

# ELECTRICAL REVIEW

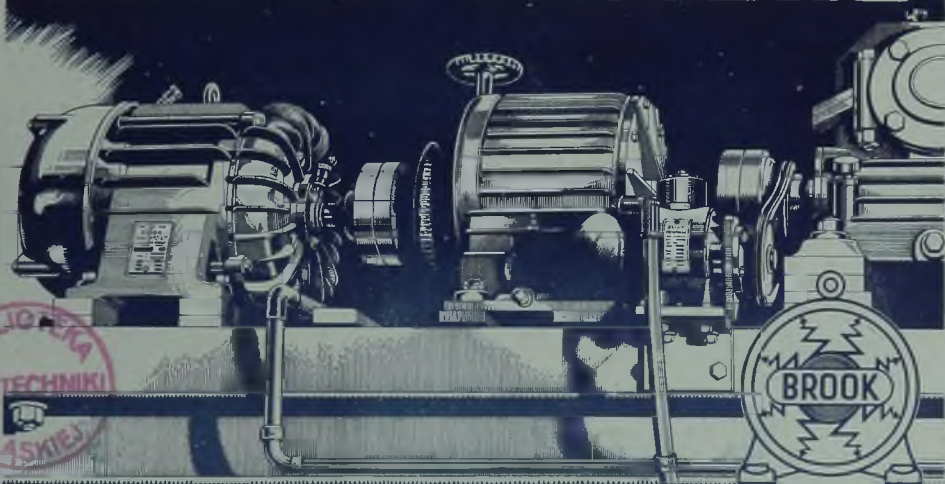
FOUNDED  
1872

Vol. CXXXVII. No. 3536

AUGUST 31, 1945

9d. WEEKLY

## POWER FOR VICTORY BROOK MOTORS



EMPRESS WORKS • HUDDERSFIELD

THE  
**BABCOCK & WILCOX**  
**ORGANISATION** *includes*

**A PROJECT DEPARTMENT**

WHICH ENSURES THAT THE MOST EFFICIENT  
PLANT OF THE RIGHT TYPE IS OFFERED.

**A RESEARCH DEPARTMENT**

WHICH BLAZES THE TRAIL FOR ADVANCE IN  
DESIGN AND SOLVES PROBLEMS OF CON-  
STRUCTION AND OPERATION.

**A CONTRACT  
ENGINEERING DEPARTMENT**

WHICH DEVELOPS THE PROJECT TO THE  
STAGE OF DETAILED DRAWINGS AND ORDERS  
FOR MANUFACTURE.

**EXTENSIVE WORKS**

FULLY EQUIPPED TO MANUFACTURE COM-  
PLETE STEAM RAISING PLANT.

**AN ERECTING DEPARTMENT**

WITH WORLD WIDE FACILITIES.

**A SERVICE DEPARTMENT**

WHICH PUTS THE PLANT INTO OPERATION,  
CARRIES OUT THE REQUIRED TESTS AND  
ENSURES SATISFACTORY PERFORMANCE.

**A SALES DEPARTMENT**

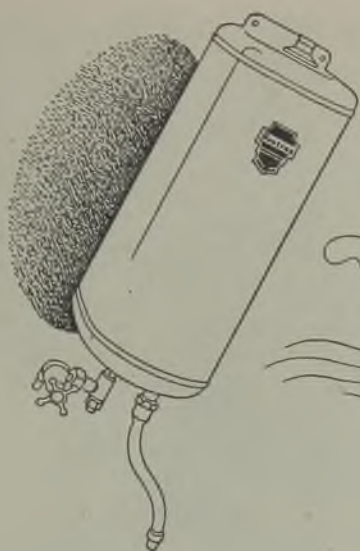
WITH BRANCHES IN ALL THE PRINCIPAL  
CITIES AT HOME AND ABROAD, TO PUT THESE  
FACILITIES AT THE DISPOSAL OF OUR CLIENTS  
AND TO GIVE :—

**BABCOCK SERVICE BACKED BY 75 YEARS EXPERIENCE  
OF STEAM ENGINEERING.**



**BABCOCK & WILCOX LTD.**

HEAD OFFICE: BABCOCK HOUSE, FARRINGTON STREET, LONDON, E.C.4



*heatrae takes the plunge...*



We have realised for a considerable time the need for eliminating the bugbear of re-tinning furred-up Water Heaters.

