co. from 1892 to 1904, after which he was with Babcock & Wilcox, Ltd., for eighteen years as head of the testing department. He later joined International Combustion, Ltd., with which company he was associated until his retirement in 1934.

**Mrs. Reddyhough.**—In our issue of 14th April we reported that Mr. H. L. Reddyhough, who recently retired from the position of chief engineer to the Gourepore Electric Supply Co., Ltd., was returning to England. We regret to learn that Mrs. Reddyhough, who was accompanying Mr. Reddyhough on an extended tour before returning to this country, died in a nursing home at Durban on 9th May. Mr. Reddyhough is on his way home in the *Winchester Castle*, which left Durban yesterday.

**Mr. N. P. Bedson.**—The death occurred at a Southport nursing home on 22nd May at the age of sixty-one of Mr. Noel Phillips Bedson, B.Sc., A.M.Inst.C.E., M.I.E.E. Mr. Bedson commenced his career with the British Westinghouse Co. in 1909 and in 1911 went to Germany, where he was later associated with Siemens Schuckert, Berlin. He joined Richard Johnson & Nephew, Ltd., in 1914 as chief engineer, with whom he specialized in the design of rolling mills and wire-drawing and wire-working machinery.

## WILLS

**Sir John Arthur Aiton,** C.B.E., late governing director of Aiton & Co., Ltd., who died on 24th January last, left £83,157 gross (£72,459 net).

**Mr. W. T. Dalton,** former chief engineer of the Newcastle-on-Tyne City Transport and Electricity Department, who died on 13th February last, left £6,850 gross (£6,752 net).

**Mr. A. L. Coward.**—In the notice relating to Mr. Coward's will in our last issue we incorrectly stated that he was manager of Highfield & Roger Smith, consulting engineers. Mr. Coward was a partner of the firm.

## Measurements Section Conversazione

IN London last week the Measurements Section of the Institution of Electrical Engineers held its first conversazione. The 180 or so members and their ladies who attended were received by the chairman, Prof. J. Greig, and Mrs. Greig and altogether the function was highly successful, the buffet in the library being exceedingly well arranged.

During the evening two films were shown in the lecture theatre, the first presenting the story of the Tennessee Valley project in America and the second depicting the breakdown of the ill-fated Tacoma Narrows suspension bridge, also in U.S.A.

There were a large number of exhibits of scientific equipment and although these were primarily of appeal to the members of the Section, the interest of ladies and other visitors was by no means overlooked. For example, the effect of wall coverings was demonstrated in relation to the efficiency of room heating. Demonstrations of the high-fidelity reproduction of gramophone recordings also aroused considerable interest.

# National Supply Survey

## ELECTRICAL ASSESSMENT OF THE FOURTEEN AREAS

## 12 YORKSHIRE AREA

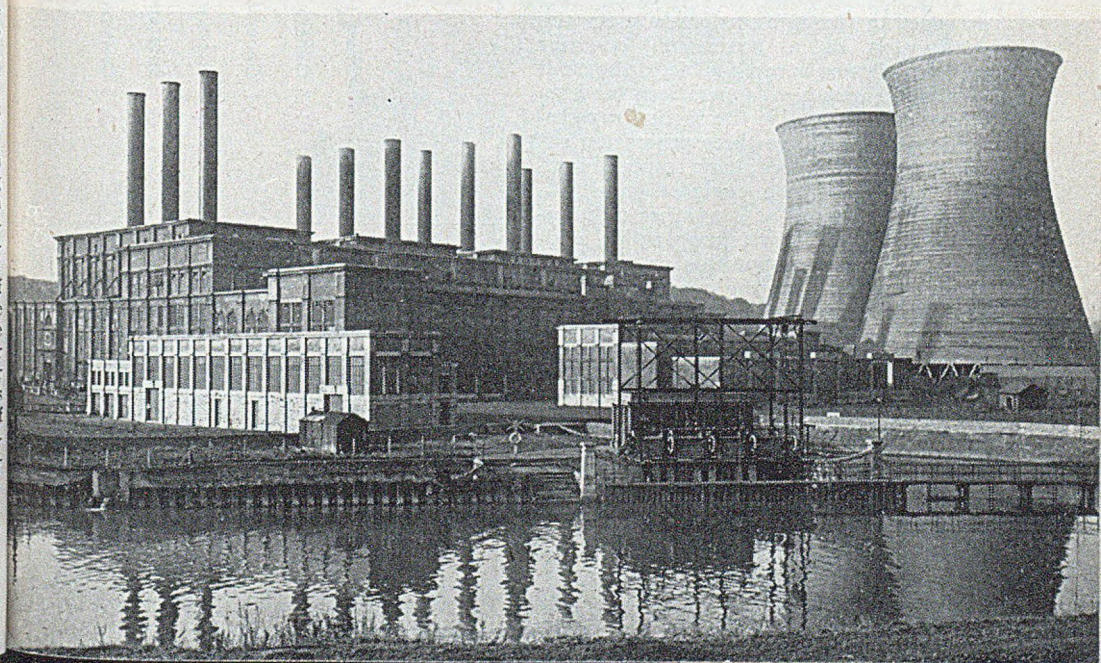
OF the fourteen new public electricity supply areas which came into being in 1948, the Yorkshire Area by no means absorbs the whole of Yorkshire. Roughly speaking it comprises the West and East Ridings and Lindsey, the northern "Administrative County" of Lincolnshire, as well as a small north-western district of Derbyshire and tiny fringe parts of Nottinghamshire.

The complete Area has 4,094 sq miles of territory, of which 921 sq miles is urban and 3,170 sq miles rural. Corresponding approximate population figures are, urban areas 3,565,290 and rural areas 585,580, giving a total population for the Area of 4,150,870. A glance at the Ordnance Survey "Population of Urban Areas" map leaves no doubt as to the disposition of these urban and rural populations, for in the western half of the area is a great mass of red circles indicating Leeds and Sheffield in the 500,000 "range," Bradford approaching 250,000, and numerous smaller towns like Huddersfield and Halifax, Doncaster and Rotherham, Barnsley and Wakefield, and Keighley and Batley. The few red circles in the eastern half of the Area include Hull, Grimsby and Scunthorpe.

The "Population Density" map tells a like story, with its great preponderance of "dense urban" (over 25,000 per sq mile), "urban" 6,400 to 25,000) and "suburban" (400 to 6,400) markings in the west and the overwhelming "dense rural" (50 to 400) and "sparse rural" (1 to 50) shadings in the east. A 30-mile strip of white (virtually uninhabited) runs NNW—SSE at the south end of the western boundary.

Finally, to complete this physical picture, let us consider jointly the "Land Utilization" and the "Coal and Iron"

With an installed capacity of 200 MW, Kirkstall (Leeds) power station is the largest in the Area



maps. Above ground "arable land" is dominant in the east and a curious mixture of "chief urban," "arable land" and "meadowland" characterizes the west, while underground the greater part of the Yorkshire and Midlands coalfield coincides with the populous area. And in the east we have the Frodingham and Claxby iron ore fields near Scunthorpe and Market Rasen, respectively, associated with which there are the great steelworks around Sheffield and Rotherham.

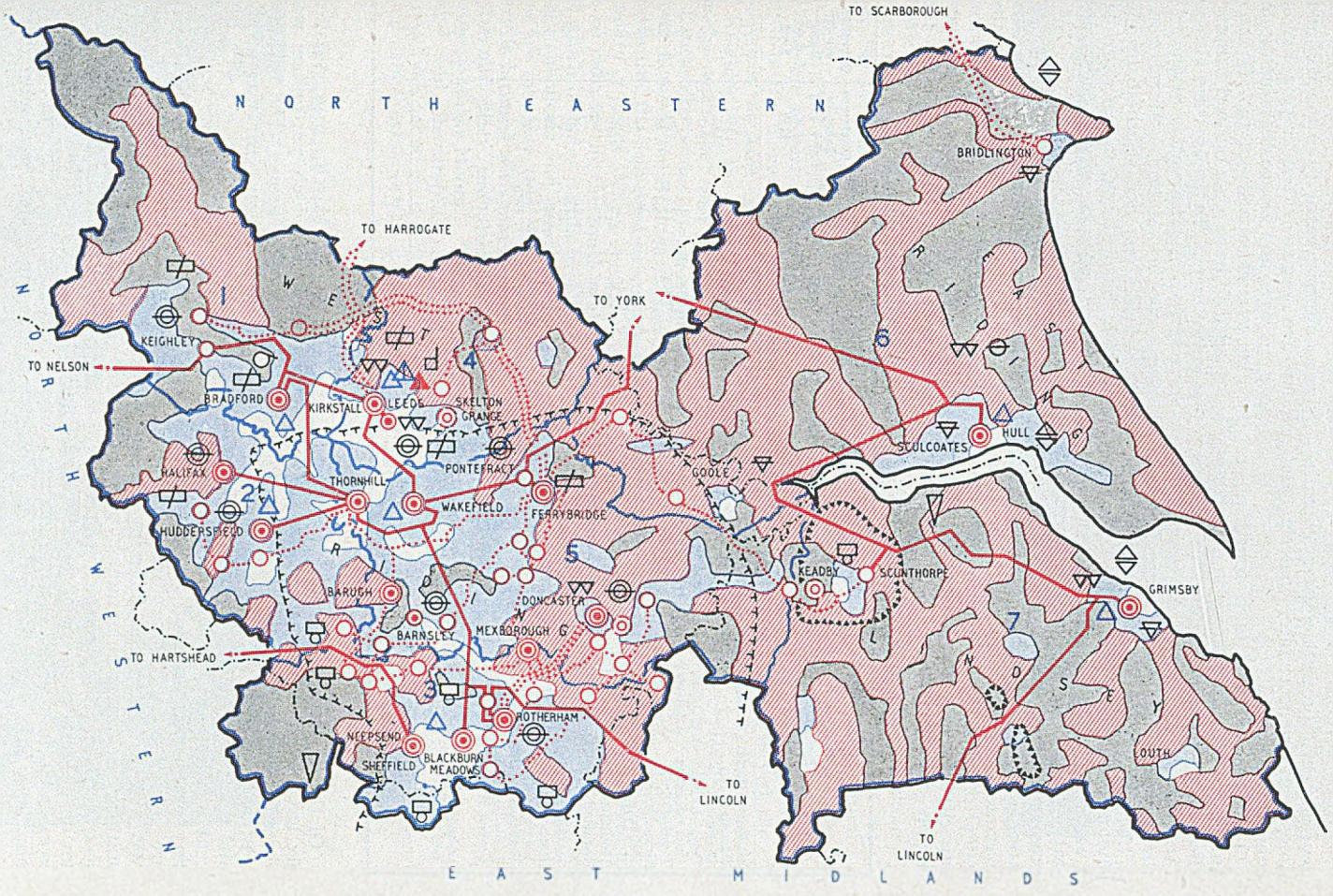
The Yorkshire Electricity Board has its headquarters at Wetherby Road, Scarcroft, Leeds, where Mr. W. M. Lapper, chairman, and Mr. F. Newey, deputy chairman, and their principal officers, Mr. S. R. Siviour, chief engineer, Mr. A. Haselhurst, chief commercial officer, Mr. E. Van Ham, chief accountant, and Mr. J. M. Dodds, secretary, constitute the Board executive team. For survey purposes we favour the tree method of outlining the structures of the organization.

Similarly at British Electricity House, St. Mary's Road, Leeds, 7, Mr. G. A. Vowles leads his divisional executive team, the other members of which are Mr. C. G. Richards, chief generation engineer (operation), Mr. W. H. Dunkley, chief generation engineer (construction), Mr. H. C. Ogden, system operation engineer, Mr. A. K. Mills, transmission engineer, Mr. W. J. A. Painter, technical engineer, Mr. W. McL. Wishart, divisional accountant, and Mr. C. F. Walkland, divisional secretary.

The generation operation department is arranged in three groups, each under the supervision of a generation engineer (operation) who is responsible to the chief generation engineer (operation) and to whom are responsible the station superintendents. There are three generation engineers (construction), each responsible to the chief generation engineer (construction) for the work at a number of specified stations. The system operation engineer is directly responsible to the divisional controller for the operation of the grid system and its associated generating stations in the Leeds grid control area.

The transmission engineer is responsible for the construction and maintenance of the transmission network and the associated sub-stations, while the technical engineer takes charge of planning and


**This electrical assessment map of the Yorkshire Area was specially prepared by the *Electrical Review*. It should be studied with the load analyses given in the text. The population-density is indicated thus: dense urban in white, urban in blue, dense rural in red and sparse rural in grey, and is shown together with the outlines of the coal and iron ore fields. The Whitehall Road (Leeds) generating station near the Kirkstall station is unnamed on the map because of congestion. Three of the very small power stations included in the schedule have been omitted for clarity**


NORTH EASTERN
TO SCARBOROUGH
BRIDLINGTON
TO HARROGATE
TO YORK
KEIGHLEY
TO NELSON
BRADFORD
KIRKSTALL
LEEDS
SKELTON GRANGE
PONTEFRACT
GOOLE
SCULCOATES
HULL
HALIFAX
THORNHILL
WAKEFIELD
FERRYBRIDGE
HUDDERSFIELD
KEADBY
SCUNTHORPE
GRIMSBY
BARUGH
DONCASTER
BARNSLEY
MEXBOROUGH
TO HARTSHEAD
ROTHERHAM
NEEPSEND
SHEFFIELD
BLACKBURN MEADOWS
TO LINCOLN
TO LINCOLN
NORTH WESTERN
EAST MIDLANDS

development, protective gear commissioning and maintenance, metering and communications.

The Yorkshire Area takes fourth place among the fourteen Areas in regard to effective generating capacity. The figures (31st March, 1949; B.E.A. Report) for the four areas in question are London, 2,377 MW; North Western, 1,385 MW; Midlands 1,238 MW; and Yorkshire, 1,226 MW. The following schedule of stations in the area is designed again to present a ready mental picture of the Area, and we would stress here that the maximum capacity figures are the equivalent of what we have termed effective capacity in most of the foregoing National Supply Survey articles.

have an ultimate capacity of 360 MW and looks like having a set in commission early in 1951; and Doncaster which is to have an overall capacity of 120 MW and is intended to have a set on load towards the end of 1952. Extensions are also in various stages of construction at the following existing stations—Ferrybridge, Huddersfield, Neepsend, Rotherham and Thornhill. Since March, 1949, extensions to the Bradford station have been completed.

The following round figures relating to generation are of a preliminary nature and have been estimated to cover the Division as distinct from the grid control area. The kWh sent out by the generating stations in the Division during the

**GENERATING STATIONS OPERATED BY THE YORKSHIRE DIVISION**

| Station | Previous Owners | Type | Installed Capacity of Generating Plant MW | Maximum Capacity at 1/4/49 s.o. MW | Operation (Winter Basis) 1, 2 or 3 Shift |
|---|---|---|---|---|---|
| Barnsley (Queen's Road) ... ... | Barnsley Corporation ... ... | Steam | 6 | 4 | 1 |
| Barugh ... ... ... ... | Yorkshire Electric Power Co. ... | Steam | 10 | 10 | 1 |
| Blackburn Meadows ... ... | Sheffield Corporation ... ... | Steam | 197 | 185 | 3 |
| Bradford (Valley) ... ... ... | Bradford Corporation ... ... | Steam | 127.5 | 107 | 3 |
| Doncaster (Greyfriars Road) ... | Doncaster Corporation ... ... | Steam | 13.5 | 9 | 2 |
| Ferrybridge ... ... ... | Yorkshire Electric Power Co. ... | Steam | 125 | 120 | 3 |
| Grimsby (Moss Road) ... ... | Grimsby Corporation ... ... | Steam | 38 | 33 | 2 |
| Halifax (Foundry Street) ... ... | Halifax Corporation ... ... | Steam | 49.8 | 42 | 3 |
| Huddersfield (St. Andrew's Road) | Huddersfield Corporation ... | Steam | 60 | 53 | 3 |
| Hull (Sculcoates) ... ... ... | Hull Corporation ... ... ... | Steam | 124 | 118 | 3 |
| Kirkstall ... ... ... ... | Leeds Corporation... ... ... | Steam | 200 | 190 | 3 |
| Mexborough ... ... ... | Yorkshire Electric Power Co. ... | Steam | 60 | 57 | 3 |
| Neepsend ... ... ... ... | Sheffield Corporation ... ... | Steam | 110 | 104 | 3 |
| Rotherham (Prince of Wales) ... | Rotherham Corporation ... ... | Steam | 80 | 76 | 3 |
| Thornhill ... ... ... ... | Yorkshire Electric Power Co. ... | Steam | 82.5 | 73 | 3 |
| Wakefield (Calder Vale Road) ... | Wakefield Corporation ... ... | Steam | 13.5 | 9 | 1 |
| Leeds (Whitehall Road) ... ... | Leeds Corporation... ... ... | Steam | 37 | 35 | 2 |
| Craven Hydro* ... ... ... | Craven Hydro E.S. Co., Ltd. ... | Water and Oil | 0.3 | 0.3 | 3 |
| Gainsborough* ... ... ... | Gainsborough U.D.C. ... ... | Oil | 0.4 | 0.4 | 1 |
| Tadcaster* ... ... ... ... | Tadcaster Electric Co., Ltd. ... | Water and Oil | 0.3 | 0.3 | 1 |
| | | | 1,334.8 | 1,226 | |

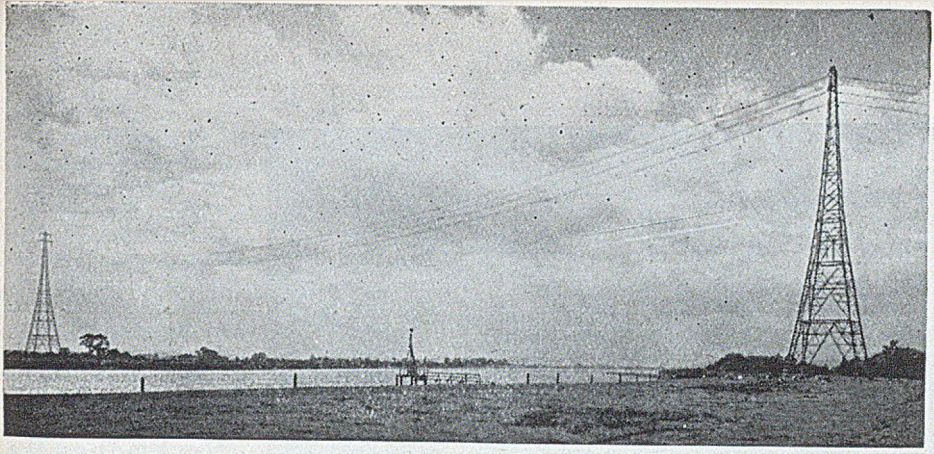
* Not shown on Assessment Map.

Of the 20 stations now in commission, six have megowatt capacities running to three figures (with Kirkstall taking the lead at 190 MW "effective capacity") and totalling 824 MW, or roughly 66 per cent of the whole. Excluding the three tiny water-power and oil stations there are only three with capacities below 10 MW. In addition the following three stations are under construction or projected: Skelton Grange which is designed for an ultimate capacity of 360 MW and is expected to have its first machine running later this year: Keadby which will

year ended 31st March, 1949, totalled 5,355 million, of which 720 million was exported to other areas. The m.d. for the area in the same year was of the order of 1,100 MW.

Connected to the Yorkshire section of the grid are the following major substations with their transformer capacities: Blackburn Meadows (90 MVA), Bradford (60 MVA), Ferrybridge (120 MVA), Kirkstall (120 MVA), Thornhill (90 MVA) and Wakefield (30 MVA).

Our intention this time is to couple the locational analysis with some notes on the



One of the most noteworthy river crossings in the national grid is that over the Ouse

Sub-Areas. No. 1 Sub-Area extends northwards into the Yorkshire Dales where the Wharfe and the Aire seem to compete. To follow the Dales in the direction given we pass Bolton Abbey and Barden Tower, an ancient building steeped in the memories of the Cliffords. Southwards the Area extends to Bradford and Keighley. In the west the boundary coincides with the Area boundary and the Lancashire border, and near here we find the home of the Brontës at Haworth.

Eastwards the Sub-Area extends to the boundary of Leeds. There is a concentration of industry in the south and south west which includes textile (wool), engineering, chemicals and printing, but as a whole we may say that the principal industry is farming with market centres at Skipton and Otley, the latter lying in the "Gateway to the Moors." The consumer density and consumption are 350 and 960,000 kWh per sq mile, and the average annual consumption per consumer is 2,800 kWh. With a population of about 546,000 the urban areas cover 171 sq miles. Corresponding figures for the rural areas are 32,000 and 322 sq miles. The 171,900 consumers were responsible for the disposal last year of 474 million kWh.

The following undertakings served the Sub-Area before vesting day: Bradford Corporation, Ilkley U.D.C., Barnoldswick U.D.C., Earby U.D.C., Skipton U.D.C., Pudsey Corporation, Bingley U.D.C., Keighley Corporation, Shipley U.D.C., Craven Hydro-Electric Supply Co., Ltd., Yorkshire Electric Power Co. (part), and Electrical Distribution of Yorkshire, Ltd. (part). The following showrooms are at the service of the public: Barnoldswick, Bingley, Bradford (four), Ilkley, Keighley, Pudsey, Shipley, Skipton (two), Grassington, Earby and Otley.

No. 2 Sub-Area comprises 321 sq miles of territory immediately south of No. 1 Sub-Area, and on the Lancashire border it extends from about Haworth in the

The headquarters of the Yorkshire Electricity Board has a lovely setting at Scarcroft, Leeds

The Yorkshire Electricity Board's executive team. Seated, from left to right: Messrs. W. M. Lapper and F. Newey. Standing, from left to right: Messrs. S. R. Siviour, J. M. Dodds, A. Haselhurst and E. Van Ham

north to near Dumford in the south. The southern boundary runs right across "no man's land" to near Penistone. Along the eastern boundary, however, we meet quite different conditions, for roughly the boundary follows that of the coalfield on the west, and it runs through the most industrialized district, largely textile, which extends west into the heart of the Sub-Area and includes Huddersfield, Brighouse and Halifax.

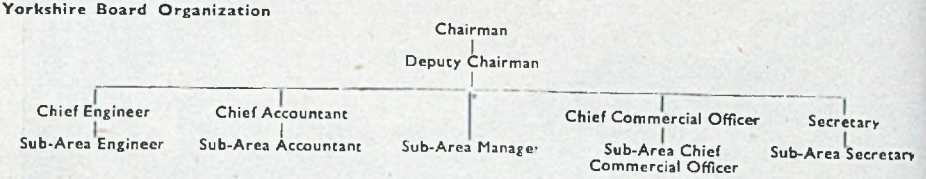
Generally, however, we may describe the Sub-Area as largely rural, with great stretches of moorland with isolated farms and hamlets. Even in remote places, however, the textile industry seems to dominate the scene if one is on the move, for the mills are to be found in almost every valley, despite the fact that only 59 sq miles of the Sub-Area is rural, with a population of only 7,740. The urban population is 477,460 (262 sq miles). There are 146,115 consumers in all and 513 million kWh was sold last year.

The undertakings formerly embraced by the Sub-Area were: Huddersfield Corporation, Halifax Corporation, Todmorden Corporation, Mirfield U.D.C., Holmfirth U.D.C., Hebden Royd U.D.C., Colne Valley U.D.C., Spenborough U.D.C., Heckmondwike U.D.C., Brighouse Corporation, Elland U.D.C., the Y.E.P. (part) and the E.D.Y. (part). There are service centres at Huddersfield, Halifax, Todmorden, Hebden Royd, Brighouse, Spenborough, Heckmondwike, Mirfield and Holmfirth.

No. 3 Sub-Area occupies 389 sq miles (272 rural and 117 urban) in the S.W. part of the area. The extreme S.W. corner of about 50 sq miles is the north of Derbyshire or the greater part of that terrain we have already referred to as virtually uninhabited. It includes The Peak. Although this Sub-Area is the third smallest it has the largest overall population, namely, 829,720, and its urban population is also the highest at 692,010. Even so the rural population of 137,710 is the second largest, and we attribute this curious condition to what may be termed heavy rural industry by virtue of the fact that two-thirds of the area cover the coalfield on which numerous villages depend.

Sheffield, where the great steel making plants contrast so severely with the Cathedral and the University, is largely responsible for the high urban popula-

**Yorkshire Board Organization**



tion. The estimated figure for 1947 was around the 500,000 mark. In 1947-48 the former Sheffield Corporation electricity undertaking had 172,054 consumers who took 882 million kWh, of which 559 million went to power consumers. The m.d. was 224,880 kW and the load factor was 46.7 per cent. Consider this with the 1,492 million kWh consumed within the whole Sub-Area and we have a striking illustration of the influence of the iron and steel industry on electricity supply. The consumers last year numbered 228,725, again heading the list. The former electricity supply undertakings were Sheffield Corporation, Rotherham Corporation, Mexborough U.D.C., Y.E.P. (part) and E.D.Y. (part). There are service centres at Sheffield, Rotherham and Mexborough.

Immediately north of No. 3 Sub-Area is No. 5 Sub-Area which covers 558 sq miles. Of this as much as 400 sq miles is rural, but this almost entirely represents heavy rural industry; it is claimed that the Sub-Area has more collieries in it than any other territory of similar size in the country. Wakefield, Barnsley, Pontefract and Doncaster are the chief coal mining centres, but there are many textile mills, clothing factories and engineering and printing works within the area, and the rich farming lands of Lincolnshire continue in the south-east corner of the Sub-Area. The urban and rural populations are 631,320 and 168,550 respectively, the latter figure being the highest rural population figure for any of the Sub-Areas. Last year the 173,291 consumers took 436 million kWh.

The following undertakings served the Sub-Area before nationalization: Doncaster Corporation, Adwick-le-Street U.D.C., Barnsley Corporation, Wakefield Corporation, Dewsbury Corporation, Batley Corporation, Dearne District Electricity Board, Normanton U.D.C., Pontefract Electric Supply, Castleford U.D.C., Ossett Corporation, Y.E.P. (part), E.D.Y. (part), and North Lincolnshire & Howdenshire Electricity Co., Ltd. (part). There are service centres at Barnsley, Batley, Castleford, Dearne, Dewsbury, Doncaster, Normanton, Pontefract and Wakefield.

With 305 sq miles of territory the No. 4 Sub-Area is the smallest of them all. The population is the third highest at 622,310, but Leeds alone has a population of about 450,000. In 1947/48 the Leeds undertaking had a total of 172,804 consumers who took 409 million kWh. The m.d. was 200,110 kW and the load factor 42.9 per cent. The respective urban and rural areas of the Sub-Area are 98 and 207 sq miles, and the population figures are 579,870 and 42,440.

This Sub-Area is primarily industrial in character, having Leeds, with its great clothing factories, in the west and including the northern part of the Yorkshire coalfield in the south. But there is quite

**The executive team of the Yorkshire Division of the British Electricity Authority. Seated, left to right: Messrs. W. McL. Wishart, W. H. Dunkley, G. A. Yowles, C. G. Richards and C. F. Walkland. Standing, left to right: Messrs. A. K. Mills, W. J. A. Painter, P. G. Hieatt and H. C. Ogden**

a large expanse of good farming land in the north which extends to the Harrogate and York boundaries. The former undertakings in the Sub-Area were those of Leeds Corporation, Morley Corporation, Tadcaster Electricity Co., Ltd., Y.E.P. (part) and E.D.Y. (part). There are service centres at Garforth, Leeds, Morley and Wetherby.

By far the largest of the Sub-Areas is No. 6, in the north-east of the Area, which has for its eastern boundary the coast line from the Humber up to a little north of Bridlington where it adjoins the North Eastern Area. The area is 1,136 sq miles and the population, the third smallest, is 533,340. The urban area (71 sq miles) and urban population (425,360) figures are both second lowest. It is not surprising, then, to hear the Sub-Area described as chiefly rural, with thousands of acres of farmland producing cereals, roots and feeding stuffs for the dairy herds.

In doing so, however, we must not overlook some outstanding industrial places, particularly Hull, one of the largest ports in the country, and as such exercising a considerable influence on the Yorkshire Area as a whole. Shipbuilding, milling and fishing are associated with Hull in a large way, and to a lesser extent the first two industries are very active upstream at Goole and Selby. Further, a small part of the coalfield projects into the south-west of the Sub-Area.

The Sub-Area embraces the former undertakings of Hull Corporation, Bridlington Corporation, Y.E.P. Co. (part), Buckrose Light & Power Co., Ltd., South East Yorkshire Light & Power Co., Ltd., North Lincolnshire & Howdenshire Electricity Co., Ltd. (part), and E.D.Y. (part). There are service centres at Hull, Bridlington (two), Driffield, Goole, Hornsea, ,Withernsea, Flamborough, Hunmanby, Pocklington and Selby.

Finally there is No. 7 Sub-Area which is practically Lindsey (Lincolnshire), where there is a slight break away from the county's reputation for flatness by virtue of the Lincoln heights and wolds, with their considerable stretches of woodland beauty. It includes the Isle of Axholme in the north-east corner, cut off by the Trent, whose people once tried to stop drainage operations for fear of loss of freedom. It is in the architecture of the 13th and 15th centuries that this part of the country has such astonishing wealth, and at Barton-upon-Humber are pre-Conquest towers which fit in well with the flat land.

Authoritative claims are made for the highest farmland yields for this part of the country and dairy production is in a particularly thriving condition. There is thus no doubt about naming the principal interests of this Sub-Area, but again there are some places of particular interest in other spheres. Grimsby, for instance. is the largest fishing port in the kingdom and has a considerable shipbuilding industry. Scunthorpe makes an important contribution to steel making.

The undertakings absorbed by this Sub-Area were those of Grimsby Corporation, Cleethorpes Corporation, Louth Corporation, Scunthorpe Corporation, Gainsborough U.D.C., Y.E.P. (part), and the North Lincolnshire & Howdenshire Co. (part). There are service centres at Grimsby, Cleethorpes, Scunthorpe, Gainsborough and Louth.

To complete the foregoing Sub-Area analysis we present in table form the consumer and load (consumption basis) densities of the Sub-Areas and the Area.

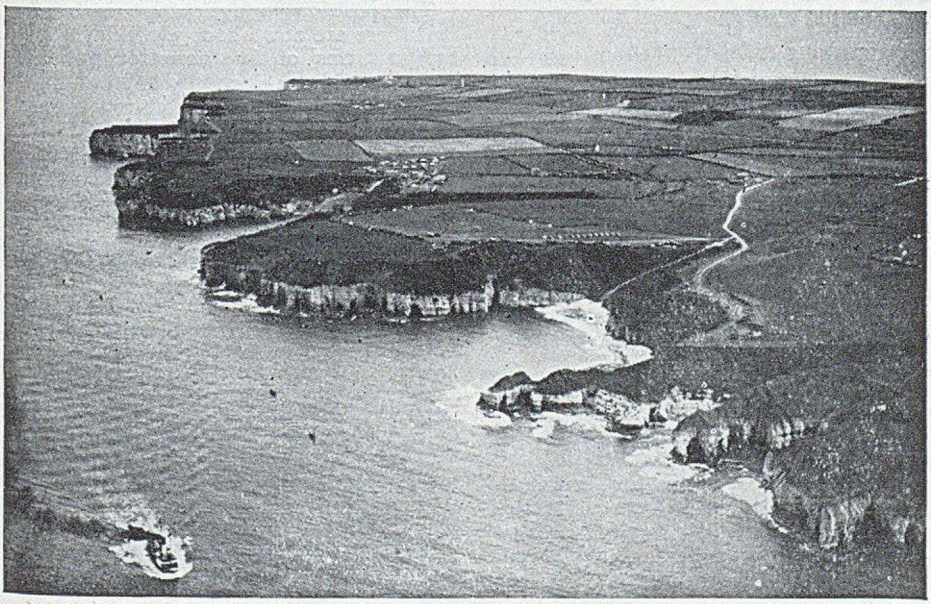
**CONSUMER AND LOAD DENSITY TABLE**

| Area | Consumers per sq mile | Average annual consumption per consumer kWh | Annual consumption per sq mile kWh (thousands) |
|---|---|---|---|
| No. 1 Sub-Area ... | 350 | 2,800 | 960 |
| No. 2 Sub-Area ... | 460 | 3,500 | 1,600 |
| No. 3 Sub-Area ... | 590 | 6,500 | 3,840 |
| No. 4 Sub-Area ... | 610 | 2,700 | 1,650 |
| No. 5 Sub-Area ... | 310 | 2,500 | 780 |
| No. 6 Sub-Area ... | 120 | 3,000 | 370 |
| No. 7 Sub-Area ... | 80 | 3,900 | 310 |
| Yorkshire Electricity Area ... | 270 | 3,700 | 1,010 |

As a prelude to the presentation of an estimated load analysis for the Area it is fitting to give the following information relating to the overall load conditions. The number of consumers on 31st March, 1949, was 1,118,868, to whom were sold a total of 4,125 million kWh during the year ended on that date, and who, in the aggregate, were responsible for an Area m.d. of 1,100 MW, this figure being the sum of the individual m.d.s. at the points of supply from the British Electricity Authority and other Area Boards.

Leeds, with its great clothing factories, is the Yorkshire Area's second largest city

The eastern boundary of the Area is part of the Yorkshire coastline: Flamborough Head



The consumers range from the smallest domestic consumer with, say, half a kilowatt of lighting load, up to a large steel works with a m.d. of about 30,000 kW and an annual consumption of 120 million kWh. The following references to a few selected large consumers will help to create an appreciation of the general load conditions of the Area. An ice factory with a production of about 1,600 tons of crushed ice per day has a m.d of 2,200 kVA and consumes about 7·5 million kWh per year. A large works manufacturing copper-alloy tubes has a m.d. of 4,500 kVA, and its annual consumption is 18 million kWh. A chemical works making fertilizers, dyestuffs, etc., consumes 32 million kWh a year and has a m.d. of 6,000 kVA. Consuming 46 million kWh per annum, a large cement works has a m.d. of 7,500 kVA. The textile industry has, of course, some notable consumers and there are the important ports.

Now we can present the final Area load analysis as follows:—

**AREA GENERAL LOAD ANALYSIS (ESTIMATED)**

| Class of Load | Consumption for 1948/49 kWh (million) |
|---|---|
| Domestic ... ... ... ... | 1,093.3 |
| Commercial ... ... ... ... | 319.2 |
| Industrial ... ... ... ... | 2,539.9 |
| Agricultural ... ... ... ... | 16.7 |
| Traction ... ... ... ... | 133.9 |
| Miscellaneous (Public Lighting Authorities) ... ... ... ... | 21.9 |

Because of its extremely mixed character, the industrial load cannot be separately analysed.

The foregoing locational and statistical load analysis should, of course, be studied in conjunction with the accompanying specially prepared electrical assessment map, the value of which has been enhanced by the "population density" background, with outlines of the coal and iron-ore fields.

An outline of the tariff position is helpful. At vesting date there were more than 500 different published tariffs in force throughout the Area. In the domestic field most of the former undertakings made use of two-part rateable-value tariffs with widely varying charges —fixed from 8.33 per cent to 42 per cent and secondary from 0.3d to 2.0d per kWh. The Board, however, has recently achieved a measure of standardization. Domestic rateable value charges have been levelled at 15 per cent per annum, and former kWh charges less than 0.75d have been increased to that figure. In all other classes of load, too, the minimum running charge is 0.75d per kWh, except where there is provision for fuel cost adjustment in the tariff and in cases of "off-peak" supplies. Lighting flat rates have also been rearranged so that the maximum is now 6d per kWh for credit consumers.

To round off this contribution to our National Survey a speculation on some future possibilities in the Area is permissible. Large increases in load are expected in the near future as a result of the National Coal Board's decision to concentrate on the operation of the larger pits, thus calling for large coal preparation plants. While the N.C.B. may build a few pithead stations, it is anticipated that it will have an additional load for the Yorkshire Electricity Board of the order of 120 MW in the next five years. There is scope, too, for the electrification of more textile mills, a considerable number of which still use steam for machine driving. The steel industry is also expected to increase its demand very considerably.

The position in agriculture is briefly that there are now about 320 villages and 13,300 farms of five acres or more in the Area without electricity supply. Electrification of the Manchester to Sheffield railway line is going ahead.

We are indebted to Mr. Lapper and Mr. Vowles, and to their principal officers, for the co-operation.

## Symposium on Information Theory

A SYMPOSIUM on Information Theory is to be held in the rooms of the Royal Society from 26th to 29th September inclusive. The programme will be concerned, in particular, with the recent work of Dr. C. Shannon of the Bell Telephone Laboratories, N.J., who is himself to present two papers, and will be of interest to mathematicians, physicists, physiologists and communication engineers. Those wishing to attend are asked to write to Prof. Willis Jackson, Electrical Engineering Dept., Imperial College, London, S.W.7.

# ELECTRICAL CONTRACTING: Organization and Routine

By H. R. TAUNTON, A.M.I.E.E.

## 5—*Correspondence and Filing*

IF capital be the life-blood of a business, its correspondence may well be termed its nervous system, receiving and transmitting the thousand impulses which give it its activity. And like any nervous system, it is peculiarly liable to break down. In every large business the mass of papers going to and fro will, unless methodically handled, soon accumulate to unmanageable proportions and clog the whole machinery of its routine. We shall discuss in this article how to avoid that calamity.

