

ELECTRICAL REVIEW

FOUNDED
1872

Vol. CXXXIX. No. 3591

SEPTEMBER 20, 1946

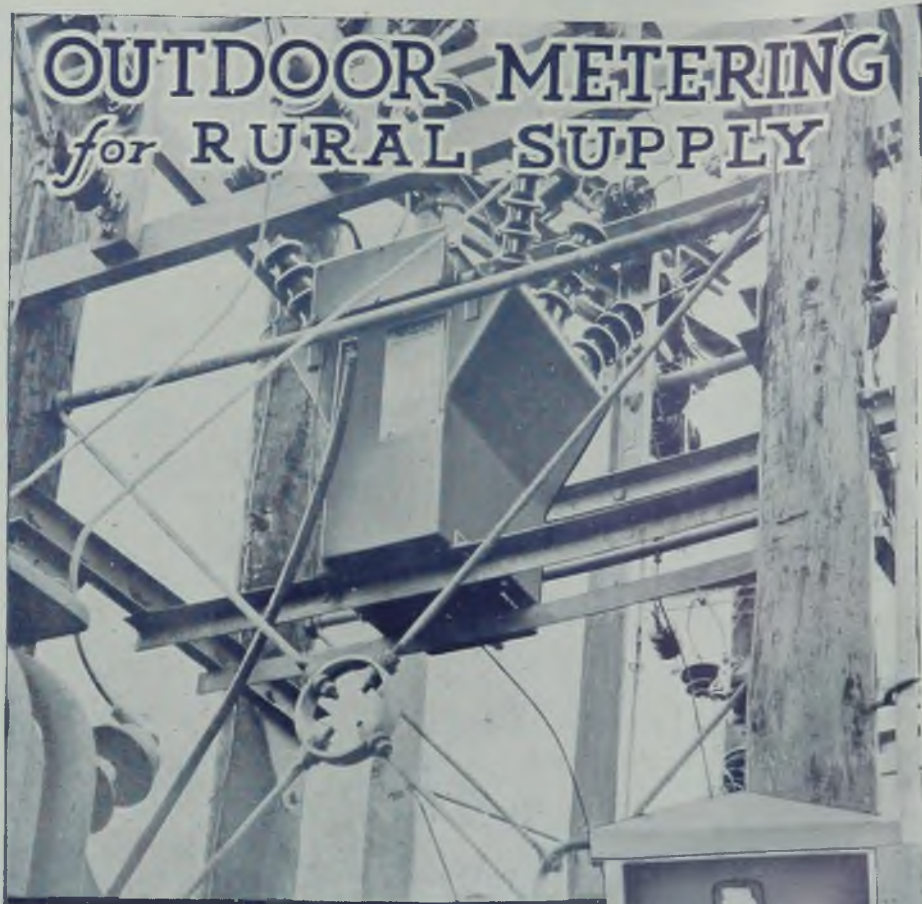
9d. WEEKLY

127

Osram

THE WONDERFUL LAMP

BIBLIOTEKA
POLITECHNIKI
SLASKIEJ



This typical outdoor equipment is connected to an 11 kV system.

A voltage transformer and two current transformers are oil-immersed in the tank shown.

The kWh meter is mounted in a weather-proof steel pillar (shown inset) for mounting near the foot of the pole, but alternatively it can be housed in a sheet-steel pole-mounted cubicle.

METROPOLITAN
Vickers

ELECTRICAL CO. LTD.
TRAFFORD PARK ... MANCHESTER 17.

and for better lighting—METROVICK COSMOS LAMPS

G/A401

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"As one who has to select the most suitable types of Electrical Apparatus for simple hire or hire-purchase, my principal worry was to 'forecast' the future expense of maintenance and repairs.

"But 'Heatrae' seems to have anticipated this problem as I see it—that simplicity at the start obviously avoids subsequent 'complications.'"

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leaders in electric water heaters

HEATRAE LTD., NORWICH

PHONE: NORWICH 25131

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ELECTRIC WELDING MACHINES



11 kVA Spot Welder

SPOT, SEAM
AND BUTT
WELDERS

35 years' experience

Automatic or Non-Automatic
With or without
Electric Control

The quickest and most economical method of Welding Oil Drums, Bars, Tyres, Wheel Rims, Tubes and Angles.

The WESTMINSTER ENG. Co. Ltd.

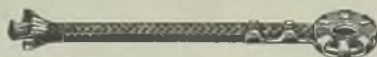
Victoria Road, Willesden Junction, N.W.10

Dynamos, Motors, Alternators and Transformers Rewound and Re-constructed.
"Westminster" Brush Holders. Process Arc Lamps

Telephones: Elgar 7572 (3 lines)

Telegrams: "Regency, Phone, London."

SOUND TERMINAL WITHOUT SOLDER



Suitable for Telephone Lines

FOR CABLES
AND WIRES
OF ALL KINDS



SIZES FROM
1/2" to 1"
HOLE

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RAMS



to the specific requirements of our customers

Makers of all types of repetition products from the bar in all metals



MCLand REPETITION LTD.
Pool Lane Langley Birmingham.




The advertisement features a central illustration of various electrical components. At the top left is a long threaded rod with a nut. To its right is a rectangular metal box with four threaded ports. Further right is a 90-degree elbow fitting. Below these are two more threaded rods, one with a nut and another with a washer. In the center is a circular metal component with a threaded port. At the bottom center is a large, square metal base with the word "Walsall" embossed in a stylized font. A small circular logo on one of the rods reads "ASSEM Walsall". The background consists of vertical lines radiating from the center, creating a sense of depth and focus.

*T*HE essential foundation stone upon which a quality-first and durable Electrical Installation is founded.

WALSALL CONDUITS LTD • WEST BROMWICH



THE SMALLEST TRIPLE POLE SWITCHFUSE
EMINENTLY SUITABLE FOR MACHINE TOOLS
 RADETTE. 10 AMPERES. 500 VOLTS. CATALOGUE N° Q1438

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MANCHESTER CLASSON
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PHONE BIRCHFIELDS 5011. GRAMS BILLSWITCH 8MAM

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ELECTRIC MOTOR REPAIRS SERVICE ★ DELCO ELECTRIC FANS
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WILLS PRESSURE-FILLED JOINT RINGS ★ DELCO ACCESSORIES

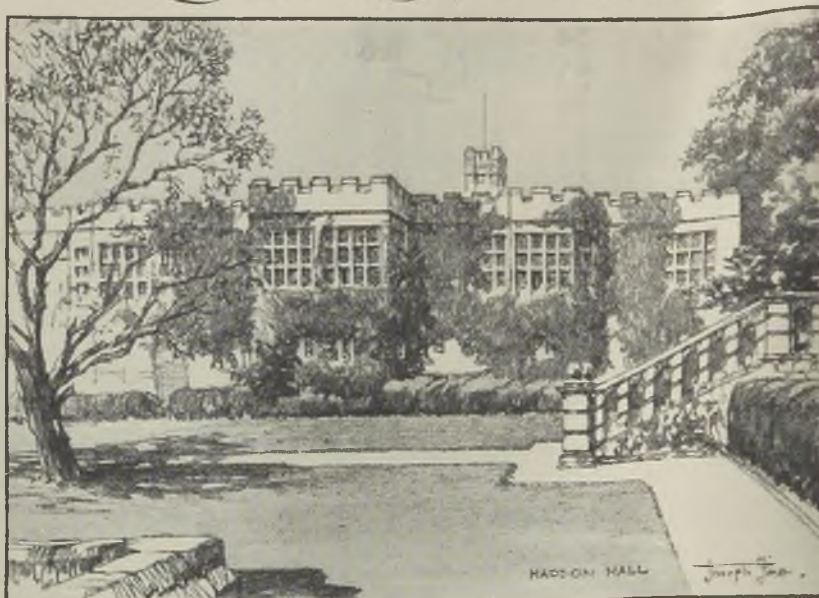
DELCO ELECTRIC MOTOR REPAIRS SERVICE
DELCO ELECTRIC MOTORS DELCO ACCESSORIES DELCO FANS
DELCO CAR RADIO DELCO BEARINGS DELCO JOINT RINGS
DELCO PRESSURE-FILLED JOINT RINGS DELCO ACCESSORIES



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Landmarks of Britain

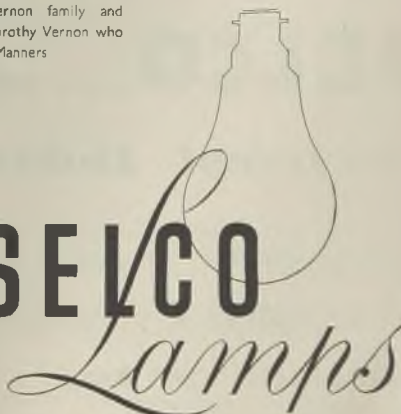


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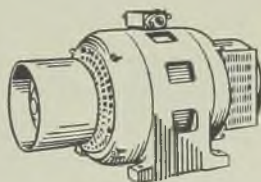
CRYSELCO LIMITED, KEMPSTON WORKS, BEDFORD

*The
Progressive
Symbol*



For more than half a century, the distinctive symbol of the BTH has been accepted as the ultimate guarantee of quality and reliability.

Ever in the forefront of technical progress, the BTH symbol will inevitably be found on a large proportion of the electrical equipment that will help to re-build the war-torn world.



BTH

RUGBY

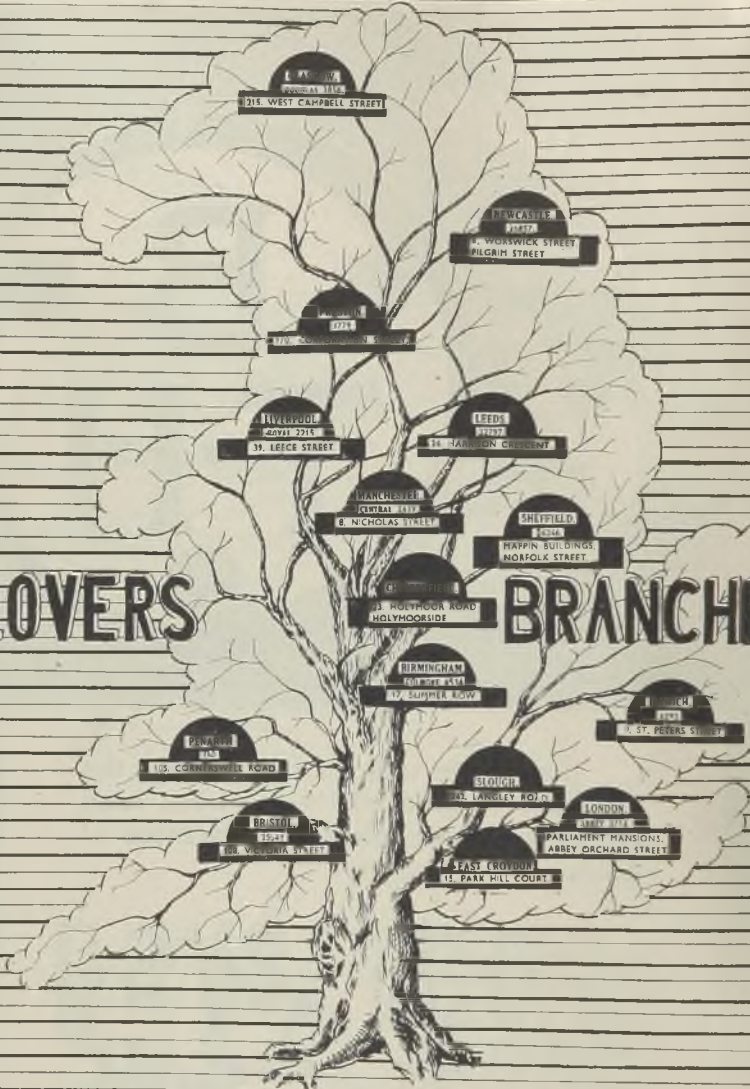
THE BRITISH THOMSON-HOUSTON COMPANY LIMITED, RUGBY, ENGLAND.

A 3606



GLOVERS

BRANCHES

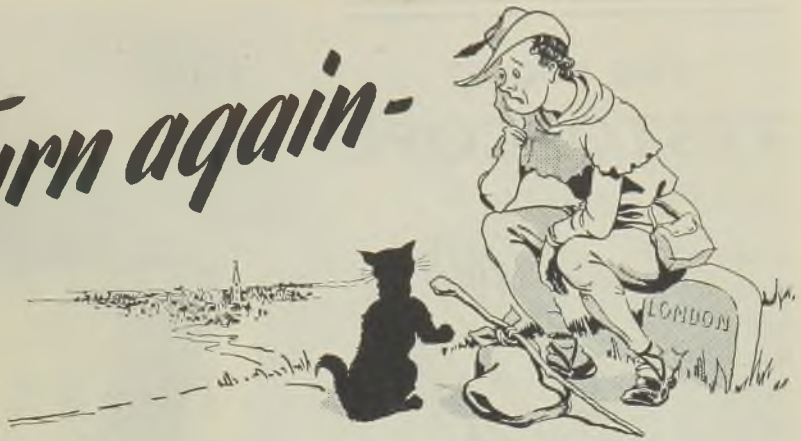


TRAFFORD PARK 2141

HEAD OFFICE AND CABLE WORKS :

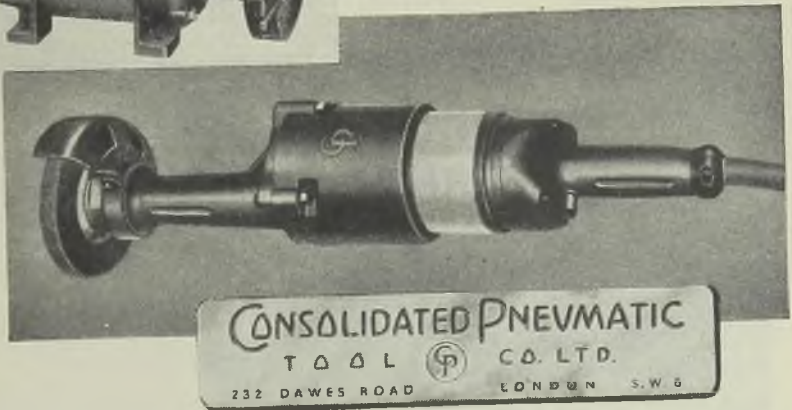
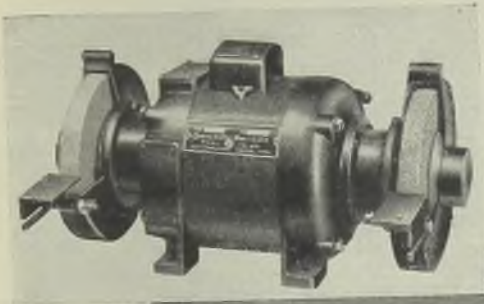
W. T. GLOVER & Co. LTD.
TRAFFORD PARK MANCHESTER 17

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design ensures a remarkable degree of reliability, whether in bench mounted or portable applications. Turn to Φ Electric Grinders and Polishers for real efficiency and economy in operation!

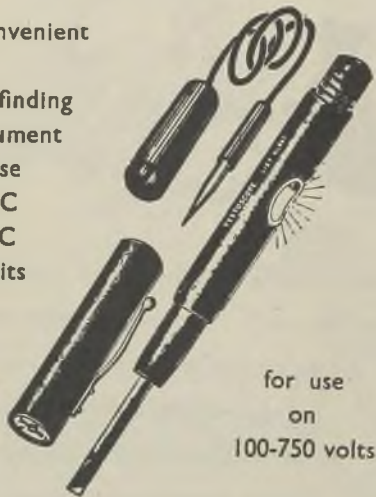


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 CONTRACTORS' EQUIPMENT · ROCK DRILLS · DIAMOND DRILLS · OIL WELL TOOLS
 CP.9

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Size of a Fountain Pen

A convenient rapid fault-finding instrument for use on AC or DC Circuits



for use on 100-750 volts

FOR TESTING

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|-----------------|-------------------|
| SWITCHES | OPEN CIRCUITS |
| LIVE CONDUCTORS | LEAKAGES |
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| NEUTRAL WIRE | POLARITY |
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The Electrician's Good Companion.

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Telephone : TEMple Bar 3993

MANCHESTER: 29 Piccadilly, BRIGHTON: 24 Marlborough Place. GLASGOW: 182 St. Vincent Street. Bristol: 2-4 Church St., Temple. DUBLIN: 2 Church Lane, College Midland Representative: Green W. T. BOWER, 184 Jockey Road, Sutton Coldfield



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AIRSCREW
AIR CONDITIONING FUME EXTRACTION
DUST EXTRACTION

Airscrew Fans are the secret of the success of Airscrew installations throughout the country. Wherever there is a problem involving Air Treatment, you should first consult Airscrew.



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*Phone: Weybridge 1600. *Grams: Airscrew, Weybridge
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**AVAILABLE
ON
REQUEST**



Mining engineers interested in the advantages of power factor improvement should send for our new publication No. 205A, "Mining Type Capacitors." It contains full information on a wide range of capacitors for installation at bank or inbye on voltages up to 11 kV including outline dimensions of adaptor and cable coupling arrangements.

BRITISH INSULATED CALLENDER'S CABLES LIMITED
NORFOLK HOUSE, NORFOLK STREET, LONDON W.C.2

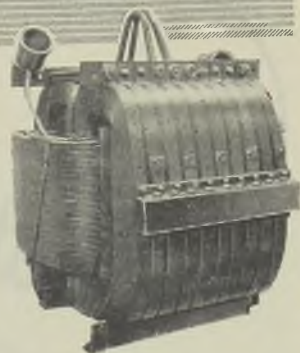


SIMPLEX

1890

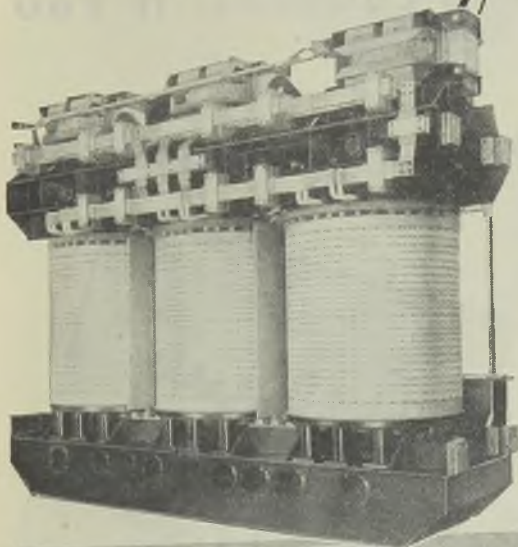
*56 years
experience
in the
manufacture
of*

THE FIRST 10kV.
TRANSFORMER
(150h.p.) EVER BUILT
This Ferranti Trans-
former, built 56 years
ago, embodied a ducted
core and ducted wind-
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features of design used
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A 40,000 kVA Ferranti
Power Transformer of
modern design

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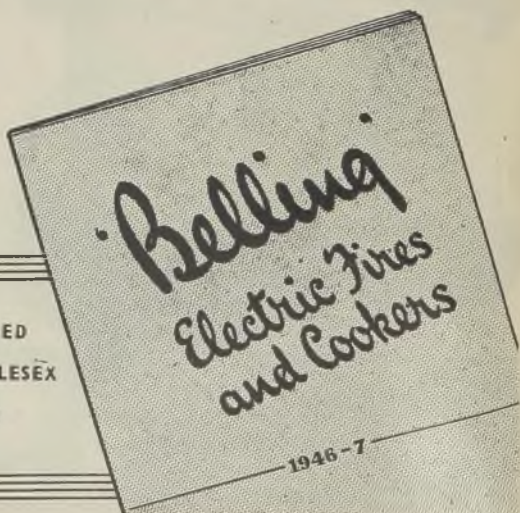
Autumn BRINGS THE
NEW *Belling* Catalogue **OF**

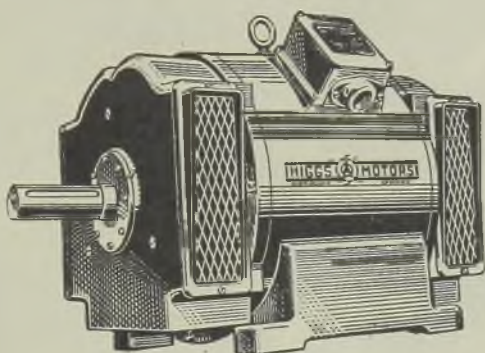
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HAVEN'T GOT YOURS YET, WRITE FOR

ONE NOW

BELLING & COMPANY LIMITED
BRIDGE WORKS, ENFIELD, MIDDLESEX
Telephone: Howard 1212





HIGGS large alternating current machines up to 600 H.P. are the successful outcome of extensive research and experiment in design, and are produced individually by a highly specialized plant. Maximum efficiency and reliability in performance is thus ensured.

Belfast, Birmingham, Bristol, Dundee, Glasgow, London, Manchester,
Nottingham, Peterborough, Sheffield, Wolverhampton.

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*Cables
and Flexibles*



Types for every purpose

Insist on ASHTON Cables, Flexibles and Cords and be sure of the best. Supplied to H.M. Government Departments and all Electrical and Allied Trades.

The wide range of 'ASHTON' Cables, Flexibles and Cords includes types and finishes to meet every requirement.

Manufactured under the strictest laboratory supervision throughout and finished to perfection, they are of the finest quality obtainable.

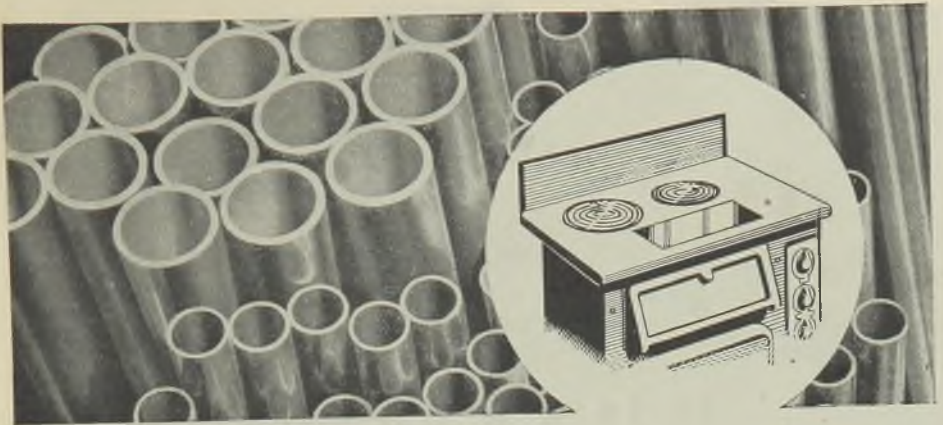
Supplies are available from numerous distributors throughout the country, but in case of difficulty in obtaining your requirements write direct to the makers.

LCF3

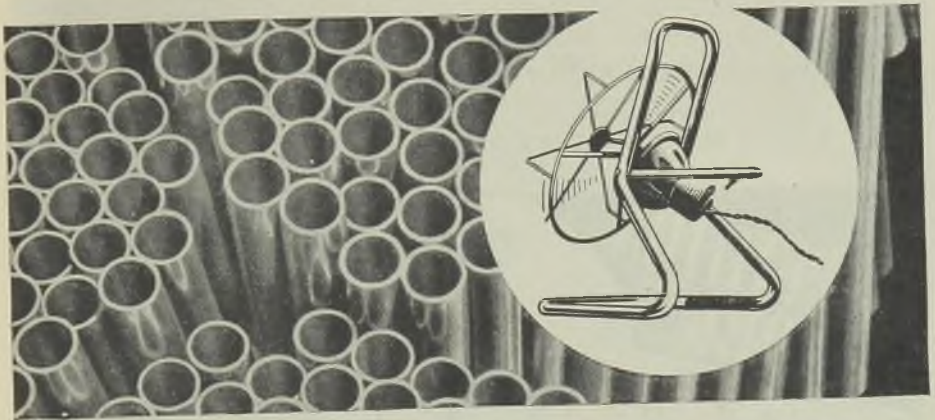
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CASTLE WORKS · STALYBRIDGE · CHESHIRE *Ltd.*



For Warming up or Cooling down



Never were so many things wanted for making new homes habitable and old homes new. Electric fires and fans, and cooling tubes for transformers,

are random selections from the long list of public wants. And if you are assisting to satisfy this demand, Tru-Wel electrically-welded steel tubes are able to help. For they simplify assembly; can be easily manipulated to specific designs; will very likely save you time, money and labour. Write to us for our illustrated booklet.



A Member of the Tube Investments Group 

TUBE PRODUCTS LIMITED · OLDBURY · BIRMINGHAM



**YOU CAN
KEEP A
GOOD CABLE
DOWN . . .**

. . . if it's a LANCASHIRE

There are plenty of good cables — on drums — but it is when they go underground that the real testing period begins. LANCASHIRE cables will carry your load — year in and year out. We shall be happy to quote you for Paper or Varnished Cambric Insulated, Lead Covered, and Armoured, High and Low Tension Cables for pressures up to 11,000 volts.

LANCASHIRE CABLES LTD · WARRINGTON · LANCS

Controlled by Sterling Cable Co. Ltd., Enfield, Middlesex, specialising in all types of Rubber, Synthetic Rubber, and Thermo-Plastic Insulated Cables and Flexibles.

IN THE MAIN THEY'LL SERVE YOU BEST

**REPETITION
WORK**

**FOR PRICE, ACCURACY
AND SPEEDY DELIVERY**

**ENGINEERING
ORMOND
COMPANY LTD.**

THE ORMOND ENGINEERING COMPANY LTD.

Head Office and Trade Counter:—Ormond House, Rosebery Avenue, London, E.C.1.

Telephone:—Terminus 2888 (6 Lines).

Telegrams:—"Ormondengl, Smith."

Introducing

TOTALLY ENCLOSED · FAN COOLED

Fractional H.P. Motors



the

Newman 'Imp'

*adds Sales Appeal
to your product*

SINGLE PHASE	from ½ H.P.-1000 r.p.m. to 1 H.P.-1500 r.p.m.
CAPACITOR START	from ½ H.P.-1000 r.p.m. to 1 H.P.-1500 r.p.m.
CAPACITOR START & RUN	from ½ H.P.-1000 r.p.m. to 1 H.P.-1500 r.p.m.
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VOLTAGES	200/210 220/230 240/250 and dual voltage 110-115/220-230
CYCLES	Standard 50 or 60 cycles—special freq. if desired

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Cogent

POWQUIP

HEAT CONTROLLED



The Special Balanced grip has interior metal reinforcement giving easy control and facilitates ironing awkward articles such as hats, the inside of cuffs, pleats, under lapels and collars.

The "POWQUIP" iron is a high grade, robust, reliable article of modern and attractive appearance embodying an automatic temperature control Element totally enclosed, which can be set instantly for all the usual fabrics. The sole plate temperature is controlled to within 5% either way.

The

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MANUFACTURED BY


**POWER EQUIPMENT
COMPANY LIMITED**

Sole Distributors for
London and the Home Counties

**LONDON ELECTRICAL
CO. (BLACKFRIARS) LTD.**

KINGSBURY WORKS
HENDON, N.W.9
Colindale 6196

BLACKFRIARS' ROAD
LONDON, S.E.1



another
NEW moulding

New moulds, designed and built by De La Rue, are now producing this large moulded plastic meter housing and cover for Aron Electricity Meter Ltd.

More than seventeen inches long, it gives sturdy protection to the delicate meter mechanism, whilst good electrical insulation is an inherent property of the material.

Further large new mouldings will be appearing soon to play their part in the drive for industrial recovery.

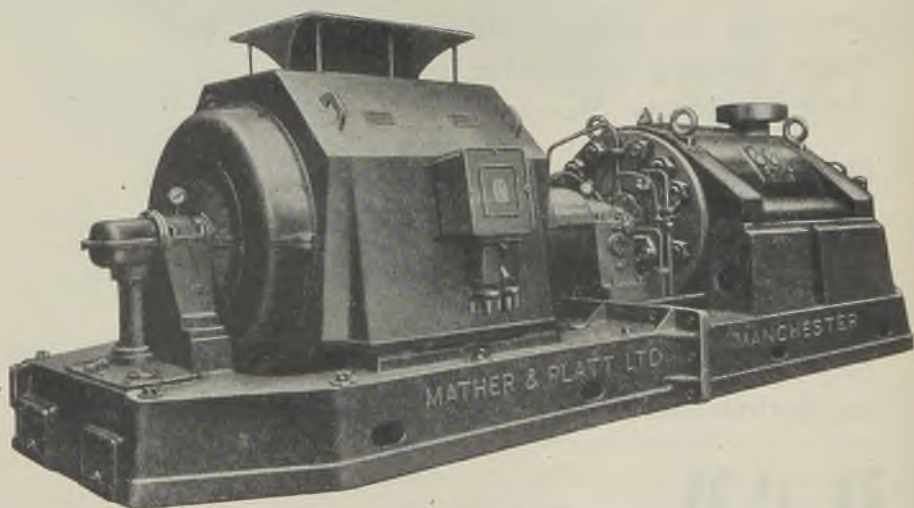
DeLaRue PLASTICS LTD

Imperial House, Regent St., London, W.1. Telephone: Regent 2901

3,000

Horsepower
Volts
r. p. m.
lbs per sq. inch
pressure.

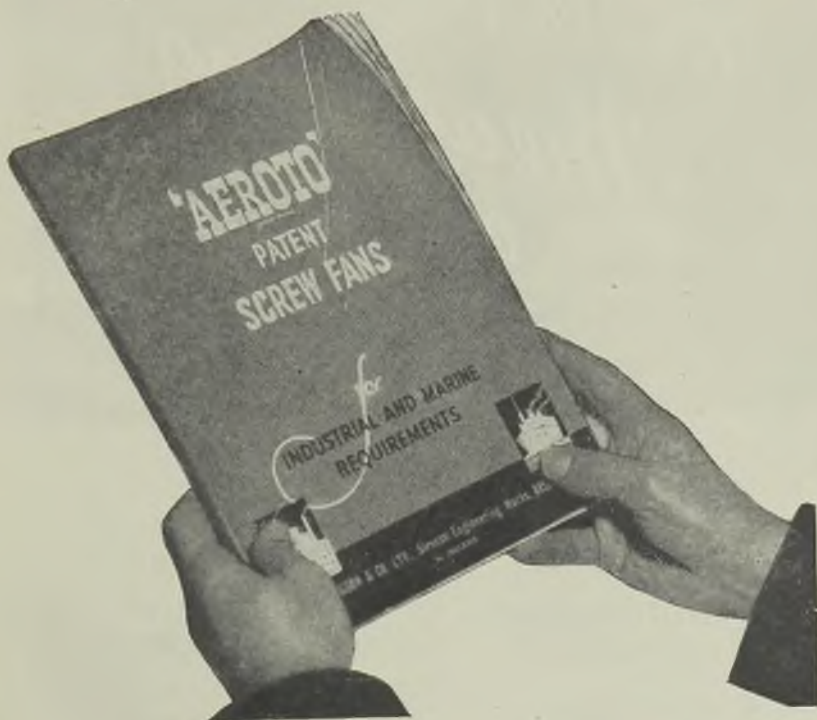
TAKING NOT MORE THAN $4\frac{1}{2}$ TIMES full load current
when started by switching direct on to the supply mains.
this Mather & Platt 3,000 H.P. 3,000 Volt, 3,000 r.p.m.
Squirrel Cage Motor drives a Mather & Platt Boiler Feed
Pump operating at a pressure of 3,000 lb. per sq. inch.



MATHER & PLATT LTD
PARK WORKS MANCHESTER 10



*This should be
in your hands!*



Already described as "undoubtedly a work of reference," this attractive publication, designed and profusely illustrated to show the uses of Aeroto fans for Industrial and Marine requirements, and containing a wealth of valuable technical information, may be obtained on application . . . with our compliments.

Quote Ref. No. SF372

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SIROCCO ENGINEERING WORKS - BELFAST

London . Leeds . Manchester . Glasgow . Birmingham . Newcastle . Cardiff . Dublin

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Manufacturers of :

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| ★ MINIATURE PANEL INSTRUMENTS | ★ ELECTRICAL RECORDERS |
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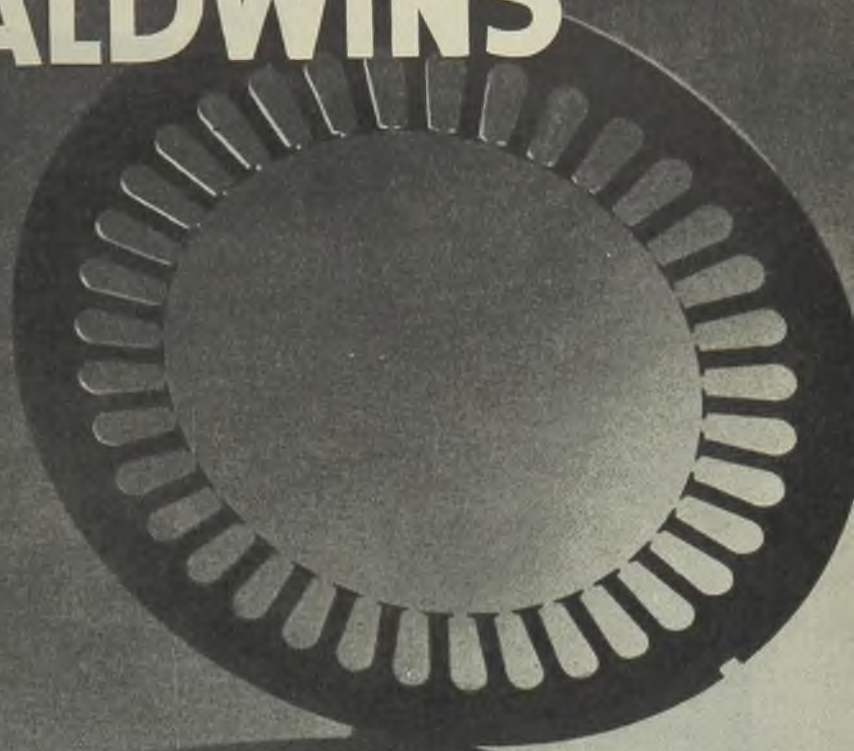
ELLIOTT BROTHERS (LONDON) LTD**CENTURY WORKS, LEWISHAM, LONDON, S.E.13**

TELEPHONE: TIDEWAY 3232

TELEGRAMS: OHM, LEWIS, LONDON

Electrical Review, Sept. 20, 1946

BALDWINS



ELECTRICAL STEEL SHEETS
FOR TRANSFORMER AND DYNAMO WORK

ELECTRICAL STAMPINGS
OF ALL DESCRIPTIONS

SPECIAL ALLOY SHEET FOR MAGNETIC TEMPERATURE
COMPENSATION - HIGH FREQUENCY WORK - RELAYS

RICHARD THOMAS & BALDWINS LIMITED
MILDEN, IRONWORKS, STOURPORT - ON - SEVERN, WORCS

W

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E

X

SWITCHES

for

RELIABILITY

'Wylex must be good'

GEORGE H. SCHOLES
& CO. LTD.

Wylex Works, Wythenshawe
MANCHESTER



Now Available
ON REQUEST



EIGHT PAGE ILLUSTRATED BOOKLET IN COLOUR
Users of solder for radio and electrical work are invited to write for a complimentary copy of "Modern Soldering" which incorporates free samples of Ersin Multicore Solder—the 3 core solder wire which requires no additional flux.

MULTICORE SOLDERS LTD.

MELLIER HOUSE, ALBEMARLE STREET, LONDON, W.1.
Tel. : REGent 1411 (P.B.X. 4 lines)

*The Usual Standard
isn't enough*

We can supply you with
**FIBRE JOINTS
AND WASHERS**
OF GUARANTEED ACCURACY

ALSO "Corrujoint" All-Metal Gaskets, Taylor's Corrugated Packing, Copper Joints and Washers, Compressed Asbestos Jointings, Shims and Kinghorn Type Metallic Valves, tabwashers to specifications.

Write for Booklet.