The use of Monel is the answer, for this metal needs no tinning. That's why we are concentrating on ALL-MONEL construction, as increasing supplies of this metal become available.

**HEATRAE**

*leaders in electric water heaters*

HEATRAE LTD., NORWICH

PHONE : NORWICH 25131

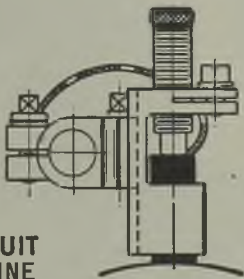
GRAMS : HEATRAE, NORWICH

## "WESTMINSTER"

**Brush  
Holders**

**100,000  
SUPPLIED**

**MADE TO SUIT  
ANY MACHINE**



Dynamos and Motors Rewound and Re-constructed. "Partridge" Pressure Detectors, "Partridge" Earthing Devices, Switchgear, Photographic Arc Lamps, Electric Welders, Medical Arc Lamps

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Telephone:  
Elgar 7372 (2 lines)

Telegrams:  
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## THE "FACILE" TERMINAL



Send for Prices  
and List of all  
kinds of  
Terminals

**ROSS COURTNEY & CO. LTD.**  
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## SADDLE PILLARS



to the specific  
requirements of  
our customers

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



**MCL and REPETITION LTD.**  
Pool Lane, Langley, Birmingham.



## Motor operated valves

The pre-eminence of the Blakeborough motor operated sluice valve is well reflected in our list of installations—always impressive, but increased to a remarkable extent during the past few years. An analysis covering a recent twelve months period shows that of the total number of sluice valves above 24 inch supplied (itself a record) almost 70% were motor operated—a significant pointer to the trend of modern development. Whilst the electrically operated type generally predominates, compressed air, steam, water, or petrol motor versions are also supplied. As an example we illustrate an installation of four 60 inch sluice valves, with provision for both electric and air motor operation—the latter a standby in case of failure of the power supply to the former.



**BLAKEBOROUGH** VALVES & FITTINGS

**J. BLAKEBOROUGH & SONS LTD . BRIGHOUSE .**

# SIEMENS TELECOMMUNICATION EQUIPMENT

*for service in all parts of the world*

PRIVATE  
TELEPHONE SYSTEMS

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TELEPHONE EXCHANGES

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CARRIER - CURRENT  
EQUIPMENT

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TELEPHONE INSTRUMENTS  
OF ALL TYPES

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CARRIER - CURRENT  
CABLES

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LOADING COILS

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CELLS & BATTERIES  
Dry, Fluid & Inert

\* Contractors for the supply and installation of complete Automatic and Manual Telephone Exchanges for Public and Private Service, Automatic and Manual Trunk Exchanges, all types of Telephone Cables for Trunk and Local Service, and Carrier-Current and Repeater Equipment for Telephone Lines.