### Letterheadings

A few words first about stationery. It should be of good quality with headings die-stamped or engraved. There is plenty of scope here for originality; but avoid loading it with semi-advertising matter, such as "Bells a speciality," "Estimates free"—it would be a poor firm which did not give estimates free; or silly slogans like "We lead, others follow!" What impression of you and your standing will a potential customer gain from cheap paper with a shoddily printed heading, other than that your work is likely to be cheap and shoddy.

All quotations, big or small, should be typed on special forms, the word "Quotation" (or "Estimate") prominently printed on it, and on its back, in feint, the standard conditions of contract adopted by the firm, which thus automatically become an integral part of any quotation.

We must study economy, however. Reserve the standard paper for letters and estimates to customers and the more important correspondence. For ordinary trade and routine letters a cheaper quality will serve, with, say, a lithographed heading. A third and still plainer quality, with a narrow printed heading, can be used for internal memos and letters to workmen. Quarto is the most convenient size for the best grade; and for the other two—which will be used mostly for short letters—a size intermediate between quarto and octavo.

Duplicate paper for carbon copies should be of one quality and, for convenience in filing, of one size. A variety of tints, however, is sometimes useful: certainly for "follow-up" copies. Here is meant not only the copies of letters following up inquiries, but those which should be made of any letter to which an answer is necessary by a certain date, or which deals with a matter which has to be left in abeyance for a period. These copies, with their distinctive colour, then serve as a "memory-tickler," and their use avoids the undesirable practice of keeping the ordinary copies out of the files for any protracted time.

Postcards are not so commonly used in business as once they were. This is rather a pity, as, where short unimportant notes are in question, their use is a definite saving of the typist's time, of an envelope, and—still—of a halfpenny in postage. What has perhaps brought them into disuse is the slight difficulty in securing a copy for filing, but this can be got over easily with a little ingenuity.

### Incoming Mail

The morning mail should preferably be opened by the principal himself, or his manager. With it he should find on his desk each morning the carbon copies of every letter written the preceding day, so that he is kept in touch with the activities of every department. Alternatively, he may make a point of seeing the originals before they are posted.

All incoming mail should be stamped with at least the date of its receipt, or better, with a space for that of reply and for a filing reference. Adequate references are essential if the filing system is not to drift into chaos and cause exasperation. The filing clerk, usually a junior, cannot be blamed for an unlucky guess if

left without a guide, so easily supplied. Some of the incoming correspondence may be headed with the name of the job to which it refers, but most of it will have at best no more than a reference to an outgoing letter. It is for the man who opens the mail to supply the deficiency.

A system of storing correspondence and other records which shall be comprehensive, inherently accurate, and easily handled is particularly essential to a contractor, who, from the very nature of his work, is constantly referring to his files. In his case it is not simply a question of filing Brown's letters under "B" and White's under "W," or under any other straightforward classification.

## Contracts the Keynote

In any electrical contracting business the essential feature is *contracts*. Classification by contracts must therefore be the keynote of any filing methods adapted to his needs. In effect, he must have not one general system covering the whole of his business, but a large number of individual systems, each complete in itself. His mail, in and out, consists of: (*a*) Inquiries and resulting letters, (*b*) orders and tenders or estimates, (*c*) customers' letters, (*d*) trade quotations and inquiries to trade, (*e*) trade letters, (*f*) workmen's reports and letters, (*g*) interdepartmental notes, (*h*) administration letters, (*i*) accounts and payments, (*j*) letters regarding accounts, and (*k*) advertising matter.

There will also be drawings, plans, dimensioned diagrams, and the like matter coming in and going out. They may be considered as illustrative to the various sections enumerated, mostly (*a*), (*b*), (*c*) and (*d*). The bulkier of them, which cannot be folded easily, are not amenable to ordinary letter-filing methods. Their storage is a matter of drawing-office organization; but a list of them should be kept in the appropriate letter file.

Finally, to complete this survey we must include telegrams and telephone calls. The latter are mainly ephemeral, or if they are of importance are confirmed in writing by one side or the other, or can be treated as interdepartmental notes and dealt with accordingly. Incoming telegrams can be dealt with as letters. Telegrams sent out are commonly written in triplicate books, one copy being subsequently posted as confirmation and the other kept in the book as record, or better, filed.

Advertising matter (*k*), whether incoming or outgoing, need not here detain us. Most of it will probably be filed in the waste-paper basket. Similarly, (*i*), in and out, are outside any general filing system, and are the concern of the accountant and the storekeeper.

Generally, too, letters regarding accounts (*j*) are the concern of the accountant, questions of book-keeping. In many cases, however, questions of fact arise which have to be dealt with by the engineer or other person responsible for carrying out a certain job. The correspondence must then be treated as coming under sections (*c*) or (*e*), in or out. Copies—of the replies at least—should be provided for the accountant.

Assume now that letters and copies not permanently retained by special departments have found their way to the filing basket. The problem is their final disposal. Correspondence under section (*a*), in and out, dealing with "inquiries" and their "follow-ups" has already been discussed in an earlier article. We have therefore only now to consider sections (*b*) to (*h*), incoming and outgoing.

Let us first dispose of (*h*), administration letters: correspondence dealing with the general management. It is easily provided for by straightforward alphabetical filing, apart, of course, from private letters which the principal or manager may want separately filed, under lock and key. The remaining sections (*b*) to (*g*) are directly concerned with the remunerative work of the business: contracts or jobbing and maintenance. This suggests a twofold division of the papers. We will take it for granted that copies of all outgoing matter are in the form of loose carbons. The old-fashioned letterpress book is out of the question for the contractor, who cannot have his letters dealing with a hundred jobs mixed together in no order but that of the date.

## Vertical System

The "ideal" system, lauded by "business organizers," is the vertical-filing system. Followed fully, it involves for each correspondent a separate folder, in which letters and copies are kept loose,

the folders being stacked in large drawers and arranged in some definite system. Without a doubt, this is *the* system for businesses with a large number of independent correspondents, e.g., an insurance company, but it has the drawbacks of bulk and expense, and further, that as the papers are usually kept loosely in folders, they are apt, if frequently handled, to get misplaced or even mislaid. For the contractor, moreover, this would involve a drawer for each contract, in which each correspondent would have his individual folder. But the drawers are large ones and, except perhaps in the case of an occasional very big contract, that would involve an impracticable bulk, largely wasted.

## Weakness of Method

The multiplicity of folders resulting is, indeed, the weakness of this system for the contractor's correspondence. It is not simply a matter of one folder for each correspondent, but of scores of folders for some of them. Take the case of firms which, as some do, make most of their purchases through one wholesaler. Under this system there would have to be a folder for that wholesaler's letters in every contract file, even if we agree not to subdivide the smaller jobs. The same would apply equally to the manufacturers with whom the firm commonly dealt and, in a less degree, to certain architects and consultants for whom it might be carrying out several contracts.

On all these counts the vertical-filing system is unsuited to the contractor's needs. Leaving original cost and upkeep out of the question, he wants a system which, simply and compactly, will allow him to keep together the papers of each job in such a way that they can be handled repeatedly without risk of loss or displacement.

Nothing answers more nearly to that requirement than the common "arch" file, in which papers, suitably perforated, are secured on metal binding-posts in stout folio cases, with alphabetical guide sheets. They are firmly held together when the file is not in use; they can be easily turned over without losing their sequence, by a movement of a sliding grip; and, when necessary, they can be quickly removed and replaced. Using one or more binders for each contract, every paper connected with it is permanently kept together in a conveniently handled form, instead of being scattered loosely in a number of folders or drawers.

Preliminary correspondence accumulated when a contract was still in the "inquiry" stage will naturally form the nucleus of the file, concluding with a tender. The papers have been lying, for weeks perhaps, on the estimator's desk, but he has now no further use for them, until—if ever—the order follows. Too bulky to be returned to the "inquiry" files, they are best kept loosely in temporary folders of a distinctive colour, labelled and numbered to correspond with the pagination of the permanent estimate file, which thus forms an index to them. The folders can then be stacked together in numerical order until wanted and here a vertical-filing drawer may well be used.

The estimate file referred to is a special file of the extra carbon copies which should be made of all estimates, specifications, schedules and reports, permanently bound together in order of date, and numbered consecutively with a suitable index. They should never be removed from this file—the contract copies are available for all ordinary purposes—and thus collected together they form a most valuable record and useful data for future estimating.

## Interdepartmental Correspondence

Interdepartmental memos, in a firm so organized as to make them necessary, are usually typed on tinted paper, a different tint for each department. Such memos, referring to contracts, should be filed under the departmental initial, and not under that of the writer. Personal memoranda, sheets of calculations and engineering notes relating to contracts should be similarly filed, under any convenient and constant initial. Workmen's letters and reports are a form of interdepartmental correspondence, and should be treated in the same way.

It is desirable to issue duplicate letter-books to all charge-hands: quarto, with a ruled margin; otherwise they will buy their own, flimsy octavo things or else use all sorts of scraps, pencilled up to the edge and difficult to file neatly. They are apt to embody requisitions for material in their letters. Requisitions should be on

separate forms, as they have to be dealt with by the storekeeper, and do not come into the general filing system.

There are some points to be observed in the use of contract files if they are to be kept trouble-free. If any paper is removed from them for any other than a temporary purpose, a slip giving short particulars should be filed in its place. It is well to number the papers of each correspondent consecutively in coloured pencil as a check.

Inquiries to the trade, asking for quotations are usually sent to several firms but only one carbon will be made, on which their several names will be noted. When the order is eventually placed with the selected firm the carbon can be filed with its correspondence. Postcards and other stiff matter should be pasted on a tough paper hinge in which the necessary holes can be punched.

## Drawings and Plans

Blueprints and other papers not too bulky to be filed, yet larger than the standard file, should be folded so that one edge, to be punched, projects beyond the other; otherwise it will be impossible to refer to them without removal. Plans and large drawings, when not actually in use, are, as has been said, a matter for the drawing office. Smaller prints, too bulky for filing, can be folded and with such items as pamphlets, bound specifications, and mounted photographs, can be kept in a plain box file, unindexed, with a strong spring clip or in a nest of shallow drawers labelled to correspond with the appropriate contract file.

We have so far only considered contracts large enough to require one or more arch files to themselves. To treat all jobs big or little in the same way would involve an impracticable bulk of comparatively expensive files. The simpler way is to keep the papers of all these smaller jobs in separate manila folders. Some jobs may involve perhaps only half a dozen papers, and it may seem a little wasteful to use a separate folder for them. Better that, however, than to adopt a "miscellaneous" file for them and have the continual irritation of looking in it for papers which are actually in a folder, and *vice versa*. These folders are best stacked horizontally on shallow shelves, the tabs staggered if possible.

Correspondence dealing with maintenance work is kept in the same way as for contracts or jobs in progress, in arch files or folders according to its likely bulk. Correspondence, too, may trickle in for some time after a contract has been wound up (without maintenance). It is advisable to file it in a new folder rather than keep the old arch file indefinitely in use.

Summing up, it will be seen that the complete filing system consists of: (1) the "inquiry" files; (2) a special "order" file; (3) a special "estimate" file, a permanent binder; (4) arch files and folders for all contract, job, and maintenance papers, supplemented by drawers for bulky matter; (5) a temporary file—loose folders in a vertical drawer—for papers connected with estimates in suspense; (6) another for correspondence subsequent to the closing of a contract; (7) an alphabetical arch file—or a vertical file—for administration correspondence.

Of these, the only permanent ones, increasing in number with time, are (2), (3) and perhaps (7); the rest are in a state of flux. The ultimate disposal of papers in (1), (5) and (6) has already been described. It remains to consider (4).

## Completed Contracts

As soon as possible after the winding-up of a job—usually on the termination of the guarantee period—the papers referring to it should be removed from the current filing shelves, where they only waste space, and possibly cause confusion. To leave them undisturbed in their files or folders and stack them on out-of-the-way shelves would be uneconomical.

The now loose papers could be stored in plain box files, but this is almost as expensive as leaving them as they were; or, simply parcelled, would mean inconvenience if by any chance reference to them is necessary. As a compromise, a simple method is to secure them with tape passed through the existing punch holes, back them with strawboard and then parcel them in stout brown paper, so cut with flaps that, while they are completely enclosed they are easily accessible when untied. They can then be stacked and (duly labelled) can be left to the dusty oblivion of an upper shelf.

# E.T.U. at Ramsgate

## *Further Conference Decisions*

ONE of the resolutions carried at the Electrical Trades Union's annual policy conference at Ramsgate (the earlier proceedings of which were reported in our last issue) dealt with the safety of domestic electrical apparatus. It called for the enforcement of the I.E.E. Regulations, abolition of two-pin outlets, and outlawing of "such traps as the radio chassis which is 'dead' when switched on but 'alive' when switched off."

Mr. F. G. Whittal (Cheltenham), moving the resolution, said that they were greatly concerned with the increasing number of accidents arising from the use of unsafe domestic appliances. Wiring that was not up to standard was being done every day, carried out by any "Tom, Dick or Harry."

The conference also carried a special motion put forward by the Executive Council regretting that, notwithstanding the nationalization of the electricity supply industry, many of the personnel in control at management level had been actively opposed to the principle of nationalization and were anti-working class in outlook. Moving this, Mr. F. Haxell, assistant general secretary, said that steps must be taken to provide seats on the nationalized industries for workpeople, in order that their voice could be heard and that their representations could be made in the management of State-owned industries. Mr. P. Bentley (Richmond) complained that they still had the same managerial staff as before vesting day.

### Engineers' Wage Claim

Mr. H. G. Brotherton, president of the Confederation of Shipbuilding and Engineering Unions, made a statement regarding his organization's claim for an all-round increase of £1 a week. He said that the engineering industry's output was about 60 per cent above the level of 1948, and total engineering exports had more than doubled since before the war. They took pride in the contribution which the workpeople had made, but were equally concerned to ensure that the same workpeople should share in the rewards which flowed from increased production. In the absence of any positive agreement on a new wage structure the Confederation had made application for the £1 a week increase for adult male workers.

A special Executive Council resolution urging members of the E.T.U. in the engineering, shipbuilding and ship-repairing industries to support the Executive's recommendation to vote for strike action in the claim for the £1 a week wage increase was passed by the conference.

A resolution calling for the union to press the B.E.A. for a policy of full electrification, especially in the rural areas, was defeated by 130 votes to 155 votes after the Executive had opposed it.

Moving the resolution, Mr. W. E. Tubb (London Central) said that the number of homes lit by gas to-day was a national disgrace and to speak to some of the people in the rural areas on electricity would be laughable if it were not tragic.

Mr. F. Denyer (Dorking) complained that although he lived within 20 miles of London he had to go to bed by candle light.

Mr. T. Vincent explained that the Executive Council was opposing the resolution because it was not the B.E.A. which was holding up development, but problems of capital equipment.

### Boards' Contracting Departments

Making a statement on a resolution, which was carried, that the setting up of contracting departments by Area Boards should be obligatory, Mr. W. C. Stevens (general secretary) said that the Executive Council was obviously wholeheartedly supporting this motion and would do its utmost to see that it was implemented as soon as possible. Referring to the Union's claim for unilateral negotiating rights for its members employed in the contracting departments of Area Boards, he said that they had unsuccessfully endeavoured to meet the one other union which had a small number of members in these departments. The impasse was explained to Sir Robert Gould, of the Ministry of Labour, and in March last the E.T.U. presented its case to the B.E.A. but so far the Authority's decision had not been received.

Other resolutions passed asked for an overhaul of the cost-of-living index; equality of manual workers' wages and conditions with those of clerical and technical workers; negotiations with the B.E.A. to entitle employees to 13 weeks' sick pay and 13 weeks' accident pay; and abolition of age limits debarring people too old to take part in superannuation schemes from entry into industry or Government departments.

A number of the resolutions on the agenda were withdrawn when various factors were explained to the branch delegates concerned. One such resolution sought removal of the clause in the contracting industry working rules permitting the 44-hour week to be worked in 5 or 5½ days at the discretion of the employer. On behalf of the Executive Council it was explained that the right existed for members desiring to work the 44 hours in 5 days to take the matter up through the appropriate machinery. A resolution advocating registration of operatives and contractors was also withdrawn.

On Thursday Mr. Alexei Podushkin, president of the Power Station Workers of the U.S.S.R., addressed the conference, his speech being translated by an interpreter.

# MATERIALS HANDLING

## *Productivity Committee's Report*

LAST year a team comprising representatives of bodies interested in materials handling in industry visited the United States under the auspices of the Anglo-American Council on Productivity. The team's report has now been published by the Council (21, Tothill Street, S.W.1), price 2s 6d.

The leader was Mr. A. Roebuck (Hadfields, Ltd.), representing the Institution of Mechanical Engineers, and among the members were Messrs. W. J. Dimmock, secretary (Hoover, Ltd.), H. S. Carnegie (English Electric Co., Ltd.), N. Macdonald (Consolidated Pneumatic Tool Co., Ltd.), and E. G. Taylor (General Electric Co., Ltd.). Visits were paid to over twenty establishments of various types. The report surveys broadly methods adopted in the handling of materials from their intake, through the factory and in dispatching with illustrations of equipment in use.

In one section the effects of handling on productivity and costs is studied with the fact in mind that the cost of handling materials represents from 15 to 85 per cent of the total manufacturing cost. It is emphasized that each management must study its own handling problems and find ways of increasing efficiency.

Attention is paid to the use of power-driven hand tools (electric and pneumatic) which are more widely used in the United States than in this country as a means of increasing output and reducing physical effort.

In the team's main conclusions reference is made to the constant endeavour of American factory managements, with the help of educational authorities, institutions and other bodies, to improve handling methods. The greater manufacturing efficiency in the United States is achieved by the use of mechanical devices already available in this country. High labour costs have encouraged mechanization and simplification of materials handling. There is an interchange of knowledge on the subject and most American companies employ full-time engineers to plan and apply handling methods. The technical Press is given effective assistance by American users and manufacturers of handling equipment in the publication of cost data.

It is recommended that those responsible for production in this country should acquaint themselves with the best materials-handling practice in this country and that responsibilities for handling should be allocated and defined. Better use should be made of available space and equipment by the aid of improved handling systems. Liaison should be established with the Handling Division of the American Society of Mechanical Engineers by the interested British professional bodies. A positive lead should be given by engineering institutions, management and trade associations, the T.U.C., the F.B.I. and the British Employers' Federation by the encouragement of study of techniques and costs and the publication of factual information.

The report is to be discussed on 12th June at the Mechanical Handling Convention being held during the Mechanical Handling Exhibition at Olympia, 6th to 17th June.

## Finsbury Old Students

IT is proposed to wind up the Finsbury Technical College Old Students' Association, and Mr. W. B. Thompson, hon. treasurer of the Association, Elleray, Regent Road, Altrincham, Cheshire, asks members to get in contact with him with a view to calling a meeting in London, to discuss the suggestion and dispose of the funds available. It is suggested that the occasion should be made one of reunion before the final winding.

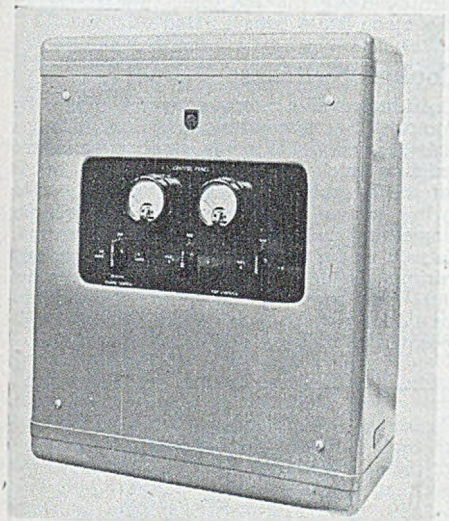
The funds available are approximately as follows: Finsbury Old Students, £275; Silvanus P. Thompson Fund, £133; Streatfield Fund, £125.

# RECENT INTRODUCTIONS

NOTES ON NEW ELECTRICAL AND ALLIED PROJECTS

## Industrial Rectifiers

A COMPACT source of d.c. power, suitable for a wide variety of industrial applications, is provided by the range of valve operated units now being manufactured by PHILIPS ELECTRICAL, LTD., Century House, Shaftesbury Avenue, London, W.C.2. Designed to deliver various outputs of up to 40 kW these rectifiers are housed in rigid steel cabinets and are characterized by high efficiency, high power factor and good regulation.



## Cooker Control Unit

An attractively designed cooker control unit in a die-cast aluminium case is offered by WM. SANDERS AND CO., (WEDNESBURY), LTD., Falcon Electrical Works, Wednesbury, Staffs, under the trade name "Sandeena." It incorporates a 30 A 250 V double-pole switch for a.c. only to control the main circuit and also a similar 15 A switch which is associated with a 13 A socket and fused plug to B.S. 1363, except that the socket is fitted with a circular cover. There are three "knock-out" entries for 1in conduit, one at the back and two at the bottom, and built-in terminals provide convenient earthing arrangements.

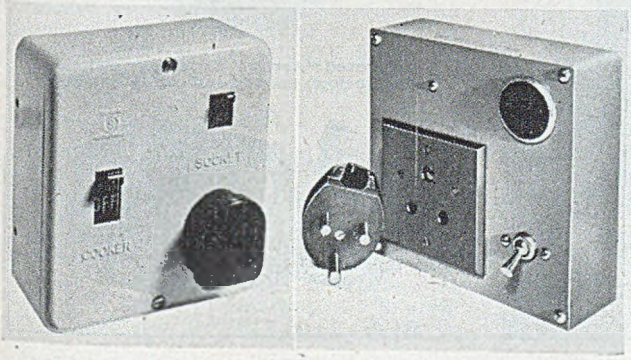
## Switched Socket and Pilot Light

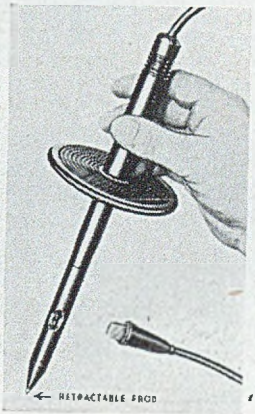
An addition to the range of products made by METALFORM, LTD., 258, Gray's Inn Road, London, W.C.1, is in the form of a 15A switched pilot assembly. The unit comprises a 15A round-pin plug and socket controlled by a single-pole switch, a red faceted lens and bayonet-type lampholder, all assembled in a sheet metal box measuring 6in by 6in by 2in. Finished in battleship grey, the unit is also available with a 13A flat-pin plug and socket conforming with B.S. 1363.

## High Voltage Tester

An instrument for testing circuits and components and determining polarity at

**Above: Philips industrial rectifier unit. Below (left) "Sandeena" cooker control unit; (centre) Metalform switched socket and pilot light assembly; and (right) Runbaken high voltage tester**



potentials between 350 V and 12 kV is offered by RUNBAKEN ELECTRICAL PRODUCTS, 71-73a, Oxford Road, Manchester, 1. This "Good Companion" consists of a discharge tube housed together with a chain of resistors in an ebonite tube. It is furnished with a retracting point shield and a large diameter hand guard so that tests on "live" equipment may be carried out with safety. An earthing lead is also supplied which may be plugged into the handle to form a means of continuity testing.

## Radar Tube

A 12in metal-backed cathode ray tube designed for electromagnetic focusing is now being made by MULLARD ELECTRONIC PRODUCTS, LTD., Century House, Shaftesbury Avenue, London, W.C.2, primarily for use in plan position indicator (P.P.I.) radar systems. It is fitted with a duodecal (12-pin) base, and has a long-persistence fluoride, aluminized screen. Under conditions of high ambient light, the makers claim that the superior brilliance and spectral coloration of this tube gives excellent contrast.

## Welding Transformers

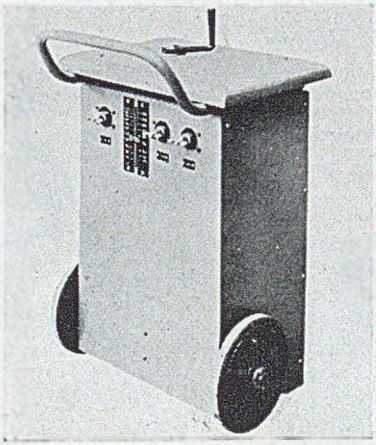
An addition to the range of welding transformers made by PHILIPS ELECTRICAL, LTD., Century House, Shaftesbury Avenue, London, W.C.2, is transformer type 1368, which is compact, portable, and embodies features which make it of value for all types of maintenance welding, and for use on production lines in sheet and heavy metal-working shops. The welding current control is continuous over the range 70-350 A and the transformer can be connected to any of six mains voltages between 190 V and 500 V. The connection value at the maximum load of 350 A is 24.5 kVA

## Modelling Lamp Socket

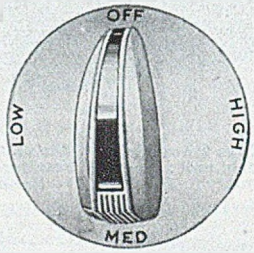
The electronic flash tubes LSD4 and LSD5, made by MULLARD ELECTRONIC PRODUCTS, LTD., Century House, Shaftesbury Avenue, London, W.C.2, which are widely used for studio photography, can now be supplied with a composite socket designed to allow the insertion of a suitable modelling lamp. This socket can be adapted to meet the individual requirements of equipment designers and is also available as a separate item for the convenience of photographers already using the 400 joule tube LSD4, or the 1,000 joule tube LSD5.

## Cooker Switches

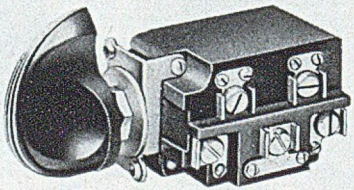
An improved a.c. cooker switch offered by ARROW ELECTRIC SWITCHES, LTD., Hanger Lane, London, W.5, is smaller than the existing quick make-and-break types, but is interchangeable as regards fixing. The switch is available in a variety of forms for single- and double-pole three-heat operation, as well as for multi-heat arrangements and various circuit controls. These accessories can be supplied with a streamlined moulded pointer-type handle or with a recently introduced self-indicating handle.

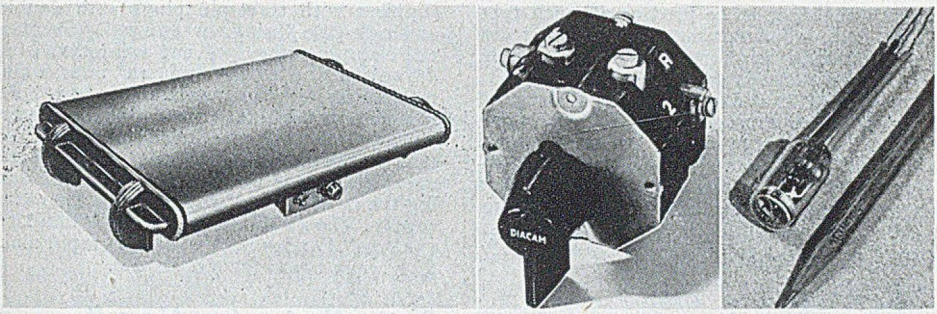


Philips welding transformer, type 1368




mproved "Arrow" a.c. cooker switch and (below) the self-indicating handle





Left: Falk, Stadelmann "Choice" 300 W heat-insulated hotplate. Centre: "Diacam" rotary switch with moulded casing. Right: The Mullard 58CV miniature vacuum photocell

## Table Hotplate

The latest "Raydex" product, the "Choice" hotplate, brought out by FALK, STADELMANN & CO., LTD., 91, Farringdon Road, London, E.C.1, is heat-insulated and will not scorch or scratch polished surfaces. A switch controls the 300 W pencil-type elements and a pilot light is incorporated.

The unit is constructed of brass finished in pre-nickel chromium plate, with a black heat-resisting frame. The useful surface is 18in by 12in. The price is £7 10s.

## Rotary Switch

A rotary switch for both industrial and domestic applications, known as the "Diacam," is offered by CRAIG & DERRICOTT, LTD., Royal Works, Sutton Coldfield, Warwickshire. Housed in moulded casings, these switches are so designed that several can be built up in the form of a ganged assembly. The self-aligning silver contacts are actuated by cam and roller mechanisms and give a double break on each pole, compression springs ensuring correct contact pressure and switch position registration. The terminals, which are patented, are clearly indicated by a letter or number and can accommodate two 7/.036 conductors. "Diacam" switches are available for all standard and most special sequences for panel or base mounting and are rated at 30 A at 250 V or 15 A at 440 V for use in a.c. circuits only.

## Miniature Photocells

A vacuum photocell, for use with extremely small and compact lens systems, has been introduced by MULLARD ELECTRONIC PRODUCTS, LTD., Century House, Shaftesbury Avenue, London, W.C.2. This photocell, type 58CV, which is $1\frac{3}{16}$in long and has a diameter of $\frac{5}{8}$in, is designed for an end-on aspect of illumination. In spite of its small size, the 58CV has a sensitivity of better than 15 $\mu$A per lumen. Other characteristics are: maximum anode voltage 100 V; maximum cathode current 3 mA; dark current at an anode voltage of 100 V 0.05 $\mu$A. A gas-filled version, the 58CG, is also available for "stop-go" applications where the light change is large and sudden.

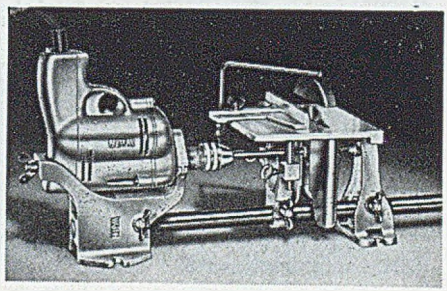
## Insulating Material

A machinable, non-tracking insulating material which is available from SONDAHL CONCESSIONS, LTD., 80, Victoria Street, Bristol, 1, has a dielectric strength of 190V/mil and an insulation resistance of above 1 million MΩ. Virtually non-hygroscopic, it possesses low inflammability, and the N.P.L. figure for its water absorption is 30 mgm. This material can be supplied in moulded form, with inserts if required, or in sheet, rod or tube up to a limit of one thickness of 1.5in.

## Home Constructors' Kit

In order to provide a useful multi-purpose tool kit for the home-constructor WOLF ELECTRIC TOOLS, LTD., Pioneer Works, Hangar Lane, London, W.5, have introduced an inexpensive $\frac{1}{4}$in capacity pistol grip electric drill together with a comprehensive range of fittings and accessories

This 7in circular saw assembly is included in the Wolf "Cub" multi-purpose tool kit



which enable it to be used as a bench type drill, buff, wood turning lathe, circular saw or polishing machine. The drill itself, which is suitable for either a.c. or d.c. mains, is rated at 210 W and can be supplied for use on all normal mains voltages. This "Cub" outfit comprises a bench clamp for the drill, a drill stand, grinding and polishing attachments, circular saw assembly and a set of lathe parts. The price of the complete kit is £11 11s 9d, but if required, individual items can be purchased separately.

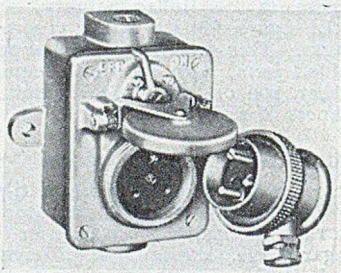
## Plinth Lighting Unit

Following the introduction of their plinth unit for decorative schemes of illumination, ROWLANDS ELECTRICAL ACCESSORIES, LTD., R.E.A.L. Works, Hockley Hill, Birmingham, 18, have produced a smaller model. The "Junior" plinth light is 2⅜in high, the top and base diameters being 5¾in and 6½in respectively, and it incorporates a 25 W bayonet cap pygmy lamp.

## Switch-Sockets and Plugs

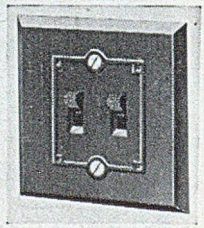
A heavy-duty weatherproof switch-socket introduced by the GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, London, W.C.2, is made in 5A and 15A sizes and supplied with three-pin plugs with double- or single-pole fusing, or unfused. Substantial clamping rings prevent accidental withdrawal of the plugs and an interlocking mechanism ensures maximum safety. For installations where there are alternative voltages the plugs are furnished with dowel pins which engage with the corresponding apertures in the socket discs, thus preventing the connection of apparatus to the wrong supply. The switches are G.E.C. "Landor" (5A) or "Landor Senior" (15A) rapid make and break types for a.c. or d.c.

G.E.C. industrial switch-socket and plug



Left: Marconi output power meter

Below: "Cumbrian" 15A tumbler switch



## Water Heater for Aircraft

To meet the increasing demand for hot water in large modern aircraft the GENERAL ELECTRIC CO., LTD., has introduced a lightweight all-aluminium water heater of 3 gal capacity, which weighs only 10 lb 10 oz when empty. Operating on a 120 V supply, the heater is suitable for the majority of electrical systems in the larger types of long-distance aircraft. The two 750 W cartridge type immersion heaters are thermostatically controlled, and will maintain the temperature of the water at 170 deg F during withdrawals of up to 2¼ gal. Water is supplied to the taps on the displacement system, being under pressure from the incoming feed to the heater.

## Output Meter

An audio frequency output power meter, now available from MARCONI INSTRUMENTS, LTD., St. Albans, Herts, covers an exceptionally wide range of power and maintains its accuracy at both very high and very low frequencies. Power is measured by a temperature compensated constant resistance multi-range rectifier voltmeter, the required input impedance being obtained by the use of a tapped transformer and a switched resistance changing pad. The ranges of the instrument are: Power, 20 $\mu$W to 10 W; impedance, 2.5 $\Omega$ to 20 k$\Omega$, provision also being made for balanced working.

## Tumbler Switches

The range of "Cumbrian" 15 A tumbler switches introduced by D. S. PLUGS, LTD., Ordsal Electrical Works, Manchester, 5, is so designed that one- or two-gang switches may be accommodated in a standard B.S. 1299 box with lugs at 2⅜in centres. Both single- and two-gang switches employ two fixing screws only, in slotted mounting brackets, and are made of non-track moulded material. The switch mechanisms are of the snap-action type with silver pressure contacts and are available as single or two-way switches.

# CORRESPONDENCE

**Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents**

## Transformer Design

I HAD 17½ years on transformers up to 1933 and from R. W. Flux's remarks on faults I am inclined to think there must be some rather incompetent persons in the industry.

Regarding surges, three methods I have in mind might help: (1) surge absorbers in each phase; (2) brass or phosphor-bronze ring, insulated, and made same potential as windings, irrespective of clamping ring; (3) clamping ring made same potential as winding. The last would entail a little more cost as regards clamping, but end insulation could be reduced and, again, it would allow a bigger oil space and enable any magnetic field or earth disturbance to be broken.

In winding, perhaps taking care to see that coils are completely even all round would cut out any hilly effects, thereby allowing voltage to flow evenly and reducing impulses.

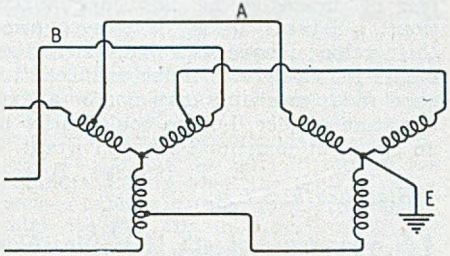
With regard to Mr. Tobin's remarks respecting insulation, wasn't a theory recognized some years ago that too much insulation tended to increase generation?

*Coventry.* J. C. SPENCER,
*H.M. Admiralty.*

## Auto-transformers

THE letter by "L. K." (5th May issue) raises important technical points regarding the use of auto-transformers on electrical transmission services. The saving effected by this form of connection, say 35 per cent on capital and current costs, may obscure the technical difficulties attending their use. It is not easy to clarify all of these but it should be borne in mind that the isolation of faults is of serious moment otherwise instability and dislocation may be reflected by surges throughout the system.

As the auto-transformer forms an interlinked path throughout the system it is in consequence subject to the higher pressure relative to earth and must be insulated accordingly. Furthermore, earths on the secondary side tend to invert the neutral. In the accompanying diagram a fault on "B" would reduce this phase potential to that of "E" and as the




**Fault in secondary side of auto-transformer**

potential of "A" is fixed by the generator, the phase would be reversed with a corresponding change in the excitation of that portion of the auto-transformer connection. A. G. COLLIS, M.I.E.E.

*Bath.*

## Service Qualifications

I CANNOT see why Service training as an electrical engineer should not be useful in civilian life. Electric motors, switchgear and controls do not change their mode of operation whether they are used to elevate a gun or a lift. A man trained in the Services to be an armature winder can confidently expect that a civilian armature has the same winding formulæ. The man who has been trained as a fault-finding mechanic in the Services will have had, in my opinion, the advantage of a better training and the use of better equipment than he will find amongst works electrical maintenance gear.

In the case of wiremen, a better training may possibly be obtained outside the Services, since firms in competition would insist on æsthetically neat work, in addition to "electrical" soundness.

I do not see the relevancy of Mr. Alex.