THE
**CORRUGATED PACKING
AND SHEET METAL CO. LTD.**
GATESHEAD - ON - TYNE

PHONE: GATESHEAD 71785.
GRAMS: CORRJOINT GATESHEAD

'English Electric'

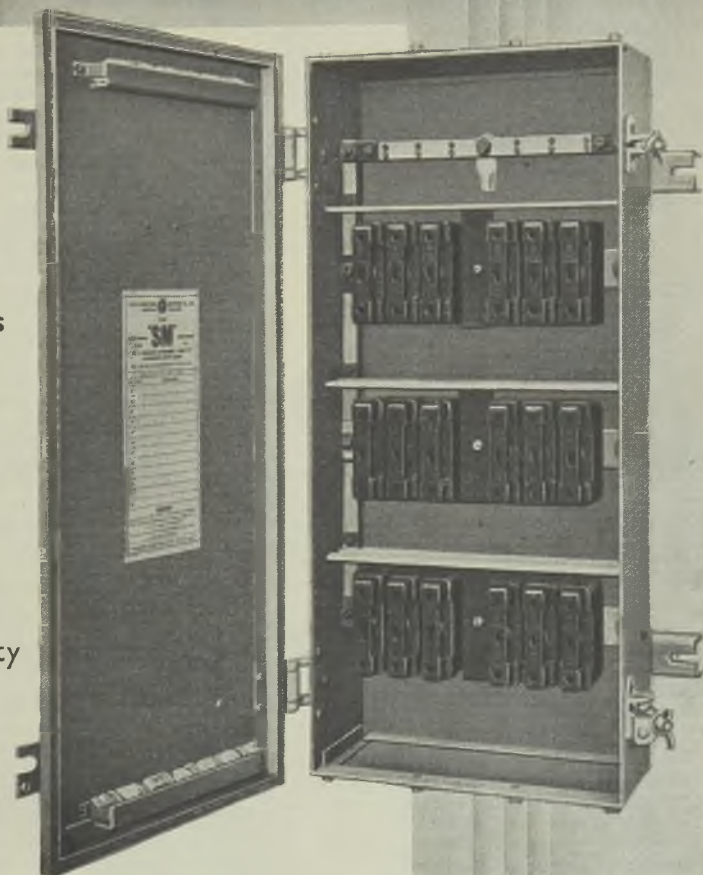
DISTRIBUTION FUSEBOARDS TYPE 'SM'



30 and 60
Amps Rating
Available
up to 12 Ways

•
Rapid cabling
facilities

•
Incorporating
H.R.C. Fuses
Category of duty
440 A.C. 4



AVAILABLE FOR QUICK DELIVERY

Write for Publication No. FG. 112

THE ENGLISH ELECTRIC COMPANY LIMITED

London Office : QUEEN'S HOUSE, KINGSWAY, LONDON, W.C.2

FUSEGEAR WORKS

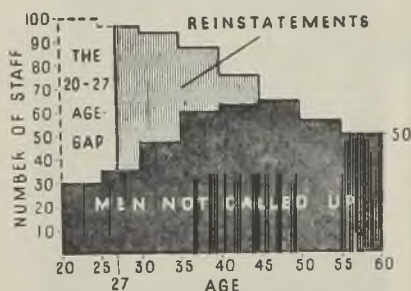
STAFFORD

THE SEVEN-YEAR GAP

Shortage of promising young men

FOR seven years, business and industry have been unable to recruit young men to train for responsible positions. Nearly all have been going into the Services.

This absence of "new blood" may not yet be generally felt. Many firms find their immediate needs met by reinstated staff. When they say, "No Vacancies," they believe what they say.



In this chart, the whole area shows the male administrative, executive and managerial staff of a typical engineering firm before the war, analysed by age-groups. The white portion is the present 20-27 gap that must be filled to restore the balance.

Yet, as the diagram shows, a gap remains in the 20-27 age-group — a gap that older men cannot fill. This hiatus in the ranks of salaried staff will prove dangerous to the future management of any business.

In ten years, it will mean a shortage of responsible men between 30 and 37: in twenty years, between 40 and 47. The time to fill this gap is now, before the young men of ability and promise drift into blind-alley jobs.

The 20-27's are beginning to come out of the Forces in rapidly increasing numbers. They are more fortunate than their fathers were after World War I. This time, the Government has set up a nation-wide appointments service to prevent the waste of talents and capabilities needed by business and industry.

A Roster of Able Men

Thirteen Regional Appointments Offices are building up, for employers to call upon, a great national roster of men (and, of course, women) of promise in different fields. As the 20-27's come out of the Services, all of the requisite

standard who apply are interviewed, classified and registered. Those who are undecided about their careers are "screened" to discover special aptitudes, by a method successfully tested on a large group of B.A.O.R. "volunteers."

Thus, men are matched to jobs. Employers can draw upon the whole country, if need be, for the right men to fill the 20-27 age-gap. And they are saved many fruitless interviews, since only likely candidates are put forward.

Since VE-day, more than 30,000 responsible posts have been successfully filled, and hundreds of appreciative letters have been received from employers and applicants alike. To make sure of securing the most promising men, and to learn about the Government Training Schemes which increase their value, employers are invited to get in touch with their nearest Appointments Office. Offices are established in the following towns:

LONDON: 1-6 Tavistock Square, W.C.1
 CAMBRIDGE: 5 Salisbury Villas, Station Road
 READING: 23 Valpy Street
 BRISTOL: Lyndale Hotel, Berkeley Square
 BIRMINGHAM: 239 Broad Street
 NOTTINGHAM: Commerce Chambers, Upper Parliament Street
 LEEDS: Greek Street Chambers, Greek Street
 MANCHESTER: Commercial Chambers, 47 Corporation Street
 LIVERPOOL: Cotton Exchange, Bixteth Street
 NEWCASTLE-ON-TYNE: 153 Barras Bridge
 EDINBURGH: 5 Rothesay Terrace
 GLASGOW: 450 Sauchiehall Street
 CARDIFF: 8 Cathedral Road

Two Training Schemes

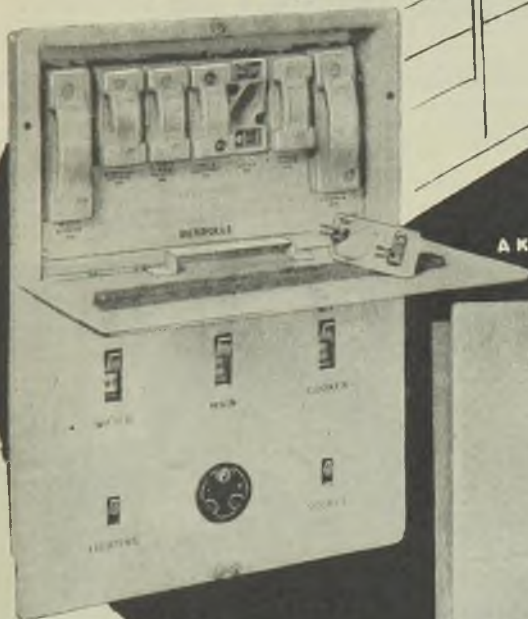
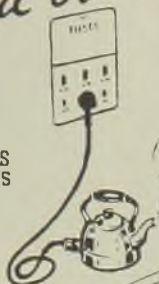
To help selected men and women from the Forces or other war service to make up for lost time in acquiring professional or business skills, two training schemes of direct interest to employers are in operation:

Business Training Scheme: A 3-months' course in the general structure, practice and administration of business, followed by practical training in a particular firm. Financial assistance where necessary.

Further Education and Training Scheme: Financial assistance in completing higher professional or technical studies interrupted by war service.

Kitchen Control Units For All-Electric or Part-Electric Installations

- APPROVED BY THE MINISTRY OF WORKS
- COMPONENTS TO SUIT VARIOUS WIRING CIRCUITS AND KINDS OF HOUSES
- CARTRIDGE OR SEMI-ENCLOSED FUSES
- FLUSH MOUNTED AND COMPACT



A KITCHEN CONTROL UNIT FOR AN ALL-ELECTRIC HOUSE



REYROLLE
HEBBURN-ON-TYNE ENGLAND



TILTING TYPE

MERCURY SWITCHES



For instrument work, domestic and industrial apparatus and power control plant. Standard switches available or designed to any individual requirement. Write for catalogue or technical advice.

THE MERCURY SWITCH MANUFACTURING CO. LTD.
WEST DRAYTON : MIDDLESEX

OKERIN

LOW POWER FACTOR WAXES AND COMPOUNDS

THE OKERIN di-electrics, designed specially for impregnating, sealing, filling and finishing Coils, Cables, Condensers, Batteries, Transformers, etc., conform to definite specifications and include grades which are stable under extreme working conditions and resistant to moulds and fungus. Tested in service from the Arctic to the Tropics.



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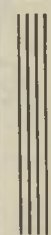
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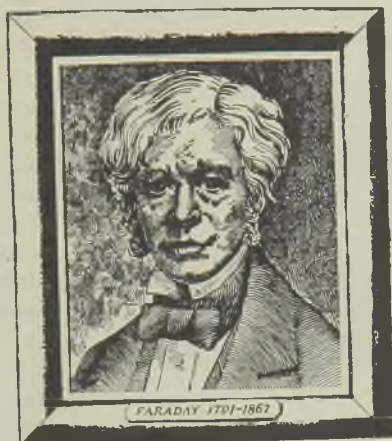
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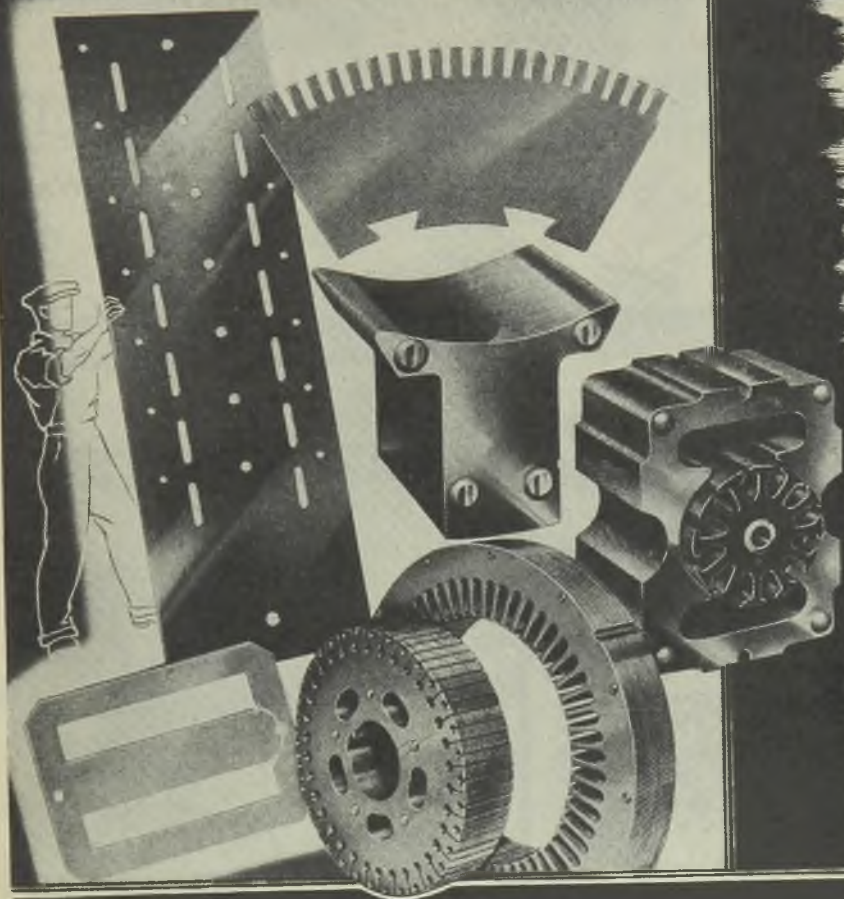
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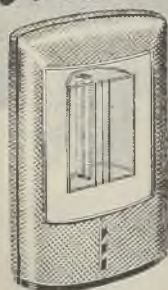


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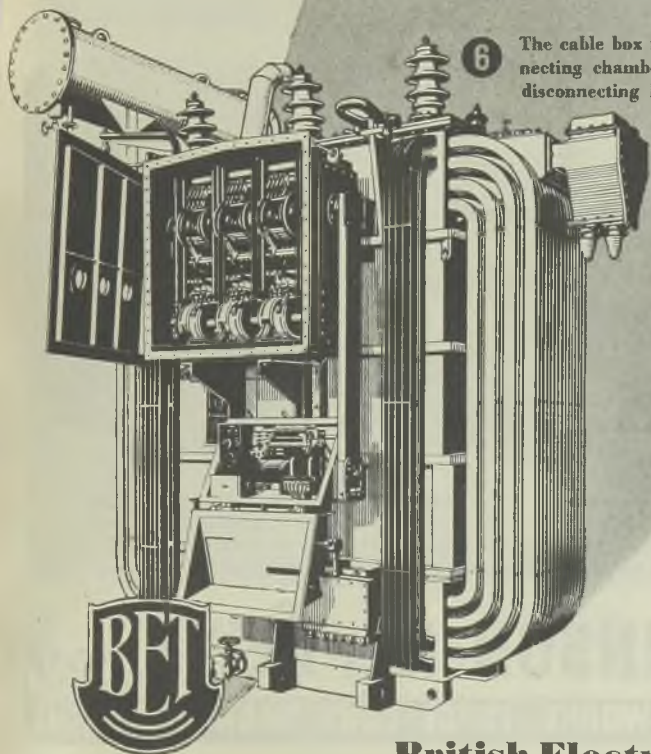
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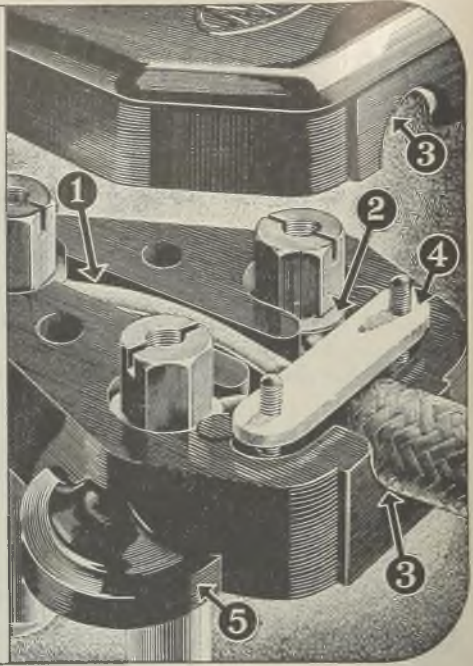
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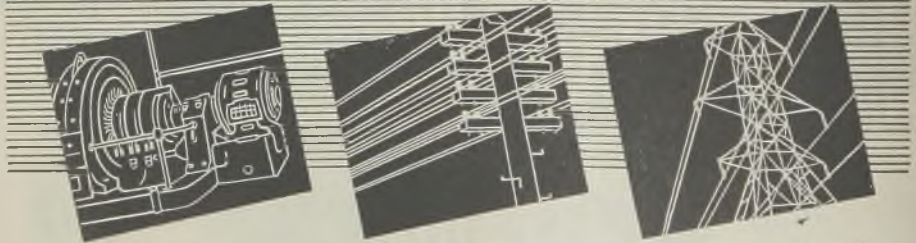


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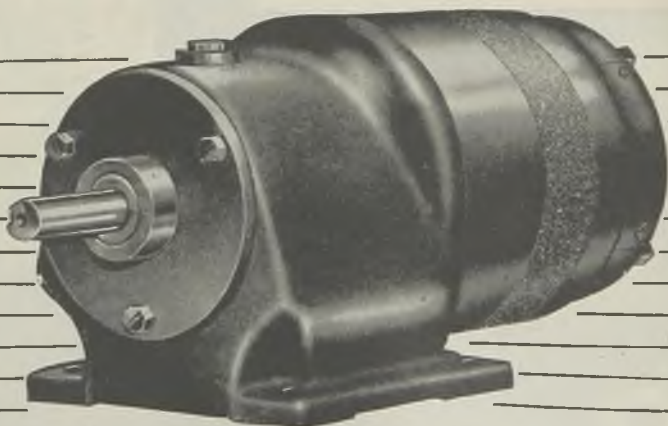
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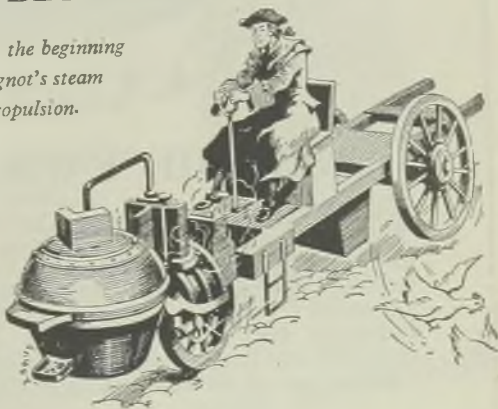
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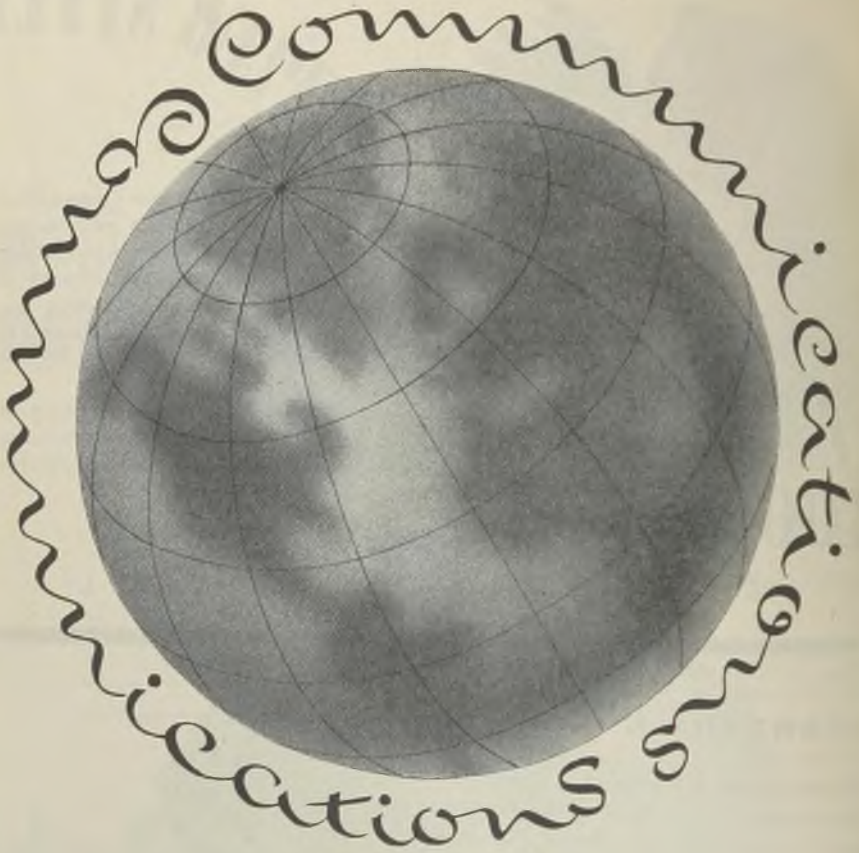
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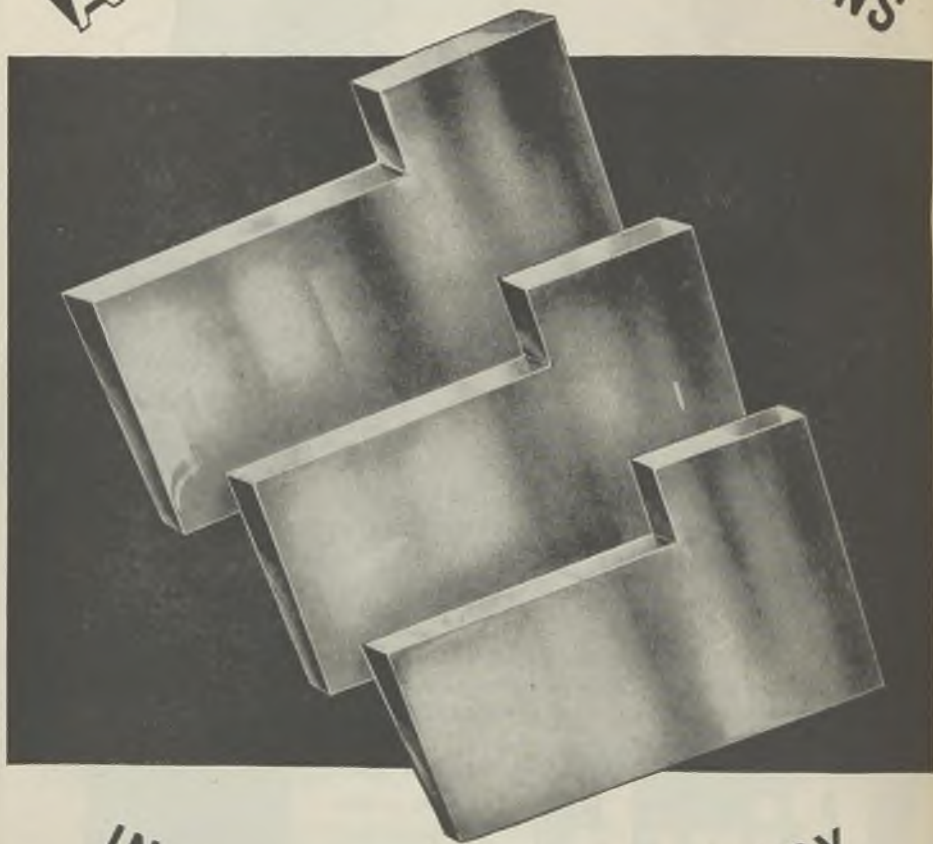
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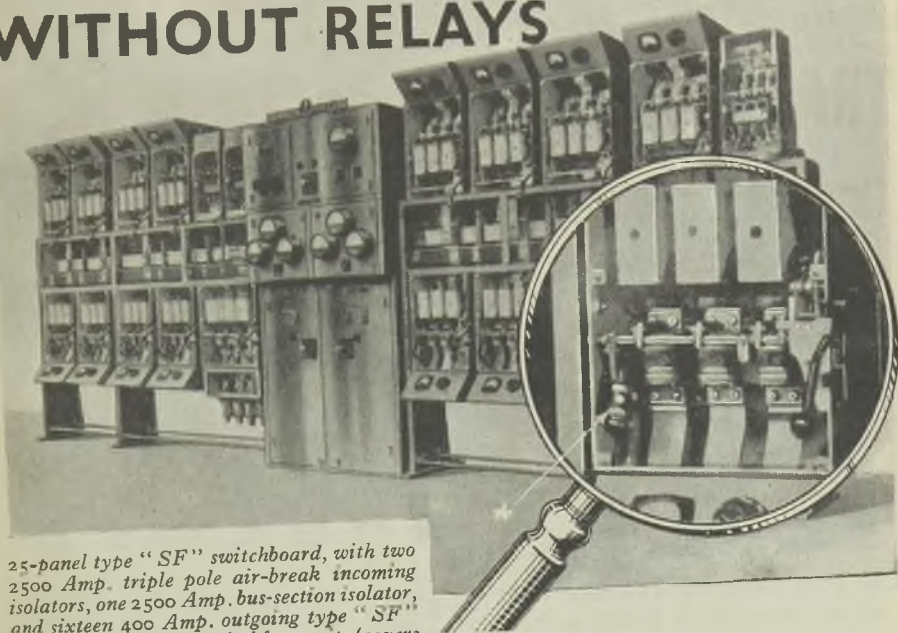
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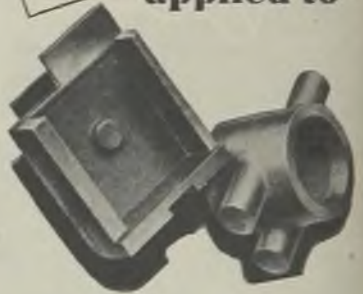
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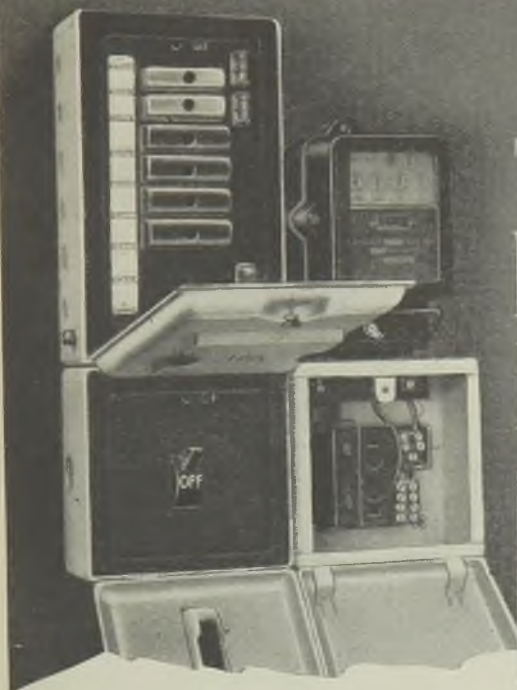
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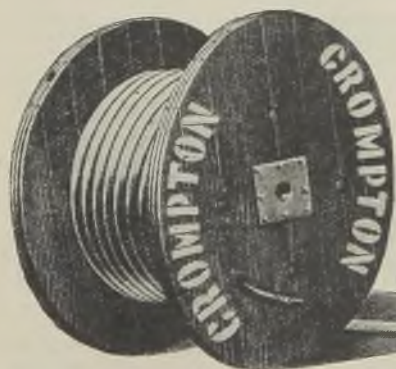
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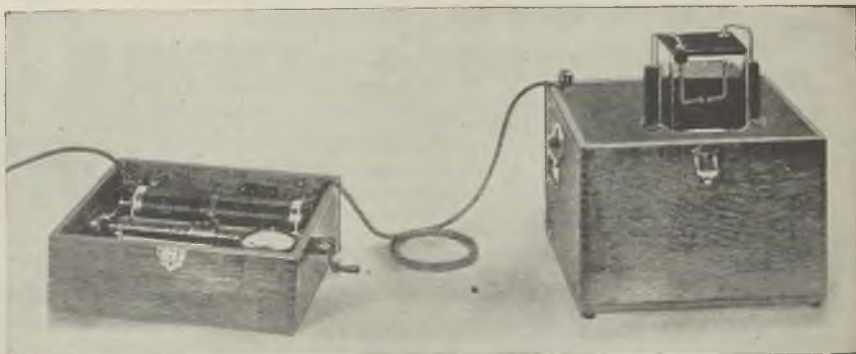
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ELECTRICAL REVIEW

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Street Lighting

Aspects of Uniformity



UNTIL action has been taken to implement the generally accepted recommendations of the Departmental Committee on Street Lighting whose two reports are now eleven and nine years old respectively, one theme is likely to predominate at all meetings that relate to street lighting. That is the need for a reasonable uniformity of illumination at suitable intensities for roads and streets having similar characteristics. The urgency of the need is primarily to reduce the accident rate after nightfall; a secondary consideration is the socially beneficial influence of well-lighted centres of population.

Although the theme was repeated in one form or another throughout the conference of the Association of Public Lighting Engineers (reported in this issue) there was in this no taint of Falstaffian "damnable iteration." The subject was approached from many angles by speakers who introduced also many matters that will no doubt become topics of outstanding importance, once the pre-requisite condition has been met.

Safety and Economy

In his presidential address Mr. W. N. C. Clinch summarized the position in his reference to the lack of co-ordination of the numerous local lighting authorities, which in addition are not in many cases strong enough financially to secure the measure of uniformity essential for road safety. Yet, as he pointed out, human lives are irreplaceable, and the value of the achievement of the object in view cannot

be assessed altogether in economic terms.

Support for larger public-lighting administrative areas was forthcoming from Mr. Lennox, who produced striking evidence of the intolerable burden in local rates that the adoption of adequate lighting would impose in thinly populated districts. On the other hand he showed that if the expenditure were spread over large and small authorities, through effective collaboration among them, the overall average increase in rates could be negligible.

Avoiding Abrupt Changes

A defect of existing legislation is that Government grants in aid to lighting authorities apply only to trunk roads, most of which are in open country, where the motorist at all events, as Mr. Fryer sees it, is able to look after himself. What the car driver does ask is that he shall be freed from the strain of driving through abruptly changing lighting conditions.

This view entails the concentration of available resources on securing good lighting for a small mileage rather than spreading them over longer routes to give perhaps only mediocre results. Uniformity of illumination results does not by any means imply a deadening uniformity of technique and should not destroy local initiative. The experimental installations described by Messrs. Davies and Sinclair make this clear. Even if the application of their system be limited to special situations, it nevertheless furnishes a good example of the scope there is for continued advance in the art.

More efficient administrative areas and monetary aid will not alone be enough. The qualifications of the lighting engineer and the organisation of his department will be the ultimately decisive factor. This aspect is again interlinked with the size of a lighting authority of the future that could best provide the co-operative technical service as well as the training facilities discussed by Mr. Parker, in which a proper regard is paid to maintenance. It was evident from the discussions of the papers that the membership as a whole would welcome the Council's taking the initiative in placing definite practical proposals before the Minister of Transport.

FURTHER acrimonious **Fuel Shortage** passages between the Minister of Fuel and Power and the electricity supply companies are reported. A statement issued by the companies drawing attention to the serious depletion of coal stocks and hinting that electricity and gas might have to be rationed was described by Mr. Shinwell as a lot of nonsense and propaganda. Would Mr. Shinwell apply the same description to warnings uttered by municipal electricity authorities all over the country and to those put out by his own Ministry? The companies would have been better advised to use the word "restricted" rather than rationed. Nevertheless it is an undeniable fact that stocks are smaller now than they were this time last year and then they were considered to be dangerously low. Mr. Shinwell is not to be blamed for this position; he, like the supply authorities, is the victim of circumstances. But he should show more tolerance to his fellow victims.

Farmers and Nationalization **ONE** reason commonly put forward by advocates of the nationalization of electricity supply is that only by this means can farmers be given a cheap supply. Not all farmers concur in this: in the *Farmer & Stockbreeder* recently a farmer in Kent expressed the view that "if a potential benefit does not justify the meeting of proper charges by the beneficiary, it will not justify such charges being shouldered by his fellow men." He favoured the use of Diesel-electric plant but admitted that there was some advantage in convenience in the "laid-on" supply. He concluded:—

"To secure for ourselves such a doubtful increase in efficiency which, at the best, would be too small to affect the overall efficiency of the farm, it would be a drastic thing to advocate the risks involved in nationalizing one of the most efficient and enterprising industries in the country."

"J. & P." Finance **WHEN** at the end of last year Johnson & Phillips Ltd., applied to the Capital Issues Committee for permission to issue to their shareholders 200,000 £1 ordinary shares at 60s. each, when the old ordinary were standing at about 77s., they were told that the "bonus" element was too great. A similar decision was made when the directors proposed to raise the issue price to 65s. Now, however, the company has been given permission to make the issue at the latter price. It is difficult to understand why the company was not allowed to proceed in the first place for the price of the old ordinary has since advanced to about 85s., making the "bonus" actually 3s. more than the original figure.

"Britain Can Make It" **NEXT** Tuesday sees the opening of the "Britain Can Make It" Exhibition at the Victoria and Albert Museum, where there has been gathered together an excellent collection of equipment, mainly of the lighter types, selected from examples sent in by British manufacturers by independent "panels." The idea is principally to show the British public the kind of appliances, fabrics, etc., now available to them or shortly to appear in the shops and many of the exhibits will be special export designs. The electrical industry will be well represented and we propose to illustrate in our next week's issue some of the items which are to be seen.

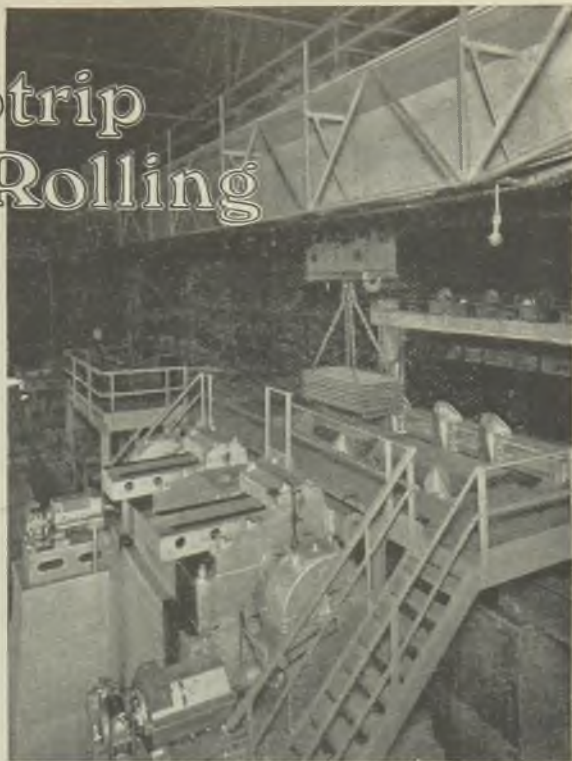
Generation at Preston **ALTHOUGH** Ribble No. 2 station, which was formally inaugurated by the Minister of Fuel and Power last Friday, is officially known as an extension, it is completely independent of the existing station on the site. The new station with the first two sets was put into commission during the war and was visited by I.M.E.A. delegates last June. A full description of the plant was given in our issue of September 7th, 1945. The ultimate capacity of 126,000 kW is expected to be reached in about two years' time.

Hot Strip Rolling

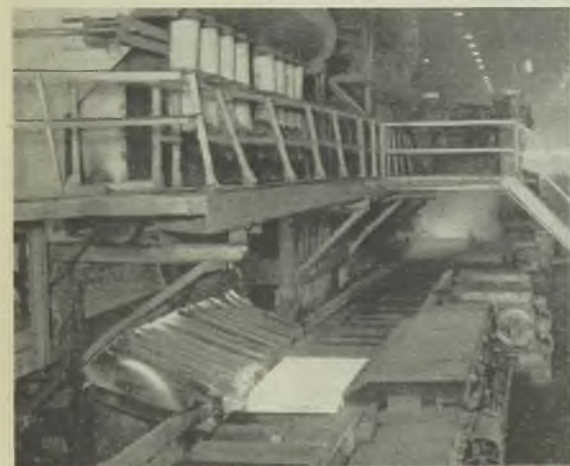
Sheet Steel Production from Slabs on the Continuous Process Principle

IN the *Electrical Review* of August 2nd we described the electrical processes in steel making and slab rolling at the works at Shotton, Chester, of John Summers & Sons, Ltd. We now follow this up with a description of electrical methods employed in hot strip continuous rolling in this works.

The slabs are drawn from the stock bay to be charged into the slab heating furnaces ready for delivery to the hot strip mill. The heating is carried out in three Stein & Atkinson producer-gas fired continuous furnaces, each capable of dealing with 50 tons of slab per hour. The cold slabs are stacked on the furnace magazine and inserted by electrically operated pusher gear; each pusher is driven by a 50-H.P. motor. The



Cold slabs are placed in the continuous furnaces by electrically operated pusher gear



slabs pass end-to-end in a continuous line through the furnace, so that a slab charged at the entry end of the furnace results in the discharge of a hot slab at the delivery end of the furnace.

The hot slabs slide on skids on to a series of live roller tables behind the furnaces for conveyance to the hot strip mill, which comprises eight stands. The first three, the roughing stands, are spaced so that the slab is never in more than one of them at a time. The last five stands, the finishing stands, are so placed that the strip is in all five simultaneously. Each of the stands has two work rolls

The hot slab slides from the furnace to live roller tables for conveyance to the hot strip mill

and two back-up rolls. The reason for this design lies in the necessity to use a relatively small diameter for the work rolls, in order to affect the required reduction on the strip, and back-up rolls of large diameter to support the smaller work rolls.

The first stand is a wide mill with rolls 96 in. long, and it is used for cross rolling slabs to increase their width, when required, from 39 in. to a maximum of 54 in. All the other stands have rolls 60 in. long, and they will roll a strip up to 54 in. wide. To avoid confusion it may be well to make it clear that the roll "length" corresponds to the slab or strip width. In the hot strip mill the slab, with an original thickness of 3½ in. to 5 in., can be rolled to a strip of about 0.055 in. minimum thickness. Ahead of the first stand is a pair of edging rolls which controls the slab width, each roll being driven by a 300-H.P. reversing slip-ring induction motor. The first stand of the mill is driven by a 2,500-H.P. s.r. induction motor with a flywheel and automatic slip regulator; this stand effects very big reductions on the slab, with peak rolling loads up to 10,000 H.P.

The second and third roughing stands are driven by 2,500-H.P. synchronous motors

The three roughing-stand motors are fed direct from the works 6.6 kV system, and are controlled from the roughing-mill pulpit through the medium of solenoid-operated 6.6-kV metal-clad switchgear. Starting of the two synchronous mill motors and of the synchronous motors driving the motor-generator sets is effected through a reactor to limit the starting current. The reactor is common to all the synchronous motors,



The three roughing stands of the hot strip mill

and it serves through a starting busbar system in the 6.6-kV switchroom.

Between the third roughing stand and the finishing stands is a delay table in two sections, each driven by two 35-H.P. motors with series-parallel and shunt-field control, which results in a four-to-one speed range. The purpose of this table is to hold the strip until it cools, when necessary, to the correct temperature, before it enters the finishing stands.