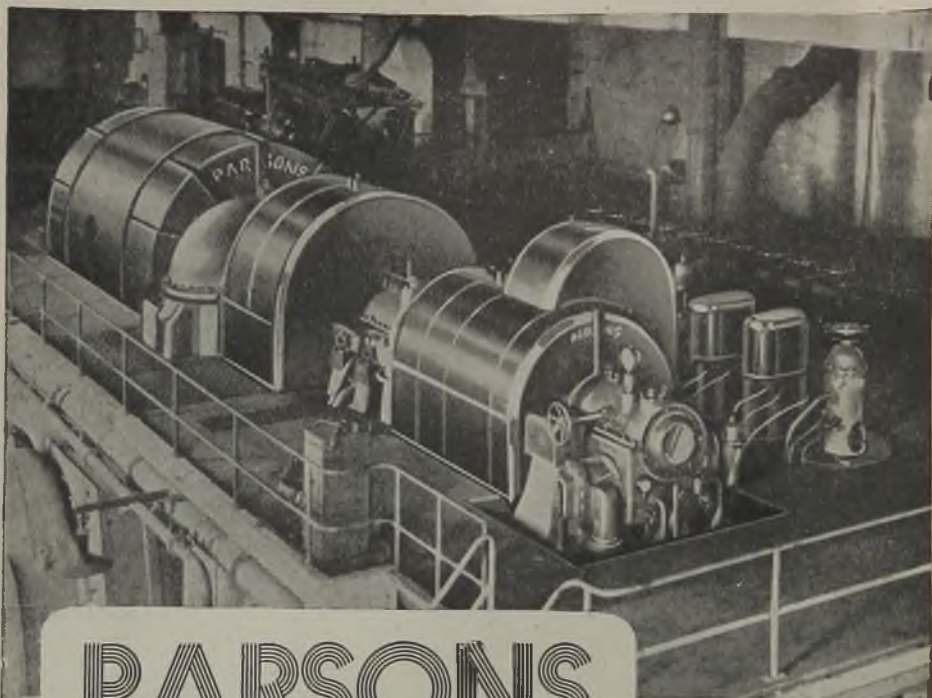
Siemens Telecommunication Equipment is giving thoroughly efficient service in all parts of the World.

**SIEMENS BROTHERS & CO., LTD.**

WOOLWICH, LONDON, S. E. 18

ESTABLISHED 1858

Telephone : WOOLWICH 2020



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**25,000 kW**  
**TURBO-ALTERNATOR**

*Recently installed in a Power Station in Australia*

Also manufacturers of:-  
TURBO-BLOWERS, TURBO-COMPRESSORS,  
SURFACE CONDENSING PLANT, GEARING,  
ELECTRICAL TRANSFORMERS, SEARCHLIGHT REFLECTORS, ETC



**C. A. PARSONS & COMPANY LIMITED**  
**NEWCASTLE-ON-TYNE · 6**





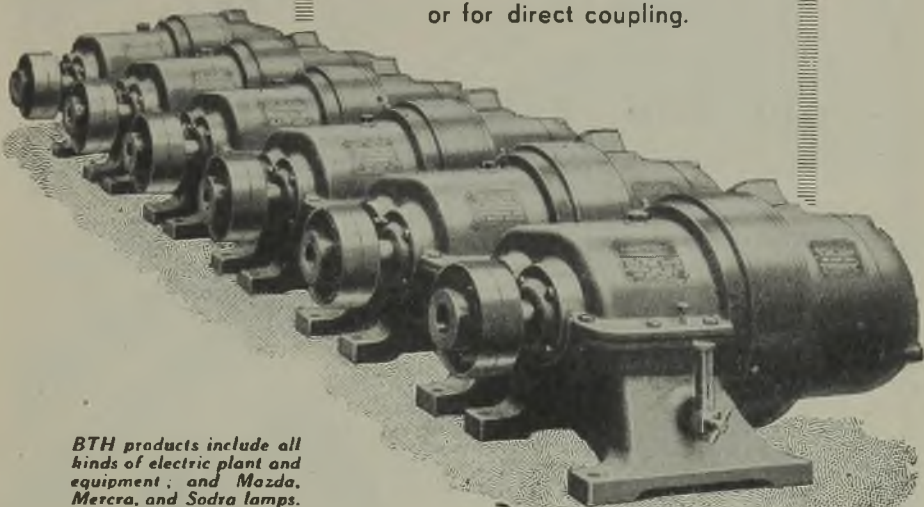
# LOW-SPEED MOTOR UNITS

## A.C. or D.C.

**For speeds  
down to  
25 r.p.m.**

**Designed and built as  
a unit incorporating  
an electric motor and  
helical gearing.**

Can be used with existing  
belts, pulleys, line shafting;  
or for direct coupling.