Milne's comparison of the capabilities of an armature winder and an outside man, to the question of the value of Service qualifications. A skilled armature winder in the Services should be compared to a skilled armature winder in civil life. Similarly the "outside man" should measure his capabilities against those of the Service mechanic.

I agree that no individual can possibly master all the branches of electrical engineering but, provided the ex-Service man seeks his civilian employment with intelligent adaptability, he need have no fear of presenting his Service qualifications. Several firms have recognized their value; I have seen many advertisements for ex-Service radar artificers. A good radar mechanic may not be a good armature winder, but he could easily be an excellent man for television work.

E. T. JENKINS, B.Sc.

*Blackheath, S.E.*3.

IN your issue of 5th May, Mr. Alex. Milne states that he is afraid that Service qualifications in the electrical trade are of little use in civil life.

So far as National Service men are concerned he is correct, but with time-serving men he is far from it. Taking the case of the time-serving leading torpedo operator, a few hundred of these have passed through this E.V.T. Centre and have been absorbed into the electrical industry, complete with an Electrical Trades Union card. All time-serving tradesmen in all branches of the Services are accepted by the E.T.U. as skilled craftsmen provided they qualify according to the E.T.U. Rule Book.

G. H. NEWTON.
Electrical Instructor (E.V.T.).
H.M.S. *Collingwood,*
*Fareham, Hants.*

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## Railways and Snowstorm

IN a review of the disruption of railway services on the Southern Region following the snowstorm on the night of 25th-26th April it is estimated that it will probably take up to four months to restore, even on a temporary basis, all the facilities which previously existed. About 540 telegraph poles were either broken or tilted to such an extent that the wires had to be taken off. In all, some 300 new poles will be required, with many hundreds of miles of wire.

# PARLIAMENTARY NEWS

*By Our Special Reporter*

DURING the second reading debate on the Finance Bill in the House of Commons last week, Mr. Norman Dodds, a Labour member, said that electrical delivery vehicles ought to be totally exempted from the 33⅓ per cent purchase tax; and to inflict such a tax on the batteries and on the chargers was also most unjust.

## British Electricity Stock

Sir John Mellor asked the Chancellor of the Exchequer what amount of British Electricity 3½ per cent Guaranteed Stock 1976-1979 was applied for by the National Debt Commissioners; what amount was allotted to them; on behalf of what funds did the Commissioners apply; and how was the amount allotted.

Sir Stafford Cripps said the investments made by the National Debt Commissioners of funds under their control were shown in the statutory accounts of the funds. It would be contrary to longstanding practice to anticipate publication of the accounts.

## V.h.f. Radio Licences

Mr. Erroll asked the Postmaster-General how many applications for very-high-frequency licences were outstanding; and what were the reasons for the delays before granting applications.

Mr. Ness Edwards said that twenty applications were outstanding. Of these ten raised a general question of policy which was under discussion with other Departments; and six had been received very recently. The remaining four were for radio service between fixed points. These cases had to be examined to see individually whether communication by telephone line was practicable and, if approved, for the selection of an appropriate frequency—a matter on which consultation with other Departments was required.

## Scottish Broadcasting

Lord Malcolm Douglas-Hamilton asked the Postmaster-General whether, under the Copenhagen Wavelength Plan, 1950, he would consider establishing a station in Inverness-shire to be synchronized with the high-power station at Daventry.

Mr. Ness Edwards said that the Copenhagen Plan provided for a station in Northern Scotland synchronized with the Third Programme transmitter at Daventry, but the B.B.C. was not at present in a position to establish a station in Inverness-shire.

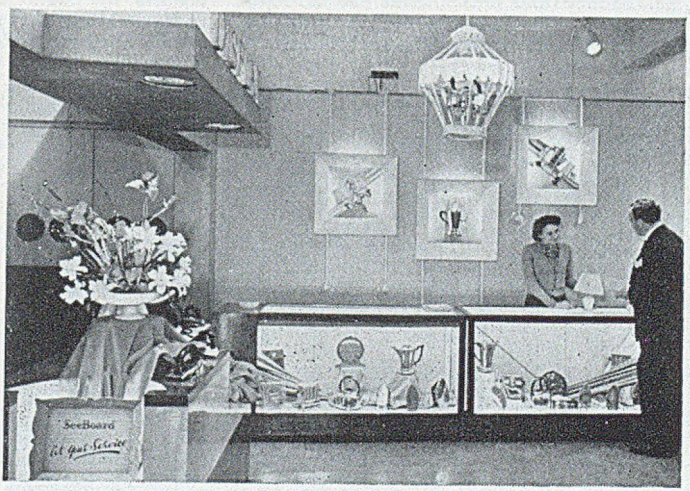
# Commerce and Industry

## Ironmongers and Electrical Trading
## New Television Studios

THE National Federation of Ironmongers proposes to form a more distinct entity to take the place of its existing Electrical Section. At the present time only members of N.F.I. may become members of the Electrical Section. As it is intended to admit direct members of the Section it is considered desirable that the status of the Section should be changed with a view to attracting the support of electrical retailers.

### S.E. Board at Lighting Bureau

An unusual experiment was recently carried out in the Lighting Service Bureau by the showrooms staff of the Purley District of the South Eastern Electricity Board in conjunction with the Board's display department. As in many other districts the sales staff are scattered over a number of showrooms and it is difficult to get them together for conferences and instruction. To solve this problem arrangements are being made for the entire showroom staff to meet about once a month for a combined instructional and social evening, and for their May meeting they staged a demonstration of interior display and window lighting in the Bureau. The shop lighting section was dressed throughout by the Board's display department, and Mr. R. L. C. Tate, the Bureau shop lighting specialist, gave a lecture illustrated with demonstrations and slides. The evening's programme, which was shared by members of the Croydon district showroom staff, concluded with a tour of outstanding shop lighting installations in the West End. The display arranged for this meeting had been installed in the Bureau in time for the 58th Illumination Design Course and was also seen by delegates to the E.D.A. Sales Conference who visited the Bureau on 2nd May.




**The South Eastern Electricity Board's display at the Lighting Service Bureau**

### White City Television Centre

Details of the development of the White City Exhibition site at Shepherd's Bush as permanent television studios and ancillary accommodation have been issued by the B.B.C. Limitations imposed on capital investment under the National Building Programme rendered it impracticable to complete sufficient accommodation for television on the site in time to replace the Alexandra Palace when the lease of those premises expires in June, 1956. In order to bridge the gap and to provide additional television studios immediately, the Corporation acquired film studios in Lime Grove. In November last, Mr. Graham Dawbarn, C.B.E., M.A., F.R.I.B.A. (Norman & Dawbarn), was appointed, in association with Mr. M. T. Tudsbery, C.B.E., M.Inst.C.E, the B.B.C.'s civil engineer, to prepare the architectural plans.

It is hoped to build and occupy the premises progressively; and subject to the limitations of capital investment, the B.B.C. plans to have the scenery block completed by the end of 1952 so that it may serve scenery to Lime Grove studios until such time as the multi-storey block, and large

studios No. 1 and 2, with the presentation suite, and the canteen, all of which would form an operational unit, are built and equipped.

## Aberdeen Electrical Exhibition

The electrical exhibition organized by the North of Scotland Hydro-Electric Board in co-operation with leading electrical manufacturers, which opened on Tuesday last at the Music Hall, Aberdeen, has been arranged to interest all classes of consumers, including industrialists, hotel, boarding house and restaurant proprietors, the housewife, and schoolchildren. The centre of the display is a 45-ft transmission tower, while models include a complete hydro-electric scheme and a miniature of the experimental windmill which is being erected in the Orkney Islands. Electronic devices and fluorescent lighting are also being shown, while the children's room includes new types of electrical pin tables, a model railway, a radiogram and other amusements.

## Scottish Television Station

The contract for the site works and the construction of the approach roads for the main Scottish television transmitting station at Kirk o'Shotts has been awarded to McLean and Co., of Wishaw. This station will have a 750ft mast similar to those at Sutton Coldfield and Holme Moss. An order for the construction and erection of the mast has been placed with British Insulated Callender's Construction Co., Ltd.

## Mobile Exhibition

A mobile exhibition has been introduced by Hoover, Ltd., which will tour the principal county and agricultural shows, halls and rural institutes all over Britain during the summer months. The exhibition is in two large caravan trailers towed by 2-ton Fordson trucks, and depends on local sources for electricity and water mains only. It provides its own hot water supply, drainage, drying cabinets, office, dressing room and other necessary services in addition to commodious display and demonstration space—1,500 sq ft in all. The self-operating back projection film unit shows Hoover films continuously.

## Copper Price Increases

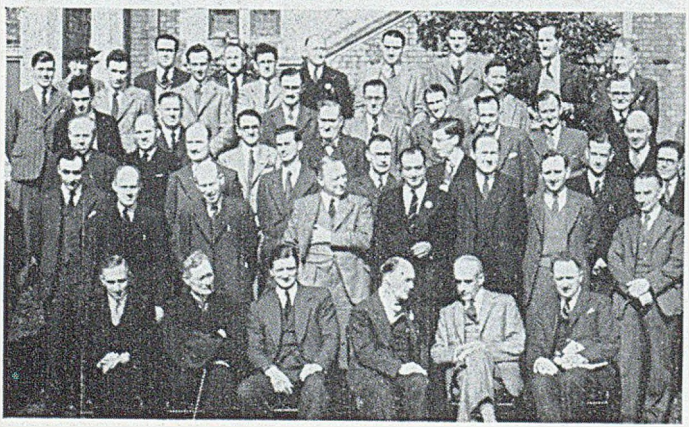
The price of electrolytic copper was increased on 18th May by £2 to £164 per ton delivered, and this was followed by a further rise on 19th May of £6 a ton to £170.

## Tube Investments Conference

Agents of Tube Investments companies from eleven European countries and Egypt are attending a three-day conference at Birmingham, which commenced on Wednesday last, to discuss sales problems in the light of changing market conditions and to consider new developments. During their stay in England the party, numbering about thirty, are visiting T.I. factories at Birmingham, Oldbury, Redditch and Wednesfield to discuss their countries' specialized needs with the men who make the products.

## Visit to Laboratory

On 10th May members of the Institution of Electrical Engineers, Reading District, paid a visit to Aldermaston Court, the research laboratory of Associated Electrical Industries, Ltd. The visitors were welcomed on behalf of the company by Dr. T. E. Allibone and were shown round the five scientific sections in small groups. The visitors included Mr. T. G. N. Haldane, past-president of the I.E.E., Sir John Cockcroft, Director, Atomic Energy Research Establishment, Harwell; Mr. R. R. B. Brown, deputy chairman, Southern Electricity Board; Mr. M. W. Perrin, Deputy Controller Atomic Energy Division, Ministry of Supply; and Messrs. H. R. J. Baigent (Maidenhead) and J. L. Bates (Reading), two mem-



**Members of the Reading District of the I.E.E. during their visit to Aldermaston Court, the research laboratory of Associated Electrical Industries, Ltd.**

bers of the Reading I.E.E. District Committee. Following the tour tea was served and Mr. Brown proposed a vote of thanks for the visit, Dr. Allibone replying for the A.E.I.

## Engineer Surveyors' Association

The annual conference of the Engineer Surveyors' Association will be held at Buxton from 16th to 18th June. The principal guests at the dinner will include Mr. H. W. Swann, Senior Electrical Inspector of Factories.

## Brush Standardization Exhibition

With the object of focusing the interest of its workpeople upon the importance of further standardization in all departments at Loughborough, the Brush Electrical Engineering Co., Ltd., is holding an exhibition in its works from 5th to 9th June. Awards are offered for the best suggestions upon the subject of reduction in variety of manufactured products.

## Safety Conference

The National Industrial Safety Conference, organized by the Royal Society for the Prevention of Accidents, was held at Scarborough from 12th to 14th May and was attended by nearly 450 delegates. An innovation this year was a trade exhibition of safety devices.

## Industrial and Commercial Finance Corporation

In the report for the year ended 31st March last of the Government-sponsored Industrial and Commercial Finance Corporation, Ltd., it is stated that the demand for the Corporation's facilities was fully maintained, and more than 500 applications were examined during the year. In a classified list of the total business approved to 31st March last it is shown that the mechanical engineering industry accounted for £4,247,900 and the electrical engineering industry for £1,617,000 out of a total of £20,610,000.

## Television Handbook

A helpful book just published entitled "Television In Your Home" tells the potential viewer everything he wants to know about the subject. The writer, W. E. Miller, M.A., explains that although many books have already been written about television, none has set out to explain what television can mean in the home. A section dealing with the programme side is illustrated with maps showing the areas where reception is excellent, good and not-so-good, the methods used to bring television to the set are fully explained, and advice is given on how to choose a set, how to install a suitable aerial, and the way to get the best reception.

Potential television viewers want many things explained before they buy a receiver, and in the last chapter many of these questions are listed. Copies can be obtained from all bookstalls, price 2s, or direct from the publishers, Iliffe & Sons, Ltd., Dorset House, Stamford Street, London, S.E.1, price 2s 6d.

## Earthing Mobile Plant

In the article on the earthing of mobile plant (21st April issue) the "plug and socket station," meaning the complete unit as made by the Ray Engineering Co., Ltd., and incorporating an isolating switch, contactor, relays and outgoing socket, was erroneously referred to as a plug and socket outlet. The actual plug and socket outlet was a standard proprietary article used as a convenient means of connecting the mobile truck to the continuous test equipment at the supply point.

## Nickel Company's Convention

Ten European countries were represented at a two-day international conference held recently by the British Driver-Harris Co., Ltd., nickel and nickel alloy specialists, in Cheshire. The conference covered a wide scope and dealt with such matters as the effect of currency devaluation, exports, and the development of new alloys.

## Workers' Awards

Three employees in the Birmingham factories of Joseph Lucas, Ltd., have recently received awards totalling £300 for efficiency-improving ideas submitted in the firm's workers' suggestion scheme. For an idea for an improvement in the winding of armatures, resulting in a decrease in the number of rejects, Mr. H. Coley, first received £20, and then an additional special award of £100 for the best idea of the month. Mr. W. Griffin was awarded £100 for a suggestion for lengthening the life of key cutters, and Mr. A. T. Argyle received £80 for designing a special tool to salvage lamp reflectors. The presentations were made at the Shaftmoor Lane works by Mr. R. C. Leech, general factory manager of the Birmingham group of Lucas factories.

## New B.B.C. Equipment

In preparation for the Festival of Britain the B.B.C. has ordered a new television outside broadcasting control van and ancillary equipment which includes five new image orthicon cameras. A £56,000 contract for

these items together with equipment for the Lime Grove studios has been placed with Pye, Ltd., of Cambridge.

## Change of Name

The National Radio & Engineering Co., Ltd., Bombay, has changed its name to the National Ekco Radio & Engineering Co., Ltd.

## Trade Announcements

**R. W. Gregory & Partners,** consulting electrical and mechanical engineers, of Newcastle-upon-Tyne and Bristol, announce that they have opened an office at Regent House, 30, Cannon Street, Manchester, with Mr. S. Jewsbury, B.Sc., A.M.Inst.C.E., A.M.I.H.V.E, as their resident partner.

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# Electric Vehicle Association

ON Tuesday at the annual luncheon of the Electric Vehicle Association of Great Britain, held at the Connaught Rooms, London, W.C.2, Mr. Peter Rochs, chairman of the Council, presided. The principal guest was the Rt. Hon. Alfred Barnes, Minister of Transport.

In proposing the toast, "The Electric Battery Vehicle," Mr. Barnes said he had often wondered why the electric vehicle, with all its advantages, was not in more common use. It was a matter which ought to be investigated. Although the number of electric delivery vans in use had risen from 4,000 in 1938 to 15,000 in 1949 it had to be remembered that there were still 780,000 petrol-driven goods vehicles.

Responding to the toast, Mr. Rochs referred with regret to the inability of Sir John Kennedy, president of the Association, to attend because of illness. He went on to refer to the imposition of purchase tax on commercial vehicles which, he held, was not really meant to apply to electric vehicles which should be given exemption.

Mr. Rochs explained why electrics could not be exported in great numbers, but pointed out that their greater use would release petrol vehicles for the export trade. It was an important point that the electric vehicle used power generated from low-grade fuel and that the British Electricity Authority was anxious to build up an off-peak load which the electric vehicle could provide. There were powerful advocates of the electric's claim to exemption from purchase tax. The Minister of Fuel and Power had paid a generous tribute to its amenity value, its economic value and its value to the B.E.A. Important trade associations had pleaded for the exemption and the great Co-operative movement which owned 60 per cent of all electrics was vitally interested. Mr. T. C. Pannell, M.P. for West Leeds, had spoken for them in the House of Commons with knowledge and courage. The vehicle manufacturers eagerly awaited the removal of the tax.

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# TRADE MARKS

APPLICATIONS have been made for the registration of the following trade marks. Objections may be entered within a month of 17th May.

HECO (design). No. 673,912. Class 9. Electric circuit breakers.—Heinemann Electric Co., Trenton, New Jersey, U.S.A. Address for service; c/o Sefton-Jones, Odell & Stephens, 15, Gt. James Street, London, W.C.1.

MEMCOL. No. 676,941. Class 9. Electrical apparatus and instruments included in Class 9, wireless sets (complete), and parts of all such goods included in Class 9. MEMCOL. No. 676,942. Class 11. Apparatus for lighting, heating, cooking, refrigerating, drying and ventilating, and parts.—Midland Electric Manufacturing Co., Ltd., Reddings Lane, Tyseley, Birmingham.

ELM. No. 679,776. Class 9. Electric switchgear, fitted electric switchboards and electric relays.—Milne & Longbottom, Ltd., Elm Works, Mere Lane, Rochdale.

TOS (design). No. 680,537. Class 9. High-frequency electrical apparatus included in Class 9, electrical transformers, measuring apparatus and instruments, gauges, balances, electrical contacts and electric welding apparatus.—United Machine Tools Factories National Corporation, Prague, Czechoslovakia. Address for service c/o Reddie & Grose, 6, Bream's Buildings, E.C.4.

AIR MARSHALL. No. 686,032. Class 9. Radio sets and television sets, all complete, parts and fittings.—Price & Co. (Manchester), Ltd., 50, Spear Street, Oldham Street, Manchester, 1.

PIXYTONE. No. 686,604. Class 9. Radio receiving sets (complete).—Ingleburn Products, Ltd., 40, High Street, Malmesbury, Wilts.

FORTRA. No. 681,580. Class 11. Electric light bulbs, fluorescent electric tubes for lighting purposes and electric lampholders.—Fortrade (England), Ltd., 19, Buckingham Street, Adelphi, London, W.C.2.

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# INFORMATION DEPARTMENT

THE extensive records of our Information Department enable us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the makers of the following:—

"AUTAX" wall brackets.

General inquiries from readers relating to sources of electrical goods, makers' addresses, etc., are replied to by the Information Department throughh the post. Inquiries should be accompanied by a stamped addressed envelope.

# OVERSEAS ELECTRICAL TRADE

## *Reduced Exports in April*

AFTER March's record figure of £11,816,984 for exports of electrical apparatus and machinery it comes as something of a shock that the corresponding figure for April should have fallen to £9,082,524, the lowest total since September, 1948. On investigation, however, it will be seen that, with only twenty-three working days (there were five Sundays as well as Good Friday and Easter Monday) as compared with a standard month of twenty-six days, the position is not unsatisfactory, especially in view of a certain amount of dislocation due to the London dock strike. Compared with April last year the total is just under one million pounds lower, exports of electrical goods and apparatus declining from £6,359,415 to £5,793,072 and those of electrical machinery from £3,236,088 to £2,963,146.

Reduced purchases by South Africa (£452,370 instead of £1,014,113) and India (£481,056 instead of £1,051,959) were largely responsible for the decrease in shipments of electrical goods and apparatus. On the other hand Australia, once again the most important market, in-

**TABLE I—ELECTRICAL EXPORTS**

| Class | April, 1950 | April, 1949 |
|---|---|---|
| | £ | £ |
| Telegraph and telephone cables and wires (submarine) | 27,144 | 68,213 |
| Ditto, not submarine | 592,553 | 536,198 |
| Wires and cables, cotton, silk or artificial silk insulated | 47,104 | 59,355 |
| Ditto, enamel, glass or asbestos insulated | 40,302 | 113,304 |
| Ditto, paper insulated | 430,111 | 742,379 |
| Ditto, rubber insulated | 202,180 | 455,759 |
| Ditto, other | 85,742 | 66,513 |
| Commercial radio apparatus | 285,623 | 143,926 |
| Domestic radio apparatus | 180,407 | 348,473 |
| Telegraph, telephone and signalling apparatus | 1,411,283 | 1,216,593 |
| Radio loudspeakers | 38,946 | 25,284 |
| Sound reproducing apparatus, components and parts other than cinematograph apparatus | 250,475 | 235,663 |
| Other sound reproducing apparatus | 61,401 | 48,807 |
| Radio valves | 175,938 | 147,330 |
| Electric lighting carbons | 16,226 | 26,384 |
| Lamps not exceeding 24 V. | 22,790 | 38,518 |
| Discharge lamps | 17,733 | 28,343 |
| Other lamps | 57,907 | 68,738 |
| Other lighting apparatus | 283,990 | 374,197 |
| Primary batteries | 80,007 | 70,717 |
| Parts other than carbons | 18,561 | 14,102 |
| Accumulators for motor vehicles | 147,168 | 167,714 |
| Ditto traction | 20,125 | 4,647, |
| Ditto radio | 1,817 | 3,796 |
| Other portable accumulators | 78,251 | 50,586 |
| All other accumulators | 80,901 | 52,824 |
| Parts and accessories | 62,644 | 96,070 |
| Cooking appliances | 108,457 | 118,928 |
| Heating appliances | 37,301 | 64,660 |
| Parts and accessories for cooking and heating appliances | 30,496 | 37,708 |
| Flat irons | 38,961 | 27,854 |
| Commercial electrical instruments | 101,792 | 93,707 |
| House service meters | 55,579 | 130,199 |
| Time recorders and time switches | 17,479 | 13,465 |
| Other electrical instruments | 96,888 | 61,058 |
| Electro-medical apparatus (not X-ray) | 34,297 | 30,976 |
| X-ray apparatus, tubes and parts | 44,584 | 57,235 |
| Permanent magnets | 17,869 | 11,139 |
| Insulating cloth and tape | 73,798 | 52,744 |
| Other insulating materials | 73,887 | 69,599 |
| Unclassified electrical goods and apparatus | 344,265 | 385,650 |
| TOTAL electrical goods and apparatus | 5,793,072 | 6,359,415 |
| Generators, up to 200 kW | 564,384 | 811,706 |
| Ditto, over 200 kW | 189,495 | 230,588 |
| Ditto, parts | 139,885 | 60,945 |
| Motors, railway and tramway | — | 22,611 |
| Ditto, other, not over ½ h.p. | 61,667 | 95,924 |
| Ditto, over ½ h.p. but under 1 h.p. | 33,530 | 52,355 |
| Ditto, from 1 h.p. to 250 h.p. | 400,891 | 510,028 |
| Ditto, over 250 h.p. | 48,991 | 58,220 |
| Ditto, parts | 77,251 | 79,059 |
| Converting machinery | 12,329 | 6,072 |
| Transformers, including coils | 416,625 | 432,080 |
| Rectifiers for power house use | 26,134 | 9,122 |
| Motor starting and controlling gear | 154,277 | 171,598 |
| Switchgear and switchboards (not telegraph or telephone) | 818,059 | 666,829 |
| Other electrical machinery | 10,628 | 28,945 |
| TOTAL electrical machinery | 2,963,146 | 3,236,088 |
| Vacuum cleaners and parts | 186,595 | 183,974 |
| Other electrically operated portable appliances | 75,426 | 183,286 |
| Portable electric tools | 64,285 | 63,681 |
| GRAND TOTAL | 9,082,524 | 10,026,444 |

creased its purchases from £681,771, to £1,002,732 and among other noteworthy buyers were Brazil (£154,477 compared with £34,363) and France (£180,007 compared with £64,509). Particularly good business was done with New Zealand, Malaya, Southern Rhodesia and British East Africa.

Thanks largely to orders amounting to £107,681 from Argentina and an increase from £124,650 to £176,401 in purchases by New Zealand, exports of telegraph and telephone wires and cables (other than submarine) rose from £536,198 to £592,553. A decline from £1,437,310 to £805,529 in sales of other types of wires and cables can be traced largely to reductions in purchases by South Africa (from £278,808 to £45,239), India (from £318,492 to £124,310), Egypt (from £64,711 to £11,314), Iran (from £56,520 to £36,614) and Venezuela (from £43,364 to £1,293).

Sales of commercial radio equipment were doubled (£285,263 compared with £143,926), the biggest buyers being France (£67,020), Sweden (£48,476) and Malaya (£20,742). On the other hand domestic radio apparatus sold abroad amounted in value to only just over half of the April, 1949, figure—£180,407 compared with £348,473: sales to South Africa fell from £129,691 to £6,780.

The market for telegraph and telephone apparatus continued favourable, exports rising from £1,216,593 to £1,411,283, of which Australia took £470,462 (compared with £221,968 in April, 1949), New Zealand £131,543 (£106,544) and South Africa £130,531 (£153,842).

Of the £893,764 worth of generating plant sold, Russia was still the largest buyer, though its purchases, amounting to £242,859, were £363,128 below those for April last year. Australia (£141,529) and India (£90,086) were among the next largest customers. Business in electric motors showed a general decline, the biggest decreases being noticeable in supplies to India (from £168,117 to £60,346) and Australia (from £143,433 to £77,578).

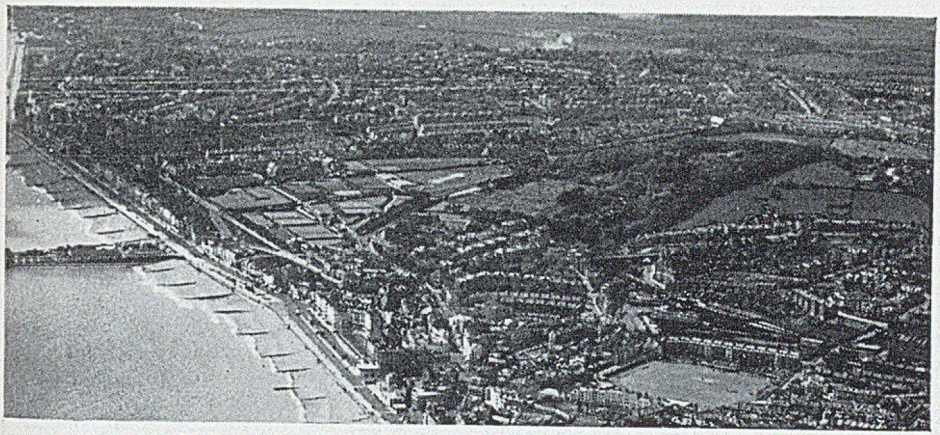
Exports of "other electrical machinery" provided one of the brighter spots in the statistics, rising from £1,314,646 to £1,477,052. India (£297,079) was slightly ahead of South Africa (£276,574) as the largest buyer, the third on the list being Australia (£119,991).

Imports of electrical goods and apparatus in April totalled £363,381 (compared with £211,404 in the corresponding month of last year). Purchases of machinery included generators, £35,137, and motors, £32,698.

**TABLE II—DISTRIBUTION OF ELECTRICAL GOODS AND APPARATUS**

| Destination | April, 1950 | April, 1949 |
|---|---|---|
| | £ | £ |
| Channel Islands | 23,865 | 23,164 |
| Malta and Gozo | 8,561 | 24,562 |
| Cyprus | 13,045 | 13,502 |
| British West Africa | 72,633 | 67,845 |
| Union of South Africa | 452,370 | 1,014,113 |
| Northern Rhodesia | 18,857 | 22,192 |
| Southern Rhodesia | 123,998 | 89,304 |
| British East Africa | 132,271 | 93,208 |
| Bahrein, Koweit, Qatar and Trucial Oman | 41,565 | 45,672 |
| India | 481,056 | 1,051,959 |
| Pakistan | 80,446 | 90,331 |
| Malaya | 250,155 | 213,591 |
| Ceylon | 60,967 | 43,435 |
| Hong Kong | 78,360 | 176,486 |
| Australia | 1,002,732 | 681,771 |
| New Zealand | 282,846 | 246,690 |
| Canada | 122,089 | 117,897 |
| British West Indies | 48,955 | 127,906 |
| Anglo-Egyptian Sudan | 29,882 | 19,883 |
| Other Commonwealth Countries | 42,918 | 51,760 |
| Irish Republic | 291,167 | 166,666 |
| Soviet Union | 24,794 | 37,600 |
| Finland | 24,273 | 15,196 |
| Sweden | 162,442 | 99,110 |
| Norway | 79,650 | 141,593 |
| Iceland | 3,676 | 18,805 |
| Denmark | 81,282 | 72,552 |
| Poland | 41,642 | 144,969 |
| Germany | 6,468 | 19,.13 |
| Netherlands | 136,525 | 116,909 |
| Belgium | 82,441 | 78,377 |
| France | 108,007 | 64,509 |
| Switzerland | 20,934 | 21,995 |
| Portugal | 27,964 | 59,731 |
| Spain | 21,050 | 15,481 |
| Italy | 25,031 | 21,040 |
| Austria | 22,625 | 15,446 |
| Hungary | 23,210 | 4,857 |
| Czechoslovakia | 11,206 | 22,028 |
| Greece | 63,206 | 77,773 |
| Turkey | 35,422 | 77,320 |
| Indonesia* | 11,177 | 35,026 |
| Netherlands Antilles | 4,196 | 8,717 |
| Portuguese East Africa | 12,621 | 4,738 |
| Syria | 16,155 | 20,915 |
| Lebanon | 47,518 | 16,870 |
| Israel | 28,095 | 21,598 |
| Egypt | 201,884 | 179,098 |
| Arabia | 7,122 | 16,239 |
| Iraq | 96,250 | 54,983 |
| Iran | 91,601 | 115,200 |
| Burma | 28,050 | 10,338 |
| Thailand | 24,735 | 8,370 |
| China | 374 | 32,382 |
| United States of America | 30,949 | 13,033 |
| Mexico | 1,390 | 209 |
| Colombia | 12,508 | 12,017 |
| Venezuela | 38,167 | 94,501 |
| Chile | 18,255 | 25,909 |
| Brazil | 154,477 | 34,363 |
| Uruguay | 19,962 | 18,782 |
| Argentine Republic | 202,526 | 38,404 |
| Other Foreign Countries | 83,784 | 89,962 |
| TOTAL | 5,793,072 | 6,359,415 |

* Includes Netherlands New Guinea in 1949.



# Contractors' Conference

THIS week over five hundred members and guests of the Electrical Contractors' Association and its allied organizations (the National Federated Electrical Association and N.E.C.T.A., Ltd.) have been holding their second post-war conference at Hastings. Wednesday's proceedings included a Council meeting and a reception by the president (Mr. S. Dickinson, Associate I.E.E.). Yesterday (Thursday) Mr. Dickinson's presidential address was followed by the reading and discussion of a paper by Mr. S. L. M. Barlow (Barlow & Young, Ltd.), which was an excellent review of current practice in the electrical contracting industry; address and paper are dealt with below. There was a mayoral reception last evening. To-day the annual general meeting is taking place and a garden party at the Crowhurst Park Hotel and Country Club has been arranged. This evening's function is a smoking concert and dance.

## Presidential Address

IN the course of his address Mr. Dickinson referred to his speech at the Association's annual dinner in which he deprecated the intrusion of politics into all spheres of life, and said that what was required was a determination on the part of all responsible citizens of this country to rid industry of politics and so restore the opportunity of even more successful competition in world markets.

We had greatly increased our exports, but he wondered whether in the near future we should suffer from the present unbalanced state of affairs. Government policy appeared to be based upon an almost complete neglect of the home market, whereas a continuously successful overseas trade must, of necessity, find its foundation in stable trading conditions at home. The necessity of creating a large export trade had produced shortages, and we had an economy which forbade the public to buy what would otherwise be available.

With the present burden of taxation one was compelled to wonder how it would be possible, in future, to compete

economically with overseas production, particularly German and Japanese.

The cost of labour formed a formidable element in the cost of production but he did not suggest that wages should be reduced. He wanted the wage packet to bear a more realistic relationship to the cost of living and be a more accurate reward for the initiative and the effort of the worker. At present every wage and salary earner had to write off a portion of his income for direct taxation and then a goodly portion of the remainder had to meet indirect taxation.

Mr. S. Dickinson

Although a substantial portion of this taxation was returned by way of the amenities which were forthcoming from the Welfare State, he wondered if it would not be better to return to an "economic state" where the wage and salary earner was free to spend his income how he liked, so long as he did not obtain an unjustifiable advantage over his fellow-beings. Initiative was being crushed and this would continue so long as the individual was no longer allowed to enjoy the reward of his own effort.

After referring to the present political uncertainty Mr. Dickinson said that during his term of office, the Association had concluded preliminary negotiations with the British Electricity Authority, resulting in the signing of a document of good relationship. The B.E.A.'s first report had since appeared. The Association was particularly interested in the portion of the accounts which reflected the competitive activities of the Area Boards. They would shortly ask the B.E.A. for an opportunity of discussing certain features with them.

Good relationships existed between the Area Board chairmen and their colleagues on the one hand, and the E.C.A. committees which had been appointed at Area Board level on the other.

Certain urgent national matters were outstanding and he hoped that these would be settled in the near future. He referred particularly to the need to establish a national "yardstick" in electrical installation practice. One relic of the past was that an installation adjudged to be perfectly safe and suitable for connection in one area, was not so considered in another. It was of first importance that a standard code should be established throughout the entire country. It was also eminently desirable that some national basis of charging for electricity should be established.

There was a further matter which was causing them great concern. It seemed hardly consistent with Government policy that the contracting departments of the electricity supply authorities should introduce wages and working conditions different from those which were already established as the result of joint collective agreements for contracting. This was likely to have serious consequences which might eventually destroy the value of the joint negotiating machinery of the industry which had served the country for so many years.

During the past year, a committee of the various interests involved began to examine the establishment of the National Inspection Service visualized in the summary of agreed principles to which he had referred but it was not yet possible to make any statement. The Working Party for the Building Industry unanimously considered that some form of registration in the electrical trade was desirable. The E.C.A. was to explore the practicability of implementing the recommendations of the Working Party.

The Electrical Contractors' Association was anxious to ensure that anybody should be allowed to carry on electrical installation contracting so long as he could qualify to the satisfaction of an independent body. It was necessary that the public should have the protection afforded by registration.

The entry of the British Electricity Authority into the trading sphere had necessitated a review of the trading structure of the industry. It was felt that the trade discount should be established on a basis commensurate with the service performed and that extra service by way of quantity buying and stocking should be rewarded by a system of quantity discounts based on a fair commercial assessment of the saving accruing to manufacturers.

The Electrical Fair Trading Policy set

out to enunciate certain general principles; it attempted no more than to reflect what was mutually acceptable by its various constituent member-associations.

Many meetings had taken place between the N.E.C.T.A. and the various trading associations of other sections of the industry during the past twelve months. The National Federated Electrical Association had endeavoured in the past year, in conjunction with the Electrical Trades Union, to keep pace with industrial changes and to cater for all the unpredictable exigencies which arose from time to time. The past year had, unfortunately, not been a period of freedom from strife.

In their relationships with the Trade Union, it was vitally necessary that there should be a mutual spirit of goodwill.

## Electrical Installation Practice

### *Abstract of Paper Read by S.L.M. Barlow, Associate I.E.E.*

THIS paper, "Trend in the Development of New Techniques in Electrical Installation," is an admirable summary of the latest practice and review of materials and equipment now available. It begins with a reference to the introduction in 1882 of the "Rules and Regulations for the Prevention of Fire Risks Arising from Electric Lighting," by the Society of Telegraph Engineers (later the Institution of Electrical Engineers). Mention is made of the formation of the Installation (now Utilization) Section of the I.E.E. in 1941 under the chairmanship of Mr. H. T. Young. There follows a brief history of the E.C.A.

After touching upon wartime conditions Mr. Barlow proceeds to deal with post-war developments. He says that to the uninitiated it seems that little plant is required to set up as a contractor; in fact, the rise in labour costs has made the use of a variety of mechanized plant and equipment an advantage, and this will be more so in the future.

In a passage on threading equipment the author refers to the perfection of the power-driven self-opening die-head, which could be very simply introduced for threading conduit. Similar devices are commonly used in America and an American concern has marketed a die-driven attachment which, it is claimed, can be operated by any ½ h.p. heavy-duty drill to cut threads on conduits up to 6in in diameter.

With regard to conduit benders, the trend should be towards a simple form of profile bender where one standard bend is made and this pattern is clamped to the bending machine and used to control the operation of the machine as in a profile cutter. Mr. Barlow advocates an inexpensive two-speed drill where a reduction gear can be brought into use to enable hole saws to be used as power-driven cutters. Suggested improvements in portable tools are quick-release chucks, a simple angle chuck and a simple foolproof transformer for reducing the voltage on the tool. A recent American development is a combined hydraulic bender and hole punch set.

Mr. S. L. M. Barlow

In a reference to labour the author mentions the subject of incentive schemes; he says that because of the diversity of the work such a scheme has been found virtually impossible and it remains to be seen whether or not a workable arrangement will be found.