All the finishing stands are driven by d.c. variable-speed motors. Nos. 4, 5, 6 and 7 have 3,000-H.P., 200/400-r.p.m. motors, and No. 8 stand has a 2,000-H.P., 175/350-r.p.m. machine. The d.c. supply for these motors is obtained



The first roughing stand is driven by a 2,500-H.P. slip-ring motor, and the second and third by 2,500-H.P. synchronous motors

designed for very high overload capacities; they regularly carry up to 2½ times full load during the short period in which the slab is passing through the mill.

from two m.g. sets, each of which has two 2,500-kW generators, making a total capacity of 10,000 kW at 600 V. For the finishing-stand drives variable speed is

essential in order to adjust the relative speeds of the five stands, as determined by the gauge of material being rolled and the reduction effected in each stand. To control the strip between each stand very rapid adjustment of speed is essential, and this is achieved by field control regulators which are chain operated from handles in the control pulpit. In addition, main motor-operated field regulators are provided.

The three roughing stands, and their auxiliaries, are controlled from an elevated pulpit at the roughing end of the mill, and the five finishing stands and auxiliaries are controlled from a similar pulpit situated near them. All the finishing-stand drives

hot strip mill main drives is an impressive cubicle-type board about 90 ft long, and it is



The finishing stands are disposed so that the strip is in all five stands simultaneously

equipped for supervisory control over all the remote control points on the mill.

The hot strip leaves the last finishing stand at a maximum speed of 1,560 ft per minute, and it travels down a run-out table for delivery for either hot coiling or shearing into plates. The shearing is done by flying shears immediately behind No. 8 stand, and this equipment is driven by two 150-H.P. motors, in parallel and under Ward-Leonard control, taking their



All the finishing stands are driven by d.c. variable-speed motors (right) supplied by two m.g. sets (left), each with two 2,500-kW generators

have emergency stop push-buttons which open the motor circuit breaker and apply quick dynamic braking. All the main driving motors and the control gear are housed in a separate motor room which is ventilated by means of four circulating air fans and one make-up fan. Each of these fans has a capacity of 35,000 cu ft per minute. The circulating-air fans pass the hot air from the motor room through Visco filters and air coolers into the motor room basement, and the make-up air fan takes in outside air through a filter into the basement to make good the air losses from the motor room.

The main supervisory board covering the entire strip mill power supplies and the



Rapid adjustment of the speed of the strip on the finishing stand is achieved by field control regulators, chain operated from the control pulpit

supply from a 530-kW d.c. generator. The control of the hot-strip flying shears employs a very special piece of apparatus, as the

shears can be made to cut the front and back ends off the the strip, as well as to shear continuously, and to work automatically from the passage of the strip through the finishing

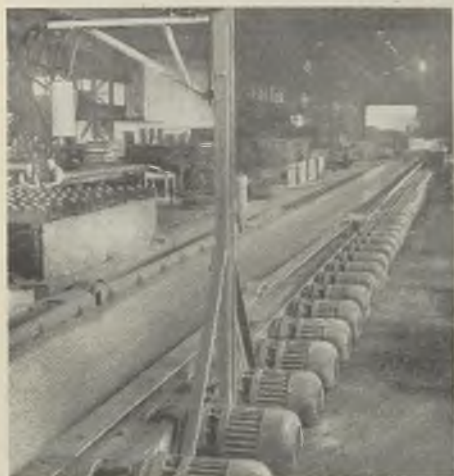


table motors are arranged in two sections, each being supplied through reversing contactors from a d.c. motor-driven variable-frequency alternator set. Each alternator is rated at 425 kVA, 16/50 cycles, and has a speed range of from 333 to 1,000 r.p.m. Two of the three motor-alternator sets installed are used at one time, and change-over switches for the main and control circuits are provided so that any combination of machines can be used. The sets are forced ventilated from the hot-mill motor room air system.

The duty of this equipment is very severe, and normal operation is to make three or

Left: From the flying shears the strip is conveyed to the hot-strip coiler on a run-out table with 122 individually driven rolls. **Below:** The hot strip up-coiler has entering pinch rolls and a cluster of driven rolls

stands, or with manual control as designed. The matching of the shears speed with the strip speed is done through Selsyns and a differential Selsyn indicator, and the cut length can be varied from 11 ft to 30 ft over the entire range of the strip speed.

From the flying shears the strip



The cubicle type main supervisory board for the entire mill is about 90 ft long

is conveyed to the hot-strip coiler on a run-out table containing 122 individually driven rolls, each roll motor being a 0.7/2-1-H.P., 180/580-r.p.m., 16/50-cycle machine. The run-out

more "plugging" operations on each strip, with the full group of motors. The hot strip, after passing down the run-out table, enters the up-coiler which consists of entering pinch rolls and a cluster of driven rolls that form the strip into a coil. The coiler has a 50/60-H.P., 400/1,200-r.p.m. d.c. motor. Sheared material passes through the pinch rolls of the coiler, and is deflected on to a piling bed from which it is transferred by crane to cooling racks for further processing.

Coiled material passes on to an up-ender

which turns the coil through 90 deg and places it on a motor-driven chain conveyor for transfer to the coil stock yard. An elevated pulpit from which are controlled the coiler, run-out table, up-ender, etc., is equipped with a variety of signalling devices from and to the mill.

The hot-strip mill main driving motors

and the associated control gear were supplied by the English Electric Co., Ltd.; the auxiliary driving motors are products of the General Electric Co., Ltd.; the auxiliary control gear was produced by the Igranic Electric Co., Ltd.; and the electrical equipment for the grease system was supplied by the Metropolitan-Vickers Electrical Co., Ltd.

New Preston Power Station

Inauguration by Minister of Fuel and Power

ANOTHER important stage in the development of the Preston Corporation electricity undertaking was officially completed on September 12th, when the Minister of Fuel and Power (Mr. Emanuel Shinwell) opened the Ribble generating station No. 2, by starting up the first of two 31,500-kW turbo-alternator sets. It was originally planned for eight boiler units and four turbo-alternator sets of a total capacity of 126,000 kW. Half that programme has been completed. The two further sets, each of two boilers, are scheduled for completion by the winters of 1946-47 and 1947-48. A model in wood of the two stations was on view in the Town Hall, where a commemorative luncheon was held.

Future of Electricity Supply

The Mayor of Preston, Ald. H. E. Rhodes, who has been chairman of the Electricity Committee for eighteen years, in proposing the toast "The Future of the Electricity Industry" paid tribute to Mr. G. A. Robertson, the borough electrical engineer, and his staff who were responsible for the lay-out and design, and to the contractors. After reviewing the progress of the undertaking in terms of consumers (now 51,000), kWh sold per annum (now 127,000,000) and distribution area (now 204 square miles), the Mayor said the undertaking had never contributed one penny to the rates. With a view to building up a structure for the future—whilst reducing tariffs which compared favourably with any in the country—they had put back every farthing they made into the "kitty." That was good business. On the other hand, he knew of one authority which had taken £176,000 from its undertaking for rate aid. While Preston was not complaining about nationalization, they did expect, when future policy was determined, not to be called upon to subsidize the profligacy of other undertakings. In these days, electricity was not a luxury but a necessity and people were demanding equipment as never before.

In response, Mr. Emanuel Shinwell, referring to the view of the I.M.E.A. that distribution of electricity should be the exclusive concern of municipal electricity undertakings, said that the Government was going to nationalize the electricity industry in the interests of consumers.

That should be the primary object of everyone. There could be no question of interests, vested or otherwise. Progress in any form, sphere or realm was never achieved unless certain interests were set aside.

The issue had been placed for a long time fairly and squarely before the electors as one of the essential items of Labour policy. There must be co-ordination of all forms of fuel and power and the search for the right method of producing heat, light and power brooked no delay.

When competitive trading conditions were again experienced, possibly at a time when there would still be a shortage of man power, greater use would have to be made of motive power. The I.M.E.A. had agreed that nationalization should be applied in principle, but it was rightly concerned about the democratic organization of electricity supply. He did not quarrel with that. The Government could not lightly dismiss the organization created by the municipalities or ignore their personnel.

Mr. J. S. Pickles (president of the I.M.E.A.) replied to the toast of the guests.

Mr. G. A. Robertson, borough electrical engineer, was responsible for the design and construction of the whole of the works, the civil engineers being L. G. Mouchel & Partners. Among the principal contractors were:—Boiler, coal and ash handling plant, International Combustion, Ltd.; turbo-alternators, transformers, switchgear auxiliary motors, English Electric Co., Ltd.; instruments, George Kent, Ltd.; control gear, Brookhirst Switchgear, Ltd.; electric boiler feed pumps, Mather & Platt, Ltd.; cables, British Insulated Callender's Cables, Ltd. and Siemens Bros. & Co., Ltd.; telephones and signalling equipment, Clifford & Snell, Ltd.; and lighting and heating installation, Preston Corporation Electricity Department.

English Electric Convalescent Home

"Hampstead," the country home of the late Sir John Hibbert, at Grange-over-Sands, recently acquired by the English Electric Co., Ltd., as a convalescent home for its employees, has received the first party of patients. It was opened by Lady Nelson and named the Sir George Nelson Convalescent Home.

Views on the News

Reflections on Current Topics

TRACT is not the strong suit of the Minister of Fuel and Power; he seems to be one of those who pride themselves on their "bluntness." Speaking at the inauguration of the new Preston plant last week, Mr. Shinwell again referred to the nationalization of electricity supply and said: "In seeking our objective we may have to ride roughshod over certain people and certain interests associated with electricity supply. Progress in any sphere was never achieved unless certain things were set aside, and so it will be in electricity." This is another way of saying that one cannot make omelettes without breaking eggs, but there is much more than egg-breaking in the production of a successful omelette.

* * *

Among the very large amount of new domestic electrical appliances which are now beginning to make their appearance on the market, I am surprised that I have not yet come across a mixing machine. Of course the Board of Trade may have had something to do with this, considering it among the less urgently needed apparatus, but it does seem to me that there would be a considerable demand for a soundly constructed multi-purpose unit of this description selling at a reasonable price. Even before the war the only apparatus obtainable was, in my opinion, either too flimsy for long, trouble-free use or unnecessarily high priced. Design of a really first-class unit having a low production cost should not present any very great difficulty.

* * *

I am frequently pulled up nowadays by the appearance of the initials "B.E.A." in what seems to be an incongruous context and find that they relate to British European Airways. It is a pity that there is no Central Registry of Initials to prevent this sort of thing. I seem to recollect that the Electrical Association for Women had to adopt this rather awkward title because the initials of its original style, Women's Electrical Association, had already been "pre-empted" by the Workers' Educational Association. The Registry would have to act internationally, too, to ensure, for instance, that initials which denote industry here (F.B.I.) should not be associated with crime in the United States (Federal Bureau of Investigation).

* * *

Very definite backing for my warning to electricity supply authorities to be careful about connecting up the Service camps which have been taken over by homeless people

comes from Dundee. Mr. P. Philip, the electrical engineer of that city, recently told the Electricity Committee that he had inspected the wiring at a local army camp which had been "commandeered." He found that "electric and telephone cables were tangled together, some wires were dangling down to almost within reach of the children's hands, and others were touching the roofs of the huts." The whole system was unsafe and he would not accept responsibility for it. Some members of the Committee were in favour of cutting off the supply altogether, but it was eventually decided that consideration of the matter should be deferred until the Housing Committee decided whether the huts should be taken over as temporary housing accommodation.

* * *

Little attention has been paid of late years to the hot-air engine, which a century back was regarded by some engineers as a possible competitor of steam. Theoretically it provides an economical method of deriving energy from heat, but with the production technique then available it proved to be unduly bulky and inefficient in practice and the development of the internal-combustion engine appeared to relegate it to limbo. Recent research in the Philips laboratories, based on modern progress in heat transfer, flow resistance and properties of metals and discussed in the *Technical Review* sent me by the company has raised once more the question of the possibilities of the heat engine with what I am informed are very promising results.

* * *

It is interesting to see how many of the developments brought about by wartime research are finding peacetime applications. The technique of mine location is, it is hoped, to be put to more lucrative use at the end of this month when archæologists are to employ all the latest electrical devices in their efforts to discover treasure buried in East Anglia. Electrical instruments of various kinds have, of course, been used with a certain amount of success for several years for water divining and the detection of minerals and oils, but this is the first time I have heard of their being employed in a treasure hunt. The principal difficulty encountered with this type of apparatus is the interpretation of the results obtained. It generally takes a highly skilled geophysicist to say what has been detected—and he is not always right then!

—REFLECTOR.

Public Lighting Conference

Papers and Discussions

MORE than 1,000 delegates from 533 local authorities and from foreign countries attended the conference of the Association of Public Lighting Engineers which was held at the Central Hall, Westminster, from September 10th to 12th. At the opening meeting on the 10th the Minister of Transport (Mr. Alfred Barnes), referring to his recent assumption of responsibility for street lighting, said that he was impressed with the view that there should be the greatest possible uniformity in the standards of street lighting and this might entail larger administrative units. There should be a closer consultation between adjoining lighting authorities. The Minister commended not only the endeavours of the Association to secure safe use of highways at night but also its active encouragement, in association with the Royal Fine Arts Commission, of pleasing designs of lamp columns.

About a quarter of the fatal road accidents and a fifth of all accidents occurred after dark, some of which might be avoided by better lighting. All schemes should, as far as practicable, be carried out to the recommendations of the Reports of the Departmental Committee on Street Lighting. Available resources should be used for providing good lighting for a small mileage rather than mediocre lighting for a greater mileage. The service should, wherever possible, be in the hands of a fully qualified public lighting engineer as this resulted in improved standards of lighting and greater economy. The Minister concluded by declaring open the exhibition of street-lighting equipment, a description of which was given in the *Electrical Review* of September 6th.

A display of street-lighting equipment was also arranged at the near-by London offices of the Wardle Engineering Co. The exhibits included a number of lanterns of new design for use with sodium and mercury discharge lamps.

Presidential Address

In the afternoon the retiring president, Mr. E. J. Stewart (Glasgow) handed the insignia of office to Mr. W. N. C. CLINCH (Northmet Power Co.), who then delivered his inaugural address. If lives could be

saved, burglaries reduced in number and moral standards raised by properly applied street lighting, he submitted, the small increase in coal consumption entailed by a removal of the present restrictions would be justified. "Properly applied" meant taking action in accordance with the 1935 and 1937 reports of the M.O.T. Departmental Committee on

Street Lighting, which had recommended that there should be reasonable uniformity in lighting the portions of traffic routes presenting similar characteristics, responsibility for which should be confined to large administrative units, the cost being aided by national grants administered by the responsible department.



Mr. W. N. C. Clinch
President of the
A.P.L.E.

The Committee had urged that a formal specification should be issued with a minimum of delay. Local preferences of the large number of public lighting authorities hampered progress towards uniformity which, moreover, many smaller councils could not afford.

In 1938, 6,648 people were killed and 226,711 injured in street accidents, and saving of lives as well as monetary cost should be considered. Mr. Clinch expressed the hope that technical differences would soon resolve themselves and that in training fuller consideration could be given to the ways and habits of people. Public lighting was not only concerned with traffic routes, but also with footways and attractive shopping centres, which offered vast scope. The popular appeal of decorative illumination, as the victory celebrations showed, was not restricted to seaside resorts.

The Northmet Co. had a standing committee comprising the engineers of undertakings responsible for public lighting in its area of 650 sq miles with more than a million population. This committee met monthly to ensure, among other things, that tenders submitted to local authorities should conform to the M.O.T. Report and it held conferences

twice a year at which papers were read. These exchanges of views resulted in a realization that their purpose was not confined to technicalities.

A presidential reception in the evening concluded the day's programme.

Larger Administrative Units Desirable

The first paper on Wednesday, on "Administration," was presented by MR. E. C. LENNOX (Newcastle-on-Tyne), who supported by examples the view that larger administrative units were desirable. Larger towns could afford special public lighting departments with qualified technical staffs and testing laboratories, whereas small areas had to rely on the advice of officials with a multiplicity of duties, who were not generally equipped to judge the relative merits of the schemes of the local electricity or gas undertaking. Estimates were tabulated of the financial results of adopting the illumination values prescribed in the Departmental Report throughout a 42-mile traffic route. The road passed through the areas of twenty-two lighting authorities of various sizes having present public lighting rates varying from 3d. and 6d. per £ of rateable value in the richer areas to 1s. 3d. in the smaller-rated parishes. With the improved lighting (omitting extreme cases) the variation would be from 0.63d. to 3s. 6d. in the £. If the authorities on this route agreed to meet the cost in proportion to rateable value, however, the overall figure would be less than a penny in the £. After outlining the extent of the financial assistance available for lighting authorities and showing its inadequacy, Mr. Lennox suggested that the central administration required should be allowed grants from the Road Fund, subject to regional control in order to ensure proper advice on individual schemes.

In the ensuing discussion MR. T. WILKIE (vice-president, Leicester) agreed that it would be necessary to think in terms of large public lighting areas and that in itself would help to solve the financial problem. Large areas could come about through co-operation between neighbouring authorities or by way of reorganization along the lines hinted at by the Minister of Transport. The problem was bound up with the question of road safety and so the money would have to be found somehow.

MR. H. MIDGLEY (Plymouth) supported the view, expressed also by several local authority lay members, that the Association

should present to the Minister of Transport practical recommendations based on the paper. ALDERMAN H. KEGIE (Gateshead) advocated appointment by the Association of a national committee, drawn from regional bodies, composed of lighting engineers of municipalities and companies to advise the Minister. Opposition was expressed by some speakers to the setting up of a large centralized control which would, in desiring standardization, pay insufficient regard to local conditions.

Organization of Lighting Departments

In his paper on "The Public Lighting Engineer," MR. R. PARKER (Aberdeen) took as his first point that the whole public lighting department should be controlled by a chief official, who should have no other duties and should be answerable direct to the street-lighting committee. He should be assisted by four sections: Technical, workshops, lamp lighting and cleaning, and administrative. The technical section would be in charge of the deputy public lighting engineer (a most desirable appointment as a means of training for ultimate chief responsibility) or, in default, a senior trainee; this section would operate a photometric laboratory, plan schemes and supervise their installations, test the correctness of light distribution in the street, of materials purchased, study lighting defects and examine new designs of apparatus and new methods. A detailed organization of lamp lighting and cleaning with duties of inspectors and their staffs was described. Particulars were given of a training scheme which it was suggested should be sponsored by the Association with a view to providing a nationally recognized status for public lighting engineers. The minimum period should be seven years to be completed normally at 25 years of age and should be spent in administration followed by technical training, culminating in the award of a diploma by the Association. The required theoretical training was set out by the Association some years ago.

Opening the discussion ALDERMAN W. SMITH (Leicester) said that the ideas expressed in the paper ran on the same lines as those which his authority had been trying to put into operation for some time. He believed that the street-lighting engineer should establish close liaison with the chiefs of other departments as these were interested in illumination matters. The last suggestion was not endorsed by Mr. Parker, who considered that street lighting was a whole-time

job, with which heads of other departments interested in interior lighting would not be concerned.

COUNCILLOR EASTWOOD (Manchester) urged lighting authorities to get the best lighting engineers by offering adequate salaries and not to be afraid of trying new ideas. COUNCILLOR A. J. BAYNE (Dundee) was in favour of retaining local control, relying upon co-operation to ensure essential standardization. The PRESIDENT also expressed the hope that no reorganization scheme would be allowed to kill initiative.

MR. R. F. B. GRUNDY (Wallasey), who urged the Association to draw up its own education scheme, argued that a lighting engineer, being concerned with the amount of light on the road irrespective of its source, should not have too technical a knowledge of either electricity or gas so that his advice might be unprejudiced. This view was controverted by the author of the paper, who held that the lighting engineer should know all the possibilities of both sources of illumination; proper training would enable him to decide in terms of visibility rather than in lamps or lumens or candle power.

Motorists and Street Lighting

"The Motorist's Point of View" formed the theme of a paper by MR. E. T. FRYER (secretary, Automobile Association). He suggested that advances in light projection from moving vehicles made it doubtful whether road lighting on a large scale would be necessary outside built-up areas. Comparatively strong lighting at road intersections alone or in short stretches was deprecated on account of the sudden transition from and to darkness. This transition should be gradual for about a quarter of a mile on roads near built-up areas. Changes in types, colours, intensities, height and spacing were disturbing to the motorist, who should be able to drive without headlamps with the same confidence by night as by day as a result of the elimination of shadows and dazzle. Adequate illumination of background (e.g., footpaths) and elimination of distracting lights from advertisements were other essentials. Traffic signs, particularly direction indicators (including street names) should also be illuminated. Mr. Fryer criticized the recommendation of the Departmental Committee that red lights should be used only for temporary obstructions; he preferred that these should be used for permanent obstructions on the near side of the road with white lights at central obstructions.

Referring to the lighting of roads in rural areas, MR. H. MIDGLEY (Plymouth) submitted that unless it were possible to have a high degree of visibility (and cost came in here) it would be better to have no light at all. The merits of a lighting installation should, he said, be judged on a wet night. That more attention should be paid to background illumination, so that the drivers of vehicles could see pedestrians about to step onto the road, was the contention of MR. G. L. MINCHIN (London).

In Gloucester, MR. S. J. SCUDAMORE reported, mercury discharge lamps were used on main roads and sodium lamps at junctions and roundabouts. DR. J. H. NELSON (Joseph Lucas, Ltd.) gave as a criterion of good street lighting that driving conditions in busy towns should be as good at night as in daylight. This was followed by a suggestion from COUNCILLOR W. D. REID (Aberdeen) that different colours should be used for lighting the two sides of a road, as this would assist in the recognition of junctions and branches.

MR. H. S. ALLPRESS (Simplex Electric Co., Ltd.) regarded the full lighting of arterial roads between towns as something far away in the future in view of the cost. Greater attention should be given to the lighting of intersections by cut-off fittings on otherwise unlighted long stretches of roads.

After the annual luncheon on Thursday, at which Mr. W. S. Morrison was the principal guest, Messrs. L. J. Davies and W. D. Sinclair (B.T.H. research) delivered a lecture on "Applications of Tubular Fluorescent Lamps to Street Lighting." This included a description of two experimental installations carried out with the assistance of Central London Electricity, Ltd., and Rugby Corporation Electricity Department. The technical features are discussed in a separate article in this issue. The last electrical business of the conference was an evening visit to the illumination laboratory of the General Electric Co., Ltd., at Wembley.

Representations to Minister

At the conclusion of the conference, the following resolution was unanimously passed:

"That this conference of the Association of Public Lighting Engineers comprising representatives of more than 500 local authorities and lighting engineers, instruct our Council to make early representations to the Ministry of Transport in order that the many urgent problems of street lighting may be thoroughly discussed."

Tubular Fluorescent Lamps

Application to Street Lighting

Summary of lecture given by L. J. Davies, M.A., B.Sc., and W. D. Sinclair, A.M.I.E.E. to the Association of Public Lighting Engineers.

THREE main factors are interconnected in building up a pattern of road brightness observable to the road user and varying with his position. Upon the quality of this brightness pattern and the flux from the lantern depends visibility. This analysis, however, excludes the light source, the characteristics of which vary with the several types of lamp available. The variation of significance to the lantern designer is the size or brightness and shape of lamp for a given wattage input.

The smallest light source, approximating to a point, permits the use of small and light lanterns, thus giving theoretically precise optical control over radiation, but inherently causing glare. As ideal siting and absolute angular accuracy are not easily obtainable, patchy distribution may also result. Large lamps, on the other hand, cannot give comparable optical control without impracticably large reflectors, but they allow greater tolerance in siting and mounting and give less discomfort glare.

Reflection from the road surface varies

With low-brightness elongated lamps placed across the direction of the road, however,

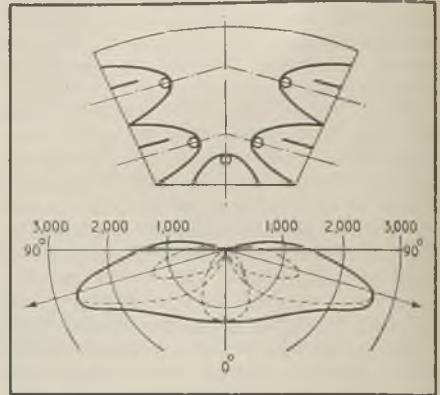


Fig. 1. — Arrangement of mirrors and light distribution for lantern containing five lamps

surface reflection is broadened and brightness is not excessive.

In the fluorescent lamp ultra-violet radiations from an electric discharge between electrodes through low-pressure mercury vapour excite a coating of fluorescent powder, which provides over 90 per cent of the light. Tests have indicated that the fall in light output and increase in starting period (normally one second) at the lowest temperatures likely to be met with in this country are immaterial.

The colour of the light is fixed by the nature of the powder. For the two "white" lamps available, the efficiencies are from 35 to 40 lumens per watt, but 60 to 70 are considered as possibly attainable; 100 lumens is reported for greenish light. A variation of 1 per cent in supply voltage causes a similar change in light output,

compared with 2.3 per cent for a high-pressure mercury vapour lamp and 4 per cent for an incandescent lamp.

For arterial road lighting, lanterns which



Experimental installation in High Street, Rugby

with the nature and condition of the latter and on wet or polished surfaces a point-source type of lantern can give, instead of light areas, thin lines of almost blinding light.

effect a compromise between cost, road brightness and limitation of glare that offer the best visibility for the money have been evolved. One recipe is: Spacing, 120 to 150 ft; height, 25 ft; luminous flux 3,000 to 8,000 lumens per 100 ft for Class A roads. Their light distribution makes full use of the reflection characteristics of the roadway to produce on the road surface and other backgrounds uniform levels of brightness, against which objects appear as dark shapes. The highest intensity obtainable with anodized aluminium reflectors of practicable dimensions and using 80-W fluorescent lamps is 1,500 to 1,800 ft-candles. The general features and polar distribution of a five-lamp 400-W lantern are illustrated in Fig. 1.

The two trial installations under consideration were designed to demonstrate the advantages of good colour and absence of glare in civic or shopping centres, where higher

way, the wide beam spread giving good visibility at the roadside and illuminating the paths and building faces. The lantern



Daylight view showing special tubular fittings housing fluorescent lamps in Old Bond Street, London

is self-contained with built-in starters, discharge-stabilizing chokes and power-factor-correcting capacitors; it weighs about 65 lb. In the Bond Street and Rugby test installations, these lanterns are set up on a double-wire span system with the fittings mounted between the cables on pulleys. An iso-foot-candle diagram of the two installations is shown in Fig. 3.

On extinguishing alternate lamps, thus giving 160-ft spacing, results were good. This was partly owing to the light being partly boxed in, allowing wall reflections to

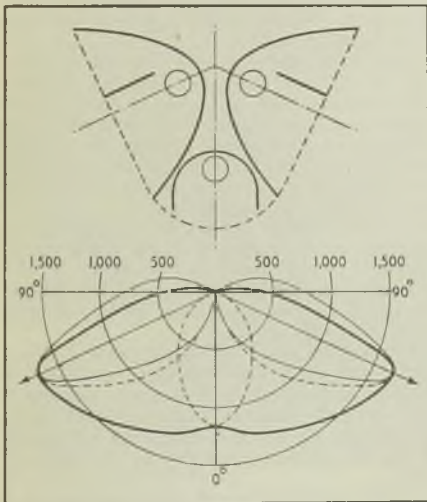


Fig. 2.—Reflectors and polar diagram for trial installations

cost would not militate against the use of smaller lanterns and closer spacings.

The lanterns adopted for the purpose contained three 80-W lamps arranged as shown in Fig. 2, spaced at 80 to 100 ft, having anti-glare shields to redirect the light to the road-

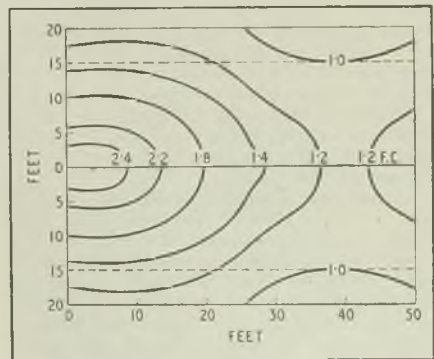


Fig. 3.—Iso-foot-candle diagram of installations in Old Bond Street and Rugby. Average density factors: Road centre, 2.2 to 1; kerb, 1.5 to 1. Average illumination at shop-window level = 1 ft.-candle

make an important contribution. It may be, however, that the shape of the light source and the low glare will necessitate a reassessment of polar-curve values in regard to street lighting.

Probably costs of this form of street lighting would be higher than for alternative systems but not necessarily prohibitive, taking into account the superior results obtained. For general road lighting, however, the authors do not advocate abandonment of existing well established light sources and lantern designs.

Those who took part in the discussion had had the advantage of inspecting the Bond Street installation on the previous evening and were obviously very favourably impressed with the results. MR. WILKIE (Leicester) spoke of the great contribution made to street lighting engineering. That there was no glare and the spread of the light was excellent was the testimony of MR. J. F. COLQUHOUN (Sheffield) who con-

sidered that the authors had produced a fundamental change in the outlook towards street lighting. He hoped that the B.T.H. Co. and others engaged upon this kind of research would be fully supported by the lighting authorities without too close a regard to £ s. d. The public wanted adequate lighting and was willing to pay for it.

MR. J. W. LEACH (Central London Electricity Co.) expected that by October there would be other trial equipments, including a seven-lamp lantern for longer spacings; this was subsequently on view at the G.E.C. Wembley Laboratories. He had every confidence that tubular fluorescent lighting would prove to be as cheap as any other. The lumen rating in Bond Street he gave as between 8,000 and 9,000 lumens per 100 ft of road.

MR. I. G. CHRISTOPHER (G.E.C.) uttered a warning against bringing this new form of lighting into discredit by putting it to uses for which it was not intended.

Survey of World Markets

Mr. P. Lister's Address to B.E.A.

UPON his return from a world tour, Mr. Percy Lister (chairman of R. A. Lister & Co., Ltd.) delivered an address last week at a meeting of the British Engineers' Association. In this he briefly touched upon conditions and prospects for British trade in the principal countries which he visited. Referring to Egypt he said that purchasing power there had considerably increased and once the thorny problems which faced us in that part of the world were solved markets of growing importance should be opened up. With regard to India Mr. Lister said that if we gave guidance and assistance in the development and spreading of secondary industries that immense country would not only be able to absorb all the production of its own secondary industries but would provide an outlet for those of other parts of the world. Our policy with regard to Ceylon should be to raise the standard of life of its people so that they became increasingly buyers of imported commodities.

It would be impracticable for Australia to revert to its pre-war position. The only solution to the Commonwealth's problems was a rapid increase in population to maintain the sound industries which had been created and increase primary production as well. British manufacturers must not ignore the changed conditions, but the speaker did not believe that manufacture of many products in Australia and India need mean a reduction in our exports as a whole because the production in each country should be only of those commodities for which

the demand provided an economical production flow and for which sources of raw material were economically available.

Mr. Lister regarded New Zealand as essentially a primary producer. Existing methods and measures must give way to others which would permit of a freer flow of trade if the principles of the Atlantic Charter and United Nations were to be adhered to and made successful. New Zealand would receive our help in making any adjustments.

In a reference to Canada Mr. Lister said that so long as we remained a big consumer of Canadian primary products Canada would have to remain, by carefully planning her secondary industries, a growing consumer of the industrial products of this country.

The speaker said, with regard to the United States, that just as they had something to learn from us, so we could learn much from them of the ways and means by which we could obtain the maximum productive yield from our labour, to the advantage of employer and employee alike.

Careful market research and investigation in Central and South American countries was urged to ensure that representation was in the hands of firms with the necessary staff, equipment and experience.

In the course of his concluding remarks Mr. Lister said that wherever he went he found a genuine respect for Britain and the British and for the quality of our products and the integrity of our methods.

PERSONAL and SOCIAL

News of Men and Women of the Industry

IN order to make vacancies on the board of Associated Electrical Industries, Ltd., for the appointment of the managing directors of the Metropolitan-Vickers and British Thomson-Houston Companies, and to secure representation for associated interests, the following A.E.I. directors have tendered their resignations:—**The Earl of Verulam, Lt.-Col. Sir John Chancellor, Sir Louis Greig and Col. T. W. Pragnell.** As from October 1st the following will join the board: **Mr. I. R. Cox,** managing director of the Metropolitan-Vickers Electrical Co., Ltd.; **Dr. H. Warren,** managing director of the British Thomson-Houston Co., Ltd.; and **Lt.-Gen. Sir Ronald Weeks, K.C.B.,** chairman of the English Steel Corporation, Ltd., deputy-chairman of Vickers, Ltd., and a director of other companies.

Sir Felix Pole has resigned the position of deputy-chairman of A.E.I. and is succeeded by **Sir George Bailey,** who remains managing director.

Sir Edward Appleton, K.C.B., secretary of the Department of Scientific and Industrial Research, left on September 8th for a ten-day lecture tour in Norway arranged by the British Council in co-operation with the Royal Norwegian Society. Sir Edward will visit Oslo and Bergen and will lecture on "British Science in War and Peace," "British and Norwegian Co-operation in Radio Research" and "The Ionosphere and Terrestrial Magnetism."

Mr. D. C. Lorkin, F.C.I.S., and **Mr. S. G. Mundy, M.I.E.E., A.M.I.A.E.,** have been elected to the board of Lancashire Dynamo & Crypto, Ltd. Mr. Lorkin has been with the company since 1932, and is responsible for the management of the Willesden Works. He is also a director of the associated company, Crypto, Ltd. Mr. S. G. Mundy has been managing director of the associated company, Crypto Equipment, Ltd., since its inception in 1935.

Mr. E. Rothwell, A.M.I.E.E., is retiring from the post of resident engineer at Birch Hill Institution and Hospital after thirty-seven years' service. Before going to Birch Hill he was for four and a half years in the Testing and Sub-Stations Departments of the Manchester Electricity Department.

Mr. A. E. Carter, who joined Kelvinator, Ltd., early this year as director of production, has been appointed general manager of the company.

At the annual general meeting of the Purchasing Officers' Association held at the Midland Hotel, Birmingham, on September 14th, **Mr. P. T. Appleby** was elected president in succession to **Mr. H. Robinson (Thos. Bolton & Sons, Ltd.).** Messrs. **R. Close (J. Bibby & Sons, Ltd.), H. M. Dale (Pyrene Co., Ltd.), H. Martindale (Brad-**

ford Dyers' Association, Ltd.) were elected vice-presidents; **Mr. F. O. Ashmore (Calico Printers' Association, Ltd.)** chairman and **Mr. T. F. Turner (English Electric Co., Ltd.),** vice-chairman. The annual report recorded a very satisfactory increase in membership and mentioned the creation of an education and training scheme.

Mr. E. Downes, A.M.I.E.E., who, until his recent demobilization, held the rank of flight-lieutenant in the electrical branch of the R.A.F., has rejoined the staff of **George Ellison, Ltd.,** and will resume his duties as representative in Cumberland and Westmorland. He will also take over an area in North Lancashire which includes Blackburn, Preston and Blackpool.



Mr. Emanuel Shinwell at the Strowger Works (see page 469). With him is Mr. A. J. Leyland, director and chief engineer of the Automatic Telephone & Electric Co., Ltd.

After forty years' service in the Glasgow Corporation Lighting Department, **Mr. William Stewart,** inspector, is retiring.

Mr. B. H. Welch is leaving the North-Eastern Electric Supply Co. to take up the position of mains assistant in the Hammersmith Electricity Department.

Messrs. Dolby & Williamson, consulting engineers, have moved to 147, Victoria Street, Westminster, London, S.W.1. (telephone: Victoria 2762).

The post-war swimming gala at Ealing Baths on September 7th, of the Hoover Sports and Social Club attracted a record attendance of over 400 people. Thirty-four events provided many exciting and amusing moments. Highest

points scorers for the club were Mr. R. Wales and Miss Vera Underwood, with Mrs. I. Furze as a close runner up. Prizes were presented by Mr. R. L. Webster, Hoover personnel manager, at a dance held in the factory canteen in the evening, when Mr. P. Myerscough was M.C.

Mr. F. L. Kessel, controlling G.P.U., Ltd., with the Electroplant Co., of Wembley, having obtained naturalization papers, has changed his name by deed poll to Frederick Lloyd-Kessel.

Mr. G. E. Wood, Area Engineer, London Telecommunications Region, who played an outstanding part in providing essential communication services during the war, has just retired after forty-one years' service with the G.P.O.