*BTH products include all  
kinds of electric plant and  
equipment; and Mazda,  
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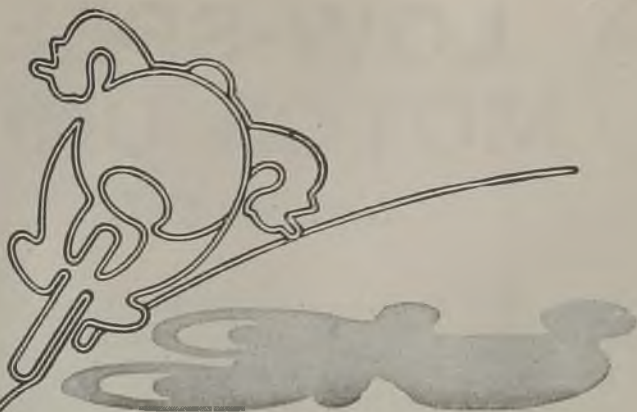
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THE BRITISH THOMSON-HOUSTON COMPANY LIMITED. RUGBY, ENGLAND



A 3187



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**CROMPTON**

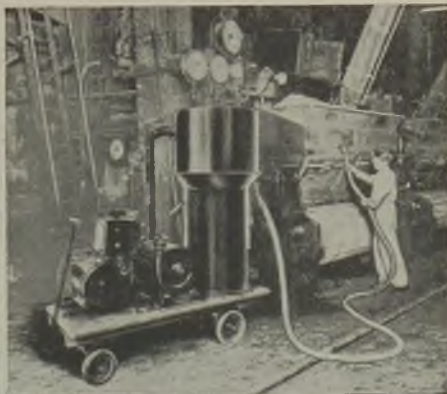
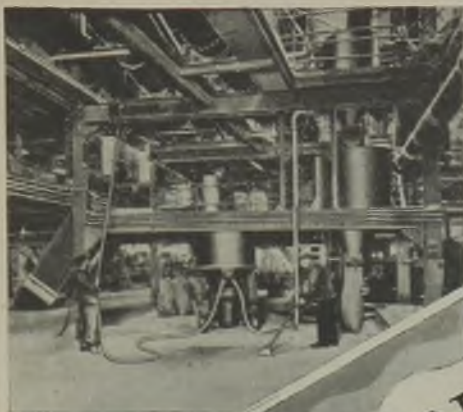
**V.I.R. CABLE**