Dealing with materials, Mr. Barlow refers to the unsuitability of polythene insulation for plugs while recognizing its excellence for high-frequency work. There are important new plastics for insulation purposes and a greater use is being made of aluminium and cold-rolled cold-annealed steel sheet (for trunking and ducts).

There is need for greater standardization of materials as well as of the requirements of electricity supply authorities. A universal code of practice drawn up in joint consultation would be a great contribution, and testing and proving houses should be developed.

The importance of correct estimating is stressed and adequate cost records are an indispensable part of any contractor's organization. A tribute is paid to the

work of the Association of Supervising Electrical Engineers in raising the standards of installation work.

Mr. Barlow then studies the latest wiring systems. He sets out the advantages of mineral-insulated copper-sheathed conductors and says that the grid suspension system has proved invaluable where there is no objection to the cable and fittings being seen and where it is difficult to support other systems, or where speed of installation is essential. The advantages and disadvantages of aluminium conduit are discussed; it is considered that here there is a possible field for future development, depending to some extent upon the availability of steel.

Insulated tubing is used to a limited extent but unless the system is to be completely insulated, an earth conductor must be provided. Copper conduit is costly but of value in special applications; its installation generally requires a higher degree of skill. It is thought that the new flexible conduit has real possibilities in a limited field.

While the "harness" pre-fabricated type of installation has been satisfactory for small mass-produced, self-contained buildings, it is regarded as a temporary expedient and the present trend away from the system, except in special cases, is to be encouraged.

There is a tendency to overdo the metal ducting system. Its extended use, particularly for lateral mains and circuit wiring increases fire risk and lowers the carrying capacity of the cables. The system is adaptable and convenient but greater discrimination should be used in installing it. There is considerable scope for the under-floor duct wiring scheme but it is perhaps more suitable for bell and telephone cables than power cables. The use in domestic installations of a duct in the form of a skirting with an easily removable front may encourage the layman to try his skill when changes are required.

## Busbar Systems

Mr. Barlow considers the use of solid copper and aluminium sections for carrying heavy currents, paying particular attention to the methods of installing aluminium sections. It is considered that a really first-class busbar distribution system for factories and for installations having a large number of fractional h.p. motors, or other light loads, has yet to be produced. Reference is made to an American system employing busbar ducting about 3in wide and 2in deep, with a plug in position every 20in, into which specially designed fused plug-in devices can be inserted for three-phase 240 V motors up to 3 h.p.

Dealing with switchgear, the paper mentions the development of the consumer's combined control unit which is being made in safe patterns. Greater standardization of fuse bridges and bases to secure interchangeability is advocated. Aluminium-cased units with steel conduit are satisfactory in dry situations.

Development of accessories has been mainly in the direction of ingenious and functional design made possible by the introduction of new materials such as plastics. Among the few completely new accessories of the past few years the author mentions the 13 A plug and socket and micro-gap and silent toggle switches.

## Lighting Developments

In a section on lighting, Mr. Barlow reviews developments in sources of low-surface brightness. He suggests that there is scope for the better protection of the circuits, considering fuse protection generally ineffective. Referring to criticisms of fluorescent lighting, he thinks that it must be regarded as supplementary to earlier methods.

Mr. Barlow considers that most electrical appliances can now be regarded as satisfactory. The trend is largely towards functional design. At present manufacturers' attention tends towards low-consumption appliances but as restrictions upon electricity supply are removed and prices are reduced there will be greater development in water and space heating. A possible trend in cooking may be towards high-frequency equipment.

Collaboration between electrical contractors and architects is of importance, particularly in lighting installations. The contractor must be capable and willing to provide a first-class technical service to the architect.

The paper concludes with an expression of the opinion that the reconstruction of our cities and the new buildings required for industrial expansion will keep the electrical contracting industry fully occupied for some time to come.

# FINANCIAL SECTION

## Company Notes and Stock Exchange Activities

### REPORTS AND DIVIDENDS

**Lancashire Dynamo & Crypto, Ltd.**—The accounts of this company were abstracted in our last issue. In his statement issued with the report and accounts, Mr. H. W. Bosworth (chairman and managing director) says that an additional factory has been taken over during the year in order to produce stampings previously made at the Trafford Park works, and this is one of the factors which enabled the latter works to increase its production in 1949 by 25 per cent as compared with 1948. The Willesden works have produced a satisfactory output and profit and arrangements have been made during the year to integrate the production of f.h.p. motors at Cardiff and Willesden.

Foster Transformers and Switchgear, Ltd., increased its production during 1949 and Crypton Equipment, Ltd., has developed the latest type of motor car testing equipment. Crypto, Ltd., has distributors in many markets overseas and much more export business could have been done if foreign import restrictions had been relaxed. This company is enlarging and consolidating its connections with all classes of the catering trades. A satisfactory profit has been produced by Lancashire Dynamo & Crypto South Africa (Pty.), Ltd. Conditions are becoming increasingly difficult in South Africa from the point of view of British manufacturers, and although there is a large outstanding order book at the present time it is not easy to predict the future. The Nevelin Electric Co., Ltd., is now a 100 per cent subsidiary of L.D.C.

Surveying the company's position generally, Mr. Bosworth says that they entered the new year with a substantial volume of unexecuted orders. The order book is less than it was a year ago, which will enable deliveries to be improved and brought more nearly into line with their competitors.

**The Sturtevant Engineering Co., Ltd.,** held its annual meeting on 22nd May, when Mr. G. R. Thursfield (chairman), who presided, said that their financial position was strong and the state of their order books continued to be satisfactory, covering the expanding demand for air-conditioning, heating, ventilating, dust collecting, industrial vacuum cleaning and other equipment. Special attention had been given to the expansion of their export trade, and visits of a director and engineers to India, Pakistan, Egypt, Australia, New Zealand, South Africa and Scandinavia would, it was hoped, result in obtaining increased business from those countries.

**Thomas Bolton & Sons, Ltd.,** held their annual meeting on 17th May, Mr. P. V. Hunter (chairman) presiding. In the course of his speech, Mr. Hunter said that last year, in referring to the future outlook, he was by no means optimistic, and for the bulk of the company's business this prediction had been fulfilled. Orders had continued to flow in very slowly and they now had practically no "back-log" of old orders to ease the situation. One bright feature of their trading had been the overseas sales of copper sulphate, and this had contributed to the improved profit position. Indications were that for the time being customers would continue their present practice of ordering only day-to-day requirements. In the case of the nationalized industries of electricity supply and railways, they felt that the present rate of ordering was below normal requirements, and had been influenced by the Government's policy of capital cuts. They were consequently experiencing difficulty in organizing production on an economical basis, and their ability to continue to provide full employment for their employers was threatened.

**The Chloride Electrical Storage Co., Ltd.**—In his statement issued with the report and accounts, Mr. A. W. Browne (chairman) says that the manufacturing and selling business has been transferred to Chloride Batteries, Ltd., and the parent company is now a holding company. The turnover of the group has been increased during the year by 12 per cent. Whilst materials have become more readily available, the price of lead is still Government-controlled. The price has fluctuated between £123 and £75 10s per ton, and at the end of the year was controlled at £97 per ton, which was more than five times the pre-war price.

Competition, both at home and abroad, is becoming more acute, to the extent that in certain instances price is the customer's only consideration. To meet such competition it is essential to reduce manufacturing costs wherever possible and to be prepared to accept lower margins of profit. There has been a steady demand throughout the year for all the standard range of

products, which has been slightly in excess of the production with the amounts of controlled materials made available. Their subsidiaries operating in Australia and New Zealand have had another profitable year of trading. Owing to labour difficulties, the factory in India was shut down for five months, but reopened in October and production is now proceeding normally. The value of overseas sales for the year is slightly better than in the previous year.

Increased facilities, both in personnel and equipment, have been provided in the Research and Development Department to meet the increasing demand for new and novel designs of batteries for special applications. The current year to date shows no falling off in the sales of the main products and the company is well placed to give prompt deliveries and to deal with competition as and when it arises.

**Newman Industries, Ltd.,** report a consolidated trading balance for 1949 of £140,069, as compared with £204,668 for 1948, which with other income of £14,263 makes £154,332. After providing for depreciation £60,222, taxation, £31,300 and deducted other charges, there is a net balance of £22,776 (against £49,633), to which is added £99,489 brought in and £33,717, provision for tax not required, making £155,982 available. As already announced, the ordinary dividend for the year is 10 per cent (against 17½ per cent), and £135,169 is carried forward.

**Worthington-Simpson, Ltd.,** report a net profit, after all charges, including tax, of £152,644, for 1949 as compared with £127,949 for the previous year. The dividend for the year is maintained at 20 per cent by a final payment of 10 per cent.

**Enfield Cables, Ltd.,** reports a group profit for 1949 of £456,504, as compared with £306,375 for the previous year. United Kingdom taxation requires £259,500, and other taxation £8,204, leaving a net profit of £188,800 (against £139,228) attributable to members of the holding company. Provision for intangible assets of subsidiary companies was £27,711, and special receipts relating to earlier years, additional to the group profit for the year, amounted to £12,539. Contingencies reserve receives £125,000 and it is proposed to pay a final ordinary dividend of 3¾ per cent, making 7½ per cent for the year (same). The balance carried forward is £61,558 (against £41,116 brought in). The capital was increased in July last by the issue of 200,000 £1 ordinary shares.

**G. & J. Weir, Ltd.,** report a group trading profit of £1,109,063 for 1949, as compared with £1,001,852 for 1948, and a net profit of £386,617 (against £388,605). General reserve receives £125,000 and it is proposed to pay a final dividend of 30 per cent, making 40 per cent for the year (unchanged). The balance carried forward is £264,263 (against £258,594 brought in).

**The London Electric Wire Co. & Smiths, Ltd.,** reports a group profit for 1949 of £672,978, as compared with £846,523 for 1948, to which is added profits on investments and adjustments relating to previous years, making £680,882. Taxation absorbs £280,746, leaving a net balance of £400,136 (against £672,975). Capital reserve receives £6,425, and general reserve £315,000. It is proposed to pay a final ordinary dividend of 6 per cent, making 10 per cent for the year (unchanged) and to carry forward £334,679 (against £310,092 brought in).

**Turner & Newall, Ltd.,** have declared an interim dividend of 3¾ per cent (unchanged).

**Marco Refrigerators, Ltd.,** have declared an interim dividend of 7½ per cent (against 12½ per cent).

## NEW COMPANIES

**Morton & Trent (Southern), Ltd.**—Registered 24th April. Capital £5,000. Hire purchase of radio and fine electrical equip- purchase of radio and electrical equipment, etc. Directors: N. Gentry and Mary Gentry. Regd. office: 5, Midhurst Parade, Prince Avenue, Southend-on-Sea.

**Elkrom Electrical Development, Ltd.**—Registered 29th April. Capital £6,000. To acquire the business of electrical engineers now carried on by K. B. McCabe and J. M. Birch at West Bridgford as Elkrom Electrical Development. Directors: Mrs. N. M. Craig, Miss I. A. Craig, and K. B. McCabe. Regd. office: 87a, Gertrude Road, West Bridgford.

**Broxlea Products, Ltd.**—Registered 1st May. Capital £5,000. To acquire the business of electrical and electronic apparatus assembly carried on by Arthur T. Izzard as Broxlea Products at Broxbourne, Herts. Directors: A. T. Izzard, L. D. H. Izzard, and B. G. Izzard. Secretary: G. B. M. Coomes. Regd. office: Park Lane Corner, High Road, Broxbourne, Herts.

## LIQUIDATIONS

**Southern Distributors, Ltd.**—Winding up voluntarily. Liquidator, Mr. F. H. Thorpe, 75, South Street, Bishop's Stortford.

## BANKRUPTCIES

**Bird, Roach & Co.,** 3A, Cheval Place, Knightsbridge, London, S.W.7, electrical contractors.—First meeting 26th May and public examination 29th June, both at Bankruptcy Buildings, Carey Street, London, W.C.2.

FINANCIAL SECTION

# STOCKS and SHARES

STOCK Exchange prices, and the disposition of markets generally, are better than the volume of business which the House is obtaining. The gilt-edged market, in particular, is distinctly firm. Prices improve week by week. There would appear to be no large amount of buying on behalf of what are still called institutional purchasers; the demand comes, to a great extent, from the numerous daily investment orders of the smaller capitalist. His hand is also discernible in the industrial share markets, where prices remain consistently steady in spite of poor public business.

## Electrical Equipment Results

The table below includes some of the electrical manufacturing companies which have published full annual accounts since the beginning of March. It shows the companies' 1949 surplus profits (those available for dividends and reserves) as a gross percentage on the issued ordinary capital and compares them with the corresponding results for 1948, as well as with the rates of dividend paid this year. In many cases the figures bring out the extent of the further progress achieved last year, and the exceedingly conservative appearance which a number of dividend rates have acquired, under the limitation agreement, in relation to the percentage available for distribution.

| Company | Earned % | | Div. % |
|---|---|---|---|
| | 1948 | 1949 | |
| A.E.I. ... ... ... | 70.6 | 92.8 | 15 |
| Brush ... ... ... | 68.0 | 66.4 | 10 |
| English Electric ... ... | 28.3 | 38.4 | 10 |
| Ericsson ... ... ... | 91.8(*a*) | 127.8(*a*) | 20(*a*) |
| Hall Telephone ... ... | 14.5 | 15.4 | 10 |
| Hoover ... ... ... | 56.6 | 94.1 | 45 |
| Johnson & Phillips ... | 41.6 | 35.0(*b*) | 15(*b*) |
| Laurence, Scott ... ... | 32.7 | 46.1 | 12½ |
| McMichael ... ... ... | 11.5 | 13.4 | 8 |
| Reyrolle ... ... ... | 34.3 | 69.9 | 15 |
| Switchgear & Cowans ... | 24.8 | 30.1 | 20 |
| Tel. Condenser ... ... | 91.1 | 69.5 | 15 |
| Telegraph Construction ... | 35.2 | 30.6(*b*) | 8(*b*) |
| Westinghouse Brake ... | 37.4 | 33.9 | 14 |

(*a*) Tax free. (*b*) After capital bonus.

## Yields and Valuation

The margin between a company's earnings and its dividend distributions has, of course, a strong influence on the valuation of the shares concerned. Among the ordinary shares of the companies in the above table, Ericssons at 46s 3d and A.E.I. at 75s are quoted to yield 3.9 and 4 per cent respectively, on the basis of dividends covered more than six times by earnings. With dividends covered three or four times over, English Electrics at 44s, Reyrolles at 65s 6d, Laurence, Scotts at 13s 6d and Telegraph Constructions at 36s 3d, all pay around 4½ per cent on the money. On distributions of rather less than half the earnings, Johnson & Phillips at 62s 6d give 4¾ per cent; Westinghouse Brakes at 56s 3d, 5 per cent; and Hoovers, at 40s, offer £5 12s 6d per cent. Hall Telephones at 14s pay 7 per cent, and Brush ordinary at 6s 9d, despite one of the most conservative payments in the list, give a return of £7 8s 2d per cent.

## Henley's and Chloride

By the same token as the above it is easy to see, from the full accounts just published, why the ordinary shares of Henley's, at 22s 6d, and of Chloride Electric, at 49s 6d, are valued to yield well under 4½ per cent. Henley's 20 per cent payment takes only £179,000 net, out of surplus profits of £754,000, leaving £575,000 for reserves: these now total over £5¾ million, which is over three times the issued capital. Chloride Electric is distributing less than one-fifth of the amount available and has also built up reserves of impressive proportions. Enfield Cables hold their advance to 32s 6d: the group profits for the year of £188,000 after all charges, including tax, are £48,000 better than those of the previous twelvemonth.

## Week's Price Changes

Anglo-American Telegraph stocks have further improved, the preferred by 5 points to 102½, and the deferred, with a gain of 2½, being now quoted at 20. The annual meeting of the company takes place shortly, and it is thought that the chairman may possibly refer to rumours current of late as to a possible reorganization, in view of the House of Lords' rejection of the Anglo-American claim against the Western Union Telegraph Company. International "Tel. & Tel." at 30 are $1½ higher. In the industrial group, Lancashire Dynamo at 95s are ½ up. Decca rose 1s to 15s. Associated Electrical Industries at 73s 9d are 1/6 harder, as are Westinghouse Brake at 56s 3d. Other gains include Mather & Platt 52s 6d, Reyrolle 65s 6d, Marconi Marine 25s 9d, Hoover 40s 3d, De la Rue 21s 3d, Electrical Components 11s 3d. On the other hand, Ever Ready shares are 2s 6d down, the recent reduction in dividend continuing to bring in sellers. Falk Stadelmann at 36s 3d are 1/6 lower.

# ELECTRICITY SUPPLY

## Progress at East Yelland

## Support for North Wales Scheme

DETAILS of the proposed new power station at East Yelland were recently given to members of the North Devon Development Board by Mr. J. T. H. Legge, controller of the South Western Division. He said that the first section with two 30,000 kW sets should be in operation by the end of 1952. There would be no unsightly alteration of the landscape, for the station would be fairly squat, and the assistance of the Royal Fine Art Commission had been sought to ensure that the colour of the brickwork blended with the locality. The most modern dust collection equipment would be installed in the chimneys, and the ash from the station would be spread over Isley Marsh and then covered. Up to 500 men would be working at the power station for the next 2½ years.

### *Welsh Water Power*

A resolution supporting the B.E.A.'s hydro-electric scheme was unanimously passed by the North Wales District Committee of the Welsh Board for Industry at a meeting at Colwyn Bay. The Committee, representing employers and workers, felt that the proposals, which would provide electricity for the rural districts, would prove to be a real contribution towards counteracting depopulation and provide a foundation on which to strengthen the economic life of the area. They strongly urged the B.E.A. to preserve to the utmost the natural amenities of the region. Two trade union representatives, who were unable to attend the meeting, sent telephone messages indicating their approval of the scheme.

### *American Practice*

At the first conference on American practice in electricity supply held at Horsley Towers from 10th to 13th May Mr. F. H. S. Brown, generation engineer (construction) in the B.E.A. Merseyside and North Wales Division, presented a paper entitled "American Practice in Power Station Construction." Mr. Brown was a member of the Authority's productivity team which recently visited the U.S.A. The second conference was held from 17th to 20th May when members of the productivity team presented papers on distribution, commercial and administrative practice in America.

### *Another Collier*

The 4,500 ton collier *Barford*, which is being built by Wm. Pickersgill & Sons, Ltd., of Sunderland, for the British Electricity Authority, was launched recently, the naming ceremony being performed by Mrs. J. S. Pickles, wife of the chairman of the S.W. Scotland Electricity Board. The vessel is the second of six sister ships; the first, the *Cliff Quay*, is now being fitted out.

### *Vertical Strip-lighting*

Smethwick Corporation Watch Committee has recommended to the Association of Municipal Corporations that consideration should be given to the question of introducing legislation to control vertical strip-lighting in shop windows.

### *"All-Electric" Policy*

Kirkcaldy Housing Committee, after discussing the question of gas versus electric cookers, has agreed to continue its "all-electric" policy. Dean of Guild A. R. Dall said that to lay cables and merely use them for lighting would not be economic; by taking a fuller load for supplying cookers and boilers it became a proposition the electricity authorities would entertain.

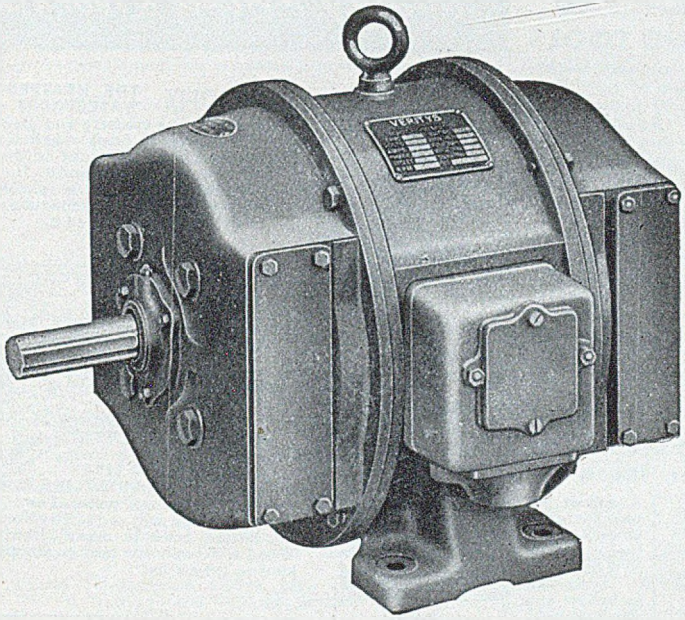
### *Arts and Crafts*

An exhibition of arts and crafts was held at the Grand Pavilion, Porthcawl, on 20th and 23rd May. It illustrated the work of electricity supply employees and their families, and included paintings, photographs and all types of handicrafts as well as literary work. In all there were more than 500 entries.

### *St. Helens Reinforcement*

The first two new 60 MVA transformers to reinforce the supply in the St. Helens district (Merseyside and North Wales Area) has been delivered to site. This involved transporting a weight of 105 tons.

# MOTORS



# FROM STOCK

**SQUIRREL CAGE**

**HIGH TORQUE SQUIRREL CAGE**

3 PHASE 50 CYCLES 400/440 VOLTS

A range of types, sizes and various speeds are now available.

***The MOTOR with a REPUTATION for QUALITY— RELIABILITY and PERFORMANCE***

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# RAWLPLUG

WALL PLUGS

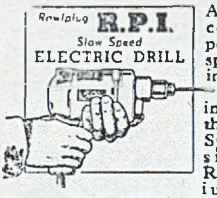
## OUTFITS AND TOOLS

Every engineer, workman and handyman knows the value of Rawlplugs for making permanent fixings in all kinds of material. Rawlplugs are made for every size of screw. Complete Outfits—Popular, Household and Handyman—contain Tools, assorted Rawlplugs and Screws for every simple fixing job.

Rawltools are made for every purpose. Rawldrills for Rawlplugs. Stardrills for boring holes for Rawlbolts (the modern device for fixing heavy plant and equipment). Wall boring and Tubular boring tools for penetrating right through walls.

Ask your local dealer for details of Rawlplugs, Outfits and Tools. He will be pleased to help you.

## R.P.I. Slow Speed Electric Drill for Masonry.




A robust yet comfortable power tool for speedy drilling in brick, tile, stone and in hollow and thin materials. Specially designed for Rawlplug Durium Tipped Masonry Drills No. 6 up to No. 20 (¾"), the R.P.I. also takes ordinary twist drills from No. 0 up to ¼", and is thus an excellent general purpose tool where slow speed is required. Chuck speed, running light, is 600 r.p.m., stepping down to 450 r.p.m. at full load. Universal motor (AC/DC) in three voltages—100/110, 200/220 and 230/250. Easy to handle (weight under 5 lbs.), the R.P.I. is an ideal tool for long efficient service. Packed in strong box.

## DURIUM DRILLS


Spiral fluted masonry drills which can be used in a hand brace for boring clean round holes in brick, stone, marble, tile, etc. They have fifty times the life of ordinary drills because the Durium Carbide tip is harder than any metal or alloy. Sizes made are Nos. 6, 8, 10, 12, 14, 16, 18, 20.

# RAWLPLUG PRODUCTS
## *handy for Home & Workshop*


### DUROFIX
**THE HEATPROOF AND WATERPROOF ADHESIVE**

Mend broken crockery and glassware yourself. When you break your best china don't throw it away. Durofix is the colourless adhesive which will mend it. Hot water does not affect Durofix. It is suitable for many household repairs, so get a tube now and be ready for when you need it.

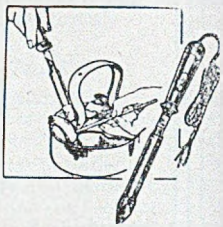
### DUROGLUE
**UNDILUTED ANIMAL GLUE of incomparable strength**

Ready for instant use for the many purposes for which an extra strong glue is needed. Wood, cloth, fabric, felt, leather and any greaseless surface can be stuck with Duroglue.

### Rawlplug PLASTIC WOOD
**APPLIED LIKE PUTTY, DRIES LIKE WOOD**

Can be cut, planed, polished and painted like wood. Will take nails and screws like wood. Does not blister, crack or decay. Rawlplug Plastic Wood is actually the best quality product of its kind on the market.

### Rawlplug SOLDERING IRON
**makes soldering certain and simple**

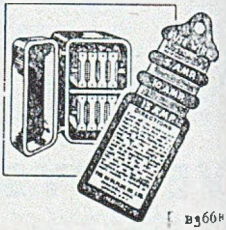


This is a guaranteed electric tool which will pay for itself many times over by repairing and giving longer life to metal household goods. In the workshop it is indispensable. Supplied with Standard, Pencil or Hatchet bit.


### Rawlplug CORED SOLDER
**A COMBINED SOLDER AND FLUX**

A special combined solder and flux which is non acid and easy flowing. Weight for weight this is the finest value in resin cored solder on the market.

### Rawlplug FUSE WIRE
**BE PREPARED FOR BLOWN FUSES**



A useful card carrying 3 gauges of fuse wire (5 amp for lighting, 10 amp for heating and 15 amp for power). Directions for use are printed on the card which is punched for easy hanging near the fuse box.

B3668

**THE RAWLPLUG COMPANY LTD · LONDON · S.W.7**

# NEW PATENTS

## Electrical Specifications Recently Published

*The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (2s each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.*

### 1945

17358. Stevens, A. H. (Submarine Signal Co.).—Electrical circuits for transmitting and receiving. 6th July, 1945. (Convention date not granted.) (639651.)

23206. Sperry Gyroscope Co., Inc.—Phase control apparatus. 8th September, 1945. (639821.)

### 1946

3509. Centre National de la Recherche Scientifique, and Felici, N.—Electrostatic influence machines. 4th February, 1946. (Convention date not granted.) (639653.)

11871. British Thomson-Houston Co., Ltd. (General Electric Co.).—Manufacture of luminescent materials. 17th April, 1947. (639823.)

12151. Hope, V.—Electric fuses. 21st December, 1948. (Cognate application 31437, 23rd October, 1946.) (639824.)

21675. General Electric Co., Ltd., and Furneaux, W. D. C.—High-frequency heating apparatus. 10th August, 1949. (Cognate application 14439, 30th May, 1947.) (639826.)

22140. Standard Telephones & Cables, Ltd., and Reeves, A. H.—Gaseous electric-discharge tubes. 22nd July, 1947. (639827.)

25999. British Thomson-Houston Co., Ltd.—Electric circuit-breaker operating means. 29th August, 1946. (639774.)

29088. Standard Telephones & Cables, Ltd., and Foulkes, C. H.—Gas-filled electric-discharge devices. 26th September, 1947. (639828.)

30319. Sylvania Electric Products, Inc.—Concentric seal assembly. 10th October, 1946. (639776.)

### 1947

418. Electroflo Meters Co., Ltd., and Gemmell, D. C. N.—Means for the automatic control of steam-boiler auxiliaries. 3rd May, 1948. (639832.)

7331. Metropolitan-Vickers Electrical Co., Ltd., and Higham, E. H.—Circuits for providing recurrent impulses. 3rd March, 1948. (639719.)

7383. Landis & Gyr Soc. Anon.—Electrical meter for measuring wattless energy. 17th March, 1947. (639837.)

7559. Sperry Products, Inc.—Apparatus for supersonic inspection. 19th March, 1947. (639779.)

7704. British Thomson-Houston Co., Ltd.—Control of electric blankets. 20th March, 1947. (639838.)

7721 & 8218. Standard Telephones & Cables, Ltd., and Reeves, A. H.—Electric-discharge tubes. 19th and 25th March, 1948. (639839 & 639841.)

9011. Westinghouse Electric International Co.—Electrical insulation. 2nd April, 1947. (639844.)

10023. Strong, H. V., and Eisler, P.—Manufacture of electrical circuits and circuit components. 12th April, 1948. (639658.)

10244. Metropolitan-Vickers Electrical Co., Ltd., and Higham, E. H.—Time delay circuits. 16th April, 1948. (639722.)

10407. Standard Telephones & Cables, Ltd., and Weston, W. K.—Tubular electric conductors, and the manufacture thereof. 16th April 1948. (639780.)

10412. Philips Lamps, Ltd.—Amplification of low voltages by means of an electric-discharge tube. 18th April, 1947. (639659.)

10875. Electrolux, Ltd.—Refrigerator cabinets, and apparatus for cooling the same. 23rd April, 1947. (Cognate applications 10876, 4th May, 1946, and 10877, 4th May, 1946.) (639848.)

11469. Telefonaktiebolaget, L. M. Ericsson.—Arrangements for the sending and recording of identification signals. 29th April, 1947. (639661.)

12205. Sperry Products, Inc. — Supersonic transmitting apparatus. 6th May, 1947. (639850.)

12210. Philco Corporation. — Velocity-modulation electron-discharge tubes. 6th May, 1947. (639851.)

13795. Metropolitan-Vickers Electrical Co., Ltd., and Higham, E. H.—Electronic control circuits. 20th May, 1948. (639724.)

18234. British Thomson-Houston Co., Ltd.—Ultra-high-frequency space resonant systems. 10th July, 1947. (639862.)

20399. Davis & Son, Derby, Ltd., J., Lucas, Ltd., J., and Davis, W. H. — Electric lighting apparatus. 25th June, 1948. (639671.)

20927. Philips Lamps, Ltd. — Electron-discharge tubes. 1st August, 1947. (639794.)

22001. Hazeltine Corporation.—Wave-signal amplitude-limiting system. 8th August, 1947. (639731.)

22288. Landis & Gyr. Soc. Anon.—Time recorder. 11th August, 1947. (639796.)

22640. General Electric Co., Ltd., Jenkins, R. O., and Clack, B. N.—Oxide-coated electrodes for electric-discharge lamps. 7th September, 1948. (639797.)

24421. Hoover, Ltd.—Hand irons. 4th September, 1947. (639677.)

24655. Standard Telephones & Cables, Ltd., and Williams, O. G. — Electronic gating circuits. 3rd September, 1948. (639800.)

24699. Cinema-Television, Ltd., and Buchanan, W. H.—Alternating-current rectifiers. 12th August, 1948. (639801.)

26392. British Thomson-Houston Co., Ltd.—Refrigerator cabinets. 30th September, 1947. (639872.)

27227. Dunlop Rubber Co., Ltd., Trevaskis, H. W., and Dewar, D. — Snap-action electric switches. 5th October, 1948. (639603.)

27767. British Thomson-Houston Co., Ltd.—Forced liquid-cooled electrical apparatus. 16th October, 1947. (639738.)

27853. British Thomson-Houston Co., Ltd.—Electric incandescent lamps. 17th October, 1947. (639604.)

28119. Suchy Holdings, Ltd., and Richards, H. E. G. —Radar reflection surfaces. 5th July, 1948. (639740.)

28276. Gilomen, F.—Releasable electrical connecting device. 22nd October, 1947. (639876.)

28768. British Thomson-Houston Co., Ltd., Blood, W. R., Moore, J. W., and Wells, R. S.—Production of fluorescent electric-discharge lamps. 21st December, 1948. (639606.)

28772. Marconi's Wireless Telegraph Co., Ltd., and Colchester, C. D.—Apparatus for testing lines, and other electrical networks for time delay. 24th May, 1948. (639741.)

28982. Radiotechnique. — High-frequency furnaces. 30th October, 1947. (639608.)

29700. Hall, Ltd., J. & E., and Hales, R. T.—Expansion valves for refrigerators. 16th April, 1948. (639682.)

29701. Hall, Ltd., J. & E., and Hales, R. T.—Apparatus for the control of expansion valves of refrigerators. 16th April, 1948. (639683.)

31441. British Thomson-Houston Co., Ltd.—Combustion chambers. 27th November, 1947. (639617.)

31540. La Perrelle, E. T. de.—Frequency-modulated radio altimeters. 24th December, 1948. (639745.)

32692. British Thomson-Houston Co., Ltd.—Tuning means for mixed radio receivers adapted for amplitude modulation or frequency modulation. 11th December, 1947. (639686.)

32885. Brookhirst Switchgear, Ltd., and Shore, L.—Locking devices. 11th December, 1948. (639687.)

32886. Brookhirst Switchgear, Ltd., and Robinson, D. B. — Protective devices for electric circuits and apparatus. 11th December, 1948. (639883.)

33479. Akt.-Ges. Brown, Boveri, & Cie.—Cable end sleeve for high-voltage conductors. 18th December, 1947. (639621.)

34200. Metropolitan-Vickers Electrical Co., Ltd., and Higham, E. H.—Telemetering systems. 28th October, 1948. (639689.)

34799. Soc. Anon. pour l'Industrie de l'Aluminium.—Welding electrodes for light metals and methods of manufacturing the same. 30th December, 1947. (639626.)

35162. Metropolitan-Vickers Electrical Co., Ltd.—Electronic-discharge apparatus. 31st December, 1947. (639894.)

### 1948

321. British Thomson-Houston Co., Ltd. — Refrigerating systems. 5th January, 1948. (639691.)

2850. Cinch Manufacturing Corporation.—Electrical plug connectors. 30th January, 1948. (639907.)

7242. General Electric Co., Ltd., and Davidson, F. D.—Electric fires. 23rd February, 1949. (639637.)

8025. Conradi, G. H. E.—Electric handlamps. 16th February, 1949. (639638.)

9458. Webber, N. W. D.—Electric couplings. 5th April, 1949. (639920.)

9612. Dehn, S. G. (Sunbeam Corporation).—Automatic electrically heated coffee maker. 6th April, 1948. (639641.)

9648. Berthiez, C. W.—Remote control device for the control of electrically driven machines. 6th April, 1948. (639704.)

9945. Standard Telephones & Cables, Ltd.—Electric-discharge devices. 9th April, 1948. (639705.)

11208. Gillespie, A. B.—Electronic valve circuits. 23rd April, 1948. (639815.)

15595. Molins Machine Co., Ltd., and Mason, J. A.—Switch control devices for dynamically-braked, electrically driven machines. 2nd June, 1949. (639817.)

17334. British Thomson-Houston Co., Ltd., and Gaughan, M.—Electric lighting fittings. 24th June, 1949. (639761.)

### Amended Specification

593484. Westinghouse Brake & Signal Co., Ltd., and another.—Automatic voltage regulating apparatus for a load circuit supplied through a rectifier from a source of alternating current.

## STREET LIGHTING IMPROVEMENTS

IN the old-world township of STEVENAGE, site of the new satellite town, Metrovick "S.O. Fifty" all-Perspex lanterns with 140 W sodium lamps have been installed to light the Great North Road which forms the main thoroughfare. The lanterns have been erected on concrete columns with a special red finish to blend with the red brick of the surrounding premises, to the specification of Mr. J. D. Marshall, surveyor and engineer.

DAVENTRY Town Council has agreed to discontinue gas lighting in the town streets and all future lighting will be by electricity.

At an estimated cost of £5,363, improved street lighting is to be installed from Belle Vue to the borough boundary, DONCASTER.

MILTON, Northants, Council proposes to install electric street lighting.

At WOOTTON, Northants, the Council proposes to install electric street lighting, using the gas standards.

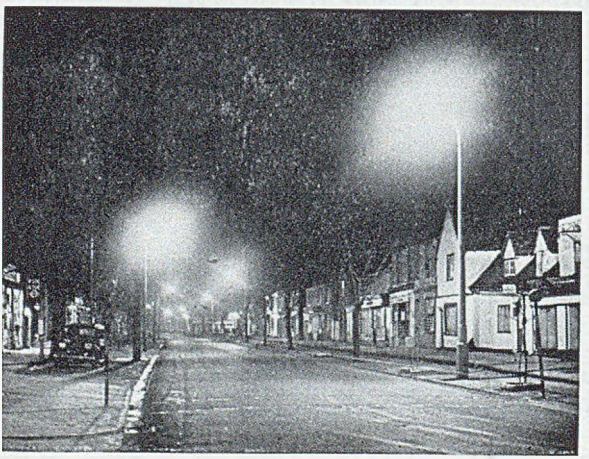
A new sodium lighting installation was recently inaugurated from the Bradford boundary to the Halifax boundary, QUEENSBURY.

MIDHURST (Sussex) Council proposes to accept the Southern Electricity Board's estimate for installing mercury street lighting.

CONSETT U.D.C. has included in its annual estimates expenditure on the conversion of street lighting from gas to electricity. It is hoped that the work will be completed during 1951-52.

After fifteen months' work, the ripple control street lighting scheme in NORWICH (Norfolk Sub-Area, Eastern Electricity Board) has now been completed and is working satisfactorily. The original specification set 99.5 per cent as the standard of operational efficiency. During the seven months from July, 1949, to 31st January, 1950, the actual level of operational efficiency attained was 99.99 per cent.

DARLINGTON Town Council has received Ministry of Transport sanction to borrow £6,287 for electric lighting in Coniscliffe Road between Stanhope Road and the borough boundary.