Obituary

Sir George Hume.—We regret to report the death, on September 13th, of Sir George Hopwood Hume at the age of eighty. Sir George Hume was born in South Russia and was educated in Russia, Switzerland and Germany and at the Finsbury Technical College. He served as a pupil with Siemens Bros. & Co., Ltd., of which company he subsequently became a director. He was a member of the Institution of Electrical Engineers and a barrister-at-law. Sir George had a long record of public service. He was Conservative M.P. for Greenwich for many years and was leader of the Municipal Reform Party in the London County Council for eight years and chairman of the Council in 1926-27. From 1913 to 1926 he served as chairman of the London Electricity Committee and he was a member of the London and Home Counties J.E.A. in 1925-26.



The late Sir G. Hume

Sir James Jeans.—We report with regret the death of Sir James Jeans, O.M., which occurred on September 16th at the age of sixty-nine. Sir James was one of the most eminent of the modern physicists with a gift of exposition which made his name familiar among a very wide public. He was a leading exponent of the quantum theory of physics on which he produced a number of papers. Among his many works were those on "The Dynamical Theory of Gases" and "Mathematical Theory of Electricity and Magnetism."

Mr. J. Scott.—The death has occurred of Mr. James Scott, principal of James Scott & Co., electrical engineers, Edinburgh, Glasgow, Perth and Dunfermline.

Will.—The late Mrs. Teresa Mary Kapp, widow of Dr. Gisbert Kapp (of Birmingham University) left estate in Great Britain valued

at £27,925. She made a number of bequests, including £600 to the Zurich Polytechnic to provide an annual medal or other prize to the best student in the electrical engineering department and several sums to the National Union of Students for various purposes.

Poor Winter Prospect

"Rationing" or "Restriction"?

IN a statement issued last week Mr. H. F. L. Williams, executive officer of the Public Relations Committee of Electricity Supply Companies, said that fuel stocks were so low that some form of electricity rationing was almost certain. Of almost equal importance was the fact that the power companies had been unable to maintain their programme of plant installation, repair and maintenance.

The Ministry of Fuel and Power had no comment to make upon the suggestion that rationing was almost certain, but an official admitted that the position would be worse than it had been during the last two winters. At the end of July distributed stocks of coal amounted to 9.4 million tons, as compared with 12.6 million tons in July last year. At the same time the production tendency was better than last year. "The big difficulty with the gas and electricity companies is the plant side and, in the London area, the labour side, but everything that can be done to overcome these difficulties would be done."

Mr. Shinwell is reported to have described the companies' statement as a "lot of nonsense" and "just propaganda." He said that if Mr. Williams had anything of importance to say he should go to the Ministry of Fuel and Power. "No electricity undertaking has gone short of coal up to now. Supplies are not so good as they should be, but that is to be expected in the present circumstances." He refuted the idea that the Government had contemplated the rationing of electricity. Later, addressing a miners' meeting, Mr. Shinwell accused the companies of conducting a "campaign of a most villainous nature against the Government." The difficulties had been accentuated by the fact that consumption was higher at present than it had ever been and was still increasing.

In a statement made as chairman of the Public Relations Committee, Sir Robert Renwick pointed out that last winter electricity supplies were necessarily restricted on a number of occasions and there was no reason to believe that next winter would be a milder one, though Mr. Shinwell might be gambling on that possibility. If the Minister preferred the use of the word "restriction" rather than "rationing" they would not quarrel over words. But unless the gamble on the weather came off, the supply of electricity would be more drastically restricted this winter than last, but whether industry or the homes of the people suffered more was a matter for the Minister to decide.

CORRESPONDENCE

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

Fluorescent Lighting

IN regard to the statement of a correspondent that the use of fluorescent lighting, is, in certain cases, giving rise to headaches, while this might be due to a slight stroboscopic flicker, a more likely explanation is that chokes are being sold with inappropriate tappings. The result is that the wattage and consequently the candle power of the lamps are nowhere the correct figures.

Unqualified and electrically ignorant concerns are to-day forcing cheap fittings on the market, by sending travellers to the Provinces to sell direct to small shopkeepers. The only concern of these travellers is to sell and, no technical knowledge being necessary, it is no unusual thing to see an 80-W tube used for illuminating an area of more than 12 sq ft, the source of light being perhaps 12 or 15 ft from the ground or working plane.

Initially a reasonably satisfactory light may be obtained, but as the intensity diminishes during the first 200 hours, a strain is thereafter put on the optical nerves by the lack of light.

London, S.E.5.

L. B. TUSEN.

Shortage of Supplies

THERE is a passage from a letter from the Ministry of Works signed by Mr. Tomlinson:—"It has been arranged that suppliers shall receive priority to obtain goods 5 per cent in excess of their orders under the W.B.A. scheme."

We read with interest the letter from Mr. E. P. Prior in the *Electrical Review* dated September 6th. Does he realize that electrical contractors cannot obtain holders, switches, wood blocks, etc., without W.B.A. priority? Yet chain stores, etc., get supplies; is this where the 5 per cent is going?

New Barnet.

EMMETT & BLOWERS,
Electrical Contractors.

(K. N. BLOWERS)

"Britain Can Make It" Exhibition

I WISH to make it clear that the panel of technical adjudicators for the electrical section of the "Britain Can Make It" Exhibition, which consisted of Mr. E. E. Hoadley, C.B.E., engineer and manager of the Maidstone electricity supply; Mr. R. H. Rawll,

engineer and manager of the Shoreditch Electricity Department; and Mr. E. M. Ackery, B.Sc., of the British Electrical Development Association, were not responsible for the selection of the electrical exhibits, but merely for the technical adjudication of such exhibits as were picked out for favourable consideration by the Selection Committee. The only function of the panel was to decide whether the items already selected from a purely artistic point of view would also satisfy the necessary technical requirements.

London, S.W.1. J. BERESFORD-EVANS,
Secretary for Council of Industrial Design
to the Selection Committee for Powered
Appliances:

Diversity Factors

WITH reference to the article entitled "Domestic Load" by Mr. H. A. P. Caddell in the August 23rd issue of the *Electrical Review*, I am pleased to note that the figures contained therein correspond very closely with those given by myself in *Electrical Review* of September 10th, 1943, under the heading of "Diversity Factors."

Bethnal Green, E.2. E. E. JOLLY,
Borough Electrical Engineer
and Manager.

"A Universal Plug—Now"

WE have read with interest the correspondence which has restarted in your columns about "A Universal Plug—Now." We agree with all the statements made but we notice that one important point has not been mentioned at all, and this is our export trade. You will remember that a similar controversy raged after the last war, in the course of which a certain standard was fixed which was not approved by two of the Dominions—Australia and New Zealand. In consequence we lost two important markets, and it appears to us that with the present controversy going on we are in grave danger of losing more of our export markets. We feel convinced that South Africa and India will not fall into line with any new standard and if they find it difficult to obtain the present standard plugs and sockets we may again lose more valuable export markets.

Further, we are now approaching a standard which is so near the American that, with little alteration, the Americans may adapt some of their flat pin tops to the new suggested standard and supply our present overseas markets, which would mean that British manufacturers will not be able to compete. We think this is an important point which should also be brought home to all the manufacturers who are interested in the export trade.

BRITISH GENERAL MFG. CO. (1941). LTD.
London, W.1. W. KUPFER.

Hosiery Industry Report

Lighting, Power and Heating

A MEMORANDUM on lighting, power transmission, prime movers and heating, prepared by a small committee under the chairmanship of Mr. John Mould, is included as an appendix to the report of the Working Party for the Hosiery Industry, of which Miss Caroline Haslett is chairman. For lighting, the tubular fluorescent lamp is favoured on account of its low surface brightness, low electricity consumption, long life and tendency to give shadowless light distribution (owing to its length) and its north-sky light for colour matching.

Automatic control of switching by photo-electric cells is recommended; in default, the operation should be vested in a responsible executive. The importance of regular maintenance is emphasized in view of the falling-off in light values of perhaps 50 per cent as a result of dirt on lamps or reflectors. Loss of efficiency from ageing of lamps should be corrected by regular periodic replacement, particularly where the visual task is exacting. Standards of illumination required vary from 15 lumens per sq ft in winding to 75 lumens in linking (I.E.S. Code).

For converting the inefficient line-shaft and belting drives now much used, a large number of motors up to 3 H.P., integral with the hosiery machines, would be required, offering scope for co-operation between machine builders and electrical manufacturers. Piecemeal additions to existing wiring are strongly condemned as inefficient. Capacitors for power-factor correction should be installed, either fitted to the motors or to serve a whole department on the recommended group distribution system. Supplies to

each department should be metered separately for costing.

When there is a continuous demand for heat as in dyeing and finishing, the steam required can first be passed through a back-pressure unit, but with efficiency only if the amount of electricity generated is small and merely a by-product. Drying plants should be designed for lower temperatures than at present, say 90 to 100 deg. Steam for pressing, in the absence of other demands for processing, can economically be raised in small automatically controlled electrode boilers. Most work in the hosiery industry, being sedentary, calls for a room temperature of about 65 deg F when the outside temperature may be 25 deg F. As the annual average day temperature is 52 deg. the average load on the heating plant is only 30 per cent of its capacity.

New Swiss Locomotives

P RIMARILY for handling light trains but also for moving fast general traffic, 26 electric locomotives under construction for the Swiss Federal Railways are designed to have a maximum speed of approximately 80 m.p.h. Running times are expected to be considerably lessened owing partly to the ability to maintain speed on curves as a result of the reduction of weight on the axles to 14 tons as compared with 18 to 20 tons for earlier types.

Each locomotive will weigh 56 tons and will have two electrically-welded double-axle bogies each driven by two 580-H.P. 1,860-r.p.m. motors. The steel chassis has a driver's cabin at each



New electric locomotive for Swiss Federal Railways

end, from any one of which several coupled locomotives can be controlled by pneumatic relays. Lightness and compactness are said to be a feature of the transformers as a result of a new reinforced construction with radial laminated cores. The high-voltage switchgear is compressed-air operated. Braking is also by compressed air, but in addition an electric recuperative brake system is employed.

I.E.E. Centre Chairmen—II

Biographies of Officers for the 1946-47 Session

THE chairman of the North Midland Centre of the Institution of Electrical Engineers is **Mr. A. G. Connell**, chief engineer and manager of the Halifax Corporation Electricity Department. Mr. Connell received his technical education at Erith Technical College, and his training with Fraser & Chalmers, Ltd., Erith. In 1919 he joined the English Electric Co., Ltd., with whom he was engaged on steam turbine design contract work, both for home and



Mr. A. G. Connell
(North Midland)



Mr. C. F. Partridge
(South Midland)

abroad. Three years later he was appointed manager of the Power Department of the Foundation Co., Ltd., and in 1930 he joined Merz & McLellan, with whom he carried out consulting work for the Central Electricity Board. From 1934 to 1940 he was chief electrical engineer to the Staveley Coal & Iron Co., and in the latter year he took up his present position with the Halifax Corporation. Mr. Connell is a member of the Institution of Mechanical Engineers and of the Association of Mining Electrical and Mechanical Engineers (past president of the Midland Branch) and a fellow of the Institute of Fuel. He is a past chairman of E.D.A. (Mid-East England Area), a member of the Consultative Technical Committee (Mid-East England Area) of the C.E.B., I.M.E.A. representative on the B.S.I., and a member of the Select Committee on the revision of electricity regulations for mines.

Mr. C. F. Partridge, B.Sc. (Eng.), Edinburgh, who is the new chairman of the South Midland Centre, received his education at King Edward's School, Stourbridge, and at Glasgow and Edinburgh Universities, and

served his apprenticeship with the Fore River Shipyard, Quincy, Mass., U.S.A. He was Carnegie Research Scholar at Edinburgh University in 1921-22. In 1914 Mr. Partridge joined Callender's Cable & Construction Co., Ltd., with whom he remained, apart from war service in the R.G.A. and R.F.C., until 1919. His next post was as lecturer at the University College of North Wales, and in 1924 he was appointed head of the Electrical Department of Leeds College of Technology. He left there in 1933 to take up his present position of head of the Electrical Department at the Central Technical College, Birmingham.

The chairman of the Southern Centre is **Mr. J. A. P. Farrant**, electrical superintendent with John I. Thornycroft & Co., Ltd., Southampton. Mr. Farrant was educated at Taunton School, Southampton, and received his technical training at the University College, Southampton. In 1905 he entered the service of John I. Thornycroft & Co., Ltd., holding various appointments before becoming electrical superintendent at the Woolston Works of the company.

The Western Centre chairman is **Mr. R. W. Biles**, operation engineer with the Central Electricity Board (S.W. England and S. Wales Area). Mr. Biles was educated at Uckfield, Sussex, and received his technical training at Faraday House, being awarded the



Mr. J. A. P. Farrant
(Southern)



Mr. R. W. Biles
(Western)

Faraday House Diploma. He served in the Royal Flying Corps from 1914 to 1918, and in 1920 he joined A. Reyrolle & Co., Ltd., as engineer in the Technical and Research Department, where he originated a number of new protective gear schemes.

In 1927 he was appointed technical assistant with the Northmet Power Co., and in 1930 he became associated with the Central Electricity Board as technical engineer in the S.W. England and S. Wales Area, taking up his present position as operation engineer in 1937. He has served as chairman of the Conference of Generating Station Engineers, S.W. England and S. Wales Area. Mr. Biles was awarded the Willans Premium for 1946 by the I.E.E. for his paper on "Standards of Performance of Generating Plant."



Mr. T. P. Allen
(Irish Centre)

This session's chairman of the Irish Centre is Mr. T. P. Allen, who is senior lecturer in electrical engineering at the College of Technology, Belfast, and extra-mural lecturer in electrical engineering and advisor of

studies, Faculty of Applied Science, Queen's University, Belfast.

Mr. Allen is a native of Belfast and was educated at the two establishments which he now serves; he is a M.Sc. of Queen's University. He was apprenticed in electrical engineering to Richard Patterson & Co. and with Birch & Workman, Ltd., Belfast. His first appointment was as lecturer in mathematics at the College of Technology (1921-22) and he then went to the Walthamstow Technical Institute as lecturer in physics and electrical engineering. In the same year he returned to Belfast as lecturer in mathematics and was appointed lecturer in electrical engineering at the College of Technology in 1924, being promoted to senior lecturer in 1935.

Mr. Allen has been interested in short-wave radio transmission and has operated his own station (G16YW) since 1925. At one time he was district commander of the Royal Naval Wireless Auxiliary Reserve in charge of the organization of the Northern Ireland area.

I.M.E.A. Notes

Supply to "Squatters." Contractors' Registration.

THE recent "commandeering" of unoccupied premises by people seeking housing accommodation has raised the question of the obligation of electricity authorities with regard to supplies to the premises. An I.M.E.A. view is that unless occupiers are legal tenants they may be regarded as trespassers and as such cannot demand a supply of electricity. If, however, the "squatters" are accepted as tenants by the authorities and it is arranged that they shall pay rent for the premises it may be argued that they can demand a supply. Undertakings are warned to safeguard themselves in the furnishing of a supply; one undertaking is demanding from the "squatters" some security for the payment of accounts.

Joint Committee with C.M.A.

Messrs. E. A. Mills, W. A. Royle and R. A. S. Thwaites have been appointed members of a liaison committee which has been set up by the Association and the Cable Makers' Association.

Prepayment Meter Cards

It was held in the recent case of the Attorney-General v. Northwood Electric Light & Power Co. that an entry upon a prepayment meter card did not constitute a receipt requiring the affixing of a 2d. stamp, as the card was a document remaining the property of the supply authority. It is recalled that a few years ago the London &

Home Counties J.E.A. raised a similar contention with the Inland Revenue authorities, stressing the point that a meter card constituted a record of information and was not intended to be a receipt. For convenience the card is left with the consumer although there is no obligation to leave it. It is, however, considered essential that such cards should be clearly marked with a statement that they are the property of the undertaking.

I.M.E.A. and "National Committee"

The Minister of Works and the Minister of Fuel and Power have both stated that they are not prepared to recommend the Government to introduce legislation for the compulsory registration of employers and operatives in the electrical contracting industry. In view of this decision the Council of the I.M.E.A. has informed the National Committee on Statutory Wiring Regulations and Registration that the Association is not prepared to continue its representation on the Committee.

Scottish Pole Factory

The Grampian Electricity Supply Co. is negotiating with Perth Town Council for a site at the Shore, Perth, to set up a concrete pole factory. These poles will be used for the heavier type of h.v. line in Scotland, though experiments are also to be made with a lighter pole for rural supplies.

Dimming Fluorescent Lighting

Circuits Available for Cold-Cathode Tubes

By H. A. Miller, A.M.I.E.E.

HIGH-VOLTAGE cold-cathode tubing cannot be dimmed to extinction owing to flicker at low current values. As a general rule, argon-mercury-vapour tubes may be

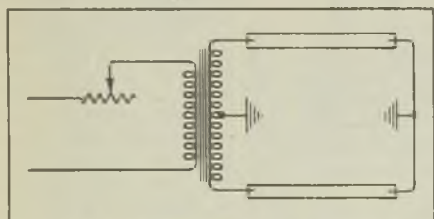


Fig. 1.—Resistance dimming control

effectively dimmed to about 10 per cent of their maximum light output, whilst neon-filled tubing can be reduced satisfactorily only to something like 15 per cent.

A variable series resistance in the primary circuit (Fig. 1) is suitable for dimming small fluorescent-tube installations, but is wasteful. Wattage consumption remains practically constant, even when the illumination is at a minimum, in which case most of the energy is dissipated by the resistance, which must therefore be adequately protected and ventilated.

Continuous control over a wide range can be obtained by means of a variable-voltage auto-transformer (Fig. 2). In this case the wattage consumption is dependent on the light output, little energy being absorbed by the transformer itself. When the cold-cathode tubes are hardening, or nearing the end of their efficient life, the auto-transformer provides a ready means of stepping up the voltage. Thus, the light output can be maintained reasonably constant throughout the life of the tubes.

With saturable reactor control (Fig. 3), two of the three coils used are interconnected in series with the transformer input. The

third or centre coil is supplied from a source of variable direct current. A small d.c. through the centre coil produces magnetic saturation of the core, so that the effective inductance of the reactor is reduced, thereby increasing the current through the tubes.

Thyratrons have been used widely in the United States. This form of control is more efficient than the variable-rheostat method and can be applied to a large number of cold-cathode fluorescent-tube circuits.

The principle is that of supplying the luminous-tube load through a saturable-core reactor, the saturation being provided by the rectified output of two grid-controlled gas-filled relays. Thus, when the core is saturated, little impedance is offered by the reactor, whilst if the rectified current is switched off,

the appreciable impedance of the reactor causes the lighting load to be dimmed. A potentiometer rheostat is transformer-connected to the grids of the thyratrons.

The type of saturable reactor used consists of a laminated iron core having two windings (Fig. 4).

One winding, in series with the lighting load, is connected to the a.c. supply; the other, supplied from the thyatron, carries direct current. Thus, when the fluorescent tubes

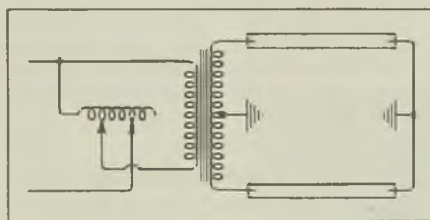


Fig. 2.—Variable voltage transformer dimming control

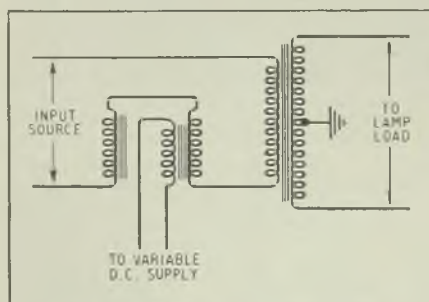


Fig. 3.—Saturable reactor control

are completely dimmed and no saturating current is flowing in the d.c. winding, considerable impedance will be offered by the a.c. winding.

For particularly complex theatre lighting

is necessary for fading each scene into the next. Total "black-out" control of the lighting is provided for by the employment of a master potentiometer.

Thyratron reactor control was installed just before the outbreak of war in the ball-room of R.M.S. *Queen Mary*. In this case the equipment was arranged for sound control and the lighting was split up into three banks of red, blue and green. By the aid of a microphone in conjunction with the thyratron reactor circuit, the lighting could be varied according to the characteristics of the orchestral music. A great variety of tints could be obtained in this

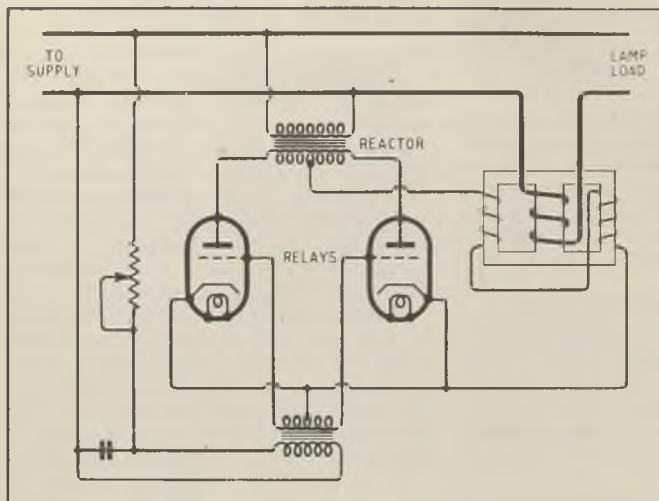


Fig. 4.—Thyratron control

control, utilizing pre-set features, individual potentiometers are set to give the required lamp brightness for each scene, and a high-resistance "scene-changing" potentiometer

way, and the amplitude of sound emitted determined the intensity of illumination, the light altering automatically in sympathy with the music.

German Power for France

(From Our Paris Correspondent)

A CONSIDERABLE storm has arisen over reports that France is no longer to receive electricity from the British zone of occupation in Germany. The British Embassy, in a communiqué on the subject, stated that supplies had not been cut off, and that electricity would continue to be furnished to the French and American occupation zones as well as to France and Belgium. It is said that during August, however, the French authorities consented to limit their imports for September to 85 per cent, and this voluntary reduction was accepted. The communiqué points out that although exports of power have increased in recent months there has not been a corresponding increase in the coal available in the British zone for electricity generation, and future production will depend on coal supplies.

The French Minister of Industrial Production is reported as having denied that there had been an agreement to limit imports of electricity, which have been reduced by 1,500,000 kWh a day since September 1st. The newspapers are making the most of the fact that the Coblenz-Merzig line, over which the power is transmitted

was constructed mainly by French efforts, and the Minister's request that the public should economize in the use of electricity has been given wide publicity. *L'Humanité* states that the supplies received by France from Germany are compensated for by the electricity produced in the Tyrol and Vorarlberg in the French zone of Austria. This electricity is transmitted to Bavaria and is used to feed Ruhr factories.

In spite of the more favourable conditions at the French hydro-electric plants it is now considered that it will be impossible to meet the winter demand unless the deficiency can be made up by imported power.

Municipal Refrigerators Advocated

At the Sanitary Association's congress at Dunoon last Friday, Mrs. Helen Anderson, public health convener of Dunoon, advocated the provision of municipal refrigerators. Much food was wasted at piers and stations, she said, by failure to provide this important service. She also called for a refrigerator in every home.

COMMERCE and INDUSTRY

Employment During June. Large Electrical Shipment for Russia.

THE following table, compiled from statistics published in the *Ministry of Labour Gazette* for August, shows the position with regard to employment in the various branches of the electrical industry during June. The figures are compared with previous totals, and the number of female workers included in each figure is given in parentheses:—

Branch	Mid-1939	Mid-1945	May, 1946	June, 1946
	Thousands			
Electrical engineering . .	133.9 (28.0)	175.8 (69.7)	152.0 (48.4)	151.4 (47.3)
Electrical wiring and contracting	41.7 (2.8)	37.5 (5.5)	46.4 (5.4)	46.3 (5.4)
Electrical apparatus, cables, etc.	195.9 (79.5)	279.9 (167.7)	235.9 (116.8)	238.5 (116.9)
Gas, water and elec'y. supply	214.8 (11.6)	166.6 (28.4)	205.1 (24.8)	206.2 (24.2)

Unemployment figures for July (Great Britain) included the following:—Electrical engineering, 2,614 (748 females); electrical wiring and contracting, 1,330 (75 females); electrical apparatus, cables, etc., 3,454 (females); and gas, water and electricity, 2,564 (465 females).

Reconstitution of Finance Company

The Electrical Manufacturers' Finance Co., Ltd., which has carried on the hire-purchase business of the Associated Electrical Industries group is to be reconstituted and used as a clearing house for the financial operations of all the companies of the group. The present directors, Messrs. J. N. Stephens and R. H. Haviland, are retiring and to make the central control of the group's finances more effective the directors will be the comptrollers of the A.E.I., B.T.H. and Metropolitan-Vickers Companies—Messrs. A. N. E. McHaffie, E. S. Little and J. G. Lowe, with Mr. McHaffie as chairman. The company, whose name has been changed to Associated Electrical Industries Finance Co., Ltd., will no longer offer hire-purchase facilities.

Awards to Inventors

An article on this subject appeared in last week's issue of the *Electrical Review*. The Royal Commission on Awards to Inventors has now issued a pamphlet containing the relevant part of its terms of reference, the rules regulating the procedure before the Commission and general instructions for the guidance of intending claimants before the Commission. Copies can be obtained from the Stationery Office, or through any bookseller, price 2d., by post 3d. The Commission will not begin its public hearings of claims before November 12th and a further announcement of the times and dates of sittings will be made. Details of cases to be heard will be published in the Daily Cause List.

The Royal Commission on Awards to Inventors set up in 1919 after the first European War issued a number of reports which have been

summarized in a pamphlet first published in 1929 and entitled "Statement of the Principles of Assessment Governing Compensation adopted by the Royal Commission on Awards to Inventors." Reprints of this pamphlet are available, price 6d., by post 7d. Whilst in no way bound by the rulings and decisions of the 1919 Royal Commission, the present Commission will in general have regard to the principles and policy adopted by the 1919 Commission. Communications intended for the Commission should be addressed to the Secretary, Royal Commission on Awards to Inventors, Somerset House, Strand, W.C.2.

Electrical Equipment for Russia

Last week 2,300 tons of electrical equipment for Russia were loaded aboard the Finnish vessel *Yrsa* at the Great Western Railway's Swansea Docks. This is part of some 12,000 tons of equipment which have been accumulating at Swansea Docks during the last year, waiting to be carried forward as required. Floating cranes capable of handling 60 tons will be used to put the heavier items aboard.

Cooking Competition for Schoolgirls

It has often been stated by electricity authorities that even a child can use an electric cooker as it is so easy to manipulate and so simple in operation. The Lothians Electric



Councillor Reid presenting prizes to winners of the cooking competition for schoolgirls organized by the Lothians Electric Power Co.

Power Co. recently arranged an all-electric kitchen in its showroom at West Calder and to test the truth of the above statement it invited girls of thirteen and fourteen years of age to take part in a cooking competition which required them to cook a breakfast for two people and set out the breakfast table. They had also to make and bake a fish pie. Although none of the girls had had experience with electric cookers at home, the operation of the cooker

presented no difficulty and excellent meals were prepared. Thanking Councillor Reid who presented the prizes, Mr. C. H. A. Collyns, the general manager stated as a matter of interest that electricity sold by the company in 1945 was 54½ million kWh compared with 12 million kWh in 1935.

Brewood Agricultural Show

About 13,000 people visited a joint exhibit which the Wolverhampton Corporation Electricity Department and the West Midlands Joint Electricity Authority arranged at the recent Brewood Agricultural Show. The public was able to see the appliances in full working order and from a sales point of view the additional effort required to make this possible was fully justified, orders being taken for all the



The joint exhibit of the Wolverhampton Electricity Department and the West Midlands J.E.A. at the Brewood Agricultural Show

various appliances. Domestic appliances were much in demand and orders received and inquiries made were in the following order of popularity:—Refrigerators, cookers and washing machines, sink heaters, clocks and kettles, fires and wash-boilers. Apparatus for display was lent by the following:—Listers Tools (small tools); Electric Construction Co., Ltd. (motors); General Electric Co., Ltd. (electrode boiler); Joseph Evans & Sons (Wolverhampton), Ltd. (pumps); Wolseley Sheep Shearing Machine Co., Ltd. (sheep shearing equipment); Legge Industries, Ltd. (battery charging equipment); Alfa-Laval Co., Ltd. (milk machine); J. W. Wooley & Co., Ltd. (sterilizer); Curfew Poultry Appliances, Ltd. (5-tier brooder); Refrigeration (Birmingham), Ltd. ("Prestcold" dairy cooling equipment); British Thomson-Houston Co., Ltd. (washing machine); Catons Metal Productions, Ltd. (fires); and S. B. Jackson, Ltd. (soil heating cable).

Summary of Emergency Legislation

Supplement No. XI to the "Summary of the Emergency Statutes, Regulations and Orders Affecting the Electricity Supply Industry" compiled by Messrs. Leslie Gordon (London J.E.A.) and Mr. J. W. Simpson (I.M.E.A.), assisted by Mr. F. Newey (Lincoln) represents the final issue. It deals with all new and amending regulations, etc., issued between the date of the tenth supplement and July 31st last, and it is stated in the preface that the

gradual resumption of more normal operations and the marked decrease in the number and importance of regulations and orders issued has removed the need for further supplements. Notes on Parliamentary Bills affecting the electricity supply industry are dealt with in quarterly reports of the proceedings of the Joint Committee of Electricity Supply Organizations. The last supplement is obtainable (price 4s.) from Mr. Simpson at 254-260, Earl's Court Road, S.W.5.

Electrolux Silver Jubilee

In September, 1921, Mr. James Scrivener took a small office in No. 73, Newman Street, W.1, with a staff of nine and founded Electrolux, Ltd. To-day the company's refrigerator factory at Luton is one of the largest and most up-to-date in Europe. It covers an area of nearly half a million sq ft, capable of employing 2,000 people. To mark the silver jubilee a presentation was made last week to Mr. Scrivener by Mr. Broughton, the general manager, in recognition of his achievements. Silver souvenirs were also given to three members of the organization who joined the company twenty-five years ago. Among those present at a function held on Friday were the Mayor and Mayoress of Luton, Sir Harold Wernher, K.C.V.O., present chairman of the company, Lady Zia Wernher, Mrs. Scrivener and Mr. Gustaf Sahlin, managing director of the Swedish Electrolux Company.

A Government contract for 50,000 built-in refrigerators for its temporary housing schemes will be practically completed by the end of December. Already 33,000 of these refrigerators have been delivered.

Torch Battery Prices

The Electric Torch Dry Batteries (Maximum Prices) Order, 1946 (S.R. & O. 1946 No. 1496), reduces the maximum prices of home produced electric torch dry batteries by the amount of Purchase Tax from which exemption was granted on July 22nd.

Rubber Imports and Consumption

Figures given in the second number of the "Rubber Statistical Bulletin" (August, 1946) show that during the first half of this year the net imports of natural rubber into this country totalled 74,621 tons and the consumption 35,859 tons; stocks at the end of June amounted to 86,654 tons, representing an increase of 34,137 tons during the period. As regards synthetic rubber, net imports were 15,424 tons and the consumption 21,496 tons; stocks at the end of June were 11,191 tons, a decrease of 5,965 tons since the end of last year.

In the first half of this year there was a steady rise in the amount of rubber consumed by the

United Kingdom cable industry. The total consumption for the period was 4,385 tons (2,125 tons of natural rubber and 2,260 of synthetic). The consumption in 1945 was 6,073 tons (1,983 tons natural and 4,090 synthetic).

The "Bulletin" is produced by the London Rubber Secretariat and is obtainable from W. H. Smith & Son's branches at 2s. per copy (annual subscription £1).

International Tin Conference

The United Kingdom Government, after consultation with the Governments of the United States, Bolivia, Belgium and the Netherlands, has invited the main tin-consuming and tin-producing countries to an International Tin Conference to be held in London about October 8th. The countries invited are Belgium, Bolivia, China, France, the Netherlands, Siam, U.S.A. and U.S.S.R. The object of the conference is to consider the prospective world tin position and whether any continuous inter-governmental study of that position is necessary.

New E.A.W. Headquarters

After more than fourteen years' residence at 20, Regent Street, London, S.W.1, the Electrical Association for Women is leaving these premises owing to the disposal of the Crown lease. New accommodation has been secured at 35, Grosvenor Place, S.W.1. The Association's annual conference will be held next year from May 14th to 16th at Southport.

Electrical Housecraft Examinations

One hundred candidates qualified for the Electrical Association for Women's certificate for electrical housecraft for teachers in the examination held in June, bringing the number of certificate holders to 1,201. Eighty-one candidates were successful in the similar examination for demonstrators and saleswomen, 1,045 of whom now hold certificates.

United States Exports

In the table giving United States electrical exports during 1945 published in the *Electrical Review* of August 23rd, p. 305, the first item should have been headed "Generators, d.c."

Tool Makers' Visit to Prague

A party of directors and export managers of firms belonging to the Gauge and Tool Makers' Association left England on Saturday for a ten-day visit to Prague, for the International Fair now being held there.

Visco Silver Jubilee

At the end of September the Visco Engineering Co., Ltd., Croydon, celebrates its silver jubilee. The company was formed in 1921 to market the "Visco" air filter; the staff then consisted only of the founder, Mr. F. Curt Smith, and two assistants. Increasing demand, however, soon necessitated a removal in 1925 to larger premises in Grosvenor Road. Water cooling tower production was begun; a ventilation department was added in 1927; and in 1928 the manufacture of "Visco" and "Visco-Beth" dust collecting

plants was started, followed by industrial vacuum cleaners.

The present works in Croydon was opened in 1932. A large part of the premises was destroyed in 1944 by a direct hit from a flying bomb, but production continued in a temporary building. Further extensions are now in hand. To celebrate the silver jubilee, a dinner followed by a concert is being held at the Greyhound Restaurant, Croydon, on September 27th.

Reports on German Industry

The latest list of reports by investigating teams on various branches of German industry include the following:—B.I.O.S. 587, "German Naval Mining Relays and Moulded Powder Permanent Magnets" (5s. 6d.); B.I.O.S. 604, "The Shellac Industry in Germany" (2s.); B.I.O.S. 622, "Investigation of Cold Cathode Tubes made by Siemens-Reinigerwerke, Rudolstadt, Part II—Production Details" (3s.); and F.I.A.T. 676, "German Scientific Literature Published during the War" (10s. 6d.); F.I.A.T. 294, "Interrogation of German Television and Electronic Authorities" (1s.); F.I.A.T. 516, "Recent Cable Development in Germany" (6d.); F.I.A.T. 535, "Industrial X-Ray Field in Germany" (1s. 6d.); F.I.A.T. 671, "Some Characteristics of Selenium Rectifiers Prepared by the Vacuum Method" (1s.). The prices are those at which a few copies are available from the Stationery Office. Many of the leading libraries have copies for inspection.

Electric Vehicles in Wales

Thomas & Evans, Ltd. (Motor Engineering Dept.) Porth, nr. Cardiff, are to undertake the distribution, maintenance and servicing of the Northern Coachbuilders' range of battery electric vehicles for the whole of Wales. In view of Thomas & Evans' own requirements (they are large-scale users of electric vehicles themselves for their fruit drinks and bakery and grocery branches), a first order for 208 vehicles has been placed to be delivered over a period, for mineral water distribution. Meanwhile, a new factory on the Team Valley Estate has been taken over by Northern Coachbuilders, Ltd., and production is being stepped up to meet the increasing demand. The vehicles will be fitted with "Exide" batteries and incorporate B.T.H. electrical equipment.

Fatalities

The Norwich city coroner (Mr. L. G. Hill) last week returned a verdict that Leslie Charles Brooks (27), died "from asphyxiation following shock accidentally received in handling live electric wires." Evidence was given that when lights went out in the house, Brooks went to discover the cause. A few minutes later he was found lying on the ground outside the house with the end of a piece of flex in his hand. This was connected to the light in the bathroom. The wires, which were coiled in a box, had been removed from a shed some days previously.

Mr. B. C. Harper, a Norwich Corporation Electricity Department employee, suggested that a pool of water on the cement path had "shorted" the wires which were then bare. The deceased, evidently suspecting this lead to be the cause of the trouble, apparently picked up

the wires thinking them to be "dead" as the fuse had blown. This was not the case as the fuse which had blown was on the "dead" side of the circuit.

An electrician, Harold Gamble (38), of Ibstock, Leics., was killed at Ellistown Colliery while attending to a fault on a coal-cutting machine. At the inquest Mr. H. Insley, chief electrician at the colliery, said he found the switch of the machine in the "on" position. A fixing screw had worked out of position and had become lodged across the pilot switch contacts, so completing the circuit as if the switch were on and counteracting the safety measures. The main circuit voltage was 550 and that of the pilot circuit 25. An assistant coal cutter said that Gamble connected the cable after testing the cutter but disconnected it again later. He believed that he (witness) put the cable in next time, taking Gamble's remarks to mean that he wanted it connected. A verdict of "Accidental death" was recorded.