CROMPTON PARKINSON LIMITED, ELECTRA HOUSE, VICTORIA EMBANKMENT, LONDON, W.C.2  
Telephone: TEMple Bar 5911

Telegrams: Crompark Estrand, London





# STURTEVANT INDUSTRIAL VACUUM CLEANING

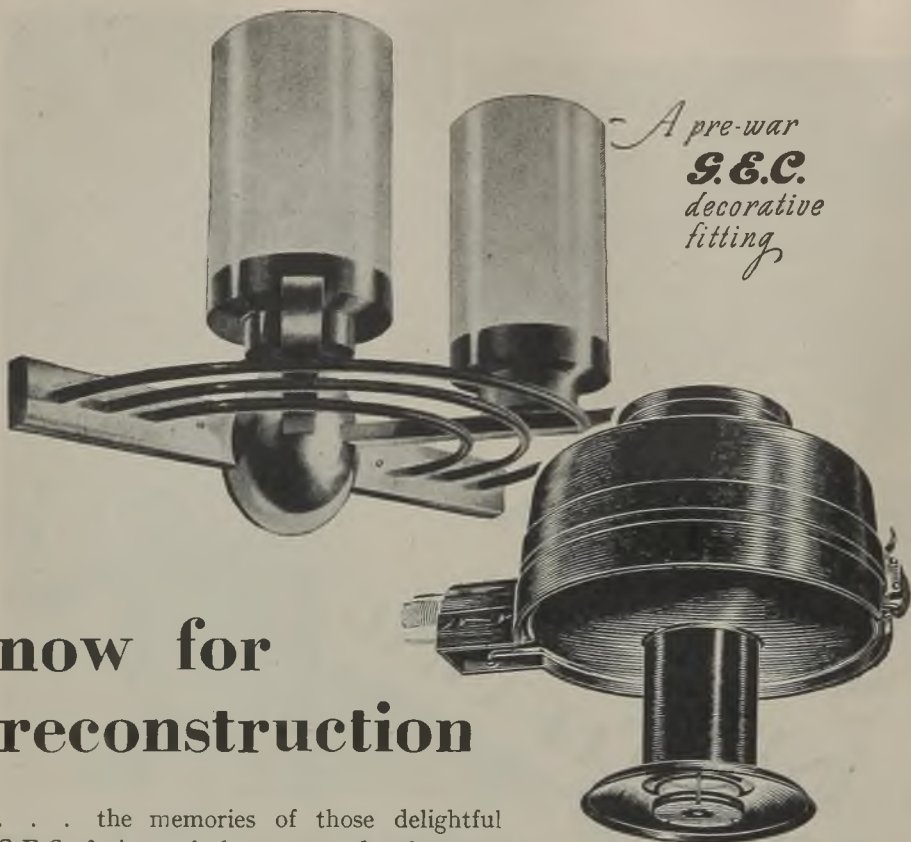
Large numbers of Sturtevant Industrial Vacuum Cleaners are successfully operating in factories and industrial works of all types.

They are giving continuous service and maintaining the highest efficiency under the most exacting conditions. Experience shows that the systematic and regular use of a Sturtevant Cleaner overcomes dust problems and increases the efficiency of all cleaning operations. Furthermore, it has been proved conclusively by a great many users that better and greater output can be produced as a result of the very clean conditions obtainable by using a Sturtevant Industrial Vacuum Cleaner.

Innumerable tests have proved that, due to the high mechanical and electrical efficiency, Sturtevant Cleaners clean more quickly and thoroughly than any others of equal power. May we send particulars and our publication U.1391?

**STURTEVANT ENGINEERING CO. LTD.**  
25, WORCESTER ROAD, SUTTON, SURREY.

TELEPHONE: VIGILANT 2275



*A pre-war  
G.E.C.  
decorative  
fitting*

## now for reconstruction

. . . the memories of those delightful G.E.C. fittings of character and refinement known so well before the war may soon be happily revived. The cloak of the Company's great war effort will be shed, and its fittings designers and manufacturing craftsmen will be free to turn their skill and artistry once again to producing ranges of fittings that will satisfy the tastes and needs of all.

*A G.E.C.  
lantern  
for war  
street lighting*

# G.E.C.

DESIGNERS AND MANUFACTURERS OF

## ELECTRIC LIGHT FITTINGS



### SAVE SPACE!

A HIGGS MOTOR  
TAKES LESS THAN A  
QUARTER OF THE  
SPACE OF A N  
ENGINE ———  
AND SAVES  
MAINTENANCE  
AND INITIAL  
COST AS  
WELL.



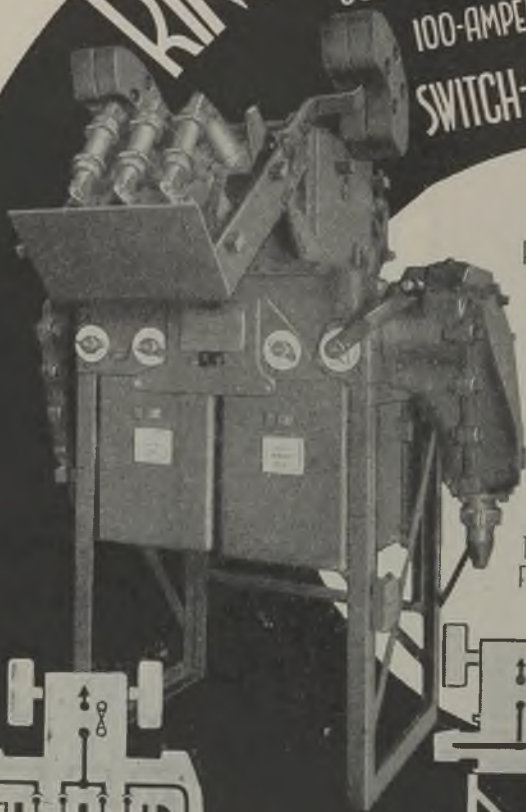
Birmingham, Bristol, Dundee, Glasgow, London, Manchester,  
Nottingham, Peterborough, Sheffield, Wolverhampton.