**Metrovick "S.O. Fifty" lanterns at Great North Road, Stevenage**

# CONTRACT INFORMATION

## Accepted Tenders and Prospective Electrical Work

## CONTRACTS OPEN

*Where "Contracts Open" are advertised in our "Official Notices" section, the date of the issue is given in parentheses.*

**Australia.**—QUEENSLAND.—21st June. State Electricity Commission. L.v. switchgear for Thursday Island Town Council. (C.R.E. (I.B.) 52694/50. Ten/1271.)* 19th July. 66 kV, 125 kW alternator. (C.R.E. (I.B.) 53102/50. Ten/1286.)* 30th August. Three sets of turbo-alternators (C.R.E. (I.B.) 52669/50. Ten/1273)* for Capricornia, Townsville and Wide Bay Regional Electricity Boards.

VICTORIA.—2nd August. State Electricity Commission. Belt conveyor system, open cut to briquette factory, Morwell. (See this issue.)

**Belfast.**—2nd June. South Belfast Hospital Management Committee. Electrical installation in auxiliary maternity unit at Belfast City Hospital. F. W. Parkinson and Partners, 93, Ann Street.

7th June. City Council. Supply of kitchen electrical equipment for cafés, etc. Parks and Cemeteries Department, Botanic Gardens Park.

**Edinburgh.**—30th June. North of Scotland Hydro-Electric Board. 33 kV, 11 kV and l.v. overhead distibution lines. (See this issue.)

**Egypt.**—13th June. Mechanical & Electrical Department, Ministry of Public Works. Two 270 kVA diesel generating sets for Tura Prison power station. (C.R.E. (I.B.) 53100/50. Ten/1284.)*

**Eston.**—20th June. Urban District Council. Street lighting units. (See 19th May issue.)

**Exeter.**—19th June. City Council. Pumping and generating machinery including water turbines, electric centrifugal pumps, with cables, meters, etc. J. Brierley, water engineer, Municipal Offices.

**Glossop.**—19th June. Corporation. Electric lighting, stage lighting and ventilation at Victoria Hall. (See this issue.)

**Haltwhistle (Northumberland).**—Rural District Council. Electric wiring of 44 houses, Redburn housing estate. Surveyor, Council Offices, Haltwhistle.

**Harwich.**—1st June. Town Council. Electrical installation work in four blocks of eight flats on the Grange site, Dovercourt. Borough architect, King's Quay Street.

**New Zealand.**—DUNEDIN.—17th July. City Electricity Department. Two 50 ton electric overhead travelling cranes. (C.R.E. (I.B.) 53208/50. Ten/1285.)*

**Tangier.**—19th June. International Administration. Transformers. (C.R.E. (I.B.) 52784/50. Ten/1275.)*

*Specifications may be inspected at the Commercial Relations and Exports Department, Board of Trade, Thames House North, Millbank, S.W.1 (Victoria 9040).

**Warrington.**—7th June. Town Council. Rewiring the electrical installation at the borough treasurer's office, Bank House. Borough surveyor, Town Hall.

**Wiltshire.**—14th June. Education Committee. Machines, equipment, etc., for the electrical engineering section at Chippenham branch of North West Wilts College of Further Education. P. A. Selborne Stringer, clerk, County Hall, Trowbridge.

**Uruguay.**—MONTEVIDEO.—16th June. Usinas Electricas y Telefonos del Estado. Pylons for h.v. cables (C.R.E. (I.B.) 52276/50. Ten/1269).*

## ORDERS PLACED

**Coventry.**—Electrical installations in 94 houses, Proffit Avenue, and 28 houses, Sadler Avenue.—Thompson Electrical Co.

**Gateshead.**—Town Council. Lanterns and columns for the lighting of the Lobley Hill and Lyndhurst estates, Gateshead (£1,459).—G.E.C.

**Islington.**—Borough Council Housing Committee. Supply of 154 U.D.B. water heaters (£31 2s 3d each) and 178 2 kW electric fires complete with surrounds (£4 19s 2d each) for the Sussex Way, Pembroke Street (Part 1.) Queen Margaret's Grove and the Tollington Park housing schemes.—London Electricity Board.

## CONTRACTS IN PROSPECT

*Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.*

**Aldershot.**—Factory, North Lane; H. Comoy and Co., 2, Cross Street.

**Barnard Castle.**—Houses for U.D.C. (£30,575); Lane Fox & Co., Ltd., contractors, Sunderland.

**Bebington.**—Houses (56), Brackenwood; T. Warrington & Sons, Ltd., 82, Station Rd., Ellesmere Port, Cheshire.

**Bedlington.** — Pithead Baths, Netherton Howard Pit, for Miners' Welfare Commission, Queen Square, Newcastle-on-Tyne; Commission's divisional architect.

**Birkenhead.**—Factory, Corporation Road; Alfred Holt & Co., India Buildings, Liverpool, 2.

**Blackpool.**—Houses (52), Mereside; W. R. Ward & Co., 293, Whitegate Drive.

**Brighton.**—Houses (125), Parkside extension of Coldean estate, borough engineer.

**Bristol.**—Houses (114), Oldbury Court, Fishponds and primary school, Henbury; city architect.

**Gateshead.**—Laboratory, boilerhouse, etc., St. James's Road, for Clarke, Chapman and Co., Ltd., constructional engineers; own architects.

Houses (79), Lyndhurst estate; chief architect, Municipal Buildings.

**Gosforth.**—Large new offices for Thomas Hedley and Co., Ltd.; Stephen Easten, Ltd., builders, Westgate Hill Grange, Westgate Road, Newcastle-on-Tyne.

**Grantham.**—Additions to St. Catherine's Children's Homes, for Kesteven C.C.; C. B. Metcalfe, county architect, County Offices, Sleaford.

**Greenock.**—Foundry extensions (£24,000); Scott's Shipbuilding & Engineering Co., Ltd.

**Hartlepool.**—Houses for the T.C.:— Rennie and Son, builders, Regent Square, Hartlepool (fourteen); John Proud, Ltd., builders, West Hartlepool (twelve); and Watt Brothers, builders, West Hartlepool (eleven).

**Hereford.**—Four blocks of flats (78 dwellings), Hunderton; city surveyor.

**Hove.**—Flats (36), Sunninghill estate; borough engineer.

**London.**—Buildings, St. Andrew's Street, for Morning Advertiser, Ltd.; Ellis, Clarke and Gallanough, architects, 58, Grosvenor Street, W.1.

Poplar.—Civic restaurant, East India Dock Road, for L.C.C.; E. D. Mills, architect, 38a, Soho Square, W.1.

St. Johns Wood.—Flats (54), Hamilton Terrace, for St. Marylebone B.C.; Culpin & Son, architects, 3, Southampton Place, W.C.1.

**Longbenton.**—Houses (76), Crossley Terrace, Forest Hall, for U.D.C.; surveyor, Council Offices, Forest Hall.

**Middlesbrough.** — Houses (68), Saltersgill estate; borough engineer.

**Newcastle-on-Tyne.**—Additions to general hospital for Regional Hospital Board (£180,000); Rider Hunt and Partners, quantity surveyors, Bridge House, Queen Victoria Street, London, E.C.4.

College of technology, Northumberland Road; city architect, 18, Cloth Market.

Luxury flats (110), Hindhaugh Street; city architect, 18, Cloth Market.

Works additions, Waterloo Street, for Kodak, Ltd.; S. Easten, Ltd., builders, Westgate Hill Grange.

Canteen at County Hall (£6,000); county architect.

Factory, Glasshouse Street, for British Engines, Ltd.; Bowey and Son, builders, Back Raby Street.

**Newport (I.o.W.).**—Extensions to X-ray department of St. Mary's Hospital; Adams, Holden & Pearson, architects, University of London, W.C.1.

**Northallerton.**—Adaptations and extensions at Friarage Hospital; R. Blackett & Sons, Darlington.

**Norwich.**—Dwellings (52), Cooper Lane estate; city architect, City Hall.

**Okehampton.**—Council offices; L. G. Bailey, surveyor, Station Road.

**Oldham.**—Stage 1 of primary school at Limehurst; Greenwoods Building Industries, Ltd., Oldham.

**Ongar.**—Houses (44), Shelley estate; R.D.C. surveyor, Bowes Field, High Street, Chipping Ongar, Essex.

**Orrell.**—Houses (38), Moor Road estate, for U.D.C.; E. Rylance & Sons, Ltd.

**Plymouth.**—Dwellings (103), Whitleigh estate; city architect.

Block of six shops with offices above, New George Street; W. H. Watkins & Partners, architects, 1, Clare Street, Bristol.

**Portsmouth.**—College of Art at Hyde Park Road (£275,000); city architect.

**Radcliffe.**—Extensions at Bury Road, for General Engineering Co., Ltd.; F. Hill, consulting engineer, 14, Manchester Road, Bury.

**Reading.**—Flats (60), Gosbrook Road; C. H. James, architect, 5, Bloomsbury Street, W.C.1.

**Rochdale.**—Houses (220), Kirkholt estate; James Hobson & Sons, Ltd., 55, Newark Street, Nottingham.

**Rotherham.**—Secondary technical school, Oakwood (£367,600); E. J. Manson, borough surveyor, Municipal Offices.

**Rushden.**—Houses (20) and 12 maisonettes for U.D.C.; Robert Marriott, Ltd., 171, High Street.

**St. Neots.**—Electrical installation for infants' school and technical wing; county architect, Huntingdon.

**Sheffield.**—Extensions for Ambrose Shardlow & Co., Ltd., Ealing Works, Meadow Hall Lane; W. & A. Forsdike, Ltd., St. Mary's Road.

Works, warehouse and offices, Effingham Road; Swift Levick & Sons, Ltd., Clarence Street Works.

Flats (60), Manor Park estate; city architect.

**Skelton & Brotton.**—Houses (20), Brotton; U.D.C. surveyor.

**Southport.**—Houses (18), Grantham Road site; T. Southworth and Sons, Ltd., 142a, Virginia Street.

**Stretford.**—Factory and warehouse extension, Park Road; Kellogg Co. of Great Britain, Ltd.

**Sunderland.**—Houses (1,800), Castletown; borough architect, Grange House, Stockton Road.

**Sutton Coldfield.**—Houses (50), Falcon Lodge estate; borough surveyor.

**Thurrock.**—Dwellings (134), Corringham-Stanford development scheme; C. S. H. Hawkes, U.D.C. surveyor, Council Offices, Palmers Avenue, Grays.

**Urmston.**—County secondary modern school for boys; G. Noel Hill, county architect, Preston.

**Wallasey.**—Town Hall annexe (£11,181); J. H. Waring, St. Denis, Borrowdale Road, Moreton.

**Wallsend.**—Blocks of six-storeyed and three-storeyed flats on the Low Willington estate to house 600 families, borough engineer, Town Hall.

**Watford.**—Works extensions; Yeatman & Co., Ltd., Cherry Tree Works.

**Wellingborough.** — Three-storey secondary modern school, Doddington Road; county architect, County Hall, Northampton.

**Wembley.**—Fire station extensions (£45,000), for Middlesex C.C.; county architect, 10, Great George Street, S.W.1.

**West Hartlepool.**—Houses (176), Owton Manor estate; borough architect.

**Whiston.**—Out-patients' block at County Hospital; Liverpool Regional Hospital Board, architects Dept., Alder Hey Hospital, Liverpool, 12.

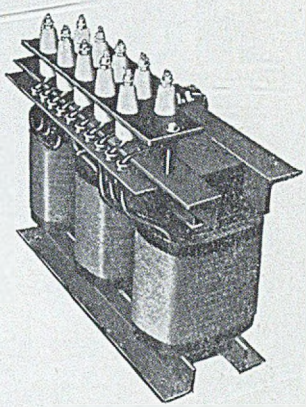
**Woking.**—Houses, flats and other buildings, Sheerwater site, for L.C.C.; Sir Lindsay Parkinson & Co., Ltd., builders, 171, Shaftesbury Avenue, W.C.2.

# TRANSFORMERS

HEAYBERD Transformers are designed to give the utmost reliability and economy in operation, fully in accordance with the relevant British Standard Specifications.

Write for List 1044, which gives full particulars of air-cooled transformers up to 15 kVA. Quotations for larger and oil-insulated types on application.

*We shall be glad to quote for Transformers, Battery Chargers and Rectifying Equipment made to your own special requirements.*



*The photograph shows a high voltage transformer. Primary, 400 volts three-phase 50 cycles. Secondary, 3,000 volts per phase.*

HEAYBERD

**F. C. HEAYBERD & CO. LTD**

Head Office: GREENWICH SOUTH STREET, S.E.10. Phone: TIDeway 4646 (3 lines)
Works: Greenwich. Cables & Telegrams: "Heayberd, Green, London"

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**MARTINDALE**

# PROTECTIVE MASKS

Patent Number 479,807
Registered Design Number 819,509

**Are liked by employers because :—**

- They give adequate protection against dust and mists.
- The workers will wear them whether watched or not.
- They reduce absenteeism.
- They are so inexpensive—each worker can have his own, so avoiding infection.

**Are liked by workers because :—**

- They allow free breathing, clear vision, use of goggles, free speech.
- They do not cause perspiration or skin irritation — they are always clean because pad is so easily replaced.
- They are so light—weight only ½ oz.
- They fit perfectly because they bend to fit the face.

**Used by "the million", they have given satisfaction for over 20 years and withstood all imitations**

*Send 4/- for Mask and 8 refills (Trial Sample) to the Sole Patentees and Manufacturers:—*

**MARTINDALE ELECTRIC Co. Ltd., 4 Westmorland Road, London, N.W.9**

**Telephone: Colindale 8642/3** **Telegrams: "Commstones, Hyde, London."**

# CLASSIFIED ADVERTISEMENTS

**ADVERTISEMENTS** for insertion in the following Friday's issue are accepted up to **First Post on Monday,** (*See Notice below for Whitsun*) and should be addressed to Classified Advertisement Department, Dorset House, Stamford Street, London, S.E.1.

**CLASSIFIED** advertisements are PREPAID at 3/- per line (approx. 7 words) per insertion. Where the advertisement includes a Box Number this counts as two words and there is an additional charge of 1/-.

**DISPLAYED :—** 42/- per inch, per insertion. Cheques and Postal Orders should be crossed and made payable to ELECTRICAL REVIEW PUBLICATIONS LTD.

**SITUATIONS WANTED :—** Three insertions under this heading can be obtained for the price of two if ordered and prepaid with the first insertion.

**REPLIES** to Box Numbers should be addressed to the Box Number in the advertisement, c/o ELECTRICAL REVIEW, Dorset House, Stamford Street, London, S.E.1. but if not to be delivered to any particular firm or individual they should be accompanied by instructions to this effect, addressed to the Manager of the ELECTRICAL REVIEW. Replies in such cases cannot be returned. The name of an advertiser using a Box Number will not be disclosed.

**Original testimonials should not be sent with applications for employment.**

## WHITSUN

Classified Advertisements for the issue of June 2nd have now closed for press.

## OFFICIAL NOTICES, TENDERS, ETC.

### BOROUGH OF GLOSSOP

**Victoria Hall**

TENDERS are invited for work at the above Hall, as follows:—

(a) Electric Lighting.
(b) Special Stage Lighting.
(c) Ventilation.

Specification and Form of Tender may be obtained on application to Geo. Faulds, Esq., M.I.Mun.E., Borough Surveyor, Municipal Buildings, Glossop.

Tenders must be on the prescribed form, and enclosed in plain sealed envelopes endorsed "Tender for Lighting, etc., Victoria Hall," and be delivered to the undersigned not later than the first post on Monday, 19th June, 1950.

The Council does not bind itself to accept the lowest or any tender.

W. S. A. ROBINSON,
Town Clerk.

Municipal Buildings,
Glossop.
May, 1950. 3648

### NORTH OF SCOTLAND HYDRO-ELECTRIC BOARD

**33 kV, 11 kV and Low Voltage Overhead Distribution Lines**

TENDERS are invited for the supply, delivery and erection of 32 miles of 33 kV and 58 miles of 11 kV single-circuit wood pole overhead lines and 77 miles of low voltage lines between Huntly and Ballater in the County of Aberdeen.

Copies of the Tender Document may be obtained on application to the Engineers, Messrs. Merz & McLellan, 39, Northumberland Street, Edinburgh, 3, on or after Wednesday, 31st May, 1950. Applications should be accompanied by a cheque for one guinea, which will be refunded on receipt of a bona fide Tender.

Tenders, in duplicate, enclosed in a sealed cover and endorsed on the left-hand corner "Contract AC/NC/1," must reach the subscriber not later than 30th June, 1950.

The Board do not bind themselves to accept the lowest or any Tender.

W. D. D. FENTON,
Secretary.

16, Rothesay Terrace,
Edinburgh, 3.
17th May, 1950. 3649

### STATE ELECTRICITY COMMISSION OF VICTORIA

**22-32, William St., Melbourne, Victoria, Australia**

THE Commission is inviting tenders for the manufacture of a Belt Conveyor System, Open Cut to Briquette Factory, Morwell, in accordance with Specification No. 50-51/4 and B.5 Contract Conditions.

Full particulars are available from the Agent-General for Victoria in London.

Tenders, endorsed "Tender to Specification No. 50-51/4," together with a preliminary deposit of £20, are returnable at the Commission's Head Office, 22-32, William St., Melbourne, Victoria, Australia, by 11 a.m. on Wednesday, 2nd August, 1950.

The Commission does not bind itself to accept the lowest or any tender. 3604

## SITUATIONS VACANT

### CITY OF MANCHESTER

**Appointment of Technical Assistant in the Electrical Engineer's Section of the Transport Department**

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT in the Electrical Engineer's Section of the Manchester Corporation Transport Department.

Salary will be in accordance with the National Joint Scales Grade A.P.T. I (£390-£435 per annum).

Candidates should have had a thorough practical training as electrical engineers and have obtained the Higher National Certificate in Electrical Engineering. A knowledge of, and previous experience, with V.H.F. radio equipment will be an advantage.

The position is subject to the National Scheme of Service Conditions and the Standing Orders of the Council. The successful applicant will be required to pass a medical examination and to contribute to the Manchester Corporation Superannuation Fund. Canvassing in any form is prohibited, and relationship to any member of the Council or Senior Officers must be disclosed to me in writing.

Forms of application, which can be obtained from the General Manager, Manchester Corporation Transport Department, 55, Piccadilly, Manchester, 1, should be submitted to him accompanied by copies of not more than two recent testimonials, not later than Saturday, 3rd June, 1950.

PHILIP B. DINGLE, Town Clerk.

Town Hall, Manchester.
May, 1950. 3667

### CAMBRIDGESHIRE EDUCATION COMMITTEE

**Cambridgeshire Technical College and School of Art**

**Principal: D. E. Mumford, M.A.**

APPLICATIONS are invited for the full-time post of LECTURER IN ELECTRICAL MEASUREMENTS AND MATHEMATICS, required from 1st September, 1950, for the Higher National Certificate Course in Electrical Engineering, with some practical mathematics in Senior and Preliminary Courses.

Candidates should hold qualifications appropriate to the post.

Salary will be in accordance with the Burnham Scale for Assistants in Establishments of Further Education (£300 by £15 to £555 per annum), with the usual additions for training and a degree. The starting position on the scale will depend on previous teaching experience, war service and industrial or commercial experience.

Further particulars and forms of application can be obtained from the Chief Education Officer, Shire Hall, Cambridge. Completed application forms should be returned within 14 days of the appearance of this advertisement to the Principal Cambridgeshire Technical College and School of Art, Collier Rd., Cambridge. 3662

### DRAUGHTSMEN FOR SOUTH AFRICA

TWO DRAUGHTSMEN required for the works of Johnson & Phillips, Ltd., at Johannesburg, South Africa. The following qualifications are necessary: Apprenticeship with a leading switchgear manufacturer, suitable technical training, at least two years' intensive drawing office experience. Senior or well experienced men preferred, but a younger man of the right calibre would be considered. Salary £600-£780 per annum, according to experience and seniority, plus statutory cost-of-living allowance (at present £57/4 p.a.). Applications, which will be treated in strict confidence, to:—

**Employment and Welfare Manager,**
**JOHNSON & PHILLIPS, LTD.,**
**Charlton, S.E.7.** 3406

## NORTH EASTERN ELECTRICITY BOARD

### Wear Sub-Area

**Vacancy for Demonstrator or Assistant Demonstrator or Trainee Demonstrator**

A VACANCY exists for a DEMONSTRATOR or an ASSISTANT DEMONSTRATOR or TRAINEE DEMONSTRATOR for South Shields Service Centre.

A Demonstrator should hold the Certificate of a recognised Domestic Science Training College and preferably the E.A.W. Housecraft Certificate or Diploma and should have some practical experience.

An Assistant Demonstrator should have some or all the above qualifications.

A Trainee Demonstrator should be a woman without the above qualifications but with good domestic experience or should be a girl over 16 years of age, preferably with general education up to School Certificate Standard and with an aptitude for domestic work, to whom some Domestic Science training would be given.

Training in the use of electrical appliances will be given to all Grades.

Salaries and Conditions will be in accordance with the National Joint Council Agreement for the Electricity Supply Industry.

Demonstrator

Grade I.—£310/390 per annum. Annual increments of £20 up to £350; beyond £350, increments subject to Certificate of Competence.

Assistant Demonstrator

Grade equivalent to Shorthand Typist, i.e., £135 to £335 per annum. Initial salary in accordance with age. Annual increments of £20 subject to Certificates of Progress.

Trainee Demonstrator

General Clerical Grade.—£108/308 per annum. Initial salary according to age. Increments up to £248 per annum according to age. Increments above £248 per annum, subject to Certificates of Progress.

Applications, giving particulars of age, education, training and experience and stating for which of the three grades application is being made, should be sent to The Manager, Wear Sub-Area, North Eastern Electricity Board, Dunning Street, Sunderland, to arrive no later than June 9th, 1950. 3590

## BRITISH ELECTRICITY AUTHORITY

### Southern Division

APPLICATIONS are invited for the following vacancies on the staff of the Generation Engineer (Operation).

1. ASSISTANT TEST ENGINEER (STEAM).—Applicants must be in possession of technical qualifications admitting to corporate membership of the Institution of Electrical and/or Mechanical Engineers, and/or Institute of Fuel. Candidates must have a wide practical experience in all operations associated with performance determination of large P.F., and stoker-fired boilers and/or modern steam turbines. A thorough knowledge of instrument maintenance and calibration is desirable.

2. ASSISTANT CHEMIST. — Applicants should possess at least a Higher National Certificate and have a wide experience in the analysis of ferrous and non-ferrous alloys, together with metallography. Some experience of fuel analysis would be an advantage.

The salary range for both the above posts will be £579-£731 per annum. In the case of the Assistant Chemist, this is provisional only, pending final negotiations.

The appointments are superannuable and subject to a satisfactory medical examination.

Applications for forms stating for which post candidate wishes to apply, should be made to the undersigned. Completed forms must be returned by 9th June, 1950.

P. D. A. OLIVER,
Divisional Secretary.

British Electricity House,
High Street, Portsmouth. 3660

## AUSTRALIA

### City Electric Light Co., Ltd., of Brisbane-Queensland

THIS rapidly expanding public utility company with an extensive transmission and distribution system from 110 kV has vacancies for

ASSISTANT ELECTRICAL ENGINEERS.

Good opportunities exist for suitable applicants who should be eligible for associate membership of the I.E.E. and have experience as distribution engineers. Housing guaranteed. Commencing salary according to qualifications and experience.

Interviews may be arranged on receipt of written applications with personal particulars including war service, if any, training and experience, and accompanied by certified copies of testimonials, addressed to:—

**CITY ELECTRIC LIGHT CO., LTD.,**
**c/o The Agent-General for Queensland,**
**409, Strand, London, W.C.2.**

3669

## BRITISH ELECTRICITY AUTHORITY

### Southern Division

APPLICATIONS are invited for the position of SECOND ASSISTANT ENGINEER on the staff of the Generation Engineer (Operation) at Divisional Headquarters, Portsmouth.

The salary will be in accordance with Grade 2 of the National Joint Board schedule, namely £752-£911. per annum, according to qualifications and experience.

Applicants should have had wide experience in the maintenance of a large generating station, and be well acquainted with the operation and administration of plant in such stations.

An acquaintance with the problems arising from the operation of small steam and diesel stations will also be a recommendation.

Candidates should also have a working knowledge of the National Agreements governing the conditions of staff and manual workers, and should preferably be corporate members of a recognised professional Institution or hold equivalent qualifications.

Forms of application can be obtained from the undersigned and should be returned not later than 9th June, 1950.

P. D. A. OLIVER,
Divisional Secretary.

British Electricity House,
High Street, Portsmouth. 3658

## BRITISH ELECTRICITY AUTHORITY

### Southern Division

APPLICATIONS are invited for the position of ASSISTANT SHIFT CHARGE ENGINEER at Portsmouth Generating Station.

Candidates should be in possession of technical qualifications admitting to corporate membership of a recognised professional Institution, have had previous experience in a large modern generating station, and preferably have had manufacturing works experience.

The conditions of service will be those approved by the National Joint Board and the salary in accordance with Class G, Grade 9 (£571-£597).

The appointment is superannuable and subject to a satisfactory medical examination.

Forms of application may be obtained from the undersigned and must be returned by 9th June, 1950.

P. D. A. OLIVER,
Divisional Secretary.

British Electricity House,
High Street, Portsmouth. 3659

## SOUTH EASTERN ELECTRICITY BOARD

DISTRICT COMMERCIAL ENGINEER—Hastings District.

Salary of £722 p.a. under the revised N.J.B. Schedule, Class E, Grade 4. Superannuation will be arranged. Applications must be from qualified engineers with extensive experience in the Commercial Department of a large district, and be conversant with tariffs, commercial statistics, sales, installation work of all types and all aspects of service to domestic, commercial and agricultural consumers. The person appointed will be responsible for the complete control and organization of the Department.

Applications, giving two referees, must reach J. Savage, Esq., A.M.I.E.E., Hastings Manager, South Eastern Electricity Board, 12/13, York Buildings, Hastings, by June 5th, 1950.

DISTRICT COMMERCIAL ENGINEER — Purley District.

Salary of £722 per annum, plus London Weighting under the revised N.J.B. Schedule, Class E, Grade 4. Superannuation will be arranged. Applicants should be Corporate members of the I.E.E. or hold equivalent qualifications, have practical experience in the commercial department of an Electricity Undertaking covering aspects of service to all classes of consumers. The District is largely residential, with rural and industrial development, and has a large installation contracting section and five showrooms. The person appointed will be responsible to the District Manager for the control and organization of the department.

Applications, giving two referees, must reach J. McAlister, Esq., B.Sc., A.M.I.E.E., Purley Manager, South Eastern Electricity Board, Electric House, High Street, Purley, by 5th June, 1950.

DEMONSTRATOR—Eastbourne District.

Salary within the scale £310 p.a.×£20 to £390 under N.J.C. Agreement, Grade 1. Applicants must possess the E.A.W. Diploma, be fully experienced in demonstrating to consumers in their own homes all types of domestic electric appliances and be able to organize and conduct public lectures.

Applications, giving two referees, must reach N. Boydell, Esq., M.I.E.E., A.M.I.Mech.E., East Sussex and South West Kent Manager, South Eastern Electricity Board, Electric House, Grove Road, Eastbourne, by 5th June, 1950.

A. L. BURNELL,
Secretary.

May, 1950. 3661

## ELECTRICITY DEPARTMENT—SINGAPORE MUNICIPALITY

CHARGE ENGINEERS, permanent staff, required for shift duties in the Singapore power station. Present capacity 37,000kw with proposed extensions to 87,000kw.

Experience of extra High Tension 3 phase Generation in a modern High Pressure Steam Power Station is essential. Appointment subject to medical examination.

Basic salary scale $440—$870 per month. Starting point according to qualifications and experience. Graduated scale of Allowances, e.g., present Allowances on $500 p.m. basic salary amount to: Expatriation $110 p.m. plus Cost of Living $180 p.m. for single man or $225 p.m. for married man or $285 p.m. for married man with family. Annual increments $30 per month. Local taxation much lower than England. One Straits Dollar equals 2s 4d. Thus a married man with family on basic salary of $500 would draw equivalent of £1,252 sterling per annum.

Quarters with heavy furniture provided at 8% of salary or housing allowance of 12% in lieu. Initial engagement on 3 years agreement. 8 months leave after 4 years service. Free medical attention. Passages paid including family. Compulsory Provident Fund contribution 7½% of salary and Municipal Commissioners donate 7½% for first 10 years increasing later.

Applications in duplicate with full personal and technical information and copies of three testimonials to Messrs. Peirce & Williams (Agents to the Municipal Commissioners), 1, Victoria St., London, S.W.1. 3523

## BRITISH ELECTRICITY AUTHORITY

### Eastern Division

APPLICATIONS are invited for the following appointment:—

SHIFT CHARGE ENGINEER, Brimsdown "A" Generating Station.

Salary in accordance with the revised N.J.B. Schedule, Grade 7, Class F (£625-£643 per annum+5% London Weighting).

Applicants should have served an apprenticeship and obtained an Ordinary National Certificate in Electrical and/or Mechanical Engineering or equivalent and possess experience in the operation of Power Stations. Experience in the operation of plant at high steam pressure will be an advantage.

The appointment will be Superannuable in accordance with the British Electricity Authority and Area Boards' Superannuation Scheme

Applications, stating age, experience and present position, should be sent to the Divisional Controller, British Electricity Authority, Eastern Division, Northmet House, Southgate, N.14, to arrive not later than 9th June, 1950. Envelopes should be endorsed "Shift Charge Engineer, Brimsdown."

W. N. C. CLINCH,
Controller.

Northmet House,
Southgate, N.14. 3623

## AIR MINISTRY

AIR Ministry invites applications for appointment as ASSISTANT MECHANICAL AND ELECTRICAL ENGINEERS in the Directorate General of Works, which is responsible for the design, operation and maintenance of all ground mechanical and electrical works services on R.A.F. and Civil Aviation Stations. The appointments are non-pensionable, but competitions are held periodically to fill established vacancies.

Candidates must be willing to serve anywhere in the United Kingdom and undertake tours of duty overseas up to a maximum period of three years.

Salaries on entry range from £475 to £675 per annum in London, according to age, qualifications and experience, rising to £750 per annum, but are slightly lower in the provinces. A foreign service allowance is payable during overseas service.

Candidates must be natural born British subjects between the ages of 25 and 45, possessing the following qualifications:—

(i) (a) be the holder of a university degree or equivalent diploma in electrical and/or mechanical engineering and have had at least a two-year apprenticeship; or
(b) be a Graduate or Corporate Member of the Institute of Electrical Engineers and have served at least a three-year apprenticeship; or
(c) be a Graduate or Corporate Member of the Institution of Mechanical Engineers with appreciable electrical engineering experience and have served at least a three-year apprenticeship;

(ii) have been employed for a minimum of three years with a well-established engineering concern of sufficient size and scope for him to have gained experience in both electrical and mechanical engineering practice.

Applications, stating age, qualifications and all previous appointments with dates, to be addressed to The Under Secretary of State, Air Ministry, S.2(h), Cornwall House, Stamford Street, London, S.E.1. 3622

## BRITISH ELECTRICITY AUTHORITY

### Eastern Division

APPLICATIONS are invited for the following positions in the Generation Construction Department at Divisional Headquarters in North London:—

(a) Grade I DRAUGHTSMAN (Electrical).

The commencing salary will be within the range of £494-£600 per annum, plus 5% London Weighting, depending upon experience and qualifications.

(b) Grade 2 DRAUGHTSMAN (Electrical).

The commencing salary will be within the range of £347-£461 per annum, plus 5% London Weighting, depending upon experience and qualifications.

Applicants for position (a) should possess the Higher National Certificate, and for position (b) the Ordinary National Certificate in Electrical Engineering and have a knowledge of the layout of electrical power plant, E.H.T. Sub-stations and the preparation of tranmission and works power systems.

The salaries are provisional and will be subject to negotiation through the medium of the appropriate negotiating body.

The appointments will be Superannuable in accordance with the British Electricity Authority and Area Boards Superannuation Scheme.

Applications stating age, experience and present position should be sent in envelopes endorsed with the appointment sought, to arrive not later than 2nd June, 1950, to the Divisional Controller, British Electricity Authority, Eastern Division, Northmet House, Southgate, N.14.

W. N. C. CLINCH,
Controller.

Northmet House,
Southgate, N.14. 3524

## LONDON ELECTRICITY BOARD

### Meter Testers and Meter Repairers (Mechanicians)

APPLICATIONS are invited for the above positions at Lithos Road, Hampstead, and Acton Lane, Willesden, in the North Western Sub-Area.

Rates of pay and conditions of service will be in accordance with the agreement of the National Joint Industrial Council for the Electricity Supply Industry, the present rate of pay being 3/3 per hour, which amounts to £7/3 per 44-hour week.

Applications, stating age, qualifications and experience, should be sent direct to the Establishments Officer, 46-47, New Broad St., E.C.2, to reach his office not later than 3rd June, 1950. Please quote EST/V/681/R on envelope and all correspondence. 3664

## LONDONDERRY CORPORATION ELECTRICITY DEPARTMENT

### Power Station Superintendent

APPLICATIONS are invited for above appointment. Salary in accordance with N.J.B. Schedule A, of 15th November, 1949, Class D, Grade 2, £810-£840 per annum. A station house, free of rent, rates and taxes, will be available.

Applicant should have sound operating and maintenance experience in a medium or large capacity generating station, and should possess good technical, practical and administrative qualifications. A Superannuation Scheme is in operation.

Applicant must not be over 35 years of age, except in the case of ex-Servicemen, who must not be over 40 years of age.

The successful candidate will be required to pass a medical test as to fitness, and to produce a Certificate of Birth, and would be required to comply with the performance of the Safeguarding of Employment Act (N.I.), 1948.

Applicant to supply the following information, also his qualifications, experience, etc., under each heading, as follows: (1) Name and address; (2) age, if married or single, number of children, if any; (3) if war ex-Serviceman; (4) present position, giving class of station and grade of position; (5) details of apprenticeship; (6) technical training; (7) academic distinctions; (8) administration, up to 35 men; (9) operation and testing of power station plant; (10) supervision, maintenance and overhaul of turbo alternators, W.T. boilers, ancillaries, feed water treatment plants, etc.; (11) copies of recent testimonials, or names of references; (12) applicant to state if prepared to arrange for interview at very short notice, travelling and subsistence expenses being paid, and earliest date he could take up duties from date of receipt of appointment.

Applications marked "Power Station Superintendent" should be lodged with the undersigned not later than 10 a.m. on Monday, 5th June, 1950.

Canvassing in any form will be a disqualification.

Dated this 15th day of May, 1950.

JAMES THOMPSON,
Town Clerk.

Guildhall,
Londonderry. 3603

## PUBLIC SERVICE OF VICTORIA, AUSTRALIA

### Vacancies for Draughtsmen

EXPERIENCED architectural and mechanical and electrical engineering DRAUGHTSMEN are required by the Public Works Department of Victoria Melbourne

Salary Ranges:

| | | |
|---|---|---|
| Grade I | .. .. .. | £527—£579 |
| .. II | .. .. .. | £449—£501 |
| .. III | .. .. .. | £390—£436 |
| .. IV | .. .. .. | £312—£364 |

In addition to the above rates a cost of living allowance—at present £114 a year—is payable.

Applications in writing in duplicate, giving age and details of experience and qualifications, should be lodged at the Office of the Agent-General for Victoria, Victoria House, Melbourne Place, Strand, London, W.C.2, not later than 31st May, 1950.

Applicants will be selected for subsequent interview when details of appointment, etc., will be made available. 3491

## GENERAL SALES MANAGER

A HIGH executive position is available in a large company manufacturing electrical lighting fittings and accessories. A four-figure salary will be paid to a good man who is capable of directing a sales force of 20-30 representatives and branch managers. Applicants should have a sound knowledge of the usual trade associations, discounts and price structure, and preferably be a Corporate Member of I.E.E. or equivalent.

Applications, which will be treated in strict confidence, should be addressed to Box 3624.

## SOUTH WALES ELECTRICITY BOARD

APPLICATIONS are invited for the position of ASSISTANT DISTRICT ENGINEER in District 347 (Cardiff East), in the Central Sub-Area of the Board.

Preference will be given to applicants who possess an Engineering Degree of a British University, the Higher National Certificate or its equivalent, or have passed the Graduateship Examination of the Institute of Electrical Engineers.

The salary for positions will be in accordance with Class F, Grade 4 (£767/£785/£803) of the National Joint Board Schedule for the Electricity Supply Industry.

Applications, stating age, present position, present salary, qualifications and experience, and whether married or single, together with the names and addresses of three referees, should be addressed to the Secretary (Establishments Section), South Wales Electricity Board, St. Melons, Nr. Cardiff, so as to reach him not later than 7th June, 1950. 3653

## GOVERNMENT OF PUNJAB, PAKISTAN

APPLICATIONS are invited from men only for the following special posts in the Punjab College of Engineering and Technology, Lahore:—

One PRINCIPAL. Pay Rs.2,500 (R. equals approx. 2s 2d) p.m.

Three PROFESSORS, one each of Civil, Mechanical, and Electrical Engineering. Pay Rs.1,600-100-2,000 p.m.

Nine ASSISTANT PROFESSORS, three each of Civil, Mechanical and Electrical Engineering. Pay Rs.625-40-1,025/50-1,275 p.m.