Industrial Truck Advisory Service

Crompton Parkinson, Ltd., announces the formation of an Industrial Truck Advisory Service to give expert guidance on all factory haulage problems. The service is particularly concerned with increasing the efficiency of internal transport systems by the application of "Electricar" works trucks. It undertakes preliminary investigations of haulage problems, to determine operating costs, labour requirements, types of truck, and if a stillage system is applicable, or whether the existing systems can be adapted. Plans and estimates are submitted without obligation. A brochure on the subject is obtainable from the company's offices, Electra House, Victoria Embankment, London, W.C.2.

Contract Price Adjustment Formulae

The latest figures for the B.E.A.M.A. price adjustment formulae are as follows:—Rate of pay for adult male labour at September 14th, 193s. (unchanged). Cost of material: The index figure for intermediate products published by the Board of Trade on September 14th is 198.0 and is the figure for the month of August (against 196.0 for July).

Trade Publications

Elliott Brothers (London), Ltd., Century Works, Lewisham, London, S.E.13.—Illustrated and priced catalogue (section one) with index and fixing dimensions of a complete range of miniature measuring instruments, for panel mounting, with scale lengths of from 2 to 3.25 in.

Truvox Engineering Co., Ltd., Exhibition Grounds, Wembley.—An attractively illustrated brochure dealing with the company's wartime activities and outlining its future plans which include the production of loudspeakers, public address speakers, broadcast receivers, machine tools and domestic appliances.

Bakelite Developments

The first issue of *Bakelite Progress* to appear for seven years is dated August, 1946. Its purpose is to review developments for manufacturers and other users of the particular kinds

of plastic substances indicated by its title. The current issue, which is largely illustrative, contains articles on "Design for Export" and on joint making by the recently devised wet abrasion process. Resulting from the company's entry into the vinyl plastics field (for wartime cable insulation in place of natural rubber) the manufacture of vinyl chloride acetate compounds is now to be undertaken on a large scale at a factory which is being erected on a 38-acre site at Aycliffe, Co. Durham.

Changes of Name

Herbert Electrical, Ltd. (390,619), has changed its name to Herbert & Lascelles, Ltd.; Keates & Co. (Electrical), Ltd., becomes Megaphos, Ltd.; Capital Electrical Industries, Ltd., becomes Electrical Appliances (Kent), Ltd.; and the Société Industrielle d'Electro-Metallurgie, Ltd., becomes S.I.E.M. Industries, Ltd.

Trade Announcements

E. K. Cole, Ltd., have opened new West End premises in London at Rembrandt House, 5, Vigo Street, S.W.1 (telephone: Regent 2601; telegraphic address: Ekkorad, Piccy, London) to cover all the company's products. Show-rooms are in course of preparation. Mr. W. W. Syrett, export manager, Mr. C. B. Cleland, Thermovent sales manager, Mr. F. C. Pullen, plastics sales manager, Mr. E. S. Evans, southern area lighting sales manager, Mr. E. L. Cator, lighting engineer, as well as radio and television representatives, have been transferred there and the general administration is undertaken by Mr. L. Newman. The head office remains at Southend-on-Sea.

Albright & Wilson, Ltd., 49, Park Lane, London, W.1, have been appointed distributors of Silicone resins, fluids, greases, Silastic rubber and other Silicone materials manufactured by the Dow Corning Corporation of Midland, Michigan.

The National Fire Protection Co., Ltd., has moved to Argosy Works, 201a, Kingston Road, Leatherhead, Surrey (telephone: Leatherhead 2208).

B. Finch & Co., Ltd., are moving tomorrow (September 21st) to 238, Waterloo Road, London, S.E.1.

TRADE MARKS

THE following applications have been made for the registration of trade marks. Objections may be entered within a month from September 11th:—

DRYMAX. No. B640,439, Class 8. Electric dry batteries.—The Chloride Electrical Storage Co., Ltd., Exide Works, Clifton Junction, near Manchester.

RADADD. No. 641,675, Class 10. Surgical, medical, dental and veterinary instruments and apparatus.—Multitone Electric Co., Ltd., 223-7, St. John Street, Clerkenwell, London, E.C.1.

TABAT. No. 640,595, Class 17. Electric insulating materials.—Lindsay & Williams, Ltd., Openshaw Bridge Works, Ashton Old Road, Manchester, 11.

DURASTRIP. No. 641,175, Class 17. Thermoplastic materials (in the nature of rubber) in strip and ribbon form.—Duratube & Wire, Ltd., 16, Hanworth Road, Feltham, Middlesex.

Electric Grain Drying

Successful Operation of an Oxfordshire Plant

THE phenomenally wet weather this harvest has drawn especial attention to artificial methods of crop drying. A year's operation of an electrically heated and driven grain drying plant installed at Wilkins Brothers' farm at Bampton, Oxfordshire, provides further convincing evidence of the advantages of electrical methods. Since the plant was completed in the middle of August, 1945, it has been in daily use, sometimes as much as eighteen hours a day, and in the twelve months dealt with 24,727 sacks (2,163½ tons, taking the average weight as 1¾ cwt.) All types of grain have been satisfactorily dealt with—wheat, barley, oats, beans, maize, vetches, clover, rye grass, linseed, kale seed, etc. Normally 9–10 per cent of moisture has been removed (from 21–22 per cent down to 12 per cent). On one occasion, however, after 87 tons of mixed grain which had been soaked in water as a result of a fire had been put through the dryer twice, the weight remaining was only

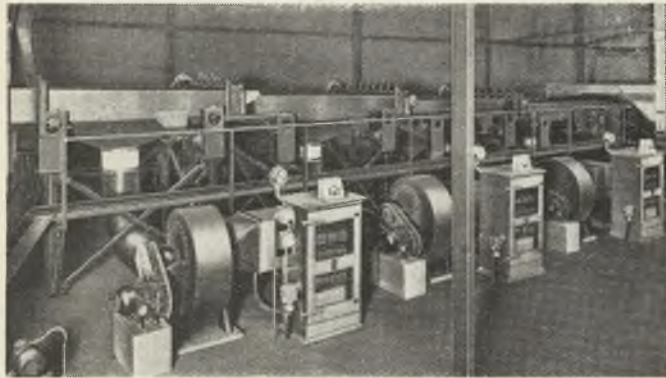
switching on, the drying temperature is much more easily regulated, and the dried grain, not being contaminated by fumes, is in better condition and may command higher prices.

Mr. Edward Wilkins told us that with the dryer handling 50 cwt an hour (the capacity for which it is designed, though in favourable circumstances it will take 3 tons) one man can feed the plant, keep an eye on its operation, make any necessary adjustments and sack off, all by himself. In fact three men with the aid of a 12-ft cut combine have been sufficient to get in the grain and operate the dryer throughout the season.

Figures taken for a typical operational run during a three-hour period, 11.30 a.m. to 2.30 p.m., early in February, during which 54 sacks (1½ cwt each) were dried from 23/25 to 12/13 per cent, show a consumption of 698 kWh. The ambient temperature was 50–55 deg F. This means that 27 cwt of grain had an average of 12 per cent moisture extracted each hour for a consumption of

172 kWh per ton, and that for every 1 per cent of moisture removed per ton 14½ kWh was used. The output in this instance was lower than normal owing to the high moisture content of the grain.

As already indicated, the only manual operations in the drying process are the tipping of the grain into the feeding hopper and the removal of the grain after it has been sacked off. The feeding hopper is divided into two



Grain drying plant at Wilkins Brothers' farm showing fans and control gear in the foreground

46 tons, representing an extraction of 47 per cent of moisture.

Consumption of electricity totalled 287,423 kWh, and supplies were obtained from the Wessex Electricity Co. Although the cost of running is appreciably higher than using coke or oil for heating, this is easily offset by a considerably reduced labour expense as no stoking, etc., is necessary. Also the plant can be ready for use within three minutes after

halves each holding 160 bushels to facilitate changing over from one type of grain to another. From the base of the hopper an 8-tons-an-hour continuous bucket type elevator driven by a 1-H.P., 1,500-r.p.m. Brook motor carries the grain up to a storage bin feeding the dryer, an overflow pipe returning surplus grain to the hoppers.

The Goodall-Butterley dryer comprises four horizontal tables or trays approximately

6 ft wide by 11 ft long assembled to form a single unit 44 ft in length. The tables are formed of a series of overlapping galvanized steel plates or slats 6 in. wide, air being blown up through the spaces between the plates.



Drying tables with the fan inlets incorporating heating elements on the left

Cams mounted on shafts, chain driven from a 3-H.P. motor with 1,425/100 r.p.m. reduction gearing, impart a definite jerking action to the tables, spring tension and rubber buffers being arranged to adjust the required impact. The length of travel is controllable as is also the thickness of the material to be dried, the latter by an adjustable weir at the discharge end. To ensure the maximum drying of the grain it can be completely turned over twice in its passage along each individual table, this operation being automatically performed by transverse ploughs fixed at intervals on two of the plates on each unit. In addition revolving tines turn over the grain again just before it reaches the end of the unit where it encounters a weir, the height of which is readily adjustable to vary the depth of the grain (normally 4-5 in.). The trays are entirely self-emptying.

To each unit is connected a fan, driven by a 2½-H.P., 1,410-r.p.m. motor, giving 3,500 cu ft a minute of free air with the dampers full open. Only the first three units are arranged for heating the air, the temperature of which is raised to 120-150 deg F for grain for milling and 110-115 deg F for seed purposes. The fourth unit is used for cooling the grain to atmospheric temperature. The spiral heating elements, which are constructed of Henry Wiggins "Glowray" wire, are built up of 7-kW sections, the three units of the dryer having loadings of respectively 70, 84

and 105 kW, making a total of 259 kW. The heaters which are placed on the inlet side of the fan, are connected to terminal boards, whence leads are taken to unit control panels. Each heater has one section

continuously in circuit and six regulating sections of 7-kW each. The permanent section and the regulating sections are individually switched by contactors. The regulating contactors are opened and closed by a double acting solenoid operated selector switch, which is fitted with adjustable oil dashpots.

A dial thermometer with bulb in the air stream having adjustable maximum and minimum contacts energizes two sensitive relays which in turn actuate the solenoids of the selector switch, so closing or opening regulating contactors as required. The space between the maximum and

minimum contacts of the thermometer gives a temperature zone in which regulating contactors are neither opened nor closed. This zone corresponds to the operating temperature differential. The scheme permits any number of regulating contactors to be placed under the control of one thermometer to provide any degree of fineness of temperature control. Control of the fan motors is incorporated, an electrical interlock ensuring that heaters cannot be switched on until the fan is running. For use when drying light seed there are supplementary switches to cut out all the permanent sections of the elements, in this manner, giving the lower temperatures required.

Leaving the dryer, the grain is taken by a double continuous bucket type elevator (1-H.P., 1,500-r.p.m. motor) either to a Boby "Superclean" cleaner (5-H.P. motor) and then into the sacking-off bin or else straight to the bin under which is an automatic weigher. Three extract fans in the roof help to remove the moisture- and dust-laden air from the building. The dryer was supplied and installed by the Butterley Co., Ltd., the control and heating apparatus being designed and constructed by S. H. Hannah, Ltd., Selly Oak, Birmingham. Brook motors were used throughout. We should like to thank Wilkins Bros., Mr. S. H. Hannah, and Mr. F. H. Foster (of the Butterley Co., Ltd.), for their help in preparing this article.

Paris Congress

British Engineering Developments Described

THE large number of technical papers being presented to the International Technical Congress in Paris (September 16th-21st) include sixteen by British authors.

Among them, DR. V. E. YARSLEY describes briefly how plastics may be expected to co-function with older materials to improve existing methods of engineering construction. But he does not anticipate that the newer substances will be able to compete on a cost basis with conventional materials of construction.

DR. H. K. HARDY (Aluminium Laboratories, Ltd.) deals with aluminium alloys for engineering purposes, briefly mentioning the production and reduction of alumina. He then surveys at greater length the manufacture of semi-finished products, the composition and properties of alloys as well as their resistance to atmospheric and electrolytic corrosion; also protective electrolytic and chemical castings.

MR. A. A. FULTON's report on hydro-electrical engineering in Scotland outlines the water power schemes that have already been developed and the projects which are now being undertaken by the North of Scotland Hydro-Electric Board, indicating their limiting features.

In addition to the main developments, a number of small projects are intended to provide power for local distribution. It is not yet possible to indicate accurately the trend and form of individual generating plant, but most of the stations will be of between 10,000 and 50,000 kW capacity. The larger stations will be linked together and, whenever possible, contain only one machine, in order to simplify switching, permit automatic control and, in some cases, enable inductor alternators to be installed.

Cooling Tower Design

MR. T. J. GUERITTE (L. G. Mouchel & Partners, civil engineers, Westminster) describes the marked evolution of ideas concerning the selection of sites for large steam power stations, referring at some length, by way of illustration, to sections A and B of the Hams Hall station of the Birmingham Corporation, on an inland site necessitating the use of water cooling towers. Their design involved the study of three alternatives for

each of six different values of condenser vacuum, with 36 corresponding alterations in the design of the condensers and turbo-alternators, their sizes and weights and structural work.

These facts, the author says, make it clear that advances during the last 25 years in the design of cooling towers have made it possible to abandon the idea that riverside siting is a necessity for large power stations. Indeed the author believes that stations of up to one million kW capacity may be erected where most advantageous (near coalfields and large industrial areas) wherever sufficient make-up water is available for the cooling towers.

Steam Boiler Practice

A paper prepared and submitted by the British Water-tube Boiler-makers' Association summarizes boiler practice in the United Kingdom with indications of wartime influences. Perhaps the most outstanding feature of latest designs, compared with pre-war ideas, is the over-riding importance now attached to availability. The inferiority and unsuitability of available fuels have forced this factor to the forefront and placed British designers at a disadvantage by comparison with practice in America and Germany.

The tendency of heating surfaces to become choked with ash deposits is likely to remain a major consideration in future, as the better quality seams of coal become worked out. Its influence on new designs is to be seen in the more extensive provision of water-tube walls in furnaces, the lowering of combustion chamber ratings, increased space allowed between convection and superheater tubes and the provision of ample means of access and cleaning equipment.

With the removal of the wartime need for decentralization, which limited capacity, many British post-war projects are approaching 500,000 lb per hr capacity with steam temperatures rising to 950 deg F. and pressures up to 900 lb per sq in., with a few designed to operate at 1,400 lb per sq in.

The rise of pressure is causing more extensive boiler feed water heating by steam bled from the turbines, which causes a rise in the feed water temperature to the boilers. The combined effect is reducing convection

heating surface of boilers and extending the use of steaming type economizers.

Forced circulation boilers have been built in Great Britain recently for 1,500 lb per sq in. working pressure and 350,000 lb per hr evaporation.

In referring to milling plant, furnaces and burners for pulverized coal firing, the paper records that powdered coal consumed in British electricity generating stations in 1944 approximated to 18.5 per cent of the total, compared with 3.5 per cent in 1929; new construction work in progress will raise the proportion substantially.

Reference is made to progress in the design of mechanical stokers, super-heaters, economizers, air heaters and draught fans, and the paper concludes by indicating how increasing steam pressure and temperature have caused more attention to be paid to steam purity, feed water treatment and boiler operation control generally, while the welding of pressure parts of steam boilers has become an accepted practice in Great Britain.

East African Trade

DETAILS of the export trade of Kenya and Uganda in 1945 have now been issued. From these the figures of imports of electrical material have been extracted and are shown in the accompanying table, together with notes of increases or decreases compared with 1944. Practically the whole trade was done by the United Kingdom, the share of the United States having been quite small. The only noteworthy increase was in wires and cables. The latest reports from the territories state that the variety of imports from overseas is increasing, but the demand is still far from being satisfied. Engagements continue to be met promptly.

Class of Goods	1945 £000	Inc. or dec. on 1944 £000
<i>Electric wires and cables</i>	109	+89
From United Kingdom	96	+82
" United States	12	+6
<i>Elec. lighting accessories and fittings</i>	10*	+1
<i>Elec. goods and apparatus, not else- where specified</i>	5*	-3
<i>Elec. light bulbs</i>	9*	—
<i>Telegraph and telephone instruments and apparatus</i>	11*	-9
<i>Radio sets</i>	5	+1
<i>Radio apparatus, other, and parts</i>	7	—
From United Kingdom	5	+1
" United States	2	-1
<i>Torches, including bulbs and batteries</i>	10	+5
From United Kingdom	3	+2
" Union of South Africa	7	+3
<i>Generators, motors, convertors, transformers, etc.</i>	7*	+6
<i>Other electrical machinery and parts</i>	20	-29
From United Kingdom	19	-26
" United States	1	-2

* All or nearly all from United Kingdom.

Australian News

(From Our Australian Correspondent)

SIR CLAUDE GIBB, who recently arrived in Sydney from England, states that generating equipment to the value of £1,000,000 sterling is now being manufactured in England for Australian power stations. This equipment is on order for electricity undertakings in Sydney, Melbourne, Brisbane and Adelaide. Sir Claude Gibb, who is the Australian-born chairman and managing director of C. A. Parsons, Ltd., is visiting his mother.

The Premier of New South Wales (Mr. McKell) announces a plan to provide electricity to 24,000 farms and 10,000 homes in rural areas within the next ten years at a cost of £6,000,000. The State Government has decided on the immediate introduction of the plan, and the work will be carried out by local government distributing authorities, who will receive "a generous subsidy" from the Government.

South Australian Trust

The Electricity Trust Bill, providing for the vesting of assets worth nearly £10,000,000 of the Adelaide Electric Supply Co., Ltd., in a trust, has been approved by His Majesty the King, and the Act, the Electricity Trust of South Australia Act, 1946, will probably be put into operation within a few weeks, when proclaimed by the Government. The Trust will consist of five members, all of whom will be appointed by the State Government.

In the Western Australian Legislative Council fears have been expressed that there will be insufficient power in the near future for local industrial purposes. Mr. Bolton (Liberal) stated that although it was said that the new power house at South Fremantle would be in operation in three years' time, he believed it would more likely be four or five years before it would be completed. "Present capacity of the East Perth power house is 57,000 kW," he said, "but due to the shutting down of units for repairs from time to time, this capacity is not always available." Efforts have been made of late to have a Select Committee appointed to inquire into the recent breakdown at the East Perth power house, but after debating the matter at some length a motion to that effect in the Legislative Assembly was defeated.

Better Electrical Supplies

Supplies of electrical merchandise are improving each month, but stocks of electric irons are still low. Good supplies of electric clocks are coming to hand, and the range and quantity of electric fans for the coming summer season look quite satisfactory. The demand for electric refrigerators is heavy, far exceeding the supply, and little relief is expected for some time to come. A brisk trade is being done in electric grillers and the like, and a good range of electric stoves is being offered. Supplies of small electrical fittings are good.

Lamp Publicity—I

Arrangements by B.T.H. Co. and Siemens

DEVELOPMENTS in lighting technique during the past year are treated in a lively fashion in the B.T.H. Company's advertising. The first comprehensive "Mazda" lamp catalogue to be issued since 1939 is being prepared and work has been started on a new edition of the "Mazdalux Industrial Lighting Equipment Business Guide." Illustrations and prices of twenty-three fluorescent lighting fittings are given in an industrial and commercial lighting equipment broadsheet and the 40-W and 80-W sizes are covered in a fluorescent lamp brochure.

The "Brighter Schools" booklet is followed by a brochure entitled "Light and Learning." This draws attention to the requirements of the 1944 Education Act in relation to illumination.

New descriptive lists, each dealing with a specific piece of lighting equipment are being issued. Advertising is to be continued in all branches of the Press and some new display pieces are being prepared; these will be made of linen with silk screen designs. The company is actively participating in a number of exhibitions. It has already shown examples of its lighting fittings in the I.M.E.A. and A.P.L.E. displays

and will be represented in the "Britain Can Make It" Exhibition and next year's British Industries Fair.

The name Siemens will be kept in the public eye by means of regular press advertisements and display material in dealers' windows. Advertisements in the principal trade journals will stress the economy of good lighting in



Siemens coloured cut-out

making possible increased production, and at the same time will offer without obligation the skilled advice of the company's lighting engineers on all matters appertaining to factory lighting.

An attractive showcard of Big Ben in five colours, measuring 9 in. by 14½ in. has the slogan, "Siemens Lamps Used for Lighting Big Ben and Just as Reliable." A new design lamp display cutout, 24 in. by 28 in., with the caption, "Good Light is Good Company," is printed in eleven colours and fitted with lock rudder strut at the back. The company is prepared to dress dealers' windows with a Siemens lamp display using the cut-out as the central feature. Price lists are available to the trade on request.

Lamp supplies continue to be short owing to pressing demands for export and to shortage of labour in the factories. Every effort is being made to increase output and steps are already well advanced which it is hoped will lead to improved supplies for the home trade.

Turbo-Electric Cargo Ships

ON April 12th we described the s.s. *Beaverdell*, the first of four turbo-electric cargo ships which are being built for the Canadian Pacific Railway Co. for its London-Montreal service. The company has just issued an attractive colour brochure relating to this fleet and copies are available from its London offices at 62, Trafalgar Square, W.C.2.



"Mazda" display piece

ELECTRICITY SUPPLY

Revised Birkenhead Scheme. Lower Charges in London.

Birkenhead.—HYDROGEN COOLED PLANT.—At a meeting of the Electricity Committee the consulting engineers, Merz & McLellan, indicated that they now favoured hydrogen cooled plant in preference to air cooled, and a revised tender of the English Electric Co., Ltd., for the three turbo-alternators was accepted.

CHANGE-OVER.—The Electricity Committee has obtained sanction to borrow £52,000 in respect of a modified change-over scheme.

LAUNDRY SUPPLY.—A supply is to be provided to the Hartlepoons Laundry & Dyeworks, Ltd., at a cost of £2,936.

Bradford.—SCHOOL LIGHTING.—The Education Committee is to replace gas lighting by electric at three schools at a cost of £1,808.

Burton-on-Trent.—SUPPLY TO ESTATE.—The Electricity Committee is to extend the mains to the Rolleston housing estate at a cost of £3,740.

Darlington.—COOLING WATER.—At the last Town Council meeting Councillor J. Neasham asked what progress had been made towards alleviating the nuisance caused by condensation from the cooling towers. Alderman J. D. Hinks, chairman of the Gas, Water and Electricity Committee, said that the original scheme was to bring a pipe right through the town to convey water from the water works to the generating station, and now after negotiations lasting two years it was probable that they would fall back on that scheme.

Dorchester.—DISTRIBUTION EXTENSION.—A scheme for an extension of the distribution system in the western area is to be prepared.

Edinburgh.—FLOODLIGHTING OF PLAY-GROUNDS.—A proposal for the floodlighting of school playgrounds during the winter is to be reported on by the City Architect's Department.

London.—LOWER CHARGES.—Central London Electricity, Ltd., has announced reductions in charges to three classes of consumers. The concessions relate to the fixed charges payable in advance by domestic and commercial consumers under the two-part tariff (System "A") and to lighting flat rates (System "B"). It is stated that with consumers back again it is now possible to make the first of the reductions promised at the time of the increase in charges.

Nottingham.—PROGRESS OF EXTENSIONS.—According to the *Nottingham Journal*, Mr. M. Wadeson, acting electrical engineer, stated recently that the Electricity Department expected to get the first new generating set at North Wilford into operation this winter, before Christmas it was hoped. A further set would be commissioned in 1947 and two more by the winter of 1949.

Paisley.—SWITCHGEAR.—The Electricity Advisory Committee reports that the main switch gear at Blackhall, which is twenty-five years old, requires renewing, and recommends that in the meantime one additional switch should be purchased at a cost of £1,062.

CHANGE-OVER.—Application is to be made for sanction to the borrowing of £15,203 for

mains and consumers' apparatus in connection with the proposal to change over the voltage and system of supply from 200 V single-phase to 250-440 V three-phase.

STREET LIGHTING IMPROVEMENTS.—Proposed additional public lighting in connection with housing schemes will cost £2,571.

Stretford.—COLLECTION OF FIXED CHARGE.—The Housing Committee has agreed to proposals by the Stretford and District Electricity Board by which the Council will collect with the rent a payment of 1s. per week in respect of each temporary bungalow for remission to the Board, less 7s. per annum to cover expenses.

Swindon.—APPLICATION OF DOMESTIC TARIFF.—Representations by tenants of M.A.P. estates, requesting a supply of electricity on the domestic tariff were considered by the Electricity Committee at its last meeting. The Committee also received a report by the electrical engineer with regard to the system of wiring of the temporary aluminium and Arcon houses being erected on the Pinehurst estate, necessitating the charging for all electricity consumed on the basis of a domestic tariff. It was agreed to rescind the requirement that an electric cooker rated at not less than 3 kWh should be installed before the domestic tariff could apply, and to adopt a minimum payment of £2 10s. per annum in respect of the fixed charge as a condition of the application of the tariff.

SUPPLY TO HOUSING ESTATE.—The Electricity Committee is seeking sanction to borrow £14,400 to supply the Beech housing estate.

Overseas

Belgium.—NUCLEAR ENERGY INQUIRY.—It is officially announced that the Council of the Belgian National Scientific Research Fund has decided to appoint a Scientific Commission to study the problems of nuclear energy. Among the objects of the new body is that of inquiring into ways in which the National Fund, in conjunction with Belgian universities, can provide for continuous efforts so that by the time nuclear energy becomes a practicable proposition Belgium may have a sufficient number of experts to maintain the country's position as regards application and utilization of nuclear energy.

Generation in August

OFFICIAL returns rendered to the Electricity Commissioners show that 2,847 million kWh was generated (2,680 million sent out) by authorized undertakings in Great Britain during August compared with the revised figure of 2,474 million kWh in August, 1945, representing an increase of 15.1 per cent.

From the beginning of 1946 to the end of August the total number of kWh generated by authorized undertakings was 26,092 million (24,604 million sent out) as compared with the revised figure of 24,259 million kWh for the corresponding period of 1945, representing an increase of 7.6 per cent.

Liverpool Jubilee

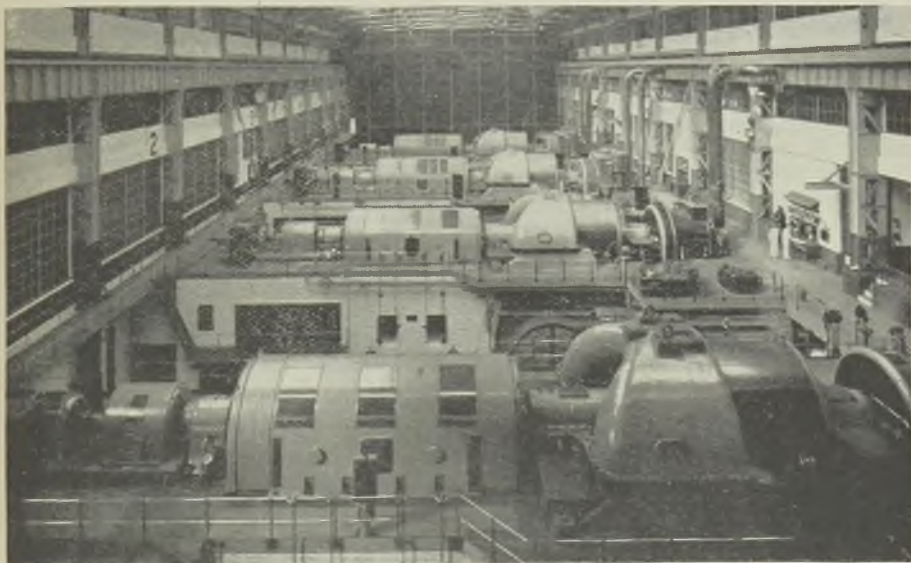
Mr. Shinwell at the Electricity Undertaking's Celebrations

LIVERPOOL electricity undertaking last week celebrated the completion of fifty years of public service. Clarence Dock and Lister Drive generating stations and several substations were open for public inspection and special displays were staged in the municipal electricity showrooms.

The culminating point in the celebrations was reached on Friday, when a large number of guests, including the Minister of Fuel and Power, Mr. Emanuel Shinwell, made a quick tour of the city with visits to the Mersey Tunnel, the penicillin works of the Distillers'

the "goods" would not be delivered so expeditiously or so cheaply as in the last fifty years. The people asked for service and not slavish allegiance to doctrines. Nothing could be more democratic than the municipal control of a utility undertaking.

Mr. Emanuel Shinwell said that the dovetailing of public money with State enterprise coupled with private enterprise was part of the trend towards a closer integration in the industrial sphere which was not peculiar to this country. He declared that there was no truth in the statement by the public



Turbine room at Clarence Dock generating station, Liverpool

Co., Ltd., and the works of the Automatic Telephone & Electric Co., Ltd. The last inspection was mainly of the automatic telephony departments. Mr. A. J. Leyland, director and chief engineer of the company, and Mr. F. C. Burstall, commercial director, welcomed the party, whose thanks were expressed by Alderman A. Critchley, chairman of Liverpool Electricity Committee.

At the dinner held in the evening Alderman the Rev. H. D. Longbottom, who proposed the toast to H.M. Government, expressed anxiety lest when the Government took over,

relations officer of the electricity supply companies that the Government contemplated rationing electricity. That had never been contemplated. He described it as propaganda designed to create the false impression that the Government had failed in the sphere of coal and electricity.

No electricity undertaking had had to close down or curtail its operations because of shortage of coal. Congratulating Liverpool on the efficiency of its electricity undertaking, Mr. Shinwell added that the ability, skill and administrative capacity of the municipal

undertakings would not be ignored when the Government considered nationalization.

Lord Brabazon, president of E.D.A., proposing the toast of "The City and Port of Liverpool, including the Electricity Undertaking," said the Liverpool supply was started in 1895, when it bought out a company, but it did not wait until someone else made a success of it and then take it over by statute. Within the period when the cost of living had gone up by 30 per cent, wages by 60 per cent, materials 100 per cent and coal 250 per cent, electricity had gone down 40 per cent. Would Mr. Shinwell tell them why he was so dissatisfied with the electricity industry, why the great undertakings of Liverpool, Manchester, Glasgow and other places were to be put in charge of others? They had got a standard frequency and voltage, there had been groupings covering large areas and a joining up of power companies with municipal undertakings. "I feel," added Lord Brabazon, "that I am asked to go into the cell of a man condemned to death and with a glass of champagne to drink his health." Up and down the country in the electrical sphere were they to see the "stimulating spectacle of Shinwell squatters in socialist stations?"

Dr. P. Dunsheath (President, Institution of Electrical Engineers) described the electrical possibilities of the British commonwealth countries as a Pandora's Box only waiting to be opened. They presented a wonderful field of opportunity.

Speeches were also made by Mr. T. H. Upton (President of the Institution of Engineers, Australia), Mr. J. S. Pickles (President of the I.M.E.A.), the Lord Mayor of Liverpool (Alderman Luke Hogan, M.B.F.) and Councillor A. O. Roberts.

Alderman A. Critchley, who presided, in welcoming the guests, said they included representatives of the Commissioners, C.E.B., the Dominions, municipal and company undertakings, industrial concerns, and organizations of the electrical industry. Also present were eighteen employees of the undertaking with service of over forty years—two of them had been with the undertaking fifty years.

Brief History

A handsome brochure published to commemorate the jubilee presents an epitome of Liverpool's history through the centuries, with many illustrations. One of these is a seventeenth century picture of the Wishing Gate, now the site of the Clarence Dock generating station. Electric lighting in the

city may be said to have begun in 1878 when a sample arc lamp was exhibited opposite St. Nicholas Church, Pier Head, and the British Electric Light Co. was awarded a contract to light several streets. The result was not very satisfactory and the company withdrew from the contract in 1882. In the following year the Liverpool Electric Supply Co., Ltd., was formed and was immediately successful. In 1887 it obtained a licence to supply electricity in the central part of the city, and by 1895 had established generating stations at Highfield Street, Paradise Street, Oldham Place and Lark Lane. The price of electricity was then 7½d. per kWh for lighting and 5d. for power. On May 28th of that year an agreement was made for the purchase of the undertaking by the Corporation for £400,000, the purchase being finally completed on July 1st, 1896. Mr. A. Bromley Holmes became the first city electrical engineer and was followed by Mr. Harold Dickinson (1913-27), Mr. P. J. Robinson (1927-44) and Mr. J. Eccles, the present "chief."

The total capacity of generating plant has grown from 3,000 kW in 1896 (when the largest unit was 150 kW) to the present 329,000 kW (largest unit 50,000 kW), at Lister Drive and Clarence Dock. There are over 500 substations in the undertaking's supply area of 142 square miles. Total capital expenditure on the undertaking now amounts to £15,000,000, of which £8,700,000 is in respect of distribution.

Raising the Standard of Living

THE direct relationship of standard of living to the use of electricity is emphasized in "Can We Be Rich?" the first of a series of films entitled "Focus on the Future" produced by the Film Producers' Guild. Using a cake to indicate the country's production, Mr. Geoffrey Crowther, editor of the *Economist*, shows that improvement in the standard of living in any direction (represented by one slice) can be achieved only by reducing the standard in another (a second slice) or by making a larger cake, that is, increasing production. This can be done without longer working hours by increasing the production per man-hour by making greater use of mechanical aids. Mr. Crowther instanced the case of the United States where the increased mechanization was indicated by the fact that the consumption of electricity per head of population was two and a half times that of this country. The film, which runs for thirty-five minutes, is being shown at the Academy Cinema, Oxford Street, London.

FINANCIAL SECTION

Company News. Stock Exchange Activities.

Reports and Dividends

Aron Electricity Meter, Ltd., in its accounts for the year ended March 31st last, records a loss of £33,471, compared with a profit of £19,266 in 1944-45. There is an estimated E.P.T. refund of £62,576, less income tax provision for the year of £16,542, resulting in a surplus of £12,563. It is proposed to pay a dividend of 10 per cent, against 15 per cent last year, leaving £21,957 (£17,750) to be carried forward. Last year £7,500 was allocated to reserve, for which there is no provision this year.

The chairman, Mr. E. D. A. Herbert, in a circulated statement, says that the year has been one of great difficulty, reconversion to peacetime production being retarded by the continuance of certain war contracts, by the necessity of storing Government machinery and material surplus to requirements, and above all by the difficulty of obtaining adequate supplies of labour and raw materials. On the subject of the general shortage of productive labour, he says that the effects are twofold in that the company is prevented from satisfactorily meeting the large volume of orders on the books, and the sub-normal production unfavourably affects costs, and therefore the profit margins. The company's technical staff are applying themselves to developing methods designed to reduce the cost of producing meters still further, a considerable quantity of up-to-date machinery is on order, and the opportunity is being taken to reorganize the factories. In view of the improbability of adequate supplies of raw materials being available, however, Mr. Herbert considers there is little hope of the company's returning to full normal production in the current year.

East African Power & Lighting Co., Ltd.—At the annual meeting in Nairobi the chairman (Mr. H. F. Ward) said that there had been unavoidable delays in the manufacture and shipment of the four 800-kW Diesel sets for Nairobi, but the first had now arrived. If U.K. manufacturers were able to adhere to their estimated delivery dates the company would soon be in a position to accept all outstanding load. On the basis of a report by Dr. C. Stansfield Hitchen, the company was advised that the building of a large dam on the Tana River was not attractive. Balfour, Beatty & Co. had indicated an alternative scheme of hydro-electric development under which use of the Tana Basin waters could be made on a satisfactory basis as part of a greater scheme.

Revision of the original plans and estimates for a hydro-electric scheme on the Nile in Uganda had been completed. This appeared to be an economic proposition although the return in the early years would be meagre. In Tanganyika good progress has been made on the extensions at Pangani Falls; a third 2,500 kW set was almost ready and a 5,000-kW set should be in service early in 1947. Extensions to the Kurasini station at Dar-es-Salaam had been held up by delays in delivery of two Diesel sets. The chairman described the conceptions

of hydro-electric development covering the whole of Kenya at Uganda, which were expressed in the Legislative Council, as extravagant and fantastic. The results of the company's investigations were made available to the body of experts appointed by the Government.

In order to provide for existing commitments and new developments the company proposes to increase the authorized capital by £1,000,000 to £2,500,000.

Johnson & Phillips, Ltd.—In a letter to the shareholders the secretary refers to the negotiations last year with the Capital Issues Committee in connection with the company's application to issue 200,000 shares to shareholders by way of rights. At that time leave to make the issue was refused and shareholders on December 17th last, increased the directors' borrowing powers to ensure that the company's activities were not restricted as a result of the refusal. Permission has now been given for the issue to be made on the terms last proposed by the directors to the Committee: the issue of 200,000 ordinary shares of £1 each at 65s. per share. The directors propose to make this issue to shareholders by way of rights in the proportion of one new share for every four shares held. The issue will be made early in November next, when an interim dividend at the rate of 7½ per cent. actual, less tax, will be declared on the existing issued share capital.