All posts on contract for 5 years in first instance; non-pensionable; contributory provident fund; rent free quarters or 10% of pay in lieu; free medical attendance; special rates of pay will be considered for exceptional qualifications.

For selected candidates of non-Asiatic domicile: Overseas pay for Principal and Professors £30 p.m. each and for Assistant Professors £15 p.m. each; free passages.

**Qualifications.**

PRINCIPAL. Fully qualified Mechanical and Electrical or Civil Engineer holding University Engineering Degree (preferably Honours) and M.Inst.C.E., M.I.Mech.E. or M.I.E.E. or with equivalent qualifications; several years' experience in modern methods of teaching engineering; ability for, and preferably experienced in, College administration; age not less than 45 years and preferably not more than 55 years.

PROFESSORS. University Hons. Degree in Civil, Mechanical or Electrical Engineering and Corporate Membership of the appropriate Engineering Institution or equivalent; 10 years' teaching in appropriate engineering subjects in a university, college, etc., up to degree standard; 5 years' practical experience, including (for Civil Engineering) in execution and design work or (for Mechanical Engineering) in workshops and drawing office; college administrative experience an advantage; age not less than 40 years and preferably not more than 45 years.

ASSISTANT PROFESSORS. Academic qualifications as for Professors; 5 years' teaching experience; practical experience an advantage; age 30 to 40 years.

Application, on the form to be obtained on request, should be made to the Office of the High Commissioner for Pakistan, 35, Lowndes Square, London, S.W.1. Closing date for the receipt of applications 12th June, 1950. 3650

## CITY OF BIRMINGHAM EDUCATION COMMITTEE

### Birmingham Central Technical College

### Department of Electrical Engineering

APPLICATIONS are invited for the appointment of SENIOR ASSISTANT in the Department of Electrical Engineering.

Salary will be in accordance with the Burnham (Further Education) Scale, plus training and graduate allowances where applicable.

The person appointed will be required to take up duty on the 1st September, 1950.

Further particulars and forms of application may be obtained from the Registrar, Central Technical College, Suffolk St., Birmingham, 1, on receipt of stamped addressed foolscap envelope. Completed forms should be returned to him not later than two weeks after the appearance of this advertisement.

E. L. RUSSELL,
Chief Education Officer.
3666

## BRITISH ELECTRICITY AUTHORITY

### East Midlands Division

### Assistant Shift Charge Engineer, Avon

APPLICATIONS are invited for the position of ASSISTANT SHIFT CHARGE ENGINEER at Avon Generating Station, Warwick.

Candidates should have had a sound general and technical education, and have experience in the operation of steam power stations.

The salary will be in accordance with the revised National Joint Board Schedule, Class E, Grade 9. The appointment will be superannuable under terms and conditions of the British Electricity Authority's Superannuation Scheme.

Forms of application may be obtained from the Divisional Establishments Officer at the undermentioned address, and should be returned to him not later than June 5th, 1950.

W. S. BURGE,
Divisional Controller.

British Electricity House,
Barker Gate, Nottingham. 3654

## SOUTH WALES ELECTRICITY BOARD

APPLICATIONS are invited for the position of ASSISTANT DISTRICT ENGINEER in District 341 (Aberdare, Hirwaun, Mountain Ash) in the Central Sub-Area of the Board.

Preference will be given to applicants who possess an Engineering Degree of a British University, the Higher National Certificate or its equivalent, or have passed the Graduateship Examination of the Institute of Electrical Engineers.

The salary for the position will be in accordance with Class D, Grade 4 (£667/£685/£703) of the National Joint Board Schedule for the Electricity Supply Industry.

Applications, stating age, present position, present salary, qualifications and experience, and whether married or single, together with the names and addresses of three referees, should be addressed to the Secretary (Establishments Section), South Wales Electricity Board, St. Melons, Nr. Cardiff, so as to reach him not later than 7th June, 1950. 3654

## SOUTH WALES ELECTRICITY BOARD

APPLICATIONS are invited for the position of ASSISTANT DISTRICT ENGINEER in District 348 (Cardiff West) in the Central Sub-Area of the Board.

Preference will be given to applicants who possess an Engineering Degree of a British University, the Higher Graduateship Examination of the Institute of Electrical Engineers.

The salary for the position will be in accordance with Class D, Grade 4 (£667/£685/£703) of the National Joint Board Schedule for the Electricity Supply Industry.

Applications, stating age, present position, present salary, qualifications and experience, and whether married or single, together with the names and addresses of three referees, should be addressed to the Secretary (Establishments Section), South Wales Electricity Board, St. Melons, Nr. Cardiff, so as to reach him not later than 7th June, 1950. 3655

## SWITCHGEAR ESTIMATOR FOR SOUTH AFRICA

A SWITCHGEAR ESTIMATOR is required for the works of Johnson & Phillips, Ltd., at Johannesburg, South Africa. Duties: Handling enquiries and preparing estimates for locally built and/or imported switchboard and components. Handling orders and passing instructions to works. Salary £720 per annum, plus statutory cost-of-living allowance (at present £57/4 p.a.). Applications, which will be treated in strict confidence, to:—

**Employment and Welfare Manager,**
**JOHNSON & PHILLIPS, LTD.,**
**Charlton, S.E.7.** 3407

## KENT COUNTY COUNCIL

APPLICATIONS are invited for the following appointments in the Buildings Department:—

(1) SENIOR ENGINEERING ASSISTANT (Electrical) in A.P.T. Grade VI (£595-£660).

(2) TWO ENGINEERING INSPECTORS in A.P.T. Grade V (£520-£570).

Applicants for (1) must be Corporate Members of the Institution of Electrical Engineers and be capable draughtsmen, with good experience in the preparation of schemes, specifications and estimates for all classes of electrical installation work. The duties will include the preparation of drawings, inspection of premises and supervision of installations.

Applicants for (2) must have had good practical experience in the design and installation of equipment in one or more of the following:—

(a) Electrical installations for buildings.

(b) Low pressure hot water heating and domestic hot and cold water systems.

(c) Steam services associated with heating and cooking installations.

Preference will be given to Members of the Institution of Heating and Ventilating Engineers or the Institution of Electrical Engineers.

The posts are superannuable and the successful candidates will be required to pass a medical examination.

Applications, on forms obtainable from the County Architect, Springfield, Maidstone, must be delivered to him not later than fourteen days after the appearance of this advertisement.

W. L. PLATTS,
Clerk of the County Council.

County Hall, Maidstone.
16th May, 1950. 3663

## CHIEF DRAUGHTSMAN

SIMPLEX ELECTRIC COMPANY LIMITED, require at their Blythe Bridge factory a chief draughtsman for the production drawing office. Duties include the production design of Creda appliances, and first-class experience of appliance production methods is an essential qualification. This is a senior position for which a substantial salary will be paid. Apply giving details of age, experience and qualifications to:—

The Secretary,
SIMPLEX ELECTRIC CO., LTD.,
Broadwell, Oldbury, Birmingham.

3591

## NORTH OF SCOTLAND HYDRO-ELECTRIC BOARD

### Aberdeen Area

APPLICATIONS are invited for appointment as MAINS ASSISTANT from persons having experience of change-over of system from d.c. to a.c. as applied to distribution work.

Applicants should preferably hold technical qualifications of High National Certificate Standard.

Salary in accordance with grade 9, class F, of the revised National Joint Board Schedule (£538-£560 per annum).

Applications should be addressed to the undersigned not later than 10 days after the publication of this advertisement.

ALEX. GARDNER, Area Manager.

Area Offices,
Millburn St., Aberdeen. 3665

## REPRESENTATIVES WANTED

HERMAN SMITH, Ltd., Reliance Works, Dudley, the manufacturers of "Smithilite" tungsten and fluorescent fittings, control gear, etc., require additional experienced REPRESENTATIVES, with cars and resident on the territory for the following areas:—

1. West and East Riding of Yorkshire.
2. Northumberland and Durham.

Remuneration by salary, commission and all expenses. Replies with full particulars addressed to Sales Manager, in confidence. 3668

## CIVIL SERVICE COMMISSION

AN Open Competitive examination will be held, commencing on the 22nd August, 1950, for not less than 75 appointments as ASSISTANT TRAFFIC SUPERINTENDENTS (Male and Female) and not less than 10 for ASSISTANT ENGINEERS (Male) in the Post Office. Age limits 18-23 on 1st March, 1950, with extension for regular service in H.M. Forces and, up to two years, for voluntary service in H.M. Forces otherwise than on a regular engagement, for compulsory national service under the National Service Acts, or for established civil service.

Particulars and application forms will be sent in response to requests (preferably by postcard) addressed to the Secretary, Civil Service Commission, 6, Burlington Gardens, London, W.1, quoting No. 3111. The latest date for the receipt of the application forms is 22nd June, 1950. 3651

## EASTERN ELECTRICITY BOARD

### Chilterns Sub-Area—Luton District

### District Senior Commercial Assistant (Industrial Power)

APPLICATIONS are invited for the above appointment, the selected candidate being required to advise important industrial consumers on matters relating to tariffs, installation of industrial electrical equipment, factory lighting, power factor improvement, etc.

Preference will be given to those having the Higher National Certificate in Electrical Engineering, of good personality and appearance, and having considerable experience of industrial installations, including preparation of estimates for work involved.

The salary offered will be in accordance with the N.J.C. (Administrative and Clerical Grade) Provincial Scale, Grade 4, £530 per annum. The selected candidate will be required to contribute to a superannuation scheme and may be required to undergo a medical examination.

Ability to drive a car is desirable.

Applications, stating age, education, technical qualifications and experience, should be submitted in writing to The District Manager, Luton District,
Chilterns Sub-Area,
Eastern Electricity Board,
487, Dunstable Road,
Luton, Beds,
to arrive not later than 14 days from the appearance of this advertisement.

19th May, 1950. 3656

## EASTERN ELECTRICITY BOARD

### Northmet Sub-Area

### Appointment of District Commercial Officer Finchley

(Ref. No. 247)

APPLICATIONS are invited for the position of DISTRICT COMMERCIAL OFFICER at Finchley.

The successful candidate will be responsible under the District Manager for all commercial activities.

Preference will be given to Corporate Members of the Institution of Electrical Engineers who possess the following qualifications:—

1. Sound engineering training.
2. Experience in commercial development, including rate of supply.
3. Experience in hire and hire purchase schemes, control of service centre sales and maintenance staff.
4. Preparation of wiring specifications and control of wiring staff.

The salary for the appointment will be on Grade 7, N.J.C. Schedule £705-£795 per annum. Future salary and conditions of service will be in accordance with agreements made from time to time by the appropriate negotiating bodies.

Applications should be made on forms obtainable from the District Manager, Finchley District, Eastern Electricity Board, Squires Lane, Finchley, N.3, and should be returned by the 30th May, 1950.

20th May, 1950. 3657

## YORKSHIRE ELECTRICITY BOARD

APPLICATIONS are invited for the following appointment:—

No. 5 (Wakefield) Sub-Area.

THIRD ASSISTANT (Street Lighting and Special Supplies)—Vacancy No. 30/50.

Applicants, who should have had a good general education and be technically qualified, must be fully experienced in the application of electricity for street lighting purposes, in the preparation of estimates and in the relevant negotiations with Local Authorities.

They must also have had experience in negotiation for special types of supply with all classes of consumer and, in particular, with those in rural development areas.

Salary in accordance with the National Joint Board Schedule, Class J, Grade 10, £609-£633 per annum.

Applications, stating the above vacancy number, and giving full details of age, education, training and experience, should be forwarded to the Manager, No. 5 (Wakefield) Sub-Area, Yorkshire Electricity Board, 1a, Denby Dale Road, Wakefield, within fourteen days of the appearance of this advertisement. 3652

A NUMBER television/radio service engineers, also radar mechanics, wiremen, testers, etc.; instrument makers and improvers; power station engineer, also shift and maintenance engineers (overseas); lift engineers; radio development engineers; junior estimator-ratefixers; production engineers; lab. assistant; trainee mechanics; draughtsmen and tracers; numerous other senior and junior positions. London and provinces.—Technical Employment Agency, 179, Clapham Rd., S.W.9 (Brixton 3487). 3639

ACCOUNTS clerk, male or female, required by well-known London contractors. Must have full experience of costing and preparation of sales invoices for all types of installation contracts.—Full details of experience, age and salary required, to Box 3581.

A WELL-KNOWN London contracting company requires a supervising and estimating engineer. Must have extensive London experience in all branches of the contracting business. Excellent opportunity and salary paid in accordance with qualifications.—Training, experience, age and salary required, in confidence, to Box 3580.

APPLICATIONS are invited by the Electrical Apparatus Co., Ltd., from Engineers with first class technical design and sales ability. Motor control gear, switchgear or instruments. Appropriate remuneration. Living accommodation available.—Apply in confidence, Secretary, The Electrical Apparatus Co., Ltd., St. Albans, Herts. 3694

APPLICATIONS are invited for the following position at the West Ham Generating Station: Electrical Fitter who must have had experience in the overhaul and maintenance of heavy E.H.T. switchgear. Electrical Fitter for maintenance of small wiring associated with control and protection of E.H.T. systems. Mechanical Fitter for repairs and maintenance of power station instruments. Wages and working conditions in accordance with the N.J.I.C. Agreement. The present rate is 3s 3d per hour for a 44-hour 5-day week.—Applications, in writing, to the Station Superintendent, British Electricity Authority, London Division, West Ham Generating Station, Bidder St., Canning Town, E.16. 3605

ARMATURE Winder, fully qualified and experienced, required immediately for important zinc/lead mine in Northern Rhodesia. Basic pay 36s. 6d per shift plus cost of living allowance and metal bonus. Pension scheme in operation. Ideal climate with facilities for all kinds of sport.—Write, in first instance, giving full details of qualifications, experience, marital state and date available, to Box No. 536, Foster, Turner & Everetts, Ltd., 11, Old Jewry, London, E.C.2. 3572

ASSISTANT Engineer wanted for wood pole and steel tower contracts in Northern Ireland. Salary according to experience.—Apply J. L. Eve Construction Co., Ltd., 17, Hill Side, Ridgway, Wimbledon, S.W.19. 3603

ASSISTANT manager required by James Scott & Co. (Electrical Engineers), Ltd., Edinburgh; apprenticeship and subsequent experience with well-known electrical contracting firm essential; must have experience in running of large contracts and handling of staff; generous pension scheme; really excellent opportunities for promotion; apply, in confidence, stating age and experience to—A. Stuart Thomson, B.Sc., Auchraw of Mailer, Perth. 3529

CHARGEHAND Electrical Fitter wanted, E.T.U. rate and subsistence.—Details of experience to Box 8695.

CHARGEHAND required immediately to supervise low voltage underground and overhead work; must be prepared to live away.—Write stating experience and wages required to Box 3598.

CHIEF Design Engineer required by large manufacturing organisation to control a design department dealing with a.c. and d.c. rotating machines of medium and large size. A chartered engineer having university degree is preferred, who has considerable practical experience of the electrical and mechanical design, development and manufacture of electrical machinery. The post offers exceptional opportunities for the exercise of initiative and responsibility, with interesting prospects of advancement to a high salary level. Congenial conditions include pension scheme and housing assistance.—Applications, in confidence, to Box 3565.

CHIEF estimator required by James Scott & Co. (Electrical Engineers), Ltd., Edinburgh; previous comprehensive experience and apprenticeship with good electrical contractor essential; excellent opportunities for advancement and promotion; apply, in confidence, stating age, experience and any technical qualifications to—A. Stuart Thomson, B.Sc., Auchraw of Mailer, Perth. 3530

CLANG, Ltd., require salaried representative for S.W. England and South Wales.—Apply, stating full details of experience, area worked, type of customer called on and details of car ownership, to Box 8621.

COMPETENT electricians required for contract in South Wales.—Apply or write W. J. Furse & Co. (Manchester), Ltd., 20, Mount St., Manchester, 2. 3592

CONTACT and Sales Representative required by James Scott & Co. (Electrical Engineers), Ltd., Glasgow, for South West Scotland. Previous sales experience essential and preference given to one with knowledge of electrical trade. Must be of good education, manner and address. Specially good opportunities for young man with energy and sales initiative.—Apply, in confidence, to A. Stuart Thomson, B.Sc., Auchraw of Mailer, Perth. 3687

CONTROL Gear Engineers with experience of electric winders and haulages required for employment in the Midlands. Applicants with good experience of this class of work and capable of preparing schemes, should apply giving details of qualifications, experience, age, salary required and whether married or single, quoting reference 769, to Box 3677.

COOKE & FERGUSON, Ltd., require fully qualified Designer-Draughtsmen having experience on switchgear or alternatively men with suitable engineering training, at least up to Ordinary National Certificate level, and willing to undertake specialised training.—Applicants should reply to the Personnel Manager, South Street Works, Openshaw, Manchester, 11, stating age, details of experience and salary required. 3671

DESIGNER-Draughtsman required by the manufacturers of "Temco" electrical wiring accessories. Must be familiar with the light electrical apparatus industry. This post carries a good salary and offers scope for advancement for the right man.—Write, giving full details of experience, to Personnel Manager, Telephone Manufacturing Co., Ltd., Martell Rd., West Dulwich, S.E.21. 3301

DESIGNER-Draughtsman with experience in domestic appliances required to develop established ideas to mass-production stage.—Submit details of experience, references and salary required to Box 3612.

DRAUGHTSMAN, preferably conversant with electrical switch and control gear, required for factory in Lanarkshire.—Please reply to Box 3614.

DRAUGHTSMEN (section leader and senior standard) fully qualified to design mechanical or electrical equipment in connection with (a) instruments, (b) light precision mechanisms, (c) electronic equipment, (d) servo-mechanisms; practical training and experience in one of the above headings together with ability to work on own initiative is essential; progressive staff positions with good prospects and congenial working conditions.—Apply, stating training, qualifications and experience in chronological order, to Personnel Officer, Ferranti, Ltd., Ferry Rd., Edinburgh. 139

DRAUGHTSMEN with electronic experience required by large radio manufacturer in the East London area; applicants should have thorough drawing office training and technical education to National Certificate or equivalent standard.—Kindly state details of technical training and experience with age and salary required to Box 3597.

ELEC design department assistant reqd. H.N.C. std., with experience in design of small a.c. and d.c. motors—Apply in writing, giving details of age, qualifications, experience and salary reqd., to Personnel Officer, Woods of Colchester, Ltd., Colchester, Essex. 3606

ELECTRIC lamps (miniature) S.W. London; works management, assistant works manager, to take full responsibility producion (belt system), control and process planning; must have wide experience, also in production engineering of modern miniature lampmaking machinery; house available; state age, education, experience and remuneration required.—Box 3601.

ELECTRICAL Draughtsmen for oil refinery work, experienced in wiring and installation layouts and taking off quantities. Should be capable of laying out small sub-stations and switch-houses. Knowledge of cable layouts and flame-proof conduit work desirable. Five-day week with paid overtime.—Apply by letter, stating age, experience, salary expected and when free to commence work, to Chief Draughtsman, The Lummus Co., Ltd., 525, Oxford St., London, W.1. 3557

ELECTRICAL engineer or physicist, with experience of the manufacture of valves or cathode ray tubes, and with Higher National Certificate or equivalent, is required by an X-ray tube production unit for technical control work.—Apply to the Personnel Officer, G.E.C. Research Laboratories, North Wembley, Middx, stating age and record. 3498

ELECTRICAL engineer required, capable of undertaking complete industrial power installations, including erection of shafting, drives, control gear and motors, permanent position offered to first class man willing to travel; write stating experience, age and rate required.—Box 8680.

ELECTRICAL engineers, age 26 to 33 years, with qualifications of Higher National Certificate standard and experience in manufacture, repairs and maintenance of electrical plant, are required as inspecting engineers in districts: Oxford, Worksop, Stafford, Coventry, St. Albans and Dunfermline. Progressive salary, commencing £450, rising to £650 per annum, and free pension scheme. Contributory widows and orphans scheme.—Apply in own handwriting, stating age, qualifications, experience, and whether married or single, by letter marked "Electrical Inspector," to Chief Engineer and General Manager, The National Boiler & General Insurance Co., Ltd., St. Mary's Parsonage, Manchester, 3. 3481

ELECTRICAL engineers required for service in Middle East; applicants should (a) possess Ordinary or Higher National Certificate and have had full apprenticeship with heavy electrical equipment manufacturers or with a large colliery or allied fully electrified industry, or (b) possess a degree and have had two years' technical apprenticeship with similar firm to above; in each case applicants must have had at least three years' subsequent experience on the installation and maintenance of heavy electrical equipment; maximum age limit 35 years; attractive salary, plus generous allowance in local currency, free passages out and home, free medical attention, kit allowance, good leave arrangements, pension scheme.—Write, giving personal particulars and details of qualifications and experience, quoting Dept. F.191, to Box 2592, at 191 Gresham House, E.C.2. 194

ELECTRICAL estimating and costing engineer required by large contracting firm in Glasgow; successful applicant's main responsibility will be the costing and detail invoicing of transmission lines, power and lighting contracts, and time and material jobs.—Apply, stating age and salary required, and giving full details of electrical experience. Box 3615.

ELECTRICAL draughtsman required large engineering firm in East Anglia for plant department, duties will include design and lay-outs of mechanical and electrical equipment for installation and development work associated with mechanised foundries and machine shops; some mechanical knowledge desirable, contributory superannuation scheme applicable to this appointment after 12 months' service, good canteen facilities and transport; Applications stating age, education, qualifications, experience and salary required.—Box 3584.

ELECTRICAL inspectors required by major oil company operating in Middle East. Applicants should have a wide experience of inspection and testing of motors, switchgear and the electrical equipment associated with modern large generating stations, substations and transmission and distribution networks with voltage range of 33kv to 440 volts. Knowledge of flameproof equipment an advantage. Possession of Higher National Certificate essential and qualifications up to A.M.I.E.E. desirable. Age limit 37 years. Attractive salary plus generous allowance in local currency, free passages out and home, free medical attention, kit allowance, pension scheme, good leave arrangements.—Write, stating age and full details of qualifications and experience, quoting Dept. F.182, to Box 2334, at 191, Gresham House, E.C.2. 188

ELECTRICIAN required, experienced in h.t. and l.t. distribution power and lighting installation, light electro-mechanical apparatus and knowledge of modern electronics.—Write stating age, experience and salary required to Box H.733, Willings, 362, Grays Inn Rd., London, W.C.1. [3594

ELECTRICIANS and mates, experienced all types installations. 12-18 months contract in Syria, required by large London firm engineers and contractors.—Box 3674.

ELEXCEL, Ltd., require additional sales representatives to operate the following areas: South Western, Yorkshire, East Midlands and South Wales Electricity Boards.—Applications, giving full particulars of previous experience, etc., in strictest confidence, to Sales Manager, Victor Works, Broadgreen, Liverpool, 14. 3496

ENGINEER wanted for sales office of electrical manufacturers near London to handle quotations and technical correspondence; experience of motor control gear design essential; salary £500-£600 per annum; state age and experience to—Box 3424.

ENGINEER Draughtsman with experience in design, layout and installation of complete electrical equipment for gas and chemical plants, required by firm of engineers and contractors on N.E. Coast.—Apply, stating age, experience and salary required, to Box 3673.

ENGLISH ELECTRIC have further vacancies at Stafford and Liverpool for Draughtsmen to meet greatly increased switchgear programme. Men with electrical or mechanical D.O. experience on any class of electrical switch or control gear are required and every consideration will be given to draughtsmen at present on other classes of work who wish to make a career on this vitally important and interesting work.—Apply, quoting reference 141, to Central Personnel Services, English Electric Co., Ltd., 24-30, Gillingham St., London, S.W.1. 3676

ENGLISH ELECTRIC require a technical representative for the Birmingham area; candidates should have good experience of industrial electronic equipment and be resident in the Birmingham area; previous commercial experience in this field is desirable; car provided.—Apply, giving full details and salary expected, mentioning reference 356A, to Central Personnel Services, English Electric Co., Ltd., 24-30, Gillingham St., London, S.W.1. 3625

ESTIMATING and technical engineer required by leading firm of London (W.C.2) contractors; actual experience contractor's office and of designing schemes essential; excellent and permanent position for good man.—Write detailed experience, technical training and salary required Box 3613

ESTIMATING engineer (first class) required in engineering dept. of Birmingham motor control gear manufacturers.—Box 3632.

ESTIMATOR, with experience electric motors and control gear, for eng. firm, East Anglia; good prospects, interesting work.—Apply, stating age, qualifications, full details of previous experience and salary required, to Box 3629.

FIRST-CLASS research physicist required for research department of a lamp works in Yorkshire, degree in physics with a knowledge of chemistry and light engineering is desirable, plus approved record in research work; the appointment will carry a good salary commensurate with qualifications and experience of the person appointed.—Please send applications to Ref. GLG, Crompton Parkinson, Ltd., Guiseley, Yorkshire. 3583

FIRST class sales representative for motors and control gear in the Midlands; good remuneration paid to experienced engineer with live connection; only those having the qualifications need apply; state full particulars.—Box 3633.

ILLUMINATING Engineer required by well-known firm of fittings manufacturers for responsible post in London.—Write, stating age, experience and salary expected, to Box M.737, Willings, 362, Gray's Inn Rd., W.C.1. 3607

JUNIOR draughtsman required, excellent opportunity of gaining first class experience in an important branch of the electrical industry; West London area; A.E.S.D. London rate.—Write full details of experience to Box 3596.

MANUFACTURERS of wrought iron products, mainly electrical, require Representatives, part time, to work on a commission basis in various areas of Great Britain.—Box 3670.

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OVERHEAD linesman and mates required, Manchester and Northern Ireland.—Apply J. L. Eve Construction Co., Ltd., 17, Hill Side, Ridgway, Wimbledon, London, S.W.19. 3519

PLANNING engineers (senior), experienced in the production and operational planning of electro-mechanical precision instruments and/or radar equipment, together with the materials used in their manufacture; knowledge of costing an advantage; flats available for successful applicants; excellent prospects.—Apply, stating salary expected and giving full details of training, qualifications and experience, to the Personnel Officer, Ferranti, Ltd., Ferry Rd., Edinburgh. 141

PRODUCTION control, senior assistant required, able to control production planning, scheduling, machine shop loading, assembling and progressing; experience in light electrical engineering essential; interesting work with prospects for the right man; 5-day week, canteen; West London district.—Write full particulars and salary required to Box 3595.

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REPRESENTATIVE required by progressive group of companies whose products are widely used including insulating material, instruments and transmission material. Permanent, progressive position offered to young man not over 30 resident London for London and Midland area. Salary £500 per annum commencing, expenses and commission later.—Box 3560.

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REPRESENTATIVE with established connection electrical wholesalers and contractors required by manufacturers of switches, lampholders and other accessories, etc. London area.—Box 3610.

REPRESENTATIVE working on commission basis required for Sussex and Surrey. Excellent opportunity for man with established connection among electrical contractors.—Box 3455.

SALES engineer required by old-established company of motors and control gear manufacturers for London and Home Counties. Applicant should be keen, energetic and preferably with sales experience and connections.—Apply with full particulars to Box 3501.

SALES Engineer required for London area by accessories manufacturer on salary and commission basis. Knowledge of electrical installation practice an advantage. State experience and basic salary required.—Box 3679.

SALES Engineer required for the East and West Riding of Yorkshire, by old-established E.W.F. wholesale house. Salary, commission and expenses. Applicant should live in the territory and must have had previous electrical sales experience.—Apply, giving full particulars in confidence, to Box 3678.

SALES engineer required to operate in the London area, must have useful connections and practical experience in the sales and utilisation of moulded, resinoid and mica products; salary £500 p.a., plus commission on sales effected.—Applications stating age, education, details of training and positions held to Southern Areas Electric Corporation, Ltd., 28, Queen Anne's Gate, S.W.1. 3599

SENIOR and junior electrical designers experienced in all classes of a.c. and d.c. dynamo electric machines from 5 to 5,000hp/kW, 5-day week; superannuation scheme in operation.—Applications stating age, experience and salary expected to Personnel Manager, Lancashire Dynamo & Crypto, Ltd., Trafford Park, Manchester, 17. 3579

SENIOR Designer-Draughtsman fully experienced in light mechanical design, required for development work on hydraulic servo systems. The position calls for a sound practical engineer of good inventive ability and initiative. Age 30-35.—Box 3675.

SENIOR Draughtsman required. Experience in mechanical design of electric motors up to 30hp essential.—Write, stating age, experience and salary required, to Box 8693.

SENIOR electrical draughtsmen are required by an established British firm with American affiliation; experience of power distribution and lighting installations as applied to the oil refinery and chemical industry essential, qualifications to H.N.C. standard; substantial salaries will be paid to suitable applicants.—Write stating age, qualifications and experience, Foster Wheeler, Ltd., 3, Ixworth Place, London, S.W.3. 3592

SENIOR electrical engineer, able to direct and control research, development, design and drawing office of old established light electrical manufacturers. Excellent prospects for man with first-class experience.—Fullest particulars of career to date and salary required, in confidence, to Box 3479.

STAFF required for engineering division of a firm engaged on instrument and radar equipment; duties involve (a) the engineering and production design of new items to be put into production after the prototype has been evolved in the laboratories, and (b) the clearing of technical snags during the various stages of production; applicants should have (a) degree or equivalent, (b) knowledge of production methods, and (c) several years' experience in production design of instrument or radar equipment; salary in accordance with age and experience.—Apply, giving full details of training, qualifications and experience in chronological order, to Personnel Officer, Ferranti, Ltd., Edinburgh. 140

TECHNICAL assistant required for power cable engineering office, with experience of cable design and calculation; B.Sc. grade or equivalent; state age, salary and qualifications.—Siemens Brothers & Co., Ltd., Ref. 701, Woolwich, London, S.E.18. 3626

TEST engineer to take charge of test department dealing with a.c. and d.c. motors and generators ¼–500hp.—Applications with full details to Higgs Motors, Witton, Birmingham, 6. 3600

TELECOMMUNICATION apparatus engineers; a large North London company has vacancies for apparatus design engineers; applicants must possess a degree and experience in the development of relays, transformers, accoustic devices, etc., is desirable but not essential.—Write, stating age, experience and salary required, to Box 3627.

TESTING Assistant urgently required for dry core telephone cable department in modern cable factory. Must be fully coversant with test requirements for British Post Office specifications covering twin local, star quad and multiple twin construction. Age approx. 25.—Full details of experience and salary required to Messrs. Aberdare Cables, Ltd., Aberdare, Glam. 3564

THE BRUSH ELECTRICAL ENGINEERING Co., Ltd., invites applications from qualified Engineers capable of taking charge of a department dealing with the design of comprehensive electrical power schemes. Experience is essential in the application of heavy electrical equipment to power stations and specialised industries, also ability to lead a team of designers and draughtsmen on field studies and layout work for tenders and contracts. Education of university standard is a necessary qualification. The work offers opportunities of exceptional interest and a progressive responsibility, with commensurate salary and congenial conditions.—Please write to The Technical Director, Loughborough. 3566

THE GENERAL ELECTRIC Co., Ltd., invites applications for the position of resident sales engineer in West Africa; the appointment is based on Lagos, but the duties would involve travel throughout the British West African Colonies and adjacent countries; applicants must be sound technically, have served an apprenticeship and have had fairly wide and responsible experience in the electrical engineering industry; professional qualifications are desirable; a single man would be preferred; age between 30 to 40 years; the position is a permanent one and will be well remunerated.—Apply to the Staff Manager, The General Electric Co., Ltd., Magnet House, Kingsway, W.C.2. 3628

TRANSFORMER assemblers required for the assembly of transformers from 20 to 2,500kva; permanent, progressive positions offered to suitable applicants; housing accommodation available in a delightful area.—Apply, giving full details of practical experience, age and salary required, to London Transformer Products, Ltd., Trading Estate, Gate Rd., Bridgend, Glamorgan, South Wales. 3611

TRANSFORMER estimator and technical correspondent required; must be capable of dealing with tenders for home and overseas business; practical experience an advantage.—Applications, stating age, qualifications, experience and salary required, should be addressed to Employment and Welfare Manager, Johnson & Phillips, Ltd., Charlton, London, S.E.7. 3631

TRANSFORMER Winder/Erector required for overseas factory. Must be single, a good all-round man and capable of winding, assembling and completely erecting all types of transformers from 5 kVA up to 2,500 kVA. The successful applicant will be required to go abroad as an instructor in an existing transformer factory after a period of intensive training in the works of a firm of long standing in the London area.—Applications by letter giving details of age, experience and salary required, to Box 3609.

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WANTED, senior and junior draughtsmen, electric motors a.c. and d.c. Modern factory with ideal conditions, now expanding. Five-day week.—Personnel Manager, Hopkinson Electric Co., Ltd., Subsidiary of The Brush Electrical Engineering Co., Ltd., Birchgrove, Cardiff. 3476

X-RAY and electro-medical engineer required for Birmingham area.—Apply in first instance, stating experience and salary required to A. E. Dean & Co., Progress Way, Waddon, Surrey. 3668

YOUNG engineers wanted for contracts and sales department of electrical manufacturers near London; keen, energetic men age approximately 25 years required; positions have prospects of outside sales engineering later.—State age, experience and salary required to Box 3532.

YOUNG instrument mechanic required in July for the calibration and repair of works voltmeters, ammeters and wattmeters.—Particulars of age, experience and salary required, to Brush Electrical Engineering Co., Ltd., Central Labour Dept., Loughborough. 3462

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Dissatisfaction having been so often expressed that unsuccessful applicants are left in ignorance of the fact that the position applied for has been filled, may we suggest that Advertisers notify us to that effect when they have arrived at a decision? We will then insert a notice free of charge under this heading.

BOX 8496.—Sales manager; all applicants are thanked.

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COMMERCIAL executive (47), 20 years' experience handling wide range of electrical products with well-known manufacturers, control of sales, publicity, travellers, buying, records, stores and staff, seeks responsible position requiring initiative, drive, organising ability; good technical background; mobile.—Box 8632.

DRAUGHTSMAN (middle aged) seeks post in office, experience detail motors and generators.—Box 8675.

ELECTRICAL Engineer, thirty years' experience in practical and administrative positions, seeks change, Hants or Dorset preferred, own car.—E. B. Green, "Cawthorpe," Munro Crescent, Millbrook, Southampton. 8700

ELECTRICIAN wireman, experienced, installations, repairs, etc.—Gane, 15, Bullsmoor Ride, Waltham Cross, Herts. 8630

EXECUTIVE, young, energetic, at present managing director manufacturing electrical engineers, qualified electrical engineer, ex-Faraday House and Metro-Vick, seeks fresh fields offering greater scope in a managerial or executive position.—Box 8624.

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TOOLMAKER (press and pipe), 47, responsible positions held for past 22 years, seeks change, London or Home Counties preferred.—Box 8685.

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Any quantities.

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**ELECTRIC MOTORS**

175 hp slip ring motor by L.D.M., 415 revs, ball bearings, circuit breaker by BRUSH, and liquid type rotor starter with Pilot motor.

150hp slip ring motor by CROMPTON-PARKINSON, 585 revs, ball bearings, Ellison oil-immersed circuit breaker and rotor starter.

150hp slip ring motor by L.S.E., 2,940 revs, T.E.F.C. ball bearings, ironclad contactor starter by Allen West.

170hp S.C. motor by MATHER & PLATT, 585 revs, with oil-immersed auto-transformed starter.

135hp S.C. motor by E.C.C., 290 revs.

120hp S.C. motor by L.D.M., 365 revs, Maxtorq, with ball bearings.

All the above are suitable for 3 phase, 50 cycles, 400-440 volts.

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## B.C.S.

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(B) 60hp ditto Motor wound for 500/550v, 3 phase, 50 cycles.

(C) 30hp Screen protected slip ring induction motor by ENGLISH ELECTRIC Co., No. 13085 B.M.; wound for 400/440v, 3 phase, 50 cycles, 960 r.p.m.; fitted with end shield Ball and Roller Bearings; bare shaft extension; complete with 30hp non-reversing drum type controller by Vlasto Clarke & Watson with grid resistance.

(D) 30hp Ditto Motor, No. 13086 B.M.; complete as above.

(E) 30hp totally enclosed slip ring motor by MATHER & PLATT type K.5C No. 29125, wound for 550v, 3 phase, 50 cycles, 1,450/1,500 r.p.m.; rotor volts 185; rotor amps 75; 2in dia. shaft extension fitted with holf-coupling, 9⅞in dia.

(F) 6hp totally enclosed fan cooled slip ring induction motor by L.D.M. Size A.A.40; No. 48511; wound for 400/440v, 3 phase, 50 cycles; 840/950 r.p.m., fitted with double shaft extension 1⅝in dia. with coupling 6¾in dia. on one shaft.

(G) 6hp Ditto Motor, No. 48512.

(H) 5hp Totally enclosed fan cooled slip ring induction motor by ENGLISH ELECTRIC; wound for 400/440v, 3 phase, 50 cycles; 960/1,000 r.p.m. fitted with bare shaft extension; complete with Ellison Oil immersed Starter and Drum Controller.

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(A) Two 250kva YORKSHIRE ELECTRIC Transformers, 250kva 3 phase, indoor type, mounted on wheels, new 1940, voltage ratio 11,000/400. Delta H.T. 11,000v, 13.1amps, Star L.T. 400v, 362amps. 5 off load tappings.

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300hp slip-ring by G.E.C. Speed 365rpm. Open type frame, R.O.B. Continuously rated. With Ellison circuit breaker and starter.

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150hp synchronous induction by MATHER & PLATT, speed 750rpm. Open protected type R.O.B. with circuit breaker, starter and exciter.

135hp slip-ring induction by BRITISH ELECTRIC PLANT. Speed 1,450rpm. Screen protected type R.O.B. With Ellison circuit breaker and starter.

The above for 400-440volts 3-phase 50cycles supply.

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A.C. and d.c. motors, all sizes, large stocks, fully guaranteed.—Milo Engineering Works, Milo Rd., East Dulwich, S.E.22. Forest Hill 2278-9 102

A.C. and d.c. motors, alternators, generators, generating sets, transformers, welding equipment, plating plant, control gear, switchgear, portable electric tools, etc., etc. Write for current electrical stock list, post free.—Thos. W. Ward, Ltd., Albion Works, Sheffield. 'Phone 26311 (ex. 347). 174

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A.C. diesel set, 60kva, Ruston Hornsby 6-cyl. 1,000rpm, 400/3/50 direct coupled, good condition; £850, clearance.—Box 3636.

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BRAND new a.c. motors, ½rd to 90hp slip ring and squirrel cages, 400-440 volts 3-phase 50 cycles at 750rpm, 1,000rpm and 1,500rpm with or without control gear. Immediate despatch from stock. Attractive prices.—Full details post free from: Thos. W. Ward, Ltd., Albion Works, Sheffield. 178

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DIESEL generating sets, English manufacture, 3-phase, all sizes, from 50kw to 260kw.—Britannia Manufacturing Co., Ltd., 22-26, Britannia Walk, London, N.1. 157

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ELECTRIC motors, generators, control gear, transformers, a.c. and d.c., new and reconditioned; all covered with our usual 12 months' guarantee; large stocks available.—Electropower Co., Ltd., Kingsbury Works, Kingsbury Rd., London, N.W.10. Colindale 4621-2. 42

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FANS.—New white Revo, 36in, 3-blade, d.c., 230 volt ceiling fans. Complete with suspensions and speed regulators. 6 for £50 or singly.—Boyask, 65, Sidney St., London, E.1. Bishopsgate 3710. 8699

FLAMEPROOF motors, ¼-5hp inclusive, 3-phase, single-phase, and d.c. New price lists available, quick delivery.—Electropower Co., Ltd., Kingsbury Works, Kingsbury Rd., London, N.W.9. 96

FLUORESCENT lighting units, 22 models in 2-3-4-5ft metal and Perspex. Send for lists. Large stocks of tapped silent ballast switches, holders, shells, etc.—Moss Brothers, 112-114, Deptford High St., S.E.8. (Tideway 2623), and 53, Goodge St., W.1. (Museum 5385.) 12

FOR sale, small quantity new and second-hand motors, 1/30hp to ½hp, a.c. and d.c.; may be inspected at any time.—Box 3617.

FOR sale, unused field telephone cable on drums; approximately 500 miles D.3 single, approximately 500 miles D.3 twin, 1,000 miles D.8 twin; in perfect condition; megger test given for insulation and continuity.—Box 3536.

FOUR Hanson & Edwards seven-wire high-speed tubular-type stranding machines, to accommodate bobbins 8in flange diameter, 4in traverse; each machine is driven by a 5hp motor (we do not include motor and starter) through a Vulcan-Sinclair fluid coupling and a tex-rope drive, giving a cage speed of 1,300 rpm; each machine is complete with a screw lift-type take-up stand fitted with automatic flaking gear to accommodate drums 30in flange diameter, 15in traverse.—Box 3618.

FRACTIONAL hp motors, new, ex-stock, a.c./d.c. Universal, B.T.H., Delco-Remy, G.E.C., Fracmo, Newman, Scophony.—Jeary Electrical Co., Ltd., 5, Lamb's Buildings, E.C.1 33

GENERATING sets. Our new Powerco diesel sets, 3.4kva 230v/1/50 a.c.; complete, self-contained, delivery ex-stock, £198; other types, 1-50kw a.c. and d.c., from £59; separate generators, alternators, 1-30kw, £15 up; lists free.—Powerco (late Benmotors Power Supplies), Wandsworth Town Stn., York Rd., London, S.W.18. Bat. 5234. 153

GENERATING sets, petrol, 5 to 15kva, single-phase, 50 periods, 230 volts.—Midland Counties Elec. Eng. Co., Ltd., Grice St., West Bromwich. 43

GENERATING sets, petrol engine-driven alternators, 220/240 volts, single-phase and 3-phase.—Britannia Manufacturing Co., Ltd., 22-26, Britannia Walk, London, N.1. 160

GENERATING sets, petrol engine-driven dynamos, 110 volts and 220-240 volts, direct current.—Britannia Manufacturing Co., Ltd., 22-26, Britannia Walk, London, N.1. 159

GENERATING sets, petrol, paraffin and diesel, 1-, 2- and 3-phase a.c. and d.c., all voltages, export enquiries welcomed; all sets can be seen on full load run of at least three hours.—Fyfe, Wilson & Co., Ltd. Bishop's Stortford. (B.S. 1000-1.) 3642

HOUSE service meters, "C. & H.," "Aron," "E.A.C.," 20-240v a.c. s/ph. 50c 2½amps, 7/6 each, 1/6 postage; 5amps, 17/6.—Universal Electrical, 217-221, City Rd., London, E.C.1. 129

HOUSE service meters, from 5s. Guaranteed two years.—Electric Meter Co., Melville Lane, Torquay. 8690

IMMERSION heaters, Grubb 2kw and 3kw standard voltages, all lengths, 12in to 36in; also 4kw (non-taxable), 16in to 36in; fully guaranteed and immediate delivery.—For illustrated brochure, latest lists and trade terms, write distributors, John Owner & Co., Springfield Rd., Birmingham, 13. Tel. Spr. 2939. 8535

LESLIE DIXON & Co., for dynamos, motors, switchgears, chargers, telephones, etc.—214, Queenstown Rd., Battersea, S.W.8. Tel. Macaulay 2159. 18

MERCURY switches are made by Hall, Drysdale & Co., Ltd., of 58, Commerce Rd., Wood Green, London, N.22. Tel. Bow 7221. 182

METERS.—All types and sizes supplied, Siemens, Ferranti, Landis & Gyr, Met.-Vick, BIC., C. & H., Sangamo, Aron, etc.—Brent Electrical Co., 6, Holmdale Gardens, London, N.W.4. 131

METERS, a.c. and d.c., new and reconditioned, all types, quarterly, single and three phase, 3- and 4-wire, 2½ to 1,000 amps. Prepayment, single and double tariff, single, dual and triple coin, fixed and variable tariff, 2½ to 50 amps. M.D.I., billiards switches, rent collectors. Prices from 5s., carriage paid, two-year guarantee, immediate delivery.—Illustrated catalogue from The Electric Meter Co., 16, Melville Lane, Torquay. 8686

MOTOR converters and motor generators, unused. 110v and 220v d.c. to 230v/1/50: 1kva, £29; 4kva, £49; 6kw, £65; 110v and 220v d.c. to 25/35v d.c.; 1kw, £19; lists free.—Powerco (late Benmotors Power Supplies). Wandsworth Town Stn., York Rd., London, S.W.18. Bat. 5234. 149

MOTOR generator sets and converters, all sizes and voltages from ½kw up to 500kw in stock.—Britannia Manufacturing Co., Ltd., 22-26, Britannia Walk, City Rd., London, N.1. Tel. Clerkenwell 5512, 5513 and 5514. 28

MOTORS.—2 Crompton Parkinson 940 rpm 2hp; 1 Crompton Parkinson 1,420 rpm 1hp; 1 Lawrence Scott 1,440 rpm 2hp; 1 B.T.H. 1,425 rpm 2hp; 3 Glasgow Electric 1,450 rpm 10hp. Perfect condition.—Victor H. Iddon, Ltd., Harper Rd., Wythenshawe, Manchester. 3681

NAMEPLATES, engraving, diesinking, stencils.—Stillwell & Sons, Ltd., 153, Far Gosford St., Coventry, 14.

NEON glassware supplied to the trade; complete signs manufactured and erected.—Rada Signs, 59/61, Fuller St., London, E.2. Bis. 1140 5688

NEW C.M.A. grade T.R.S. cable, 3 core, 250v and 660v available in considerable quantities, sizes 3/.029 to 19/.052; prices below C.M.A.—The United Africa Co., Ltd., Unilever House, Blackfriars, E.C.4. Tel. Central 7474, extension 393. 3505

ONE Hanson & Edwards four-headed No. 2 automatic wire winding machine complete with swifts and measuring gear; this machine is arranged for 3hp motor drive (motor and starter not included) through texropes, and the machine will accommodate 12½in×6in bobbins, also 8in×4in bobbins.—Box 3619.

ONE Johnson & Phillips four-headed vertical bunching machine to accommodate bobbins 12½in diameter by 6in traverse; each head is complete with creels to accommodate 162 bobbins of fine wire; this machine is arranged for a self-contained 5hp motor drive (motor and starter not included).—Box 3620.

PBJ 7052 ex-Government cable, 25,000 yards available for disposal at considerably below list price.—Box 59.

PHONE 98 Staines.—60kW Allen and 20kW Petter oil sets, 220v d/c; 7½hp reduction motor. 1430/25rpm, 400/3/50; Four W.S. cyl. tanks 18½ft×7½ft. 5,000 galls.; Weir unused condensers, 160 and 100 sq ft.—Harry H. Gardam & Co., Ltd., Staines. 60

PLATING and anodising generators, over 100 in stock from 150 to 800 amps; d.c. or a.c. motors can be supplied for most sizes.—Fyfe, Wilson & Co., Ltd., Bishop's Stortford. (B.S. 1000-1.) 3641

PLATING dynamos, new, 800amps. 6volts, 400 amps, 6 volts, with d.c. or a.c. motors or new petrol engines.—Britannia Manufacturing Co., Ltd., 22-26, Britannia Walk, London, N.1. 156

PLATING dynamos, 1,600amp, 10volts, with d.c. or a.c. motors.—Britannia Manufacturing Co., Ltd., 22-26, Britannia Walk, London, N.1. 155

PURLEY chokes and ballasts. Silent operation, excellent performance, efficiency, long life, vacuum impregnated, quick delivery, low price (e.g., Purley Queen, 80w, 14/6 each, less quantity and cash discounts). Quotations for export.—F. W. Blanshard, Ltd. (Dept. E.R.), Purley, Surrey . 52

QUANTITY of 10 amp variable tariff meters.—Electric Meter Co., Melville Lane, Torquay. 8691

QUANTITY 5amp Smith a.c. 1/- coin prepayment meters, variable tariff certified.—Kippax Bros., Boot St., Burnley. 67

REBUILT Motors and Generators Long deliveries can often be avoided by purchasing rebuilt second-hand plant. We can redesign or replace surplus plant of any size. Send us your enquiries Over 1,000 ratings actually in stock here.—Dynamo & Motor Repairs, Ltd., Wembley Park, Middlesex (Tel. Wembley 3121, 4 lines); also at Phœnix Works, Belgrave Terrace, Soho Rd., Handsworth, Birmingham (Tel. Northern 0898). 26

RIGHTWAY pulley drawers, suitable for pulleys, couplings and wheels up to 20in dia.—For details send to Electric Machinery Co., M/cr . Ltd., Union St., Ancoats, Manchester. 85

ROTARY convertors in stock, all sizes, enquiries invited.—Universal Electrical, 221, City Rd., London, E.C.1. 16

RUBBER splicing compound tape for electrical jointing and repairs, self amalgamating, simply lapped under moderate tension, withstands 10,000 volts; 8oz coils, ¾in wide, 10/- doz. post free.—Wilkinson's, 19, Lansdowne Road, Croydon. 3068

SLOT meters, a.c. and d.c., all types, illustrated list.—Electric Meter Co., Melville Lane, Torquay. 8692

STARTERS, slipring and d.c., hand operated, all voltages up to 40hp. new. Short delivery. Also Push-Button and Star-Delta 380/440/3/50, ex-stock.—Electropower Co., Ltd., Kingsbury Works, Kingsbury Rd., London, N.W.9. Colindale 4621-2. 95

STONES carbon pile type Automatic voltage regulators, new, for alternators up to 200kw.—Box 3485.

SUPERIOR-Type builders' ladders now in production, also steps trestles and extension ladders. Tel. Shaftesbury Ladders, Ltd., 453, Katherine Rd., E.7. Grangewood 3363-4 15

TOUGH rubber cables, 15,000 yds mixed, single, twin and twin with earth, all sizes 1/.044in to 7/.036in inclusive; in short lengths of 10 yds to 25 yds. As one parcel, £12 per 1,000 yds irrespective of size.—Box 3231.

TRANSFORMERS of all sizes and ratios up to 1,000kva, large stocks at low prices for quick delivery.—The Electroplant Co., Wembley. Enquiries invited. 3640

TRANSFORMERS, unused, 230v/115/1/50. 3kva, £15; 5kva, £19; 10kva, £29; 15kva, £39; 100kva, 400/200/3/50 a.c. oil-cooled £135; lists free.—Powerco (late Benmotors Power Supplies). Wandsworth Town Stn., York Rd., London S.W.18. Bat. 5234. 152

TRANSPORTABLE oil-immersed auto transformer by Met.-Vick., nearly new; 90kva, 595 volts, 3-phase, 50 cycles input, 400 volts 3-phase 50 cycles output and neutral.—Service Electric Co., Ltd., Honeypot Lane, Stanmore, Middx. Edgware 8631-4. 3567

TWO-Way metal clad 15 amp splitters, 6/- each; 15 amp porcelain fuses, 9/- doz; T.P. 15 amp switch fuses, 9/6 each; 15 amp switch plugs, 9/6 each; fluorescent chain, double rack, 5/- dozen yds; 26in immersion heaters with Satchwell thermostats, 4kw, £6/10 each; carriage and packing paid; cash with order.—Winco Industries, 17, Stretford Rd., Manchester. 15. 3312

VENNER time switches, various types, hand-wound and synchronous, excellent condition.—Kippax Bros., Boot St., Burnley. 68

WARD Leonard control equipment, all sizes.—Britannia Manufacturing Co., Ltd., 22-26 Britannia Walk, London, N.1. 10

WELDING dynamos and welding sets for sale.—Britannia Manufacturing Co., Ltd., 22-26, Britannia Walk, London, N.1. 11

WELDING plant.—Several motor generator arc welders, single double and multiple operator up to 600amps. input 440-440 volts 3-phase 50 cycles. Also several transformer arc welders. All modern plant in first-class condition.—Details post free on request.—Thos. W. Ward, Ltd., Albion Works, Sheffield. 'Phone 26311 (ex. 347). 179

Z.E.P. fluorescent starter switches are available in 6 models at list prices, from 3/4 to 5/10 each, and will suit any make of fitting. Our trade and wholesale discounts are the highest in the industry.—Fluorescent Starters, Ltd., Springfield Rd., Guiseley, Leeds. 105

9 kVA new switchboards, 230v, 1-phase with instruments, switches and regulators; also Isenthal Automatic voltage regulators.—Midland Counties Electrical Eng. Co., Ltd., Grice St., West Bromwich. 169

10 kVA alternator sets. Ideal for country house, etc., 10 kVA 230v 50 cycles. Complete with exciter, voltage regulators, switchboard, frequency meters, amp. meters, and iron-clad switch fuses for output. Mounted on angle-iron stand and complete with Vee belt pulley. Designed to run at 1,500 rpm. but being belt driven they can be driven by an engine of any speed; unused. Price £85 each.—W. D. Sales, 42-46, Windmill Hill, Ruislip Manor, Middlesex. 19

20 kva Lister/Mawdsley diesel alternator sets, 400/3/50, four-wire, rebuilt as new, complete with panel, etc., £395 each; also 15kva ditto, 230/1/50, £325 each; some 9kva Lister/Mawdsley's also available.—Box 3409.

20, 30 and 40kVA .8p.f., 400 volts, three-phase, 50 cycles, 4-wire alternators, brand new.—Horseshoe Supply Co. (Spalding), Ltd., Horseshoe Rd., Spalding. 3586

25 hp Slipring Motor, 400 volts, 3-phase, 50 cycles, 970 rpm, B.T.H., coupled to size 7½ Higears worm reduction gear speed ratio 39-4, all on bedplate; no starter. This equipment has not been used.—Offers to Engineering Department, W. D. & H. O. Wills, East St., Bedminster, Bristol, 3. 3680

50 kVA diesel generating sets, 400/230/3/50, 4-wire, complete unit, air starting, unused, £795; lists 200 others.—Powerco (late Benmotors Power Supplies), Wandsworth Town Stn., York Rd., London, S.W.18. Bat. 5234. 151

100 kVA modern diesel alternator set, comp. vert. 4-cyl. solid injection oil engine on baseplate coupled to 400-230 volts 3-phase 50 cycles, 1,000rpm alternator. Details on request.—Thos. W. Ward, Ltd., Albion Works, Sheffield. 180

100 V. 5kW. Lister-Mawdsley diesel generating set (unused), self-contained unit with radiator cooling; £225.—Scottorn Ltd., Kingston Rd., New Malden, Surrey. Tel. Malden 3633. 132

CLASSIFIED ADVERTISEMENTS ARE PREPAID

**230** kva 3/50/400v oilbreak switch and auto-transformer starter 20/L. 1 N/V.—S. C. Bilsoy, A.M.I.C.E., A.M.I.E.E., Crosswells Engineering Works, Langley Green, near Birmingham. 82

**240** kw generator, 100-120 or 200-240 volts at 420-490rpm, 6 pole, compound interpole.—Fyfe, Wilson & Co., Ltd., Bishop's Stortford. 3643

**250** kw rotary converters (2) with transformers and switchgear, input 6,600 volts, 3-phase, 50 cycles output, 420/210 volts; also a.c. and d.c. motors, switchgear generating sets, welders, etc.—Midland Counties Electrical Engineering Co., Ltd., Grice St., Spon Lane, West Bromwich. 36

**350** hp G.E.C. slip ring motor, 400 volts 3-phase 50 cycles, 375rpm on baseplate with Ellison oil-immersed control gear.—Thos. W. Ward, Ltd., Albion Works, Sheffield. 'Phone 26311 (ex. 347). 177

**375** kva L.D.M. alternator, 400 volts 3-phase 50 cycles, 4-wire, 375rpm, with exciter, mounted on baseplate with single pedestal bearing.—Thos. W. Ward, Ltd., Albion Works, Sheffield. 'Phone 26311 (ex. 347). 181

## AUCTION NOTICES

Nineteenth Sale.

G. R.

By Order of the Minister of Supply.

R.A.F. No. 25 MAINTENANCE UNIT, HARTLEBURY, WORCESTERSHIRE.

4 miles from Kidderminster, 11 miles from Worcester.

NOCK & JOSELAND

are instructed to Sell by Auction, at the above Unit, on THURSDAY, 1st JUNE, 1950, at 11 a.m. prompt.

A Large Collection of Valuable Miscellaneous Stores including:—

150 H.P. BROAD GAUGE DIESEL LOCOMOTIVE.
Large Quantity of Clothing.
3,500 Pairs Boots and Shoes.
RADIO & ELECTRICAL EQUIPMENT.
General Stores.

VIEWING

Certain of the above lots are on view at Chelveston (Northants) and Halfpenny Green (Staffordshire), and must be viewed there on Wednesday, Thursday and Friday, the 24th, 25th and 26th May, 1950 between the hours of 10 a.m. and 4 p.m.

Viewing at Hartlebury is on Wednesday, 31st May, 1950, between the hours of 10 a.m. and 4 p.m. and on the morning of the sale day from 9 a.m. to 11 a.m.

Catalogues, price Sixpence each (Postal Order not Stamps) are obtainable from the Auctioneers: Nock & Joseland, Bank Buildings, Kidderminster (Tel. 2053 and 4211). 3573

## ARTICLES WANTED

### MOTORS WANTED FOR SHIPMENT TO INDIA

REQUIRED for early shipment to India for use under tropical humid conditions the following motors with control gear suitable for 400/440v, 3 phase 50 cycles.

Two motors to drive two 400kw 350 rpm d.c. generators. Motors of 575 to 650hp running at a minimum speed of 350 or a maximum speed of 375 rpm would be entertained.

One ditto to drive a 300kw 375 rpm d.c. generator. Motors of 425 to 500hp running at a speed of 375 rpm or not less than 355 rpm would be entertained.

The aforementioned motors should have a shaft extension suitable for a coupling for direct drive.

Note: Synchronous motors are preferred but if not available, slip ring motors.

Alternatively, Motors of any speed provided these are of the three bearing type, so that "V" belt or any other methods of drive can be satisfactorily applied.

Motors wound for 6,600v, 3 phase 50 cycles would be considered if 400v motors are not readily available.

Full particulars and price should be sent to Messrs. Martin Burn, Ltd. (London Agency), 71, Queen St., London, E.C.4. 3504

ALL types of bakelite accessories for clearing lines wanted, or anything electrical.—Apply Dublin Wholesale, 39, Westland Row, Dublin, Ireland. 3382

ALTERNATORS wanted in good condition, must be 1,000 r.p.m., 15 to 30kva, any voltage.—Box 236.

APPROXIMATELY 12hp 110v totally enclosed watertight electric motor, complete with controller and resistances for an electric-driven windlass, for a small trawler; two sets urgently required.—Price and full particulars to Wm. Broady & Son, Ltd., Electrical Engineers, English St., Hull. 3574

DIESEL engines or diesel driven generator sets, 100kw up to 400kw, slow speed preferred.—Britannia Manufacturing Co., Ltd., 22-26, Britannia Walk, London, N.1. 53

MERCURY (Quicksilver) wanted. Write for packing instructions. Gold, silver and platinum also purchased.—Collingridge & Co., Ltd., Riverside Works, Riverside Rd., Watford. (Tel. 5963.) 20

ONE 50hp Automatic Starter, 220 volt d.c. supply and suitable for remote control.—Fyfe, Wilson & Co., Ltd., Bishop's Stortford. 3682

REQUIRED immediately, small vertical one-or two-spindle honing machine capable of dealing with cylinder bores 1¼in to 3in diameter, with or without motor and switchgear.—Full particulars and price to Box 3686.

SECOND-HAND 28 (or more) cell battery of 360 ampere-hour capacity. State where seen and price wanted.—Box 3683.

WANTED, d.c. and a.c. ball-bearing motors. Full details to Britannia Manufacturing Co., Ltd., 22-26, Britannia Walk, London, N.1. 29

WANTED.—Diesel engine driven generator set, 175-200 kW, 400-500v, 3-wire d.c. Alternatively generator only, 5/600 rpm.—Box 3684.

WANTED for prompt cash, ferrous and non-ferrous scrap, also plant for dismantling. Buyers of second-hand machinery and plant for re-use.—W. & H. Cooper, Ltd., 176, Brady St., Bethnal Green, E.1. 202

WANTED, Konler automatic set, 110v 1½kw, in order or otherwise, reasonable price. Also 18hp Lister diesel engine twin. Also 6hp ditto, 650 rpm.—Box 8698

WANTED, rotary converters, any size.—Universal, 221, City Rd., London, E.C.1. 22

WANTED, several 7kw 110 volt generators, electrical condition not important.—Fyfe, Wilson & Co., Ltd., Bishop's Stortford. 3644

WANTED.—750-1,200 kW steam turbine or engine driven generator set, 160 lbs pressure, condensing, 240v d.c. generator. Alternatively generator only, 300 rpm.—Box 3685.

## WORK WANTED AND OFFERED

### CASTINGS

**Fisher Foundries, Ltd., Greet, Birmingham**

have capacity for brass gunmetal and soft grey iron machine moulded repetition castings weighing 1-30lb. loose pattern work up to 3cwt; delivery by road to all parts.

Tel. B'ham, Victoria 0197. 225

A BETTER and speedier motor rewinding, repairing and maintenance service at the Max Electric Co., Ltd., 190, Thornton Rd., Croydon (Tho. 4276/8). 161

A.C. and d.c. motor rewinds and repairs. Prompt service, fully guaranteed.—Edgware 8631 (4 lines), Service Electric Co., Ltd., Stanmore, Middx. 92

ARMATURES.—Vac. dryer and small electric tools rewound and returned in 7 days. Guaranteed service.—Streatham Transformer Co., Ltd., 68, Streatham High Rd., London, S.W.16. Streatham 7626. 118

DO you want something made in quantity? If it is a metal pressing or assembled component, we can offer you the factory space and manufacturing "know-how." Send us your enquiries.—Metal Components Ltd., Dolphin Rd., Shoreham, Sussex. Tel. Shoreham 2224-5. 74

LIGHT machining, armature and coil winding, capable of handling long runs, or the complete manufacture of assembled articles, firm of excellent repute has capacity available.—Box 8681.

MANUFACTURERS and erectors of neon signs to the trade.—S. & A. Blanchard, 22, Yerbury Rd., London, N.19. Arc. 1085. 8676

MOTOR rewinds, all types of motors rewound and repaired, quick delivery. Various motors in stock new and second-hand.—C. A. Penny, 43, Benson Rd., S.E.23. For. 3397. 8696

MOTOR rewinds of all types. Heating elements and spirals of every description.—Elements (Leicester) Winding Co., 307, St. Saviours Rd., Leicester. 203

NEON to the trade; tubes, transformers, etc., complete installation and repairs, metal and wood letters.—Radiant Signs (London), Ltd., 4, Richmond Buildings, Dean St., London, W.1. Gerrard 4858. 8647

TIME switches of all makes and electric clocks repaired and reconditioned as new; 12 months' guarantee.—J. W. Hughes, Clockwork Engineers, 3, St. Thomas' St., London Bridge, S.E.1. Tel. Hop 2759. 3489

TRANSFORMER and coil winding.—We have capacity for all types of transformers up to 1kva; coil winding to special shapes and types per specification; quick delivery.—Minipot Appliances, Ltd., 87-89, Edmund St., Birmingham, 3. 3621

TRICORN designs; Stanley L. Lyons, L.S.I.A., res. lighting eng. (I.E.S.), lighting fittings designers to the trade; drawings and schemes prepared.—97, Latchmere Rd., Battersea, London, S.W.11. Bat. 5047. 3602

ZEROS refrigerators. Complete range of repair and service now available. Equipment reconditioned to conform to pre-war manufacturers' specifications.—Time Engineers, Refrigeration Specialists, 60, Southend Rd., Rainham, Essex (Rainham 2358), or Southern Area Agency (Tel, Springpark 4217). Electrical spares supplied to trade. 241

## AGENCIES

ACTIVE representative calling contractors, shops, factories, hospitals, London, seeks quality sidelines; commission basis, own car.—Box 8665.

AGENCIES required by long established firm of manufacturers agents with large sales organisation covering the whole of Great Britain, for conduit, conduit fittings, cables and flexibles, fans or any lines suitable for distribution to wholesalers; commission or buying basis.—Box 64.

AGENT possessing active connection with radio component and electrical accessory manufacturers required for London and Home Counties by established Midland company specialising in small metal pressings.—Box 3587.

AGENT required by switch fuse gear and accessory manufacturer for Scotland area.—Box 3645.

AGENTS required to obtain orders for special industrial lighting fittings and sheet metal work in principle centres of England, Scotland and Wales; full particulars of experience and territory covered to—Box 3546.

ESTABLISHED agent, East Midlands area, requires cable and lamp agency, first class connection wholesalers, B.E.A., N.C.B.—Box 3646.

MIDLAND firm of excellent repute require an energetic agent to introduce new type of control gear to manufacturers of fluorescent fittings, and large undertakings; fine opportunity for right type of man with existing connections; North and South of England available.—Box 8683.

MIDLAND manufacturers of electrical and mechanical products wishes to contact established selling organisation, or manufacturers, with a view to co-ordinating and promoting sales. This advertisement is for sales development only, no financial obligations are entailed.—Box 302, Mundy, Gilbert & Troman, 86, New St., Birmingham. 8679

## BUSINESS OPPORTUNITIES

LONDON firm of electrical engineers, engaged on all forms of installation work and the servicing and maintenance of electrical plant would like to hear from firms who would be interested in these facilities in the London and Home Counties area.— Box 3575.

MANUFACTURING electrical engineers, a firm of well known repute, wishes to contact person, or firm, who can introduce long runs of coil and armature windings of all kinds; generous terms offered.—Box 8682.

WELL organised manufacturing electrical and mechanical engineers wish to contact person, or firm, able to introduce substantial business; amalgamation or exchange of financial interest considered.—Box 8684.

## BUSINESSES FOR SALE AND WANTED

ELECTRICAL contractor's business for sale in industrial area within easy reach of Manchester this is a well-established business with a substantial turnover and is only being offered for sale on account of the proprietor wishing to retire from business.—Apply to Leslie D. Clegg, Morgan & Co., Chartered Surveyors 5 Queen St., Oldham. Tel. Main (Oldham) 4275. 3490

OWNERS of old-established businesses wishing to retire should consult Business Brokers, Ltd., 46, St. James's Place, London, S.W.1. (Regent 4720.) Many buyers available, particularly for large proposition. 200

## PATENT NOTICES

NOTICE is hereby given that The General Electric Company Limited seek leave to amend the Complete Specification of the Application for Letters Patent No. 635,287 for an invention entitled "Improvements in electrical networks for echo correction in electrical signalling systems." Particulars of the proposed amendments were set forth in the Official Journal (Patents), No. 3196 dated 17th May 1950. Any person may give Notice of Opposition to the amendment by leaving Patents Form No. 36 at the Patent Office, 25, Southampton Buildings, London, W.C.2, on or before 17th June, 1950.—J. L. Blake, Comptroller-General. 8678

## EDUCATIONAL NOTICES

CITY & Guilds (Electrical, etc.) on "No Pass—No Fee" terms. Over 95% successes. For full details of modern courses in all branches of Electrical Technology send for our 176-page handbook—Free and post free. —B.I.E.T. (Dept. 12A), 17, Stratford Place, London, W.1. 200

## COMPANY MEETINGS

### THOMAS BOLTON & SONS

#### Improved Production Efficiency

The forty-eighth annual general meeting of Thomas Bolton and Sons, Ltd., was held on May 17 at Froghall.

Mr. P. V. Hunter, C.B.E., M.I.E.E., the chairman, presided.

The following is an extract from his statement, circulated with the report and accounts:—

Last year, in referring to the future outlook, I was by no means optimistic, and I am sorry to say that for the majority of the company's business this prediction has been fulfilled. Orders have continued to flow in very slowly and we now have practically no "back-log" of old orders to ease the situation.

One bright feature of the company's trading has been the overseas sales of copper sulphate, and this has contributed towards the improved profit position.

Another contributory cause of the increased profits is the fact that, as was the case last year, relative movements of virgin metals and scrap prices reacted in our favour.

#### Trading Difficulties

As regards the rest of our manufactures, the indications are that for the time being the majority of our customers will continue their present practice of ordering only day-to-day requirements. In the case of the nationalised industries of electricity supply and railways, we can but feel that the present rate of ordering is distinctly below normal requirements, and has been influenced by the Government's policy of capital cuts. We are consequently experiencing serious difficulties in organising production on an economical basis, and our ability to continue to provide full employment for our employees is threatened.

Another matter which has been giving your Board some concern is the absence of hedging facilities for our purchase of copper and zinc. Although we endeavour, as far as possible, to arrange contracts with our customers on the basis that the price of the metals is fixed at the time when the contract is entered into and before manufacture takes place, it is not possible to make such arrangements in respect of a considerable portion of the company's throughput. The present high price of metals naturally causes apprehension, but what is more alarming still is the fact that since the devaluation of sterling, the prices of copper and zinc stand at higher levels in the sterling area than the equivalent prices in the American market.

#### Distribution of Sales Revenue

We think also it will be of interest to shareholders to see the analysis given below showing how each pound of the company's sales revenue has been disposed of. I forbear to draw the very obvious comparisons between the amounts spent in taxation and those paid in Ordinary dividend and retained in the business.

| | £ | s | d |
|---|---|---|---|
| Metals | | 13 | 9½ |
| Wages, salaries and employees' benefits | | 3 | 2¼ |
| Other working and selling expenses (including maintenance) | | 1 | 9 |
| Depreciation | | | 2½ |
| Taxation | | | 6½ |
| Debenture interest and fixed dividends (after tax) | | | 1¼ |
| Ordinary dividend (after tax) | | | 1 |
| Profit retained in business | | | 4 |
| | 1 | 0 | 0 |

Due to delays in manufacture of plant by our suppliers, completion of the major plant developments in hand has been slower than was hoped, but steady progress has been made and production efficiency continues to improve.

The report and accounts were adopted. 3589

### STURTEVANT ENGINEERING CO., LTD.

#### Strong Financial Position
#### All Previous Records Surpassed

The annual general meeting of the Sturtevant Engineering Company, Ltd., was held on May 22 in London, Mr. G. R. Thursfield, M.I.Mech.E. (chairman and managing director), presiding.

The following is an extract from the statement and speech by the Chairman:—

In submitting the Accounts for 1949, I am in the happy position of being able to report another very prosperous year which proved to be an all-time record both in Turnover and in Profit, our Consolidated Trading Profit before Tax rising from £312,119 to £449,835. Provision for Taxation is £227,400 compared with £160,650 the previous year, and the Net Profit £214,396 against £145,601 in 1948.

Since our last Annual Meeting we have increased our Authorised Capital to £400,000, and capitalised £123,285 of our General Reserve by issuing Bonus Shares to our Shareholders, thus doubling our Issued Capital. This withdrawal from General Reserve has been more than restored by appropriating £153,285 from our Profits, thereby increasing our Consolidated General Reserve from £255,047 to £285,917, which includes £870 Exchange Reserve. Our Capital Reserves have been increased from £14,521 to £29,571.

Our financial position is a strong one, and the state of our Order Books continues to be very satisfactory covering the expanding demand for Sturtevant equipment such as Air Conditioning, Heating, Ventilating, Dust Collecting (mechanical and electrostatic), Mechanical Draught, Industrial Vacuum Cleaning, Pneumatic Conveying, Drying, Crushing and Grinding, complete plant for the manufacture of Granulated Fertilisers, our well-known High Efficiency Fans and Reader High Speed Engines.

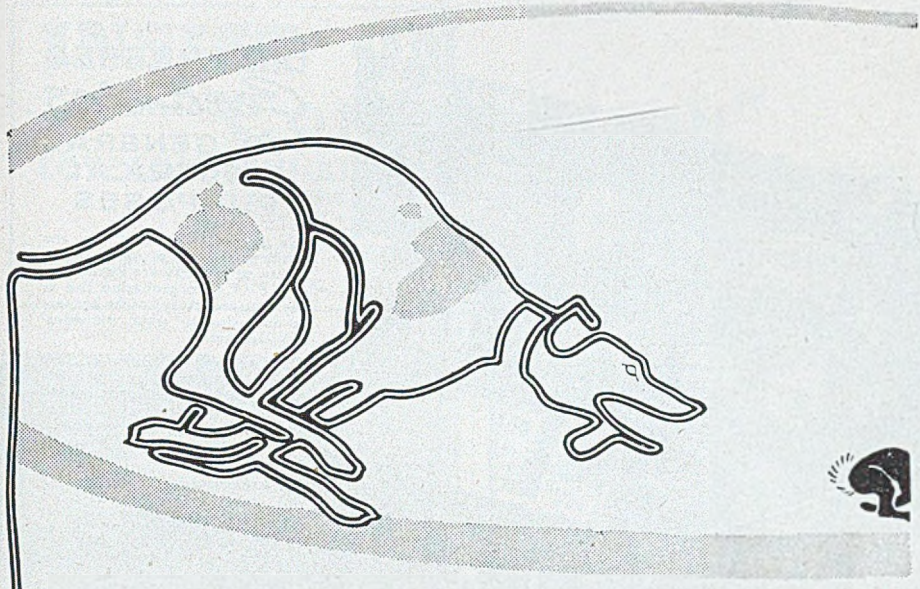
Special attention has been given to the expansion of our Export Trade, and visits of a Director and Engineers to India, Pakistan, Egypt, Australia, New Zealand, South Africa and Scandinavia will, I hope,

result in our obtaining increased business from those countries.

It is, I think, generally recognised that when increased profits have been earned through greater Efficiency and Enterprise, and the Company is in a position to distribute a part of that increase, such distribution should be made, provided that Moderation and Restraint be exercised. Following these principles, your Board recommends (in addition to the Interim Dividend of 5½% free of Income Tax already paid) a Final Dividend of 11% free of Income Tax, making altogether 16½% free of Income Tax on the Increased Capital, compared with last year's distribution of 22% on the old Capital. The proposed distribution will absorb only about 20% of the net profit earned which, I think you will agree, shows ample "Moderation and Restraint." The transfer of £153,285 to General Reserve compares with £80,000 last year, and the carry forward is £89,067 against £68,040 brought in.