Vactric, Ltd.—Last April it was intimated that the accounts for the year ended March 31st would show a substantial net trading loss, owing to the hiatus in production inevitable in the change from war to peace. This is now reported to amount to £123,473 (compared with a net profit of £23,826 for 1944-45 after providing £22,268 for taxation). As already announced, it is not proposed to pay an ordinary dividend this year (last year 22½ per cent was distributed) and the payment of the preference dividend for the half year to March 31st has been deferred. After bringing forward £21,955, to which is added £26,061 tax reserve not required, a debit balance of £76,513 is carried forward.

Associated Electrical Industries, Ltd., has declared an interim ordinary dividend of 5 per cent on the capital as increased earlier this year. The payment of an interim dividend was foreshadowed by the chairman at the annual meeting in April; in recent years a single dividend of 10 per cent has been paid.

The Reason Manufacturing Co., Ltd., reports a profit for the year ended January 31st last of £4,129, to which is added £583 from reserve for taxation written back. The interim dividend was 20 per cent and it is not proposed to recommend any further payment. A sum of £7,336 (£6,148) is carried forward.

Lisbon Electric Tramways, Ltd.—Sir Alexander Roger, chairman, in his statement at the annual meeting, said that the number of passengers carried by the company's vehicles in 1945 increased by over 19 million to a total of 229.4

million. The vehicle mileage did not increase in the same ratio and overcrowding had continued to be a source of concern. A total of 68 buses and 20 trams were on order and under construction, and these when put into service would considerably improve traffic conditions. They were anxious to obtain all supplies possible from Great Britain, but at present deliveries were taking far too long; nevertheless the flow of materials was increasing.

Cinema-Television, Ltd., in its accounts for the year ended April 30th, shows a net profit of £47,221, against £50,372 for 1944-45. The proposed dividend of 10 per cent on the "A" and "B" ordinary stock is the first to be paid. In 1940 the company acquired the assets of Baird Television, Ltd., and last year a merger with Bush Radio, Ltd., was approved.

Holophane, Ltd., out of a net profit of £9,503 for the year ended June 30th last, after provision for tax (compared with £9,076 for 1944-45) proposed to pay a dividend of 12½ per cent. This is the first payment to be made on the ordinary shares since 1938-39, when 8 per cent was distributed.

Allen West & Co., Ltd.—It is reported that of the recent issue of 487,500 ordinary shares of 5s. each, 97½ per cent was taken by shareholders, leaving 2½ per cent for underwriters.

The Isle of Thanet Electric Supply Co., Ltd.—The directors have decided to pay on October 10th the dividend on the 6 per cent participating preference stock for the year ended March 31st, 1943.

The British Aluminium Co.'s interim dividend of 2 per cent is the same as last year; for five years previously the interim distribution was 3 per cent.

The Midland Electric Corporation for Power Distribution, Ltd., has declared an unchanged interim dividend of 3 per cent.

The Scottish Power Co., Ltd., is paying an interim dividend of 3 per cent, the same as last year.

The Electric Supply Corporation, Ltd., has announced an interim ordinary dividend of 3½ per cent, the same as last year.

The Lancashire United Transport & Power Co. has declared an interim dividend of 4 per cent (same).

A. Reyrolle & Co., Ltd., are again paying an interim dividend of 5 per cent.

British Ropes, Ltd., is repeating its interim dividend at 5 per cent.

New Companies

James Holmes & Co. (Manchester), Ltd.—Registered September 4th. Capital, £1,000. To acquire the business of electrical contractors now carried on by J. Holmes and W. Beresford at 79, Princess Road, Moss Side, Manchester, as "J. Holmes & Co." Directors: J. Holmes and W. Beresford. Regd. office: 79, Princess Road, Moss Side, Manchester, 11.

John Morris Electrical Engineering Co., Ltd.—Registered September 3rd. Capital, £4,000. Electrical engineers and contractors, etc. Directors: M. J. Middleweck and J. Liebermann. Regd. office: Market Street, Bilston.

General Lamination Products, Ltd.—Registered September 7th. Capital, £1,000. To acquire the business of manufacturers of electric transformers and sound equipment, carried on by G. W. Lavington and A. T. Beaumont at Bexleyheath, Kent, as "General Lamination Products." Directors: G. W. Lavington (managing director), A. F. Beaumont and Florence M. Lavington. Regd. office: 294, Broadway, Bexleyheath, Kent.

Winfield Electric Co., Ltd.—Registered September 5th. Capital, £5,000. To acquire the business of electrical engineers carried on at 32, High Street, Boston, Lincs, as "Winfield & Co." Directors: C. B. Fleet, A. R. Leaf and E. Winfield.

Ensel & Wigley, Ltd.—Registered September 5th. Capital, £1,000. Electrical and general engineers and contractors, manufacturers of electrical appliances, etc. Secretary: K. Allday, A.C.A. Regd. office: Kingsbury Works, N.W.9.

W. F. Powdrell, Ltd.—Registered September 7th. Capital, £1,500. Manufacturers and repairers of, and dealers in, electric motors, armatures, dynamos, magnetos, batteries, etc. Directors: W. F. Powdrell and J. J. Tanner. Regd. office: 12, Bread Court, W.C.2.

Electrification, Ltd.—Registered September 9th. Capital, £1,000. Ironmasters, founders and workers, manufacturers and repairers of dynamos, motors, armatures, magnetos, etc. Directors: James Bailey, Jack Bailey and C. Clarke. Regd. office: Hill Top, Foulridge, near Colne.

Increases of Capital

British Thermostat Co., Ltd.—The nominal capital has been increased by the addition of £150,000 (in 150,000 4½ per cent cumulative preference, non-redeemable, shares of £1 each), beyond the registered capital of £150,000.

Aylesbury Battery & Electrical Co., Ltd.—The nominal capital has been increased by the addition of £5,850 (in 3,000 preference and 2,850 ordinary shares of £1 each) beyond the registered capital of £150.

Receiver Appointed

Green Electrical Industries, Ltd.—J. Civval, A.C.A., of 112, Monarch Court, Lyttelton Road, Finchley, was appointed receiver and manager on August 2nd, 1946, under powers contained in two instruments dated March 25th, 1946, and June 13th, 1946.

Liquidations

Waterloo Electric Supplies, Ltd.—Winding up voluntarily. Liquidator, Mr. W. Pickles, 48, Mosley Street, Manchester, 2.

A. C. Cossor (Holdings), Ltd.—Meeting October 14th at 14, Berkeley Street, London, W.1, to receive an account of the winding up by the liquidator, Mr. F. B. Pudney.

Bankruptcies

A. R. Carter, electrical contractor, 2, Priory Avenue, Mile End, Bridgend.—Last day for receiving proofs for dividend, September 28th. Trustee, Mr. R. Betts, Government Buildings, 10, St. Mary's Square, Swansea.

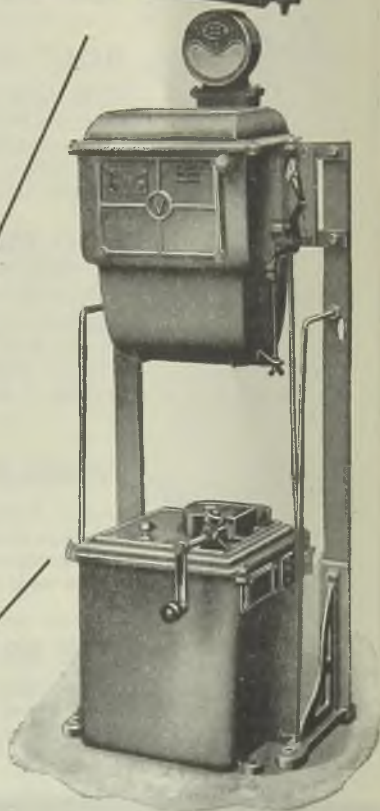
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for
slip-ring
motors
from*



THE VERITY RANGE

Oil immersed combined rotor and stator starter with or without isolator up to 90 H.P. 400/440 V.

Oil immersed rotor and stator control panel for motors up to 250 H.P. 400/440 V.

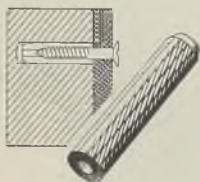


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Sales Headquarters: BRETENHAM HOUSE, LANCASTER PLACE, W.C.2

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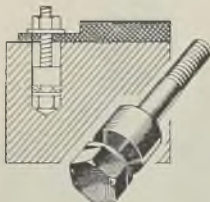


RAWLPLUGS

There is a RAWLPLUG for every size of screw and coach screw, from the tiny No. 3 for light wiring to the large No. 28 which will withstand a direct pull of over 4 tons. Rawlplug fixing is safer, quicker and neater than any other method.

RAWLBOLTS

The use of RAWLBOLTS requires the minimum of time, labour and tools. No grouting is needed. No time-lag waiting for cement to dry. Made in two types—bolt projecting and loose bolt type—they solve every bolt-fixing problem. Available with pipe clips, round and square hooks and eye bolts. Size $\frac{1}{4}$ in. to 1 in. diameter. Standard Whitworth thread.



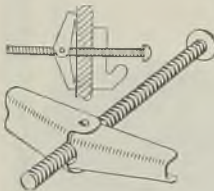
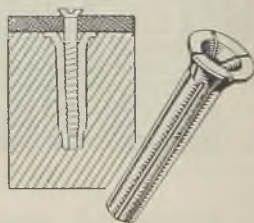
BOLT ANCHORS

The RAWLPLUG BOLT ANCHOR is especially designed for fixings of a specialised nature. Unaffected by atmospheric conditions it can be fixed below water if necessary. Full range of sizes available and the anchors will take bolts from $\frac{1}{4}$ in. to $1\frac{1}{4}$ in. diameter.

RAWLPLUG METAL PLUGS

(Screw Anchors)

Specially suited for use where the plug is likely to be subjected to extreme climatic conditions. Made in sizes to take screws from No. 8 to No. 14 and lengths from 1 in. to 2 in. Designed with flange for hollow brick work and to stop plug being inserted too far in hole.

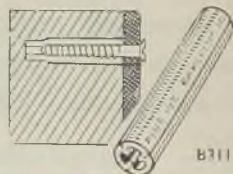


TOGGLE BOLTS

Toggle Bolts provide an ideal means of making secure fixings to hollow partition walls or ceilings, i.e., lath and plaster, asbestos board, etc., as they distribute the strain over a wide area.

WHITE BRONZE PLUGS

Specially designed for outdoor jobs where a metal plug is specified or preferred. One end of the plug is "coned" to facilitate the entrance of the screw when it is first inserted.



B711

WRITE FOR TECHNICAL LITERATURE TO:
THE RAWLPLUG CO., LTD., LONDON, S.W.7

STOCKS AND SHARES

THE course of Stock Exchange prices during the past ten days has been largely determined by the fluctuations in the Wall Street Stock Exchange of New York. Something like semi-panic conditions prevailed there, as a result of an accumulation of circumstances. Prices fell heavily, but a partial recovery took place, and this assisted the London Stock Exchange, where markets were already showing a harder tone. As soon as the spasm of flatness had passed, an all-round advance occurred, so that on the week the changes are comparatively slight.

Dividends to Come

Among the important dividends due to be declared between now and the end of the year is that of Electric & Musical Industries. The company normally makes a single payment for the year during October; 6 per cent, with a bonus of 2 per cent, has been paid for each of the last three years. A yield of 2½ per cent on the 10s. shares at 32s. indicates the expectation of higher distributions sooner or later. News is expected of a working agreement between E.M.I. and the Broadcast Relay Service Company. E. K. Cole's final dividend is usually declared about the end of the year. The Plessey Co. increased the interim dividend from 10 to 15 per cent in June; the final is due next month. A total of 20 per cent was paid for the last full year. The 5s. shares are quoted at 37s. 6d. Crompton Parkinson and Crabtree Electrical Industries dividend dates are also approaching.

Matters of Moment

Associated Electrical Industries have risen to 68s. 6d. on declaration of an interim dividend of 5 per cent. It is some years since the company paid anything but a single dividend for the full twelve-month, and this interim distribution is taken as encouraging hopefulness of a final of 7½ per cent, to make 12½ per cent for the year. Johnson & Phillips are unaffected by the success of the directors' application for permission to make a new issue of shares. The chairman of Aron Electricity Meter, at the meeting last week, spoke hopefully of the long-term outlook for his company. Fortunately the company obtained an E.P.T. refund of £62,600, which permitted payment of the 10 per cent dividend in spite of a trading loss. The shares remain at 57s. 6d. ex dividend. Metal Industries "B" shares are again lower at 58s. 9d. A new issue is contemplated in order to carry out the company's development policy.

Price Fluctuations

Except for Bournemouth & Poole ordinary, which are 6d. down at 63s. 6d., the Home electricity supply group is better. Rises have made British Light & Power 32s. 6d., Edmundsons 28s., Northmet 41s. 6d., and Yorkshire Electrics 44s. 6d. The Indian shares are lower, Calcutta Electrics being 57s. 6d., and Madras 39s. 3d.

Calcutta Trams remain depressed at 64s. The Cable group suffered in the Wall Street slump; Cable & Wireless ordinary is 2 down at 107, the 5½ per cent preference 1½, at 113½. International "Tel & Tel" at 24 reflected the New York weakness with a fall of 3 points, Marconi Marines dropped to 35s., Oriental Telephones to 55s. 6d. Radio & Television at 9s. have lost 6d. Cinema Television sixpenny "B" shares are 4s., the maiden dividend of 10 per cent causing no change. Pye deferred are rather easier at 36s.

Miscellaneous Movements

British Electric Traction deferred receded to 1110. Southern Railway 5 per cent preferred is 10s. down at 70½. In the equipment and manufacturing lists, General Electric went back to 98s. 9d., British Insulated Callender's, in spite of provincial support, to 46s. 6d. Burco rose a florin to 28s. 3d., on hopes of an increase over the last paid 20 per cent dividend. Falls have lowered British Aluminium to 42s. 9d., Ever Ready to 45s. 6d., at which they begin to look cheap, Ericssons' to 53s. 6d., and Mather & Platt to 52s.

Prices of other shares in this department are mostly easier where changed. De la Rue went back to 12½ before recovering to their previous price of 12½. British Vacuum Cleaner at 28s. 9d., have recovered the loss of last week. In the gilt-edged market, Central Electricity stocks are firmer.

Vactric

Vactric 5s. shares were marked down sharply, upon publication of the trading loss for the year ended last March. Shareholders had been warned last April, when it was decided to pay no ordinary dividend, against 22½ per cent for the previous period; but the actual figure of £122,000 as the trading loss is larger than the market had expected. Following the April dividend decision, the shares had fallen to 15s., but recovered to double that figure on rumours of good current business. In May, deferment of the half-year's preference dividend checked the rise, and the latest announcement has brought the price down to 15s. again. Transfer of production to Scottish factories is evidently responsible for most of the set-back. Two freehold properties have been sold at a profit of £92,000.

Nigerian Company

In the market for overseas electrical shares, the Nigerian Electricity Supply Corporation has attracted attention by virtue of the increase in the final dividend from 5 to 7 per cent. The interim and bonus payments of 3 and 2½ per cent respectively, were at the same rates as before, so that the total of 12½ per cent for the year goes against 10 per cent previously. The price of the £1 shares has lost some of the rise which followed the announcement, and is now 42s. 6d. ex dividend, which gives a yield of £5 17s. 6d. per cent.

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 (1s. each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

AUTOMATIC Electric Laboratories, Inc.—“Frequency changers.” 8618/44. May 6th, 1943. (580112.)

R. A. Blakeborough and C. Brotherton.—“Control system for electrically-operated valves, penstocks, sluice gates and the like.” 8876. May 10th, 1944. (580268.)

British Thomson-Houston Co., Ltd.—“Temperature controlling devices.” 12008/44. June 25th, 1943. (580232.) “Electric discharge devices.” 11004/44. June 8th, 1943. (580276.)

British Thomson-Houston Co., Ltd. (General Electric Co.)—“Gas turbines.” 11766. June 21st, 1944. (580225.)

British Thomson-Houston Co., Ltd., and H. K. Bourne.—“Circuit arrangements for operating electric discharge lamps intermittently.” 32870. December 27th, 1939. (580240.)

British Thomson-Houston Co., Ltd., and D. S. Morfey.—“Driving mechanism for use with sound films and the like.” 10210. May 26th, 1944. (580273.)

British Thomson-Houston Co., Ltd., and G. Tabberer.—“Thermally responsive means for protecting electric motors.” 135. January 2nd, 1945. (580239.)

L. F. Broadway.—“Electron discharge devices employing hollow resonators.” 1190. January 29th, 1941. (580081.)

W. W. Constantine (General Motors Corporation).—“Refrigerating apparatus.” 11693. June 20th, 1944. (580219.)

W. R. Cumming, W. F. Young and Rose Street Foundry & Engineering Co., Ltd.—“Electric timing circuits.” 17480. October 23rd, 1943. (580179.)

J. M. Dodds and Metropolitan-Vickers Electrical Co., Ltd.—“Electrical apparatus immersed in insulation material within hermetically-sealed enclosures.” 2932. February 22nd, 1943. (580089.)

Electrical Apparatus Co., Ltd., J. R. Walton and R. H. Barbour.—“Electro-magnetically operated switches.” 10847. June 6th, 1944. (580150.)

Escher Wyss Maschinenfabriken Akt.-Ges.—“Cut-off or control valve for steam or gas turbines with high working temperatures.” 5423/44. March 26th, 1943. (580259.)

General Electric Co., Ltd., and D. C. Espley.—“Wide band valve amplifiers.” Cognate applications 3045/44, 6563/44 and 6728/44. February 18th, 1944. (580099.)

General Electric Co., Ltd., and H. C. E. Jacoby.—“Electrical follow-up devices.” 6511. May 13th, 1942. (580172.)

General Electric Co., Ltd., W. A. Bourne and R. J. Clayton.—“Wave-meters.” 15039. October 26th, 1942. (580085.)

Igranic Electric Co., Ltd.—“Electro-magnetic circuit controllers.” 12662/44. July 12th, 1943.

(580278.) “Electric switches.” 13131/44. July 8th, 1943. (580279.)

Igranic Electric Co., Ltd., and S. R. Wright.—“Apparatus for effecting circuit control in accordance with the speed of a rotating part.” 11520. June 16th, 1944. (580207.)

Jack & Heintz, Inc.—“Hand-operated, automatically tripped electric switch mechanisms.” 8374/44. February 18th, 1943. (580264.)

Johnson & Phillips, Ltd., and L. Wynne-Owen.—“Welding.” 25464. December 19th, 1944. (580238.)

O. K. Kolb (Electrical Fono-Films Co., Aktieselskab).—“Amplifier circuits for automatic compression and expansion.” 11778. September 15th, 1941. (580169.)

Landis & Gyr Soc. Anon.—“Cascade-connected dynamo - electric machines.” 20821/43. December 11th, 1942. (580183.)

L'É Matériel Electrique S-W.—“Control systems for direct current motors.” 1319/42. December 30th, 1940. (580083.)

Marconi's Wireless Telegraph Co., Ltd., and C. S. Franklin.—“Electronic valve oscillation generators for extra high frequencies.” 3767. March 19th, 1941. (580082.) “Thermionic valves and circuit arrangements therefor.” 3443. March 13th, 1941. (580164.)

M-O Valve Co., Ltd., and G. W. Warren.—“Thermionic valves adapted to operate at very high frequencies.” 16494. November 14th, 1940. (580080.)

Mullard Radio Valve Co., Ltd., and L. D. Smart.—“Oscillographs.” 17886. September 19th, 1944. (580236.)

T. Reay.—“Protective coverings of batteries.” 5572. April 25th, 1942. (580244.)

H. A. Reeves.—“Air-conditioning machines.” 11439. June 15th, 1944. (580187.)

Revo Electric Co., Ltd., A. E. Felton and A. Crawford.—“Fuse boxes.” 11499. June 16th, 1944. (580193.)

R. S. Segsworth and A. R. Low.—“Electric hygrometers.” 10410. May 30th, 1944. (580143.)

Standard Telephones & Cables, Ltd.—“Generators of regularly repeated electric pulses.” 2608/44. February 13th, 1943. (580253.) “Rotatable couplers for transferring radio-frequency currents.” 4869/44. January 23rd, 1943. (580257.)

Standard Telephones & Cables, Ltd., and M. M. Levy.—“Secret transmission systems.” 8643. July 9th, 1941. (580167.)

Sulzer Freres Soc. Anon.—“Furnaces provided with mechanical stokers.” 11489/44. July 3rd, 1943. (580191.) “Gas-turbine plants.” 9446/44. May 18th, 1943. (580271.)

G. Turnock, Ltd., and E. D. Jackson.—“Plug and socket connectors for use in flexible electric current leads.” 11621. June 19th, 1944. (580216.)

A. Tustin and Metropolitan-Vickers Electrical Co., Ltd.—“Vibration damping devices.” 7222. May 6th, 1943. (580176.)

Varley Dry Accumulators, Ltd., and E. W. Sudlow.—“Combined vent and filler devices

for electric storage batteries." 11917. June 22nd, 1944. (580229.)

D. E. Warren.—"Devices or appliances for use in effecting sound purification or clarification." 5761. April 29th, 1944. (580107.)

Westinghouse Brake & Signal Co., Ltd., L. H. Peter and R. M. MacGregor.—"Apparatus for electro-deposition." 3515. February 25th, 1944. (580100.)

M. Zukowski.—"Apparatus for removing

gases in battery-charging installations." 11614. June 19th, 1944. (580214.)

Amended Specifications

529895. Wolsley Motors, Ltd., and another. — "Control means for electro-magnetically operated variable speed gears for motor vehicles."

557675. H. Ziebolz.—"Devices for measuring force electrically."

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.

Atherton.—October 8th. Electricity Department. 11,000-V switchgear. (September 13th.)

Edinburgh.—October 1st. Electricity Department. P.i. cables for twelve months. (September 13th.)

Manchester.—October 8th. Electricity Department. Substations and switchboards. (See this issue.)

Middlesbrough.—October 2nd. Electricity Committee. Street lighting equipment. (See this issue.)

Southampton.—September 25th. Electricity Department. Fourteen electric refrigerators. (September 13th.)

Walsall.—October 2nd. Electricity Supply Department. Electrical stores and materials for twelve months. (September 13th.)

Wolverhampton.—October 8th. West Midlands Joint Electricity Authority. Supply, delivery, erection, testing and setting to work of two 33,000-V, 3-phase, 15-MVA feeder reactors. (September 6th.)

Orders Placed

Bradford.—Transport Committee. Accepted. Twelve trolley-bus chassis (£22,771).—Associated Equipment Co.

North Riding.—County Council. Accepted. Electrical work for a new maternity home, Saltburn (£800).—Watson & Coates. Similar work, Northallerton Maternity Home (£1,199).—Graham Brothers.

Startforth (Yorks).—Rural District Council. Accepted. Electrical installation at the Infectious Diseases Hospital, Hardings Hunderthwaite.—A. Hamilton.

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.

Airdrie.—Houses (305), Townhead; H. Boot (Garden Estates), Ltd., 10, The Boltons, London, S.W.10.

Amblecote.—Permanent houses (46) for U.D.C.; Webb & Gray, architects, 200, High Street, Dudley.

Ashbourne.—Houses (50), Park Road, for U.D.C.; Houfton & Kington, architects, Market Place, Chesterfield.

Ashford (Kent).—Factory, off Godington Road; Ailsa Craig, Ltd., marine engineers, Strand-on-the-Green, Chiswick.

Aspull.—Permanent houses (36), Crawford estate, for U.D.C.; Gornall & Wainwright, architects, 8, Hardshaw Street, St. Helens.

Barrowford.—Houses (30) for U.D.C.; Cross & Lawson, builders, Shaw Street, Colne.

Bedford.—New nurses' home, adjoining St. Andrew's Hospital, London Road, Biggleswade; county architect, Shire Hall.

Bethnal Green.—One five-storey block of flats (50 flats), Sceptre Road; borough engineer and surveyor, Cambridge Heath Road.

Biggleswade.—"Airey" type houses (50), Hitchmead and Stratton Way, for U.D.C.; surveyor, Church Street.

Birkenhead.—Houses (18), Manor Drive, Upton; Consolidated Properties, Ltd.

Blyth.—Factory for Morphy-Richards, Ltd.; J. H. Napper, architect, Eldon Square, Newcastle-on-Tyne.

Boldon.—Houses (50) for the U.D.C.; Nox, Ltd., builders, New Bond Street, London, W.1.

Bradford.—Houses (96), Buttershaw estate (£114,576) by direct labour; city architect. Factory, Parsonage Road; Vitreous Enamelling Industries, Ltd.

Brechin (Angus).—Houses (114) for Town Council; burgh surveyor.

Buckingham.—Permanent houses (53), at Maids Moreton, Padbury, Westbury, Charndon, Edgcott and Steeple-Claydon; Scherrer & Hicks, Council's architects; 310, Upper Regent Street, London, W.1.

Bushey.—Houses (82), and bungalows (18), Coldharbour Farm estate; Ley, Colbeck & Partners, architects, Palmerston House, 51, Bishopsgate, London, E.C.2.

Cardigan.—Houses (38), Greenfield Row site; Howard Williams & Partners, architects, Graystones, Priory Street.

Carmarthen.—Houses (30), St. Clears and Whitland; G. G. Thomas, surveyor, 13, Spilman Street.

Chigwell.—Houses (52), Roding Valley estate; Amalgamated Building Contractors, Ltd., 15, Eaton Row, London, S.W.1.

Consett.—Houses (41) for the U.D.C.; H. Ayton & Sons, builders, Blackhill.

Cowbridge.—Houses (50), adjoining Tylacoch, Llanharry; Edward Loveluck, architect, 12, Dunraven Place, Bridgend.

Epping.—"Airey" type permanent houses (32), Roydon; Tooley & Foster, Midland Bank Chambers.

Eringham.—Houses (32), Holt, Mundesley and Upper Sheringham; G. L. Evatt, surveyor, St. Peter's Road, Sheringham.

Gateshead.—Factory for Fancy and Crepe Paper Mills, Ltd.; W. Hall (Contractors), Ltd., Derwentwater Road.

Glasgow.—Houses (500) for Corporation, Bishopbriggs; city architect.

Great Yarmouth.—Permanent houses (28), Magdalen College estate, Gorleston; H. F. Dyson, borough engineer, Town Hall.

Hartismere.—Houses (68); L. Barefoot, Council's architect, The Thoroughfare, Ipswich.

Hexham.—Houses (82), Cuddy's Lane; J. Sutton & Son (Contractors), Ltd., Tinn Street, Gateshead.

Hove.—Houses (122), Sunninghill estate; borough engineer.

Irthlingborough.—"Orlit" type houses (96) for U.D.C.; W. Willett, Ltd., builders, Sloane Square, London, S.W.1.

Jarrow.—Houses (418), Bilton Hall estate and 1,000 south of Leam Lane; W. H. T. Perkins, borough engineer.

Little Lever (Bolton).—Houses (64), Mytham Road estate; Bradshaw, Gass & Hope, architects, 19, Silverwell Street, Bolton.

Manchester.—Three-storey flats (168), Collyhurst clearance area; P. D. Dingle, town clerk, Town Hall.

Mexborough.—Houses (80), Highwoods estate; B. Bailey, builder, Doncaster Road.

Monmouth.—Permanent houses (50), Wyesham estate; E. Hancock, town clerk, Council Offices.

Newcastle-on-Tyne.—Houses (32) for the city council; Appleby & Co., Ltd., builders, Clayton Street.

Offices, Windsor Crescent, for the British Red Cross Society; Taylor & Turley, architects, 49, Jesmond Road.

Osgoldcross.—Houses (46), Eggborough, Beal and Cridding Stubbs; G. W. Hobman, clerk, Tanshelf House, Pontefract.

Oswestry.—Houses in pairs (110), Shrewsbury Road site (£117,950); E. Gittins & Sons, builders, Johnstown, Wrexham.

Reading.—Houses (61); borough engineer, Town Hall.

Richmond (Surrey).—Houses (24), Lammas Road, Ham; borough engineer, Hotham House, Heron Court.

St. Albans.—Houses (36), Cottonmill Lane; city surveyor, 38, St. Peter's Street.

St. Helens.—Large factory, off East Lancashire Road; Tootal, Broadhurst, Lee & Co., Oxford Street, Manchester, 1.

Scarborough.—Primary and secondary schools for North Riding Education Committee; J. R. White, county architect, County Hall, Northallerton.

Houses (52), Barrowcliff estate; Higgs & Hill, Ltd., builders, Crown Works, South Lambeth Road, London, S.W.8.

Sedgley.—Permanent houses (52), Lower Gornal housing site; K. R. F. Newton, clerk of the Council, Council House.

Smethwick.—Dwellings (80) and twelve maisonettes, Church Road; R. Fletcher, borough engineer and surveyor, Council House.

Standish-with-Langtree.—Permanent houses (54), Avondale-Collingwood Street site (£71,687); W. J. Bickerstaffe & Son, builders, Seven Stars Bridge, Wigan.

Stockport.—Junior and infants' school, Broadstone Hall Road; Cruickshank & Seward, architects, 16, Princess Street, Manchester, 1.

Tipton.—Works canteen; Chas. Lathe & Co., Ltd., Church Lane.

Torquay.—Houses (122), Watcombe estate (£152,136); Staverton Builders, Ltd., Staverton Bridge Mills, Totnes.

Towcester.—Houses (48), Silverstone; Sir John Brown & A. E. Henson, architects, 83, St. Giles Street, Northampton.

Ulverston.—Houses (60), Watery Lane site; Baker & Foster, builders, Upper Brook Street.

Walton-le-dale.—Houses (70), Hennel Lane and Hoghton; surveyor, Station Road, Bamber Bridge.

Willenhall.—Houses (100), Beacon Colliery site; H. Lee Bros., Ltd., builders, Smethwick, Birmingham.

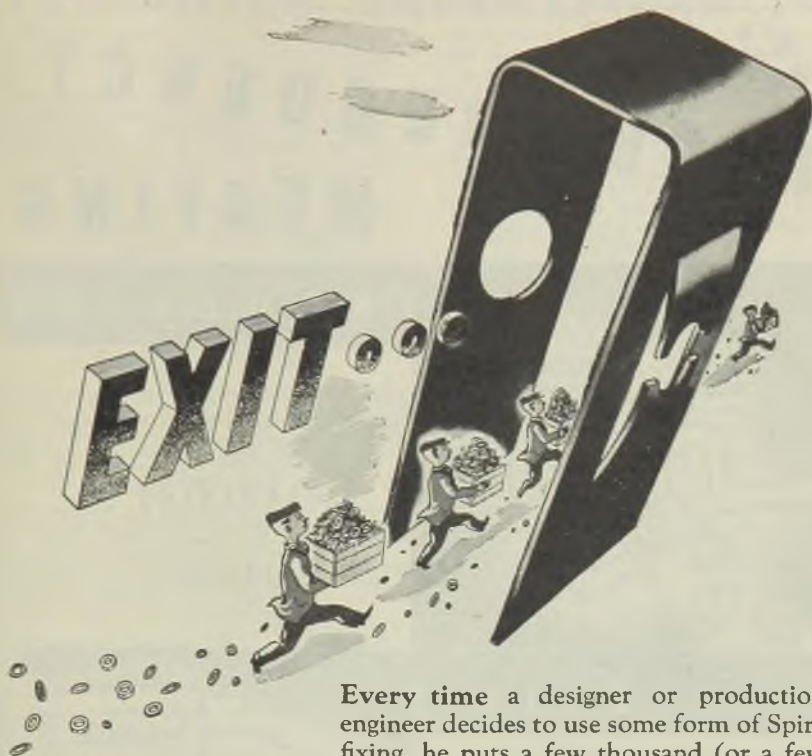
Winsford.—Works extensions; Colin, Stewart, Ltd., Wharton Lodge Works.

Worcestershire.—Police cottages and buildings (28); S. N. Cooke, architect, Sun Buildings, Bennett's Hill, Birmingham, 2.

Large Turbo-Generator High Inlet Temperature

A TURBO-GENERATOR rated at 100,000 kW at 3,600 r.p.m. is being constructed in the United States by the Westinghouse Co. for the Sewaren station of the Public Service Electric & Gas Co. of New Jersey. It will operate at 1,500 lb per sq in. and 1,050 deg F, the highest inlet temperature yet attempted. The tandem compound set with a double-flow low-pressure element will drive a 95,000 kW main generator and a 7,500 kW house generator, the former at 85 per cent and the latter at 80 per cent power factor.

The machine will be about 80 ft long, 18 ft wide and 15 ft high and will require less floor space than an 1,800 r.p.m. set of comparable rating. The root structure of the 23-inch blades must resist a force of greater than 80,000 lb, tending to lift it out of the spindle, while the disc must resist a total pull of all blades of 10 million lb. The steam chest is being fabricated from individual forgings. The main generator will be hydrogen cooled at a gas pressure of 15 lb per sq in. which increases the rating approximately 15 per cent beyond that corresponding to the conventional $\frac{1}{2}$ lb per sq in. gas pressure, or 35 per cent in excess of the capacity in air. The generator will have propeller blowers with blades of an air-foil section and require a relatively small amount of space on the shaft.



THAT'S Fixed THAT!

Type CA 725

Fixing knobs to shafts. Sounds simple but if you're a radio manufacturer you know what a headache it can be. The Spire fixing was designed to solve that particular problem. The CA 725 is made to measure for shafts of various diameters. Then it is snapped into position in the hub of the knob and the knob pushed straight on to the shaft. Don't think of Spire as a 'kind of nut.' It is a great deal more than any nut. It is a simplified and sure method of fixing. Especially awkward fixings!



Every time a designer or production engineer decides to use some form of Spire fixing, he puts a few thousand (or a few million) nuts and washers out of a job. No more fumbling and holding the bits together with one hand while you get to work with the other. Spire fixing can tackle and simplify most light assembly jobs. The best thing is to send us the job — or the drawings. If a Spire fixing will improve the job we'll design it for you and show it to you in a week or two. Then you can judge for yourself.

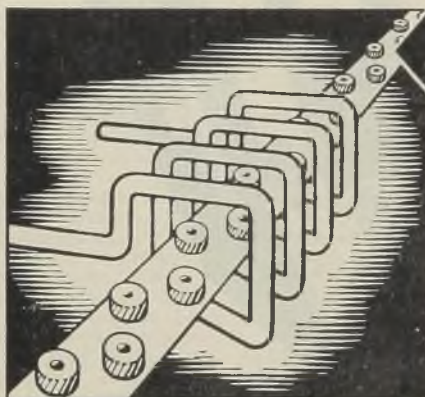
Spire

(Regd)

* A BETTER way of fixing

Simmonds Aerocessories Limited • Great West Road • London • A Company of the Simmonds Group

G.E.C. HIGH FREQUENCY HEATING

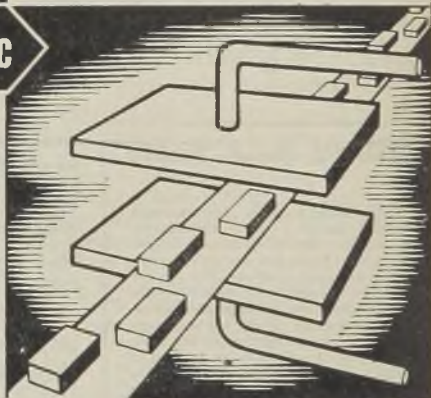


INDUCTION

- BRAZING
- HARDENING
- MELTING

DIELECTRIC

- GLUEING
- PLASTIC HEATING
- DRYING



G.E.C. Engineers are at your disposal to advise on the applications of High Frequency Heating. Generators range from 100 watts to 25 kW output

CLASSIFIED ADVERTISEMENTS

ADVERTISEMENTS for insertion in the following Friday's issue are accepted up to **First Post on Monday**, at Dorset House, Stamford Street, London, S.E.1.

THE CHARGE for advertisements in this section is 2/- per line (approx. 7 words) per insertion; **ONLY OFFICIAL AND GOVERNMENT ANNOUNCEMENTS CAN NOW BE DISPLAYED**—30/- per inch. Where the advertisement includes a Box Number this counts as six words and there is an additional charge of 6d. for postage of replies. **SITUATIONS WANTED**.—Three insertions under this heading can be obtained for the price of two if ordered and prepaid with the first insertion.

Original testimonials should not be sent with applications for employment.