In conclusion I would like to express the Board's appreciation of the loyal co-operation of our Employees and am sure our Members will join me in thanking them for the part they have played in achieving such satisfactory results. 3588

# INDEX TO ADVERTISERS



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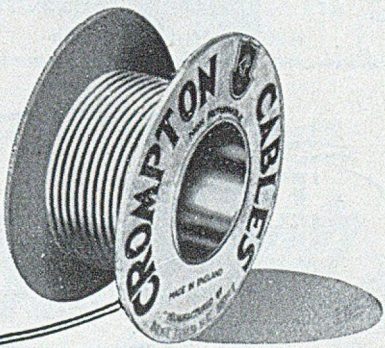
*with* **Crompton**

**V.I.R. CABLE**

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*Telephone : CHAncery 3333* *Telegrams : Crompark, Estrand, London*

A NEW and comprehensive List of **SLIDING RESISTANCES** and **DIMMERS** is now available on application

## ARM OF THE LAW...

THERE HE STANDS—symbol of authority in an orderly World—controlling —directing—obeyed because absolutely trustworthy and reliable. What a fitting comparison with BIRCH RESISTANCES, *Arms of the Ohm's Law*, Backed by many years of practical experience in which their reliability has been tested under all conditions, BIRCH RESISTANCES, in their various applications, stand up to their job and can always be depended upon to provide specified service because of their first-class workmanship.

May we quote you for any of the following :—

**DIMMERS — REGULATORS (Field, Shunt, Voltage)**
**RESISTANCES (Arc Lamp, Charging, Regulating, Sliding)**
**RHEOSTATS — ELEMENTS and SPIRALS**
**ASBESTOS WOVEN RESISTANCE NETS and GRIDS**

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# Resistances

## ARMS OF THE OHM'S LAW

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**London Office :**
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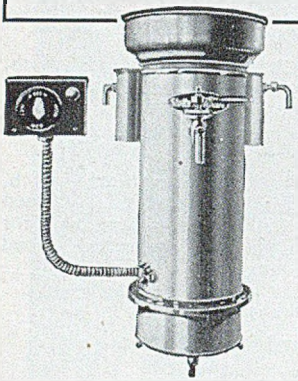
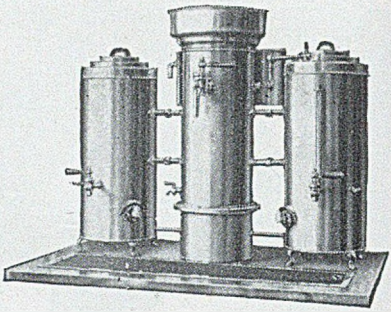
# WATER BOILERS AND CAFÉ SETS



Stott's Electrically heated Water Boilers give a quick and constant supply of boiling water only. Automatic cold feed. Economical to run.

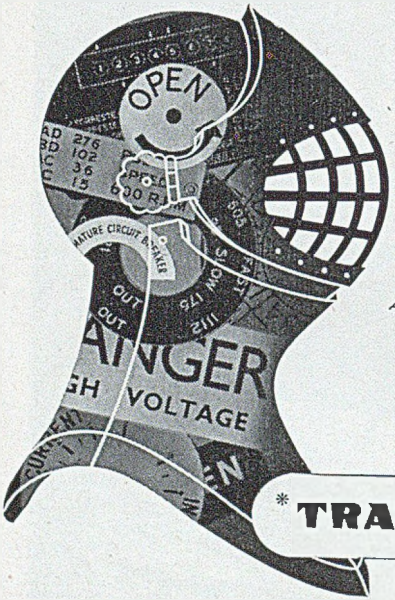


Stott's Electrically heated Café Sets comprise a water boiler with automatic cold feed, milk warming urn and urn for coffee-making by the Stott "Perco Filtro" System. Can be fitted with auto-switch coupled to draw-off top.

Send to-day for full details.

"Quality Built"

"Stotts of Oldham"

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When you have instructions, notices, diagrams or any other message printed in 'TRAFFOLYTE' interlaminated plastic, it is there permanently. Nothing can obliterate it—for 'TRAFFOLYTE' is impervious to oil, acids, water and dirt. A regular wipe with a damp cloth is all the maintenance required—no renewals are ever necessary. A product of 'DE LA RUE.'

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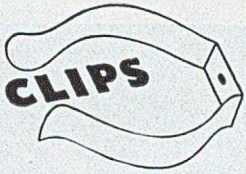
# YOU NEED CLIPS



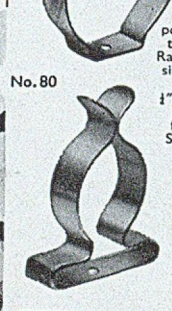
## TERRY'S MAKE CLIPS

in every shape and size — steel clips, bronze clips, stainless clips, etc., etc. Here we show a tiny selection from the enormous range we have produced. Our Research Department can design any clip to your own specification. (94 years of clip-making experience is at your disposal.)

No. 81

No. 80

Two popular types. Range of sizes to grip ¼" to 2". Del. from Stock.



No. 300 **A drawing board clip.** Plated finish, delivery from Stock. 4/- doz. plus P.T.

The most comprehensive and informative text book on springs yet published. post free **10/6d.**

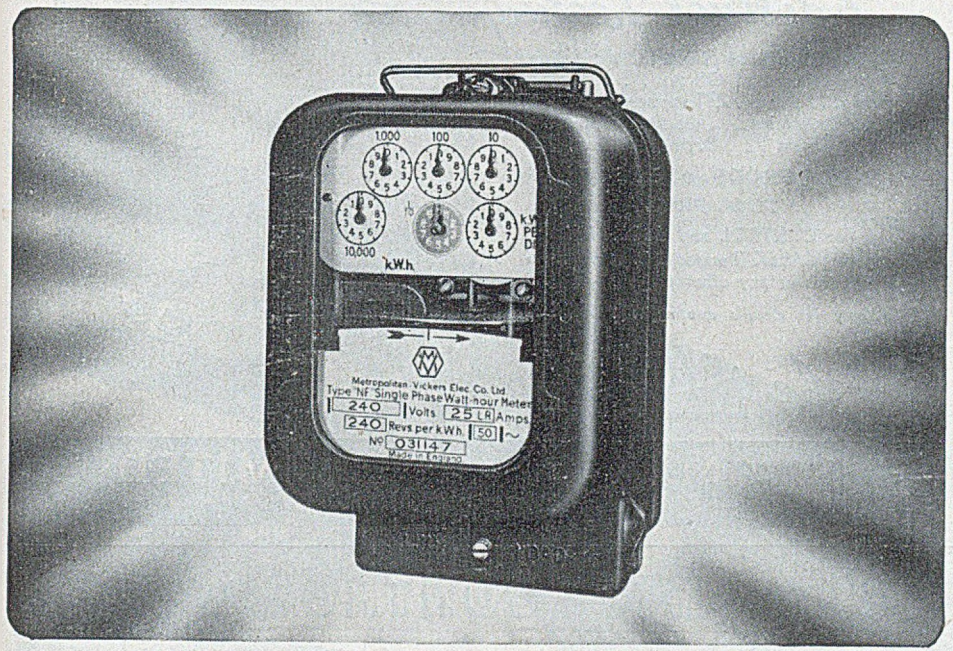
# TERRY springs

*Sole Makers:* **HERBERT TERRY & SONS LTD. REDDITCH**

*London, Birmingham, Manchester*

# Meticulous Metering

## by the METROVICK TYPE NF Watt-hour Meter




## 1—SOME NOTABLE FEATURES

- Straight-line accuracy over a wide range of load.
- Complete temperature compensation.
- High accuracy over wide range of voltage.
- Damping system giving complete stability.
- Simple and accessible adjustments for calibration.
- Resilient lower (jewel) bearing.
- One terminal block for all capacities.

*Other advertisements in this series will deal separately with the features.*

*WRITE FOR A COPY OF PUBLICATION S.P. 7356/2*

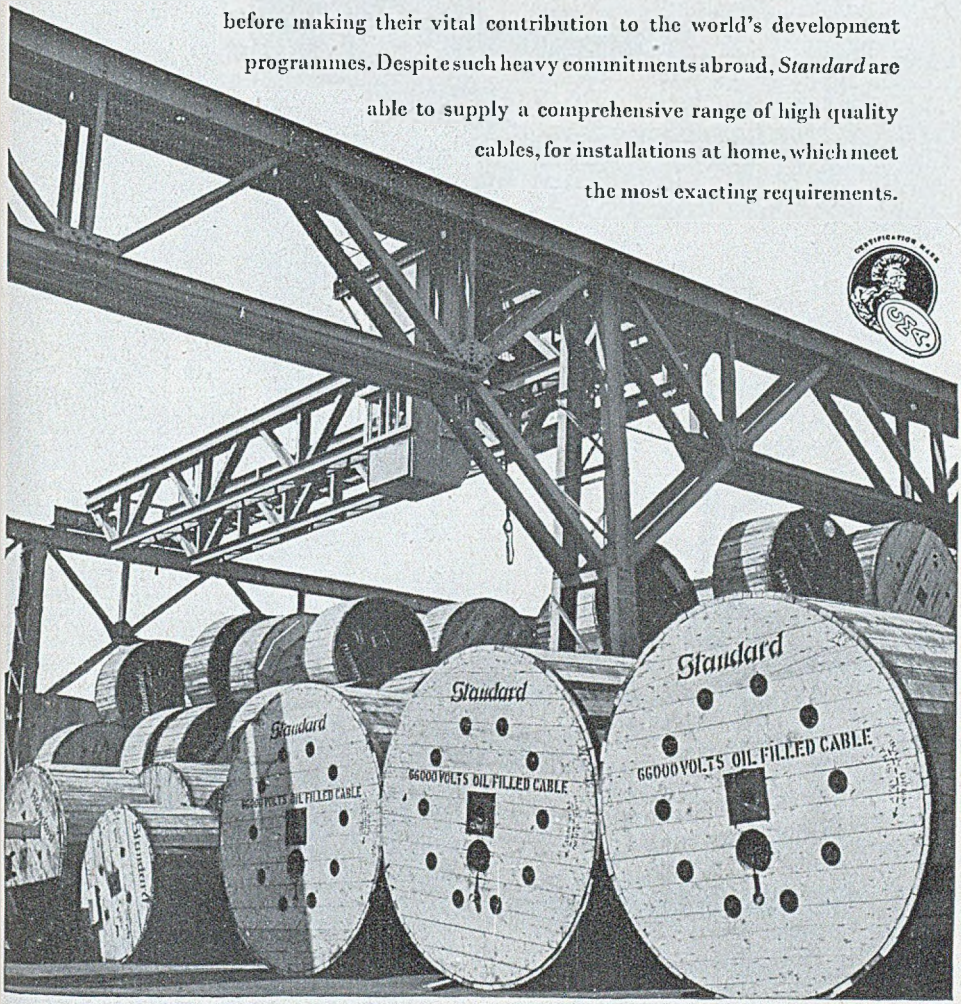
**METROPOLITAN-VICKERS ELECTRICAL CO. LTD.**

*TRAFFORD PARK, MANCHESTER 17*

G/A905

# Lifelines to the world

Testifying that "superior craftsmanship" is still one of Britain's greatest assets, *Standard* cables await shipment for export before making their vital contribution to the world's development programmes. Despite such heavy commitments abroad, *Standard* are able to supply a comprehensive range of high quality cables, for installations at home, which meet the most exacting requirements.

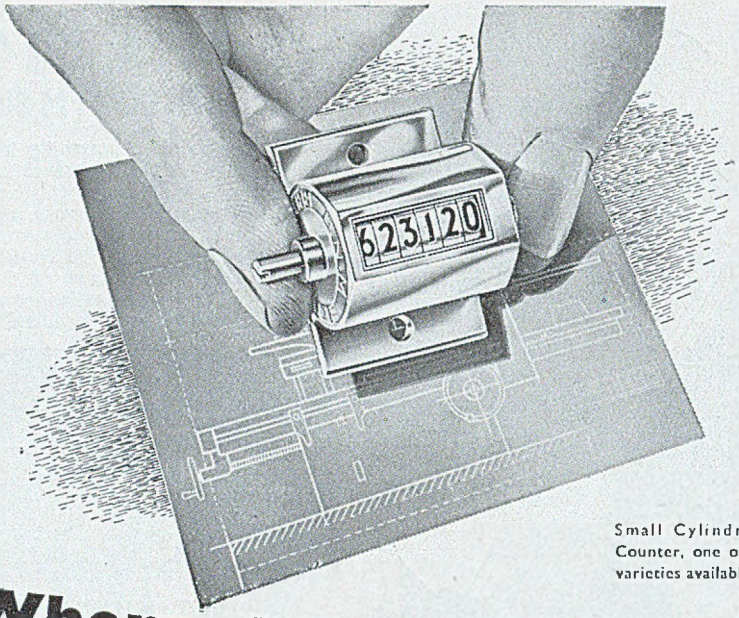



## *Standard Telephones and Cables Limited*

*Registered Office: Connaught House, Aldwych, London, W.C.2*

POWER LINE DIVISION

NORTH WOOLWICH, LONDON, E.16 *Telephone*: ALBERT DOCK 1401




Small Cylindrical Case Counter, one of the many varieties available.

# "Where shall we put the COUNTER?"

Do your machines count? With counters, machines speak — with E.N.M. counters, they speak clearly, distinctly and accurately. Apart from their usefulness, counters enhance appearance and increase selling attractiveness. **Decide where the counter shall go at the design stage so that it becomes an integral part of the product.** E.N.M. Counters are compact units able to count turns, strokes, pulsations, yards, feet, inches or specified units of measurement. Suitable for high, medium or low speeds with or without reset.

E.N.M. are the largest British Makers of Counting and Numbering machines. Unrivalled experience in designing, selecting and applying them is available on application.

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Counters are the basis of all costing and rating.

Counters are essential to all systems of Quality Control.

Counters simplify innumerable processes.

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*Cut costs with better counting*

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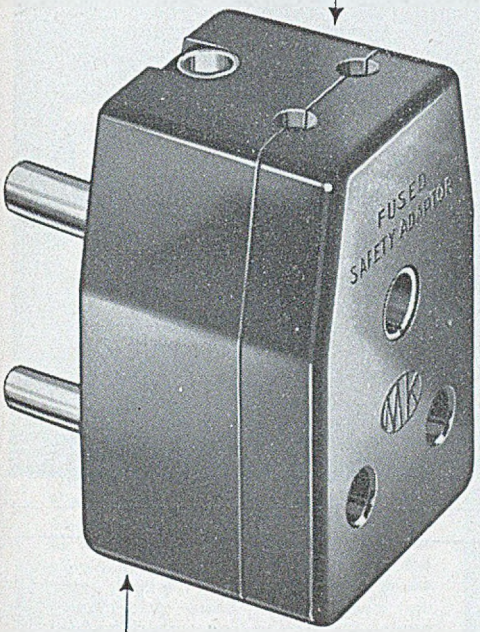
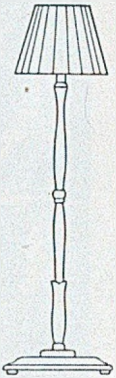
Telephone: HOWARD 2611/5 (P.B.X.) Telegrams: NUMGRAVCO, ENFIELD

# M. K. FUSED SAFETY ADAPTORS



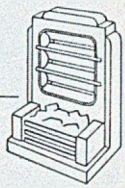
***Double Service***

*from*

*Power Socket-outlets*

*with*

***absolute safety***



FITTED WITH CARTRIDGE FUSE-LINKS & SHUTTERED SOCKETS FOR SAFETY


M.K. fused safety adaptors are the cheapest and simplest way of providing an extra socket-outlet without lowering the standards of safety. Inserted into any *Power* socket-outlet—they automatically provide *two* socket-outlets—one to take a 15 amp. plug and another to take either a 5 (or 2 amp.) plug. Both outlets can be used together or separately and the 5 (or 2 amp.) outlet is protected by cartridge fuse-links of appropriate current-rating contained within the adaptor.

Made to B. S. 546: 1934 Appendix D (with shuttered sockets) and in conformity with the Regulations for the Electrical Equipment of Buildings.

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M & EGD

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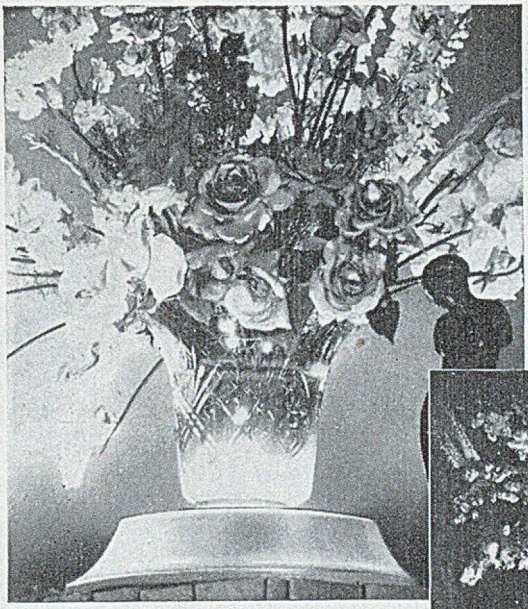
WAKEFIELD STREET, EDMONTON, LONDON, N.18

*Telephone:*—Tottenham 5151 (6 lines) *Telegrams:*—Multiconta, Southtot, London.

A.B.



# The NEW R·E·A·L (REGD) PLINTH LIGHT (PAT. PENDING)

National advertising for the new R.E.A.L. Plinth Light is bringing hundreds of enquiries daily from all corners of the Country, as well as from Overseas, and has captured the imagination of the Artistic World (as the above illustration will prove) as well as the photographic world whose natural untouched photograph is given in comparison to indicate in some small measure the possibilities of this new and intriguing Plinth Lighting.

*May we let you have the fullest information and interesting literature?*

There's a big sales possibility in both the Standard Model and the Junior Plinth illustrated

*also* THE JUNIOR PLINTH

RETAILING AT 24/9 INC. TAX

CONSTRUCTIONAL DETAILS

RETAILING AT 30/- INCLUDING TAX

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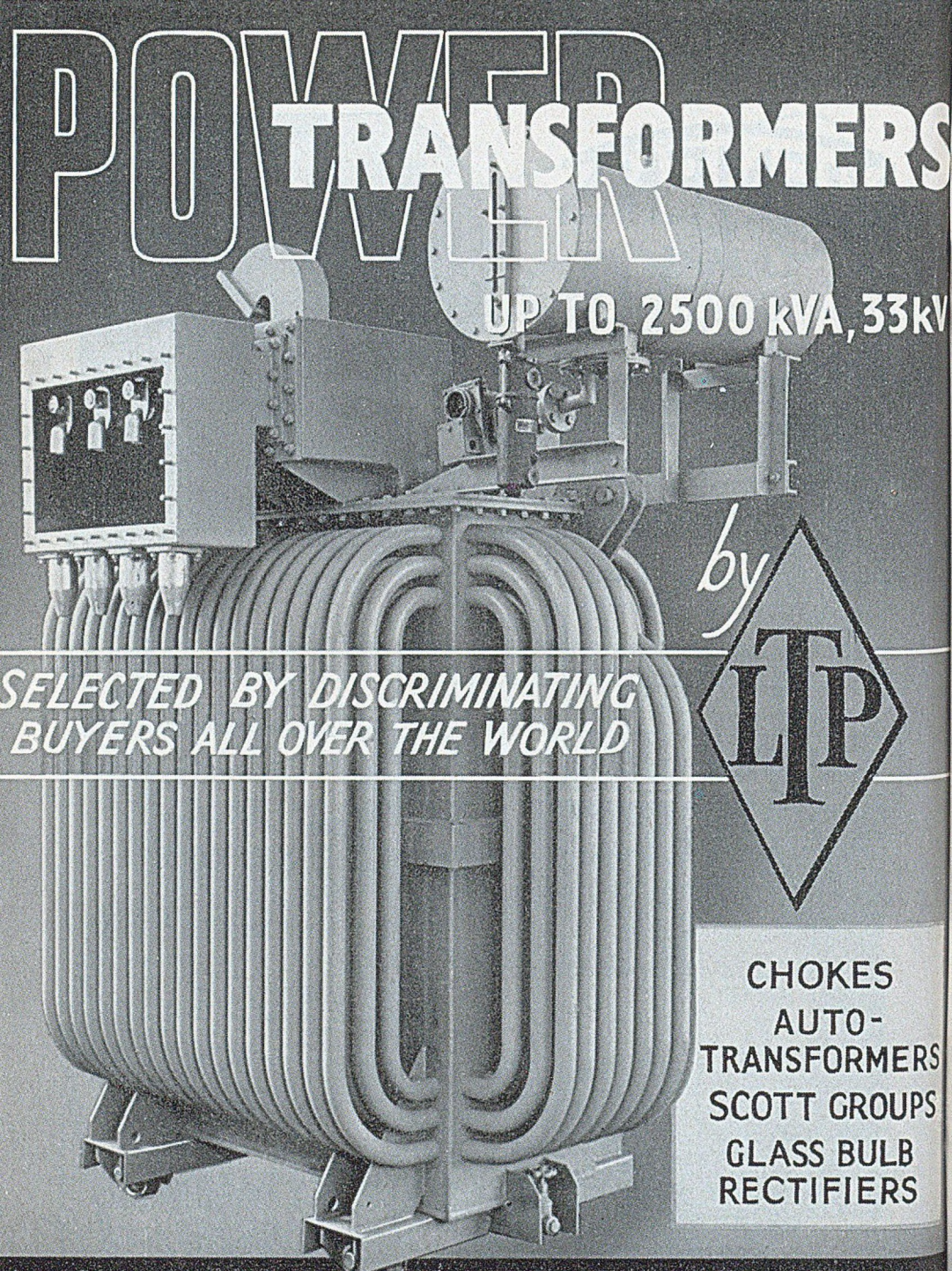
# POWER TRANSFORMERS

UP TO 2500 kVA, 33kV



*by* LTP

*SELECTED BY DISCRIMINATING BUYERS ALL OVER THE WORLD*

CHOKES
AUTO-TRANSFORMERS
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**LONDON TRANSFORMER PRODUCTS LTD.**

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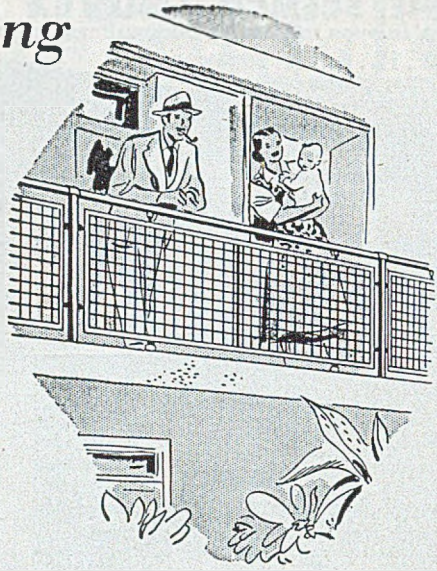
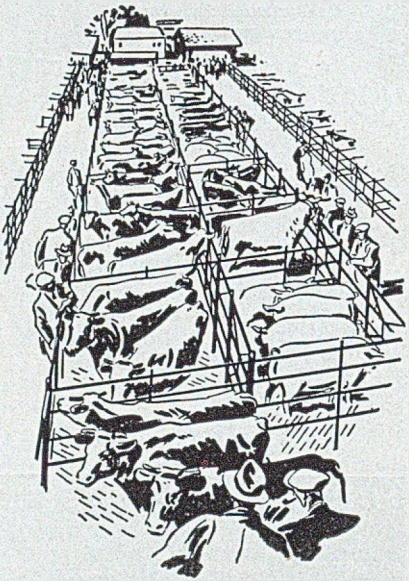
**MAIN FACTORY: BRIDGEND, GLAM.**

# *Balcony Fencing for Gibraltar*

# or —

# Railings for Cattle Markets





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**Bolts and Nuts, Railway Fastenings, Fencing, Gates, Ornamental Ironwork, Fabricated Steelwork, Rounds, Flats, etc., Steel Bars, H.T. and L.T. Line Equipment, General Forgings and Castings, Sections for Railway and Tramway Fastenings, Components for Agricultural Implements and Equipment.**

*Many of them we ship abroad to the Commonwealth and all parts of the world.*

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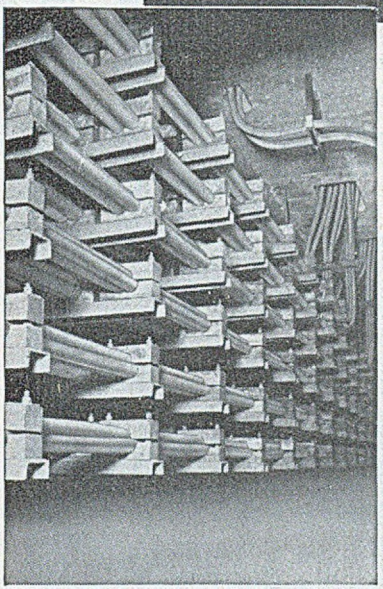
# Servants of Steel...



*Photographs by courtesy of Messrs. Richard Thomas & Baldwins Ltd.*

Electricity supplies for the recent extensions at the Steel, Sheet and Tinplate Works of Messrs. Richard Thomas & Baldwins Limited, Ebbw Vale Works, Monmouthshire, are with good reason entrusted to paper-insulated mains cables manufactured by Ediswan.

Here, in the basement of one of the Mill Sub-Stations, are seen part of the 11,000 volt and low tension cables installed to supply the Electrolytic Tinning Line and auxiliary plant.

The cable layout was designed, specified and installed by the Electrical Engineering Department of Messrs. Richard Thomas & Baldwins Limited, Ebbw Vale Works, under the direction of N. Thompson, Assoc.I.E.E., A.Am.I.E.E., Chief Electrical Engineer.

# EDISWAN

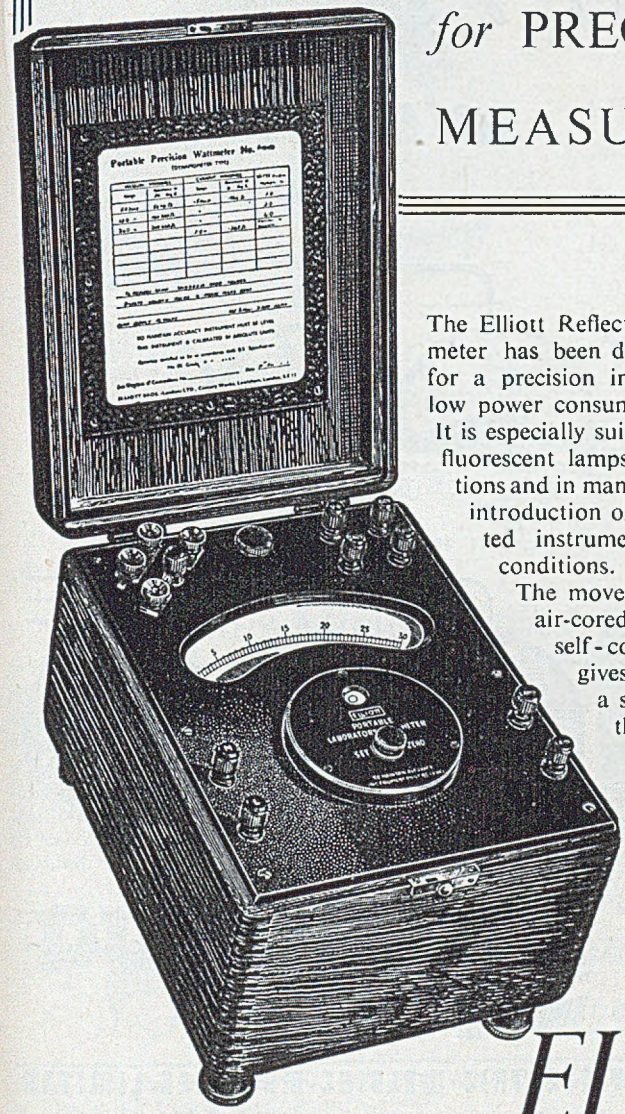
THE EDISON SWAN ELECTRIC CO. LTD.

155 CHARING CROSS ROAD, LONDON, W.C.2

EDISWAN CABLES

C.34

# A NEW ELLIOTT INSTRUMENT *for* PRECISION A.C. MEASUREMENTS




The Elliott Reflecting Dynamometer Wattmeter has been developed to meet the need for a precision instrument of exceptionally low power consumption.

It is especially suitable for testing low-power fluorescent lamps, for iron loss investigations and in many other instances where the introduction of a standard type of pivoted instrument would disturb circuit conditions.

The movement is of the suspended air-cored dynamometer type and a self-contained reflecting system gives a scale length of 5″ for a small angular deflection of the moving coil.

Multi-range instruments are available to suit specific requirements and instruments can be supplied for operation at power factors down to 0.1 at full nominal V.A.

*Write for publication No. G.*130 *—free on request.*

# *ELLIOTT*

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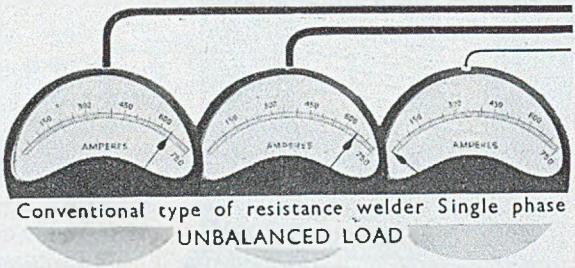
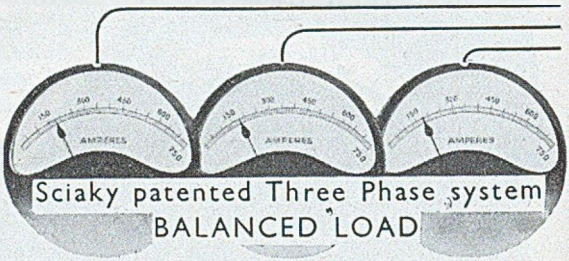
**SINGLE PHASE RESISTANCE WELDING MACHINES INCUR** unbalanced loading, high mains current demand and low power factor



Conventional type of resistance welder Single phase
UNBALANCED LOAD

**SCIAKY PATENTED THREE PHASE SYSTEM MEANS**



Sciaky patented Three Phase system
BALANCED LOAD

1 Balanced load on three phases
2 Greatly reduced line current demand
3 High Power Factor
4 Improved Welding
5 Electrode wear improved 500 per cent
6 Automatic welding Current Compensation

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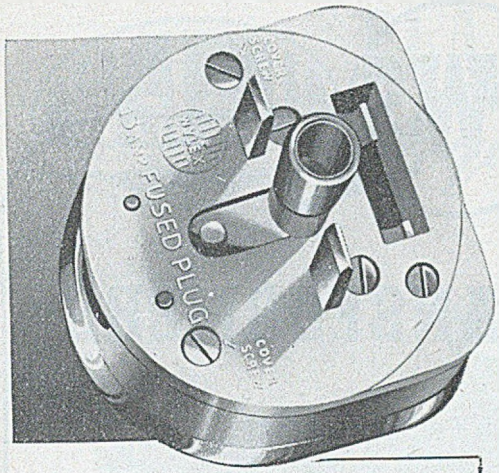
*ALSO AT LONDON, BIRMINGHAM, MANCHESTER, PARIS, CHICAGO, SYDNEY & CALCUTTA*

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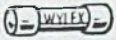
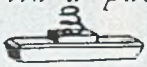
**'R-M' DUAL PLUG for RING MAIN**

*with the handiest Fuse Replacement*

# FUSE REPLACED

## in 10 seconds

*The fuse*  *is housed in the back of the plug, and held in position with a pad which is*  *spring loaded and self locking . . . . . — no screwdriver needed*

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Wylex Works · Wythenshawe · Manchester

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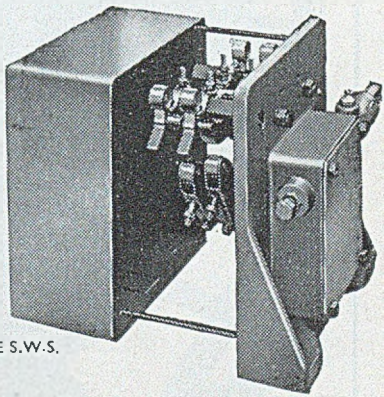
# *A new development in geared limit switches*

EVERY engineer with a problem of 2-way control for heavy duty work will welcome this latest "DUPAR" geared limit switch with micro-setting. It is an entirely new departure in screw limit control, is foolproof and does not rely on springs. Infinitely variable, for stroke or travel to be controlled, and absolutely positive in action. Reversible drive. Totally enclosed with grease-gun lubrication, and minimum attention required. A first-class switch at a reasonable price.



TYPE S.W.S.

# 'DUPAR' ELECTRIC CONTROL GEAR

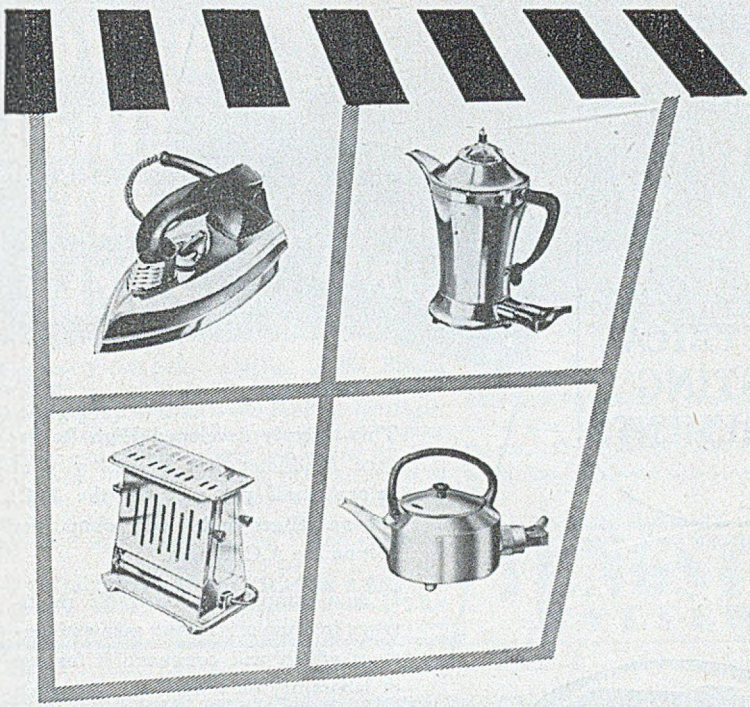
*the brain of the machine*

-DUPAR-

*Please write for descriptive leaflet No. 15D which gives full information of Type SWS Geared Limit Switch.*

**DEWHURST & PARTNER LTD.** Inverness Works, Hounslow, Middx.

*Tel: Hounslow 0085/8. Grams: Dewhurst, Hounslow. Branches: GLASGOW, BIRMINGHAM, MANCHESTER*



# Part of a Fine-Quality range of Appliances

Maximum quality together with low maintenance costs, combine to make the name of Premier Fine-Quality outstanding in the world of electrical heating appliances. This is the chief reason why Premier electric appliances are in constant demand.

**PREMIER** *FINE-QUALITY APPLIANCES*

PREMIER ELECTRIC HEATERS LTD · BIRMINGHAM 9

AVO

REGD. TRADE MARK

*Precision*

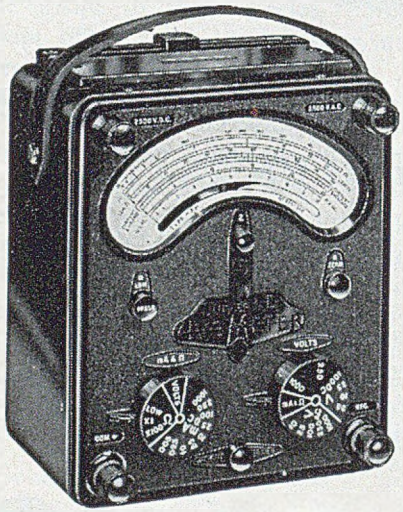
**ELECTRICAL TESTING INSTRUMENTS**

# *The* H.R. AVOMETER

This recently developed High Resistance AvoMeter has a sensitivity of 20,000 ohms per volt on the D.C. voltage ranges and 1,000 ohms per volt on the A.C. ranges.

It is a compact and portable multi-range instrument, having many advantages which will commend it for use in laboratory or workshop. A 5-inch clearly marked scale with an anti-parallax mirror is used for the following ranges of readings :

D.C. CURRENT : 50μA to 1,000 mA.
D.C. VOLTAGE : 2·5 volts to 2,500 volts.
A.C. VOLTAGE : 10 volts to 2,500 volts.
RESISTANCE :
Model 1 : 0·1 ohm to 5 megohms.
Model 2 : 0·1 ohm to 20 megohms.



The instrument can be supplied, if required, fitted with magnetic screening for protection against stray magnetic fields. It will stand up to heavy overload and is protected by an automatic cut-out.

In addition to its multi-range facilities, it can be used as a Galvanometer, for which purpose the zero can be offset to the extent of 30 per cent of full-scale deflection by a simple knob adjustment.

**PRICE**

**£19 : 10s.**

Size : 8⅛" × 7¼" × 5⅛"
Weight : 6¼ lb.

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H.R.1

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