REPLIES TO advertisements published under a Box Number if not to be delivered to any particular firm or individual should be accompanied by instructions to this effect, addressed to the Manager of the ELECTRICAL REVIEW. Letters of applicants in such cases cannot be returned to them. The name of an advertiser using a Box Number will not be disclosed. All 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. Cheques and Postal Orders should be made payable to ELECTRICAL REVIEW LTD. and crossed.

OFFICIAL NOTICES, TENDERS, ETC.

COUNTY BOROUGH OF MIDDLESBROUGH ELECTRICITY COMMITTEE

THE Electricity Committee invite tenders for the supply of Street Lighting Equipment. Contractors desiring to tender must apply in writing to the Borough Electrical Engineer, Corporation Electricity Works, Snowdon Road, Middlesbrough, for a copy of the specification and general conditions and form of tender, and enclose a deposit of £1 ls., which will be refunded on receipt of a bona fide tender.

Tenders, enclosed in a plain sealed envelope not bearing any mark indicating the sender, but endorsed "Tender for Electric Street Lighting Columns and Lanterns," must reach me not later than 5 p.m., 2nd October, 1946.

Any contract or contracts entered into will be subject to the Council's Standing Orders relating to contracts so far as they are applicable. The Corporation do not bind themselves to accept the lowest or any tender.

E. C. PARR.

Municipal Buildings, Middlesbrough. Town Clerk.
13th September, 1946. 2606

CITY OF MANCHESTER ELECTRICITY DEPT.

TENDERS are invited for the supply and delivery only at various substations of Six 420-volt A.C. Substation Switchboards, in accordance with Specification (No. 876). Specification, etc., may be obtained from Mr. E. A. S. Thwaites, Chief Engineer and Manager, Electricity Dept., Town Hall, Manchester, 2, on payment of a fee of one guinea, which amount will be refunded on receipt of a bona fide tender.

Tenders, addressed to the Chairman of the Electricity Committee, to be delivered not later than 10 o'clock a.m. on Tuesday, 8th October, 1946. The Committee does not bind itself to accept the lowest or any tender.

PHILIP B. DINGLE.

Town Hall, Manchester, 2. Town Clerk.
13th September, 1946. 2610

SITUATIONS VACANT

CITY OF PETERBOROUGH CORPORATION

Lady Demonstrator

APPPLICATIONS are invited for the position of Lady Demonstrator in the Electricity Undertaking. Candidates must have had a good general education, hold the R.A.W. diploma or certificate, or other approved qualifications, and have a thorough knowledge of domestic electric appliances; they must be competent to conduct lectures, cookery demonstrations and advise on the selection and use of electrical apparatus.

Salary in accordance with the National Joint Council Scale (£252-£288 per annum), plus cost of living bonus, at present £48 2s. per annum.

The successful candidate will be required to contribute to the Corporation's Superannuation Scheme, and to pass a medical examination.

Applications, giving full particulars of training and experience, and accompanied by copies of recent testimonials, to be sent to the City Electrical Engineer and Manager, Albert Meadow, Peterborough, in a sealed envelope endorsed "Demonstrator," not later than the first post on Wednesday, 2nd October, 1946.

A. J. REEVES.

Town Hall, Peterborough. Town Clerk.
13th September, 1946. 2611

BARNOLDSWICK U.D.C. ELECTRICITY DEPT. (Amended Advertisement)

THE above Council invite applications for the permanent whole-time position of Electrical Engineer and Manager of their distribution scheme (A.C.) from persons not exceeding 50 years of age. The successful applicant must have sound administrative knowledge and experience, be fully conversant with the business side of an undertaking, and be accustomed to controlling workmen. Commencing salary according to the Associated Municipal Electrical Engineers' agreement, i.e., £607 15s. per annum.

Applications, giving full particulars of age, training, qualifications, experience, present position, and any other relevant information, together with copies only of not more than two recent testimonials, must be sent so as to be received by the undersigned not later than 10 a.m. on Saturday, the 28th September, 1946. The successful applicant will be required to pass a medical examination for superannuation purposes. It will be a condition of the appointment that the successful applicant takes up residence within the area. Applicants should be enclosed in envelopes endorsed "Electrical Engineer."

Applicants who have already applied need not apply again providing a communication is received that they wish their applications to stand.

ROBERT W. FENTON.

Town Hall, Barnoldswick. Clerk of the Council.
via Colne, Lancs. 2563

LONDON POWER COMPANY LIMITED

Deptford West Generating Station: Boiler House Shift Charge Engineer

APPPLICATIONS are invited for the above position with salary in accordance with the N.J.B. Agreement, Class L, Grade 8, at present £625 per annum.

Applicants must have had a sound technical training, together with experience in the control and operation of large water tube boilers, combustion plant and ancillary equipment. The successful candidate would be required to pass a medical examination in order to qualify him for the company's pension scheme, for which a deduction of 5% will be made from the gross salary.

Applications, stating age, qualifications, experience and present position, together with copies of any testimonials, should be addressed to the Superintending Engineer, London Power Company Limited, Stowage Wharf, Deptford, London, S.E.8. 2547

BOROUGH POLYTECHNIC, S.E.1

Head of Dept. of Electrical Engineering and Physics

THE Governors invite applications for the above post. Salary, Burnham, Head of Department, Grade 3. The department is large and provides advanced instruction in electrical engineering, radio and telecommunications, in addition to other branches of electrical technology.

Candidates must possess a degree and be not more than 45 years of age, and have had adequate teaching and industrial experience. Special consideration will be given to applicants with an honours degree and also to those possessing research experience and qualifications.

An application form and further particulars may be obtained by applying to the undersigned enclosing a stamped addressed foolscap envelope. Applications must be received not later than Monday, 7th October, 1946.

DOUGLAS H. INGALL, Principal.
2431

SHEFFIELD CORPORATION ELECTRICITY DEPT.

Appointment of Assistant Construction Engineer

APPLICATIONS are invited from Engineers who have had sound practical training, preferably with production works experience in all branches of engineering associated with design and execution of power station extensions. Experience in structural steel, reinforced concrete, general building construction and contract procedure for civil works is required, and applicants should preferably have some knowledge of construction of plant, pipework, cooling plant, hydraulic works and other power station equipment. Applicants should have a degree or equivalent qualification admitting to Corporate Membership of the Institution of Civil or Mechanical Engineers.

The salary will be in accordance with Class M, Grade 8, of the National Joint Board Schedule, present value £635-£650-£664. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and applicants must have previous Local Authority service carrying a transfer value within the meaning of the Act, or otherwise be not more than 40 years of age. The selected applicant will be required to pass a medical examination.

Applications, on forms to be obtained from the undersigned, to be returned not later than October 7th, 1946, with copies of not more than three recent testimonials.

JOHN R. STRUTHERS,
General Manager and Engineer.

9th September, 1946. 2553

COUNTY BOROUGH OF BLACKPOOL
ELECTRICITY DEPARTMENT

Appointment of Lady Demonstrator

APPLICATIONS are invited for the above appointment at a salary of £300 per annum rising by annual increments to £336, inclusive of war bonus. Candidates must have had a good general education and hold a recognised diploma in domestic science and/or the E.A.W. Electrical Housecraft Diploma. They must be competent to take lectures and demonstrations and to advise consumers on the selection and use of electrical appliances of all types. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination. Applications, stating age, qualifications and full details of experience, accompanied by copies of not more than two recent testimonials, should be addressed to the Borough Electrical Engineer, Shannon Street, Blackpool, not later than 7th October, 1946.

TREVOR T. JONES, Town Clerk. 2575

SHEFFIELD CORPORATION ELECTRICITY DEPT.

Contracts Engineer and Clerk of Works (Temporary)

APPLICATIONS are invited for the above appointment from Engineers capable of handling mechanical and electrical plant contracts for the extension of generating stations. Applicants should be between 25 and 40 years of age and should have a University Degree in Engineering or be Corporate Members of the Institution of Mechanical or Electrical Engineers. Applicants should also have had experience or training with a firm engaged in the manufacture of plant.

The salary will be in accordance with Class M, Grade 7, of the National Joint Board Scale, at present £688-£703-£719 per annum. The appointment will be temporary and terminable by a month's notice in writing on either side.

Applications, on forms to be obtained from the undersigned, to be returned not later than October 7th, 1946, with copies of not more than three recent testimonials.

JOHN R. STRUTHERS,
General Manager and Engineer.

9th September, 1946. 2552

BRADFORD EDUCATION COMMITTEE

Technical College, Bradford

APPLICATIONS are invited for appointment as Head of the Department of Electrical Engineering in the College. The scale of salary attached to this appointment will be £900 to £1,000 per annum.

Further particulars of the appointment and forms of application may be obtained from the Director of Education, Town Hall, Bradford, and completed forms should be returned to the Principal of the College within two weeks from the date of publication of this advertisement.

THOS. BOYCE, Director of Education. 2464

COUNTY BOROUGH OF NEWPORT ELECTRICITY
DEPARTMENT

Meter Mechanic

APPLICATIONS are invited for the position of Meter Mechanic in the Newport Corporation Electricity Department's Class A Meter Testing Station. Applicants must have had experience in the repairing and testing of all types of A.C. and D.C. quarterly and prepayment meters, time switches, and maximum demand attachments. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the selected candidate before appointment will be required to pass a medical examination.

Wages and conditions of employment will be in accordance with the Schedule of the South Wales and Monmouthshire Area (No. 4) District Joint Industrial Council (Electricity Supply), the present wages being £5 16s. 6d. per week.

Applications, stating the applicant's age, whether married or single, and giving full details of training, experience and qualifications, together with copies of not more than three recent testimonials, should be addressed to the undersigned, endorsed "Meter Mechanic," and delivered not later than Monday, 7th October, 1946.

T. H. WOOD,
Borough Electrical
Engineer and Manager. 2545
Electric House,
Dock St., Newport, Mon.
10th September, 1946.

COUNTY COUNCIL OF THE STEWARTRY OF
KIRKCUDBRIGHT ELECTRICITY DEPT.

Appointment of Clerk of Works

APPLICATIONS are invited for the above post from persons who are suitably qualified and who are 26 years of age or over. The person appointed will be required to supervise all work in connection with the erection of overhead 11-kV wood pole lines, the erection of substations, and the laying of H.T. and L.T. cables, which is to be carried out under contract. Previous field experience is essential, and a knowledge of surveying will be an added qualification.

The salary is in accordance with Grade 8b, Class D, of the National Joint Board Schedule (£340-£354), and a car allowance will be provided. The appointment is subject to the Local Government Superannuation (Scotland) Act, 1937, and the selected candidate will be required to pass a medical examination.

Applications, giving full details of previous experience, etc., and accompanied by not more than three testimonials, must reach the undersigned not later than October 7, 1946.

ROBT. C. MONTEATH,
County Offices, County Clerk.
Kirkcudbright. 2581

COUNTY BOROUGH OF BURY

Appointment of Electrical Engineer and Manager
(Amended Advertisement)

APPLICATIONS are invited for the appointment of Electrical Engineer and Manager at a salary in accordance with the Agreement made by the National Joint Committee of Local Authorities and Chief Electrical Engineers, dated the 9th July, 1941, on the present unit assessment of the undertaking this will be £1,208 14s. rising by two annual increments to £1,422 per annum.

Candidates should be Corporate Members of the Institution of Electrical Engineers or possess equivalent technical qualifications, and preferably have had recent experience in the administration and management of an electricity supply undertaking and experience of a selected station operating under the Electricity (Supply) Act, 1926.

Forms of application and conditions of appointment will be forwarded on request. Applications must be delivered to me not later than Saturday, 28th September, 1946.

EDWARD S. SMITH,
Municipal Offices, Town Clerk.
Bank Street, Bury.
5th September, 1946. 2489

COUNTY BOROUGH OF WALLASEY

Meter Tester and Repairer

APPLICATIONS are invited by the 28th September, 1946, for the above at the D.J.I.C. rate of 27.61d. per hour; 47-hour week. Particulars may be obtained from the Borough Electrical Engineer, Wallasey Road, Wallasey, on receipt of a stamped addressed envelope.

EMRYS EVANS, Town Clerk. 2584
Town Hall, Wallasey.

BOROUGH OF BARKING ELECTRICITY DEPT.

APPPLICATIONS are invited for the following positions:

(1) **ASSISTANT INSTALLATION AND METER SUPERINTENDENT.** Salary in accordance with N.J.B. Schedule, Class F, Grade 7, commencing at £503 per annum. Candidates should have passed the Associate Membership Examination of the Institution of Electrical Engineers, or its equivalent, and have had sound experience in the preparation of wiring schemes, competitive estimating and supervision of the installation of lighting, heating and power systems and the calibration and maintenance of all types of A.C. and D.C. meters and instruments.

(2) **SHOWROOM MANAGER.** Salary £380-£425, plus a cost of living bonus at present £59 16s. Candidates should have had a sound education, experience in electricity showrooms, and should be familiar with tariffs and the operation of hire and hire purchase schemes.

The appointments are subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidates will be required to pass a medical examination.

Applications must be submitted in the appropriate form, which may be obtained from the undersigned, and should be returned, together with three recent testimonials, by Thursday, the 3rd October, 1946, suitably endorsed. Canvassing, either directly or indirectly, will be deemed a disqualification.

E. R. FARR,

Town Clerk.

Town Hall, Barking, Essex.

9th September, 1946.

2601

BOROUGH OF EALING

Appointment of Technical Assistant

APPPLICATIONS are invited for the above appointment from persons with sound engineering training and practical experience in the transformation, transmission and distribution of electricity. Preference will be given to applicants with recognised technical qualifications, e.g., a degree of a British University.

Salary and conditions of service will be in accordance with the Agreement relating to Salaries and Conditions of Employment of the National Joint Board, Class F, Grade 5, at present £50 13s. per annum.

The successful candidate will be required to pass a medical examination and the appointment will be subject to the Local Government Superannuation Act, 1937. Canvassing will be a disqualification and applicants should disclose whether to their knowledge they are related to any members or chief officers of the Local Authority.

Applications, giving age, technical training, qualifications, etc., together with copies of three recent testimonials, should be addressed to the undersigned so as to be received not later than first post on Wednesday, October 9th, 1946.

RONALD BIRT,

Borough Electrical
Engineer and Manager.Electricity House,
Ealing, W.5.

12th September, 1946.

2590

CITY OF MANCHESTER ELECTRICITY DEPT.

APPPLICATIONS are invited for the position of Mechanical Maintenance Engineer, at a salary in accordance with Class J, Grade 7 (commencing £563 p.a.) of the N.J.B. Schedule.

The candidate appointed will be required to take charge of mechanical maintenance in a selected power station, must be capable of controlling and supervising the repair workshop, and have had experience of machine shop practice and the maintenance of large turbo-alternators and their auxiliaries, together with cranes and conveyor equipment. Applicants should be Graduates of the Institution of Mechanical Engineers, and below the age of 45. The appointment will be subject to the City Council Superannuation Scheme, and the successful candidate will be required to pass a medical examination.

Applications, stating age and full particulars of technical training and experience, together with copies of recent testimonials, must be endorsed "Mechanical Maintenance Engineer," and addressed to the Chairman of the Electricity Committee, Town Hall, Manchester, 2, not later than 10 a.m. on Monday, 7th October, 1946. Canvassing, directly or indirectly, will disqualify.

PHILIP B. DINGLE,

Town Clerk.

Town Hall, Manchester, 2,
September, 1946.

2615

ARMATURE Winder or good Improver required, used to all types of motors. Knowledge of dismantling and assembly of motors a good advantage. Apply to Messrs. Charles H. Harwood & Co. Ltd., 32, Meyrick Road, Willenden, N.W.10.

114

BIRKENHEAD CORPORATION ELECTRICITY SUPPLY

E. H. T. Plumber-Joiners

APPPLICATIONS are invited for a number of vacant positions of Plumber-Joiner from Plumber-Joiners experienced on cables up to 11 kV. Conditions of service and rate of pay will be in accordance with the D.J.I.C. Schedule (No. 3 Area), at present 28.45d. per hour.

Applications, stating age, training and experience, together with copies of two testimonials, should be addressed to the Borough Electrical Engineer, Craven Street, Birkenhead, not later than 3rd October, 1946.

E. W. TAME,

Town Clerk.

Town Hall, Birkenhead.

9th September, 1946.

2626

A London Company of Electrical Wholesalers with offices in the W.1. district, have a vacancy for an Assistant Sales Manager. Applicants should be young and energetic with sales and organisational experience, acquainted with all types of domestic appliances and accessories, and who desire a position with scope for early advancement. Five-day week. Write, giving full particulars to—Box 2617, c/o The Electrical Review.

A position offering good prospects for a Components Designer is vacant with electrical component manufacturers. Should have degree in physics or equivalent and be familiar with radio and other electrical circuits. Knowledge of batch production methods desirable. State salary with application to—Box 2580, c/o The Electrical Review.

A M.I.E.E. or equivalent required, with industrial experience, to prepare layouts, specifications, etc., for electrical work in connection with existing large modern factory. Up-to-date knowledge of power distribution, switchgear and lighting essential. Excellent prospects for man of ability. State age, experience and salary required to—Box 2573, c/o The Electrical Review.

APPPOINTMENT of Development Engineer. Established firm of electrical and mechanical engineers operating several large repair works request applications from suitably qualified persons for the above appointment. Experience must include handling and repair of heavy, slow and high speed machines, A.C., D.C. and medium sized transformers. Knowledge and use of modern insulating materials, winding methods, modifications involving phase, voltage and speed changes, horded windings, etc., is essential. Applicants with initiative and drive, from 30-35 years of age, are invited to submit career details with full information on present appointment and salary. The person appointed will be given full control of the works and area concerned during the manager's absence. This post offers scope for near future promotion.—Box 2500, c/o The Electrical Review.

ARMATURE Winders, A.C. and D.C., wanted for good class repair shop, special terms to good men with initiative, East Yorkshire.—Box 2351, c/o The Electrical Review.

ARMATURE Winders for rewinding and repair of all types of A.C. Motors, fractional h.p. to 150 h.p. Knowledge of voltage change and conversion work an advantage but not essential. Modern factory, good conditions, canteen, etc. Apply—Labour Officer, Courtauds Ltd., Clayton-le-Moors, Accrington. 2392

ARMATURE Winders and Improvers urgently required. Top rates and good conditions.—Box 113, c/o The Electrical Review.

ASSSEMBLY Shop Superintendent required for production of electricity meters and mechanisms. Applicant must have had a comprehensive experience in instrument and meter manufacture, be acquainted with modern methods of production, capable of tactfully controlling and training raw male and female labour to full efficiency in the assembly operations. Only applicants with the above qualifications, strict disciplinarian, and good time keeper will be considered for this sound position by a well established company in South London. Please state age, experience and salary required.—Box 2520, c/o The Electrical Review.

ASSISTANT Electrical Engineer for planning and development of new installations in iron and steel works. Age 28/35, with sound technical qualifications and good practical engineering and maintenance experience, preferably gained in iron and steel works.—Box 2457, c/o The Electrical Review.

ASSISTANT to mechanical engineer required to develop light machines. Must be experienced in the design of small mechanisms and preferably in production of small electrical components. Young graduate in mechanical engineering would be considered. Salary approx. £400 p.a.—Box 2614, c/o The Electrical Review.

ASSISTANT Buyer required, accustomed to purchasing for light engineering industry, radio and domestic appliances. London S.E. area. State qualifications, age and salary required.—Box 2588, c/o The Electrical Review.

ASSISTANT Foreman for winding department. A.C., D.C. Motors, fractional to 500 h.p. Permanent progressive position to suitable applicant.—Higgs Motors, Witton, Birmingham. 100

AUTOMOBILE Dynamo and Starter Armature Winder, able to undertake fr. h.p. motor rewinds. Fully experienced and able to take charge of any established department. Permanency and good prospects. Write, stating age, experience and salary required, to—Box 2463, c/o The Electrical Review.

BUYER, experienced, required by electrical contractors in Midlands. Good connections with suppliers essential. Capable of stock and store control. Full details of experience, salary, etc., to—Box 9609, c/o The Electrical Review.

BUYER required for electrical equipment manufacturers. Must be fully experienced, progressive and capable of fully controlling department and produce results. Knowledge of general engineering products an advantage. Only first-class men with good connections need apply, with the fullest details of experience, salary required, etc.—Box 2477, c/o The Electrical Review.

CHIEF Storekeeper required, London area. Applicants should have had good storekeeping experience in an engineering stores (preferably electrical), should be capable of using initiative and must have had experience in supervising stores personnel. Please state, in confidence, age, experience and salary desired.—Box 2416, c/o The Electrical Review.

CLERICAL Assistant required for stores office. Must have good knowledge of electrical material.—London Electrical Co., 92, Blackfriars Road, S.E.1. 104

CONTRACTS Manager required by cable manufacturing company in the North. Applicants must have first-class experience of the installation of all types of underground cables and overhead transmission lines and be able to prepare and submit complete tenders. Permanent position. Applications, which will be treated in strict confidence, should state age, experience and salary expected.—Box 2578, c/o The Electrical Review.

DESIGNER for A.C. and D.C. motors and generators. Works and designing experience with D.C. machines up to 100 h.p. essential. Salary according to qualifications and experience. Manchester area.—Box 2438, c/o The Electrical Review.

DESIGNER-Draughtsman for supervisory position for developing lift control gear. Only fully experienced men need apply. Permanent position with good salary and prospects for the right man. Northern district. State age, experience and salary required.—Box 2602, c/o The Electrical Review.

DESIGNER-Engineer required, capable of laying out designs and manufacturing fractional h.p. motors. State experience and salary. Box 2544, c/o The Electrical Review.

DOMESTIC appliance manufacturers require Commission Representatives for the areas of Kent, Surrey, Sussex and Hampshire. Full particulars to—Box 2565, c/o The Electrical Review.

DRAUGHTSMAN having first-class experience on direct current motors up to 50 h.p. Give details of experience, salary expected and when available to—Personnel Manager (Birmingham Area), Box 2577, c/o The Electrical Review.

DRAUGHTSMEN. R. E. Pullin & Co. Ltd., Phoenix Works, Great West Road, Brentford, have vacancies for the following personnel: (a) Senior Draughtsman, thoroughly experienced in f.h.p. motor development and production design, to take charge of and be responsible for output, limiting and accuracy of small section, under development engineer; (b) Designer-Draughtsman, thoroughly experienced in small electro-mechanical and instrument work. Only versatile men able to work under verbal instruction and capable of taking full responsibility for their work need apply. Applications should be in writing, and contain full details of educational and commercial experience. Good salary and prospects are offered to the right men. 2574

DRAUGHTSMEN required by engineering firm N.W. London area. Applicants must have previous experience in design and development of light electro-mechanical equipment from schematic sketches of specifications and must be able to prepare detailed drawings. Previous experience in tele-communications equipment or small electro-mechanical components an advantage and a knowledge of their electrical application desirable. Write, giving full particulars of past experience, age and salary required.—Box 2496, c/o The Electrical Review.

DRAUGHTSMAN required for power transformer work.

Apply in writing, stating age and experience, to South Wales Switchgear Ltd., Treforest, Glam. 2515

DRAUGHTSMAN (Junior) required on switchgear development. Apply, giving full particulars of training, experience and salary required, to—Long & Crawford Ltd., Manchester, 12. 2583

DRAUGHTSMEN, preferably with telecommunication experience, required by large firm in the Midlands. Write giving details of experience, age and salary required.—Box 11, c/o The Electrical Review.

ELECTRICAL Lamps. Foreman for sealing-in and pumping section required.—Box 9604, c/o The Electrical Review.

ELECTRICAL Accessory Designer required by company with excellent programme and resources. Must be capable of basic design on electrical lighting fittings, electrical appliances, and accessories. Reply, stating previous experience, salary required, and include testimonials.—Box 2619, c/o The Electrical Review.

ELECTRICAL Contractors with nation-wide organisation invite applications for position of Departmental Manager for lighting and power installations with knowledge of estimating and experience in handling labour. Full details to—Box 2620, c/o The Electrical Review.

ELECTRICAL Draughtsman required (Wolverhampton district) used to designing and laying out factory installation. Good mechanical and electrical knowledge and exp. necessary.—Box 2595, c/o The Electrical Review.

ELECTRICAL Engineer for the Trafford Park district, experienced in dealing with contracts, also technical and commercial correspondence relating to all classes of A.C. and D.C. rotating machinery and appropriate ancillary equipment. Write giving full details of experience, age and salary required.—Box 2460, c/o The Electrical Review.

ELECTRICAL Engineer required to assist in technical and administrative work in a test room engaged in the production and finishing of instruments of precision. Applicants must have had previous experience in testing all types of accurate moving coil instruments. Degree man preferred. Factory situated in Home Counties. Progressive post for the right man. State age, experience and salary required.—Box 2545, c/o The Electrical Review.

ELECTRICAL Engineer required to manage department about to produce rotary switches. Must be able to deal with technical correspondence and preparation of circuit diagrams and arrangement of specials and conversant with modern production routine.—Box 2569, c/o The Electrical Review.

ELECTRICAL Switchgear Engineers to serve as Circuit Designers on diagram section. To prepare diagrams, supervise and check draughting of detail diagrams. Senior men with 3 years' recent experience of metalclad outdoor and automatic substation switchgear diagram work, and holding the Higher National Certificate or equivalent qualifications.—Ferguson, Pailin Ltd., Higher Openshaw, Manchester, 11. 2488

ELECTRICIANS for installation and maintenance work. Used to screwed conduit work and contactor control gear of all types as used on machine tools. Modern factory, good conditions, canteen, etc. Apply—Labour Officer, Courtaulds Ltd., Clayton-le-Moors, Accrington. 2393

ENGINEERING and Laboratory Assistants required in engineering dept. of light engineering firm in North London area. Applicants should have the Higher National Certificate in mechanical or electrical engineering and should state salary and experience in full.—Box 2437, c/o The Electrical Review.

ENGINEERS and Draughtsmen are invited to apply to a large electrical engineering firm in the Midlands which has vacancies in the switchgear department for Technical Sales, Contract, Costing and Design Engineers; also experienced Technical Engineers capable of handling large projects for generation, transmission and distribution. Vacancies also exist for Draughtsmen for circuit diagram and general work.—Box 69, c/o The Electrical Review.

ESTIMATOR required, fully accustomed to preparing quotations for all types of power transformers up to 1,000 kVA. Permanent progressive position. Apply—London Transformer Products Ltd., Cobbold Estate, Cobbold Road, Willesden, N.W.10. 2555

EXPERIENCED Instrument Maker. Only competent person, used to indicating electrical instruments, need apply. Progressive position and good wages paid to right man. Apply personally or by letter to—Runkbaken Electrical Products, 71, Oxford Road, Manchester, 1. 2560

EXPERIENCED Storekeeper for electrical switchgear manufacturers, Liverpool district. Competent to take complete charge and maintain records, permanent position. State age, previous experience and salary.—Box 2558, c/o The Electrical Review.

ESTIMATING Electrical Engineer with experience in preparing quotations for A.C. and D.C. motors, generators and appropriate control gear, etc. and conversant with current B.S. specifications, required for an old-established works in Trafford Park. Write giving full details of experience, age and salary required.—Box 2461, c/o The Electrical Review.

FERGUSON, Pailin Ltd., Higher Openshaw, Manchester, 11, require experienced Inside Senior Switchgear Sales Engineers able to handle enquiries and orders for power station and substation switchgear. 2546

FIRM in London area require several Senior Draughtsmen for their transformer dept. Experience on large high-voltage units an advantage but not essential. Very good salary and excellent prospects to suitable men. State age and experience.—Box 2352, c/o The Electrical Review.

FIRM of electrical contractors in Scotland requires a Manager. Must be qualified electrical engineer with commercial experience and organising ability. Capable of taking full charge. Excellent opportunity to man of initiative. State full particulars of experience, salary required, and give references.—Box 9526, c/o The Electrical Review.

FOREMAN required for Winding Shop. Should be experienced in quantity production of A.C. motors up to 75 h.p. Must be familiar with all types of A.C. windings and able to determine coil former sizes. Good prospects with expanding firm for man capable of controlling and training mixed labour. Apply—Hopkinson Motors & Electric Co. Ltd., 119/125, Carlton Vale, N.W. 6. 2621

INDEPENDENT electric lamp manufacturers need Technician capable of starting the manufacture of fluorescent tubes from scratch. Applications should state experience and salary required.—Box 9603, c/o The Electrical Review.

INSTRUMENT Makers required N.W. London area. Applicants must have considerable previous experience in model making for development of electro-mechanical apparatus and must be capable of working to sketches and instructions in addition to fully detailed drawings. Write, giving full particulars of past experience, age and salary required.—Box 2495, c/o The Electrical Review.

INTELLIGENT Girl or Boy required for electrical showrooms (London).—Box 2384, c/o The Electrical Review.

LABORATORY Assistant for experimental and development work in connection with watt-hour meters and instruments of a like nature. Salary £350 per annum. Write stating age and experience.—Box 2594, c/o The Electrical Review.

LARGE firm in London area has vacancy in its research and development department for an Engineer, to carry out design and experimental work on loudspeakers and pick-ups.—Box 2625, c/o The Electrical Review.

LARGE light electrical engineering concern (West Middlesex) requires an Electro-mechanical Engineer for design work on high-speed miniature generators. Degree standard required with appropriate design experience, preference given to an engineer familiar with either vibration or communication engineering problems. Write, giving full details and stating salary required, to—Box 2568, c/o The Electrical Review.

MAINS Foreman with experience of 11 kV and L.T. overhead lines and domestic equipment required to take charge of rural district under resident engineer. Wage £6 4s. 6d. inclusive of war bonus. Applications, giving age and experience, should be sent to the—Resident Engineer & Manager, The Wigtonshire Electricity Co. Ltd., 76, George Street, Stranraer. 2608

MANAGER or Managers of good appearance and personality required for high-class electrical and radio retail and art goods business, 30 miles from London. Must be thoroughly capable and able to take full control. Write with particulars, stating age, experience and salary required.—Box 115, c/o The Electrical Review.

PRODUCTION Engineer required by electrical component manufacturers to supervise and improve existing production processes and introduce new methods. Experience in coil winding, paint spraying and dipping, stoving and allied processes essential. Applicants must possess a theoretical knowledge of electricity and mechanics to at least Higher National Certificate standard. Apply, stating age, experience and salary required, to—Box 2579, c/o The Electrical Review.

PRODUCTION Manager required by electrical and general engineering firm in Lancashire manufacturing domestic appliances. Must be qualified technically and practically in modern production methods and processes, be thoroughly experienced in all stages of production, capable of operating factory at highest efficiency on mass production lines. Good salary and prospects offered. Full details of experience, posts held and work done, together with remuneration required, to—Box 2567, c/o The Electrical Review.

POWER Station Electrical Maintenance Engineers required for modern power station in the Middle East. Candidates should have served a full apprenticeship with a reputed company of electrical engineers and had subsequent experience in the maintenance of power station electrical equipment, particularly metal-clad switchgear for high voltages. Higher or Ordinary National Certificate in Electrical Engineering, Age 30/35. Attractive salary in sterling, plus allowances in local currency. Free furnished bachelor accommodation, free medical attention and passages. Kit allowance and provident fund benefits. Apply, stating age, qualifications and experience, to—Dept. F.17, Box 2591, c/o The Electrical Review.

PROGRESSIVE electrical manufacturers require services of skilled and experienced Designer-Draughtsman to work in close conjunction with research department on the development of electrical domestic appliances of all types. Excellent salary and full support given to right man.—Box 2561, c/o The Electrical Review.

PUBLICITY Assistant required, age about 30, for engineering company in North-West for preparation of catalogues and other technical literature, press articles, and editing of works magazine. Writing ability essential, technical background preferred. Age, qualifications and salary required to—Box 2502, c/o The Electrical Review.

QUALIFIED Electrical Engineer possessing a comprehensive knowledge of electrical installation work in all types of buildings, including factories, hospitals, schools, cinemas, etc., and fully conversant with the recognised wiring systems and all relevant regulations governing this type of work. Must possess knowledge of building construction and be capable of reading architects' and engineers' drawings. Able to prepare complete electrical specifications and illumination schemes. Previous experience in a consulting engineer's office or with a leading wiring contractor an advantage. Write, stating age, experience and salary required, to—Box 2835, c/o White's Ltd., 72, Fleet Street, E.C.4. 2435

QUALIFIED Electrical Engineer possessing good personality and initiative. Capable of giving advice in the designing of electrical installations in buildings and fully conversant with all recognised wiring systems and the I.E.E. wiring regulations. Knowledge of building construction an advantage. Write, stating age, experience and salary required, to—Box 2832, c/o White's Ltd., 72, Fleet Street, E.C.4. 2434

REQUIRED by large oil company for duty in Middle East. Electrical Foreman with extensive practical experience in the erection, operation and maintenance of medium sized Diesel-driven power plants and distribution systems and switchgear up to 3,300 volts, and possessing fundamental theoretical knowledge. Age 30-34, preferably single as no provision can be made for married accommodation. Salary £500 per annum, free quarters/messing and certain other allowances. Write, quoting reference PL-C/7 (2) to—Box 1324, c/o Charles Barker & Sons Ltd., 31, Budge Row, London, E.C.4. 2613

REQUIRED for a mining property in Burma, a qualified Assistant Electrical Engineer with general mechanical knowledge. Good salary for a suitable applicant. Write, stating age and experience.—Box 1052, Walter Skinner Ltd., 20, Cophall Avenue, London, E.C.2. 2554

SALES Manager required for controlling sales in the home and export markets by firm in the London area manufacturing domestic electrical appliances. Applicants must be of high standing and have good connections and be capable of handling large turnover. Applicants must be of good appearance and be able to control representatives. Age between 30 and 35. Good salary with excellent prospects. Write, stating full particulars to—Box 2451, c/o The Electrical Review.

SPEEDY & Eynon Ltd. offer an attractive proposition to a first-class Representative with electrical experience and with own car, to obtain contracts for all types of electrical installations in Brighton, Bournemouth and South Coast areas. Liberal commission will be paid, and the representative appointed will receive the maximum technical and commercial support from a highly efficient organisation. Applications, giving full details of experience, etc., should be addressed to—Speedy & Eynon Ltd., 163a, Strand, W.C.2. 9605

SUPERVISING Electrical Engineer with experience in preparation of specifications and estimates for industrial electrical installations. Write in first instance, giving full details of qualifications, training and experience, to—Manager, Installation Dept., Electricity House Ltd., Bramhope, Leeds. 2557

SKILLED Armature Winder required for India. £45 per month plus ten per cent. share of Bombay concern's profit. Fare paid out and home after four-year period. Must be single man with full tradesman apprenticeship.—Box 2524, c/o The Electrical Review.

SWITCHGEAR Engineer for estimating, preparation of tenders and handling contracts. Experienced man required, Manchester district.—Box 2364, c/o The Electrical Review.

TRANSFORMER manufacturers in N. Midlands require the services of an expert Transformer Designer up to 40 kV.A. Commercial experience and wide knowledge of applications and markets for all types of transformers and chokes also desired. Ability to introduce profitable business an advantage. Salary and bonus worth £1,000 per year, with further prospects. Full particulars in first instance will be treated with strictest confidence.—Box 2550, c/o The Electrical Review.

WE have a few vacancies for Testers with electricity meter polyphase testing experience. Applications should be made to—The Labour Manager, Landis & Gyr, Victoria Road, North Acton. 2603

WELL-known Electrical Engineering Company have vacancies for suitable lads, over 16 years of age, with matriculation or general school certificate, for apprenticeship in the above industry. Good rates of pay and living accommodation provided.—Box 101, c/o The Electrical Review.

WORKING Charge Hand for switchgear assembly, S.W. London. State experience, age, wages required.—Box 2525, c/o The Electrical Review.

WORKS Manager required for light electrical engineering factory in South London area. Should be qualified engineer able to take complete control of factory. Experience in improving production methods, institution and control of progress, planning and rate-fixing systems, etc., essential. Experience in electric motor production and ancillary apparatus, although not essential, would be an advantage. Reply stating age, qualifications, experience and salary required.—Box 2572, c/o The Electrical Review.

YOUNG, intelligent Lady Clerk, age 16-18, required by progressive company in S.W.1 district. Knowledge of typing preferred but not essential.—Box 2570, c/o The Electrical Review.

YOUNG Sales Engineer required by London manufacturers of electrical control gear. Full details of experience and salary required to—Box 2400, c/o The Electrical Review.

APPOINTMENTS FILLED

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.

SITUATIONS WANTED

A Capable Engineer (36), with managerial and administrative experience, seeks responsible position London area. Fully conversant all machine tools, planning and progress, time study, rate fixing. Salary approx. £750.—Box 9538, c/o The Electrical Review.

A good allround Electrician, power and lighting installations, or maintenance A.C. and D.C. Sound knowledge of refrigeration service work.—H. M. Harrison, 120, Abbeville Rd., Clapham, S.W.4. Phone, Macaulay 1645. 9584

A young man (25), at present Section Engineer on production of light Diesels in large Midlands factory, desires change of position. Would accept reasonable salary to gain executive experience.—Box 9525, c/o The Electrical Review.

ABLE, active and versatile Electrical Engineer (42). Sound technical knowledge and wide practical experience, wishes to negotiate for responsible permanency with established concern, central or N. London or S. Midlands. Salary £850/£950 subject to superannuation adjustment. Installations, maintenance, sales, correspondence, technical literature, drawing. Well versed constructional and general engineering. Willing to travel when necessary. Car available.—Box 2422, c/o The Electrical Review.

ADVERTISER is desirous of contacting an Electrical Engineering firm, preferably London area with view of obtaining position as Works Manager or equivalent responsibility, have held similar position for several years. Well educated, mechanically and electrically, conversant with modern method, office routine and machine tools for precision work, energetic and strict disciplinarian.—Box 9534, c/o The Electrical Review.

AM.I.E.E. (36), with 20 years' manufacturing and development experience, chief draughtsman, dynamo, electric machinery, etc., desires advancement, London or Home Counties preferred.—Box 9521, c/o The Electrical Review.

AM.I.E.E., 40, Asst. Works Engineer, 6 years, 500 personnel, chief electrician 3 years, requires post in sales field or works engineering. Any locality.—Box 9551, c/o The Electrical Review.

BUYER desires change. Experienced all branches elec. and genl. engineering, especially radio and high' ng.—Box 9536, c/o The Electrical Review.

CAPABLE Electrician, civilian and R.A.F. experience, desires progressive situation, home or overseas.—Box 9627, c/o The Electrical Review.

CHIEF Designer-Draughtsman desires position London, 17 years' experience on research and production design of radio equipment and measuring instruments, domestic appliances, light mechanisms, etc.—Box 9608, c/o The Electrical Review.

CONTRACTORS. Qualified Manager, N.R.E.I.C., seeks opening, 25 yrs., exp., London and provinces. Any proposition considered.—Box 9561, c/o The Electrical Review.

DESIGNER Draughtsman, A.M.I.Mech.E., Grad. I.E.E., seeks post leading to position as electrical engineer.—Box 9550, c/o The Electrical Review.

ELECTRIC Cable Manufacturers. Managing Director would accept similar responsible position overseas where ability organise and plan factory and commercial development would have full progressive scope with lucrative prospects. Communicate advertiser—Box 2433, c/o The Electrical Review.

ELECTRIC Wire and Cable Manufacturers. Managing Director of wide technical manufacturing and commercial experience in the industry prepared accept similar position offering development scope and good prospects. Confidential approach to advertiser through—Box 2432, c/o The Electrical Review.

ELECTRICAL Engineer, A.M.I.E.E., aged 34, released R.A.F. Class A, desires senior appointment with scope and first-class opportunities to attain managerial position. 15 years' experience electrical and mechanical plant inspection, maintenance, repair and installation work. Has ideas for planned maintenance of plant. Considerable technical and business ability. Highest references.—Box 9619, c/o The Electrical Review.

ELECTRICAL Engineer, A.M.I.E.E., aged 34, released R.A.F. Class A, desires appointment (preferably with consulting engineers). 15 years' experience electrical plant inspection and maintenance. Qualified to advise on maintenance planning and efficient plant operation, including compliance with regulations. Considerable technical and business ability and able to prepare reports and schemes. Must be position with scope for increased responsibility with resulting remuneration. Box 9620, c/o The Electrical Review.

ELECTRICAL Engineer, age 40, seeking change of position, requires post in supervisory capacity where wide experience in installation and maintenance could be used to advantage.—Box 9614, c/o The Electrical Review.

ELECTRICAL Engineer (21) seeks experience, progressive post. Higher and Ordinary National Certificates. Served apprenticeship.—Box 9616, c/o The Electrical Review.

ELECTRICAL Engineer, 39 years of age, seeks change. First-class qualifications, factory maintenance, installations; highest references.—Box 2566, c/o The Electrical Review.

ELECTRICAL Engineer (41), active and versatile, with practical, technical and commercial experience motors, control gear, transformers and instruments, seeks position with scope in commerce or industry, at home or abroad.—Box 9622, c/o The Electrical Review.

ELECTRICIAN, competent all systems, anywhere, disengaged.—24, Rusham Road, S.W.12. 9515

ELECTRO Plater and Polisher seeks responsible post. Age 42, extensive experience Sheffield trade shops as foreman from gold to chrome and hard chrome. Residing Middlesex.—Box 9562, c/o The Electrical Review.

ENGINEER, Electrical, Mechanical, seeks change. Wide experience stations, layouts, distribution, motor applications, light, heat, drawing office, public works, etc.—Box 9535, c/o The Electrical Review.

ENGINEER, graduate (32), with works apprenticeship, 8 years' design experience control gear and electro-mechanical devices, seeks responsible design position, London area.—Box 9537, c/o The Electrical Review.

EX-R.E.M.E. officer (26). Grad. I.E.E., Higher National Diploma Electrical Power Engineering, seeks progressive appointment in electrical industry. Experience in manufacture and testing of generators, motors and power transformers, also maintenance and repair of many types radar and communications equipment; responsible workshop and staff appointments held. Box 9613 c/o The Electrical Review.

GRAD. I.E.E. (23), indentured apprenticeship. Higher and ordinary N.C., desires progressive position, home or abroad.—Box 9617, c/o The Electrical Review.

INSSTALLATION, Supervision, Technical Sales or similar post wanted by qualified Designer. Industrial electronic and audio frequency experience.—Box 9517, c/o The Electrical Review.

ISTRUMENT Maker, 20 yrs. experience, experimental, maintenance, repair, electrical testing, seeks situation, London area. Other districts if housing accommodation can be provided. —Box 9555, c/o The Electrical Review.

MAN with 30 years' experience London wholesale trade, dealing with orders and assisting buying, would be glad to hear from interested houses in London and Home Counties area. —Box 9556, c/o The Electrical Review.

PRODUCTION Control Engineer, electrical apparatus, instruments, etc., wide technical knowledge, experienced design, proved ability locating and rectifying faults, age 41, keen, adaptable, South London. —Box 9577, c/o The Electrical Review.

RADIO, Telephone and Instruments Production and Methods Engineer, A.M.I.P.E., age 36. Keen administrator and disciplinarian. Quality productions only. Experienced all factory methods and processes. —Box 9581, c/o The Electrical Review.

REPRESENTATIVE, part or full-time, 25 years' construction builders, architects, the electrical trade, supply companies in the London and Home Counties area. —Box 9581, c/o The Electrical Review.

SUPERVISING Installations Engineer desires change, London area or South America. Supervision of installations, contracting, estimating, inquiries, planning. Age 35. At present holding executive position. Efficient organiser and administrator. —Box 9573, c/o The Electrical Review.

SUPERVISING and Estimating Engineer, 22 years' experience, used to control of labour, drawings, etc., requires position with London firm. Further particulars—Box 9580, c/o The Electrical Review.

SUPERVISOR, age 36, twenty-two years' experience of the industry, installation and maintenance, also used to drawing, planning and office routine, seeks post London, Home Counties or South. —Box 9580, c/o The Electrical Review.

TECHNICIAN (22), Grad.I.E.E., 5 yrs. manuf. and development high and low pressure fluorescent lamps and equipment, seeks further experience electron tubes. —Box 9592, c/o The Electrical Review.

YOUNG Engineer, 28, desires change, experienced manufacture, testing, repair and development of fractional h.p. motors. Studying I.E.E.—Box 9615, c/o The Electrical Review.

AUCTION NOTICES

G. R.

By direction of the Ministry of Supply.

FULLER, HORSEY, SONS & CASSELL

are instructed to offer for Sale by Auction in lots at Woolwich Arsenal, London, S.E. on Tuesday, October 22nd, and day following:

GENERAL INDUSTRIAL EQUIPMENT AND SURPLUS STORES

including: 105 Electric Exhaust Fans, 650 Grindstones, 75 Hand Trucks, 2,300 Pigeon Baskets, 120 Vices, 90 Anvils and Swage Blocks, 1,750 Trays, 40 Engine-driven Foam Generators, 250 Grease Guns, 30 tons Bolts and Nuts, 100 Engines, 250 Electric Motors, 700 Pumps, 350 Pressure Gauges, 650 Sledge Hammers, 600 Mattocks, 2,100 Wire Cutters, 4,500 Lamps, 1,000 Sheave Blocks, 500 Drawing Boards, 4,000 Leather Straps, 2 tons Emery Cloth, Physical and Chemical Laboratory Equipment, and a wide range of other Stores and Equipment.

Catalogues (6d. each) may be had when ready from Fuller, Horsey, Sons & Cassell, Industrial Auctioneers, 10, Billiter Sq., E.C.3 (Telephone No. ROYal 4861). 2589

FOR SALE

Traders buying and selling hereunder must observe the Restriction of Resale Order, S. R. & O. 1942 No. 958.

THE Admiralty offer for sale, by tender, the following Electrical Equipment:—

- 15 Sets of Motor Large Spares. Each set comprises one Armature and Field Coil.
- 226 Sets of Motor Small Spares. Each set comprises one Line of Brush-holders and six Brush Springs.
- 231 Sets of Motor Starter Spares. Each set comprises Operating Coil, Overload Coil, Springs, Contacts and Resistances (various).

The spares (lying at a contractor's works in Glasgow) are suitable for 220-volt, 8-h.p. motors and starters by Metropolitan Vickers Electrical Co. Ltd. and Allen West Ltd. respectively. Permission to view, tender forms and conditions of sale may be obtained on application in writing to the Admiralty Regional Electrical Engineer, Admiralty Office, 13/15, Crown Terrace, Glasgow, W.2. The latest date for the receipt of tenders will be 5th Oct., 1946. 2590

ACCRRINGTON CORPORATION ELECTRICAL ENGINEERING DEPARTMENT

SIXVEN panels "Edison" Unit Type draw out Switch-gear suitable for three-phase, 400 volts, four-wire supply, each panel being fitted with an oil circuit breaker, capacity 146 amps, having three overloads, time lags, ammeter and cable sealing box.—Borough Electrical Engineer & Manager, Corporation Electricity Works, Off Hyndburn Road, Accrington. 2596

A. Cooksley & Co. Ltd. offer large selection of used Electric Motors, A.C. and D.C. Write—21/25, Tabernacle Street, London, E.C.2 (Monarch 3357/58). 46

A limited number of sturdy 4-h.p. Electric Motors mounted on stout frame and supplied with driving pulley, can be supplied either 12-volt or mains A.C., 1,700/2,000 revs. Ideal for driving small tools, pumps, etc. Size 6½" high, 6½" wide, 11¼" long, weight 35 lbs. £4 carriage paid, purchasers' risk.—Ward, Anchor Cottage, Shepperton, Middlesex. 9600

A quantity of nearly new Storage Cells by Young, 350-amp-hour capacity at 10-hour rate, heavy duty, only a few weeks old, fully charged. Further quantity of new Cells, 100-amp-hr. cap. Full details from—G.P.U. Ltd., Wembley. 2599

A.C. and D.C. House Service Meters, all sizes, quarterly and prepayment, reconditioned, guaranteed one year. Repairs and recalibrations.—The Victoria Electrical Co., 47, Battersea High Street, S.W.11. Tel. Battersea 0780. 19

A.C. and D.C. Motors, all sizes, large stocks, fully guaranteed.—Milo Engineering Works, Milo Road, East Dulwich, S.E.22 (Forest Hill 2278-9). 102

A.C./D.C. 5-valve Superheterodyne Sensitive 3-wave Band Receiver. Excellent tone. Attractive modern cabinets in "Plasteel" or polished wood, £16 16s. Usual trade terms and facilities. Early delivery. Trade only.—Morgan, Osborne & Co. Ltd., Southview Road, Warringham, Surrey. 110

A.C. Motors for 400/440-volt, 3-phase, 50-cycle supply. One 100-h.p., 580-rev. G.E.C., slip-ring. Eight 30-h.p., 720-rev. Met.-Vick., slip-ring. One 60-h.p., 480-rev. Westinghouse, slip-ring. Two 35-h.p., 580-rev. Crompton, slip-ring. One 14-h.p., 960-rev. Wright, squirrel cage.—Newman Industries Limited, Yate, Bristol. 2622

A.C. Motors, 1/75th h.p. to 5 h.p., all voltages. Also D.C.—The Johnson Engineering Co., 319, Kennington Road, London, S.E.11. Telephones, Reliance 1412/3. 57

ALTERNATOR, 200 kVA, 250 r.p.m., 400/3/50, for coupling.—The Electroplant Co., Wembley. 2588

APPROXIMATELY 600 230-v., 1/2C-h.p. A.C., single-phase Electric Motors, r.p.m. approx. 2,000; 5½" long, 6" wide, 4½" high. Ex Government stock, sturdily made, all reconditioned and resprayed. Price, car. paid, £3 10s. each.—J. Ward, Anchor Cottage, Shepperton, Middx. 9599

APPROXIMATELY 2,000 220-volt D.C. Cabin Type Fans, 12" and 8" dia. In one lot or small lots.—Box 2528, c/o The Electrical Review.

ATTRACTIVE Weekly Offers from The Electroplant Co., Wembley, Middx.: (a) 750-kW Belliss-Morcrom Siemens Steam Generating Set, 440 v., 3-ph., 50 per cent. triple expansion, 185 lb. steam superheat, 250 r.p.m., complete with surface condenser and all auxiliaries; (b) 300-kW Belliss-Morcrom Phoenix Steam Generating Set, 500 v., 3-ph., 50 per cent. triple expansion, 160/220 lb. steam, 300 r.p.m., complete with surface condenser and all auxiliaries, 400 kW at 440 v.; (c) 350-kW Mirrlees-Westinghouse Diesel Generating Set, 415 v., 3-ph., 50 per cent. air blast injection, 4 cyl., 200 r.p.m., cold start, complete with all accessories, switchboard and gantry. 2600

AUDAX Ltd. now have available an extensive range of new season's designs of high-class Lamp Shades in Plastics and Parchment, together with a range of Table Lamps. Prompt delivery available to all parts of the country. Enquiries particularly invited from wholesalers and electrical factors.—84, Preston Road, Brighton (Tel. Preston 5565). 9583

B & W. Water Tube Boilers for disposal. Two 50,000 lbs. per hour, 310 lbs. W.P., together with economisers, etc., erected or F.O.E.—Burford, Taylor & Co. Ltd., Middleborough. 85

BEANTEE Pestoon Striplight Holders, made of X20 Bakelite, for use with 7/029 T.T.R. cable, require no tools or screws for wiring. Immediate delivery of any quantity. Passed by the fire authorities. Used by corporations and supply companies all over the world. Large quantities of British made Electric Lamps and Cable always in stock.—The Beantee Illuminations (London) Ltd., Temporary Address, 6, Upper Street, Islington, London, N.1 (Phone, Canonbury 4555). 71

BELT Grinders or Sanders, 4" wide belt, £6; 6" wide belt, £14 15s.—John E. R. Steel, Clyde Mills, Bingley. Phone 1066. 52

BATTERY Chargers for home and export, 4 models, 2.6-12 v., 1, 2 or 4 amp., D.C., any mains voltage. Generous trade terms. Write for catalogue.—The Banner Electric Co. Ltd., Hoddesdon, Herts. Tel.: Hoddesdon 2659. 97

B.T.A. A comprehensive service is now available for all classes of tools and equipment for the accumulator trade.—B.T.A., 246, Cavendish Road, London, S.W.12. Tel.: Balham 6691/2. 92

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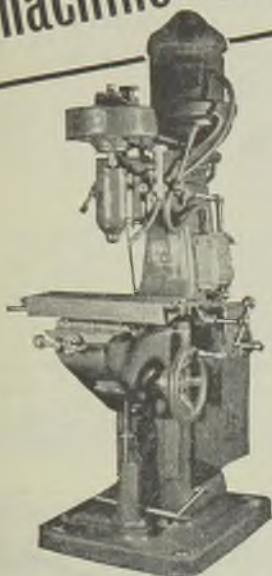
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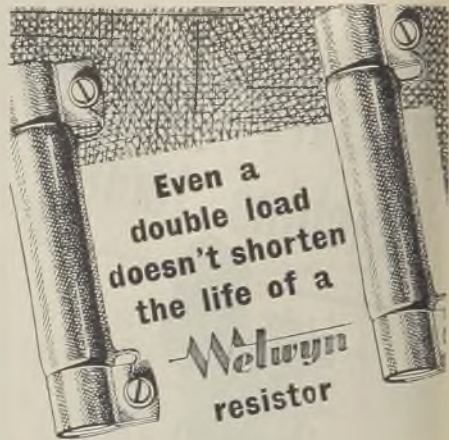
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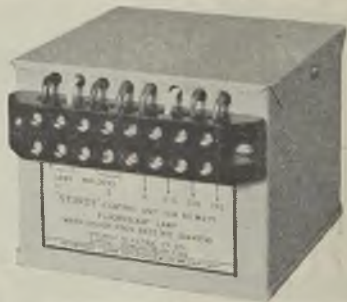
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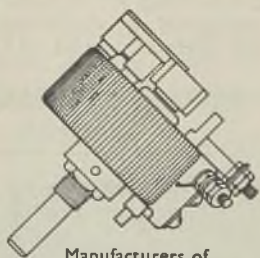
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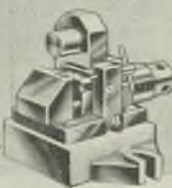
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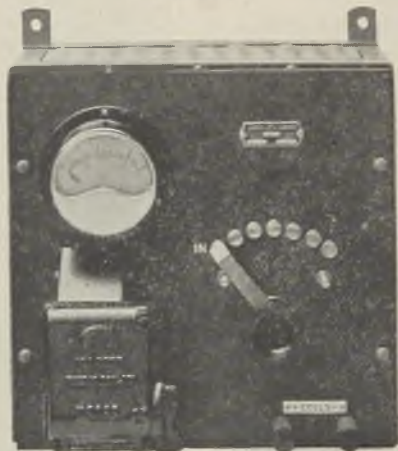
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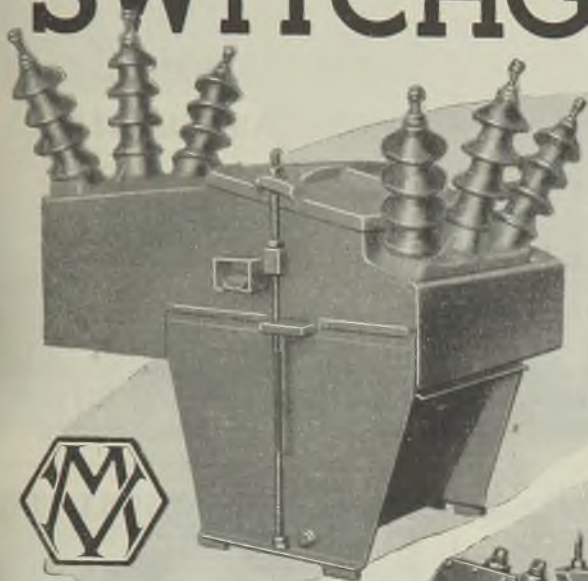
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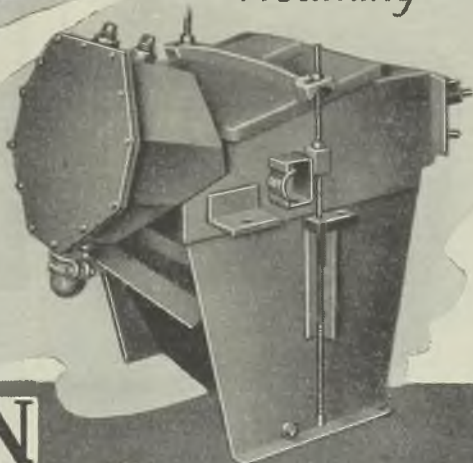
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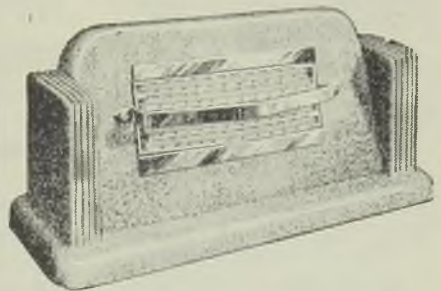


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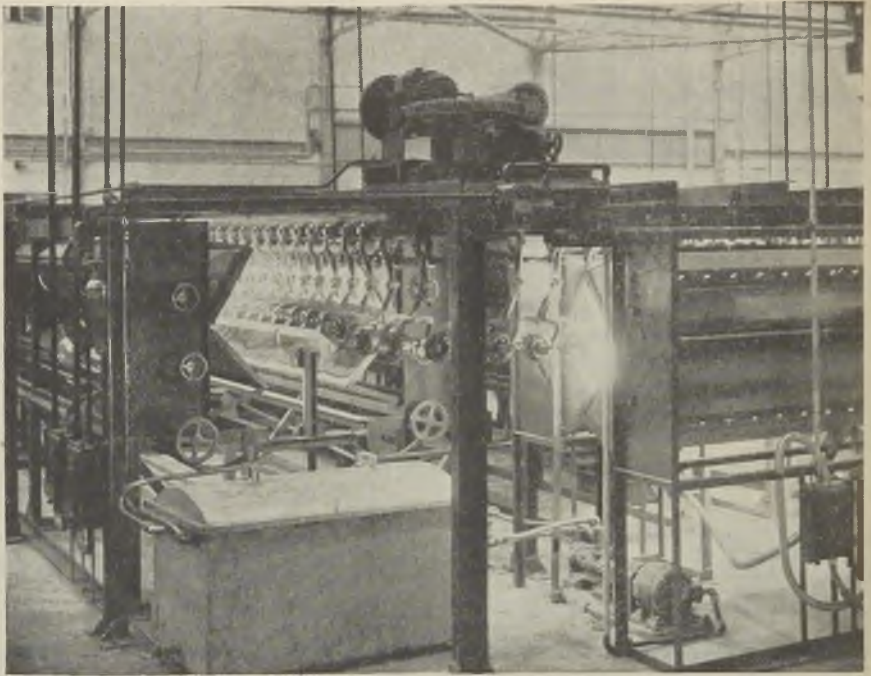
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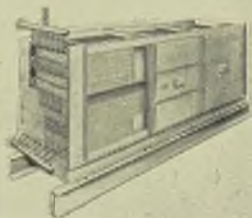
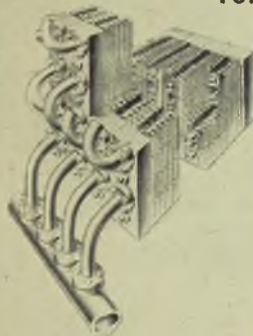


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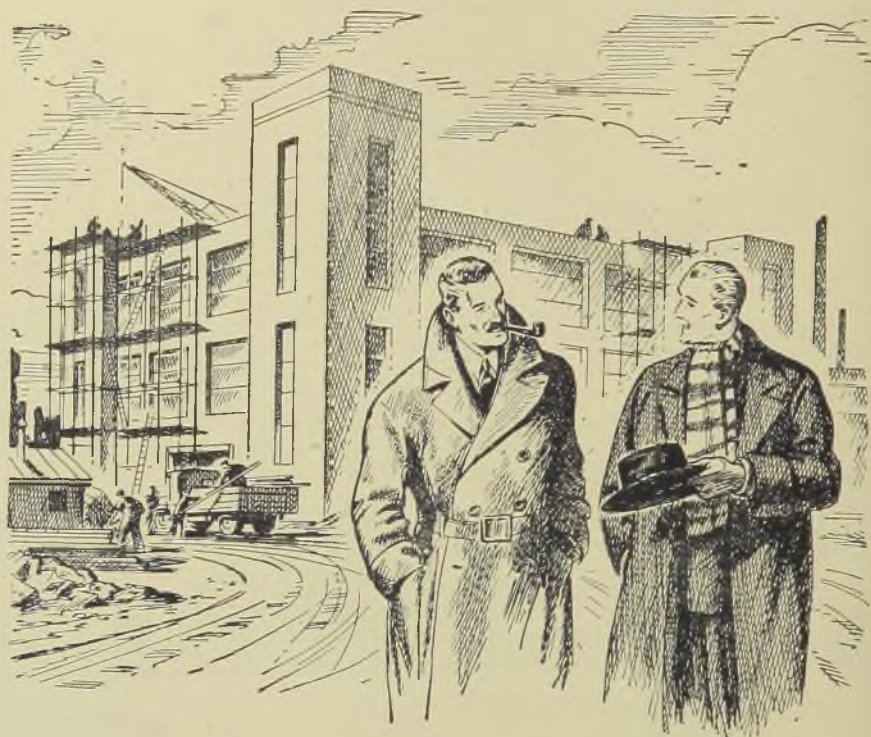


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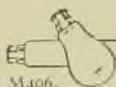
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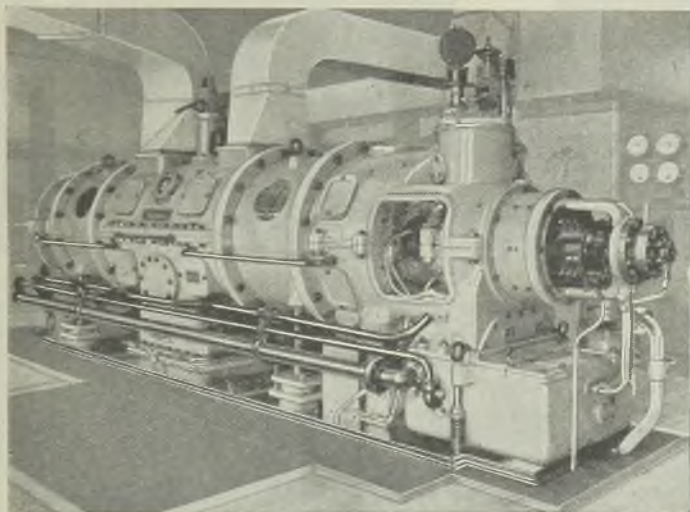


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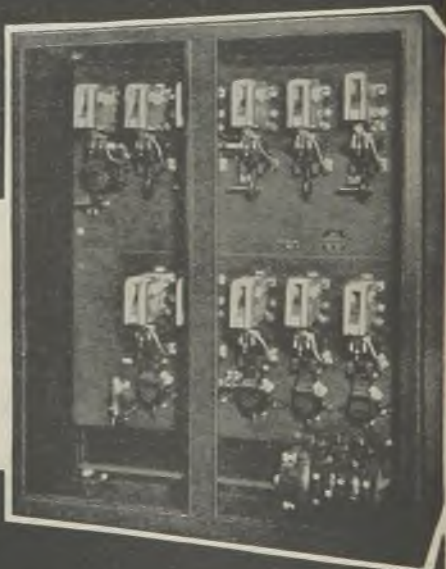
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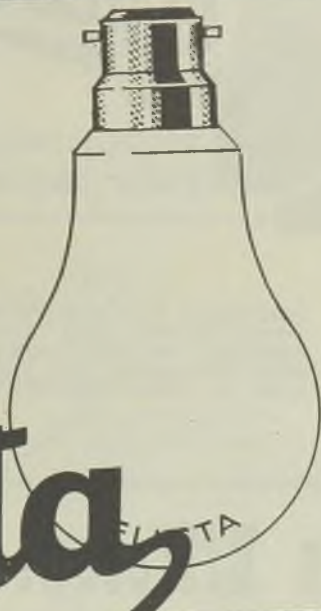
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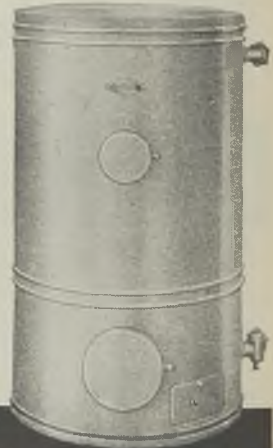


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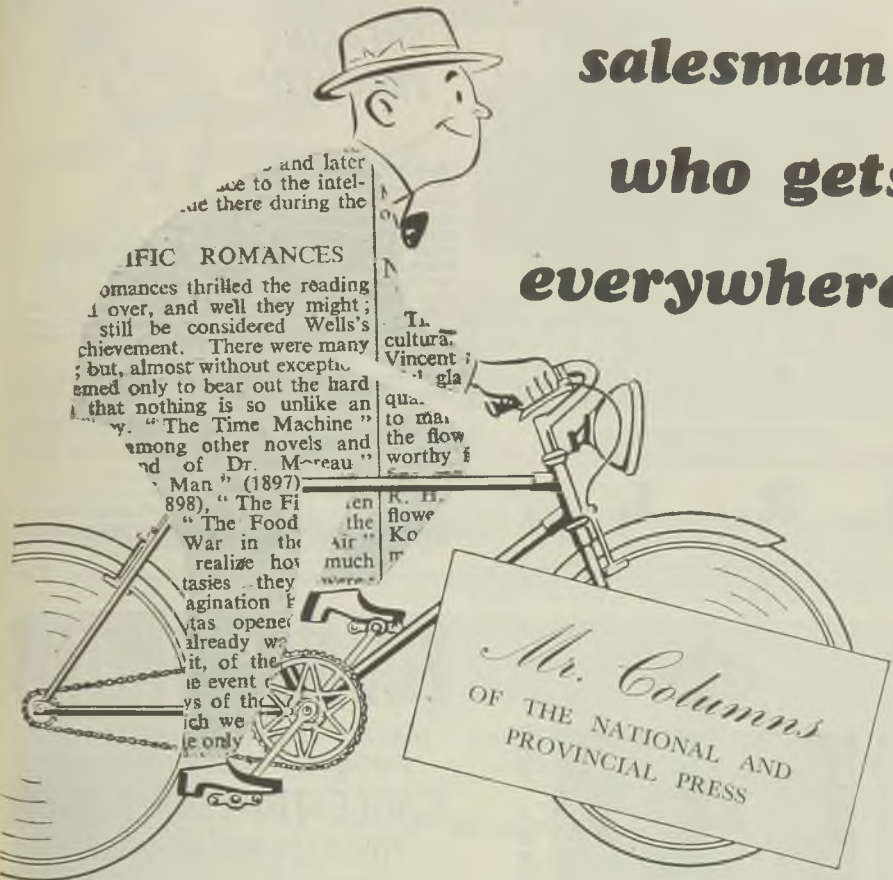
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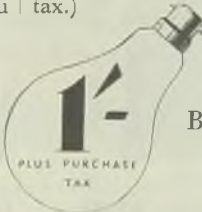
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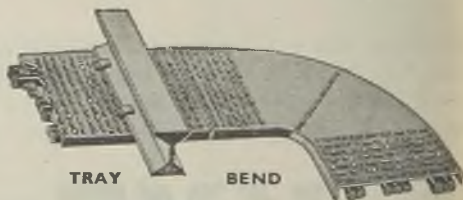
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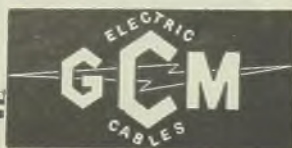


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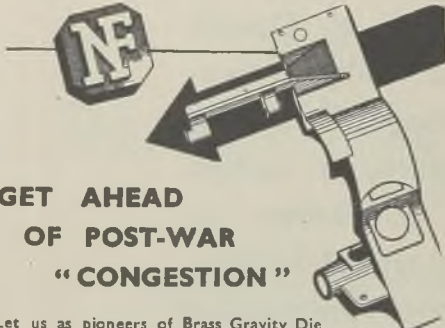
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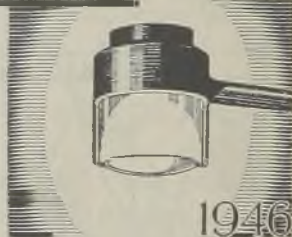
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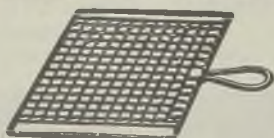
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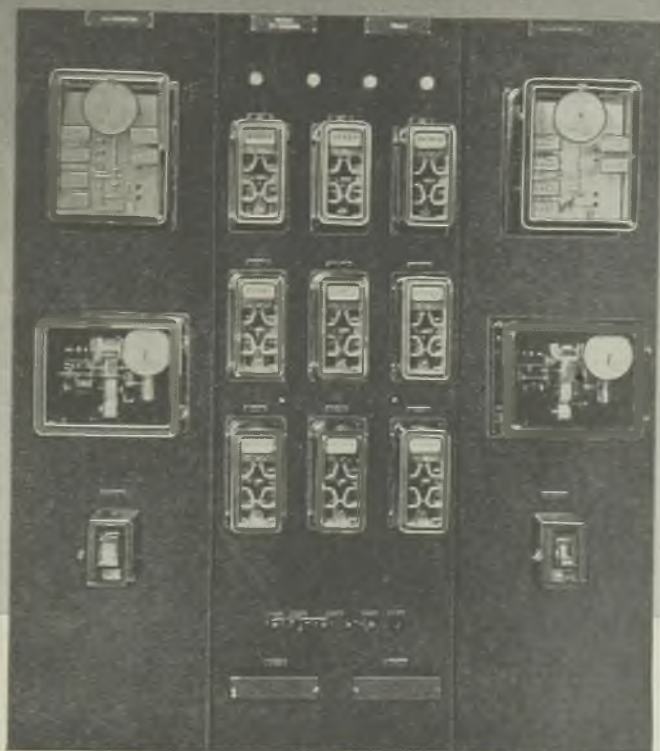


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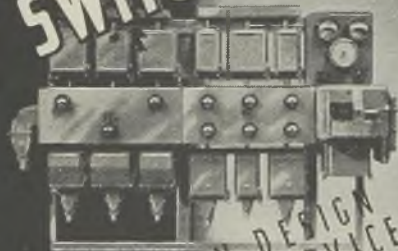
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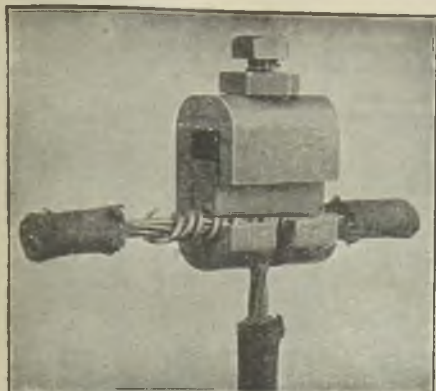
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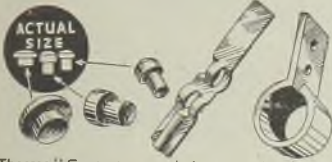
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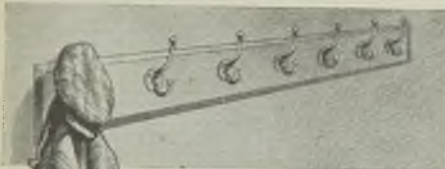


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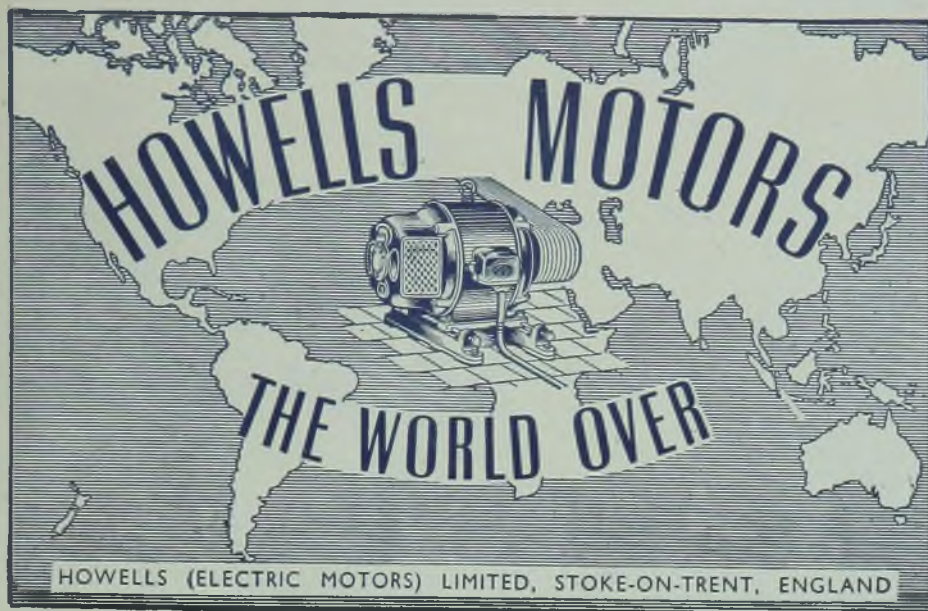
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