**OUTDOOR  
METAL-GLAD**

# RING-MAIN ISOLATORS

300 AMPERES AT 11KV, WITH  
100-AMPERE 3-PHASE-TRIPPING  
SWITCH-FUSE TEE-OFF



FOR RURAL AREAS

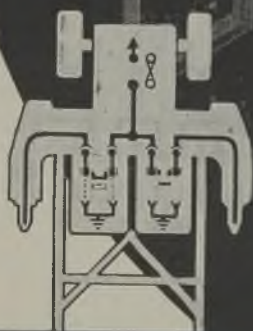
LOW COST

NO BUILDINGS REQUIRED

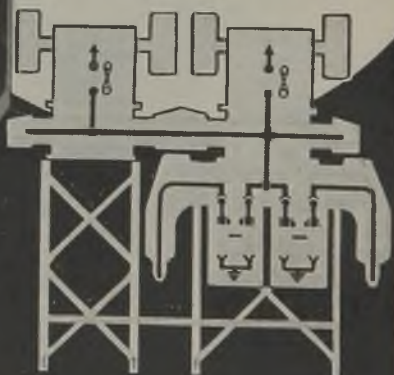
EASY TO INSTALL AND EXTEND

EARTHING AND TESTING FACILITIES  
AVAILABLE IF REQUIRED IN BOTH  
ISOLATORS AND SWITCH-FUSE TEE-OFF

TEE-OFF FUSES HAVE LOW FUSING -  
FACTORS WITH BULB-GLAD FUSE-LINKS



ONE ISOLATOR CAN  
BE MAINTAINED  
WHILE THE OTHER  
IS ON LOAD



# REYROLLE

HEBBURN-ON-TYNE

ENGLAND

FOR D.C.



*Still  
available for  
essential  
purposes*

FL52

FOR A.C.



# FERRANTI

*Multi-range*

## TESTING SETS

FERRANTI LTD., Hollinwood, Lancs. London Office: Kern House, Kingsway, W.C.2.

# The 'BELLING'

## Electric Streamline Cooker

NOW IN

LIMITED

PRODUCTION

### The Beautiful 'BELLING' Electric Streamline Cooker

—will look just lovely  
in your kitchen

- 1 Finished in finest cream and black vitreous enamel.
- 2 Grand big oven with automatic temperature control and full size patent glass door for "visible cooking."
- 3 Fast boiling plates which you can turn right down to "simmer."
- 4 Very simple to use. So easy to clean.
- 5 Hinged hob cover lifts up and keeps the wall clean when cooking.



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No. 21 & B. Cap. 4-10.  
Purchaser. Tax. £8-1-0 extra.  
Total Price, £25-10-0.  
Delivered from 4/10/49 and 4/10/49.

*Belling*

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C.R.C. 319

★ This announcement is now appearing in  
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# Everything the Jointer wants —



The standard package of jointing materials for a HENLEY straight through joint contains everything the jointer wants except the box compounds.

The paper separator, paper binder, rolls of paper-cotton tape and cotton tape are all impregnated ready for use and packed in a hermetically sealed tin.

The lead sleeve is complete with two caps for the filling holes. "Grip" type jointing sleeves, solder and plumber's metal are also included.

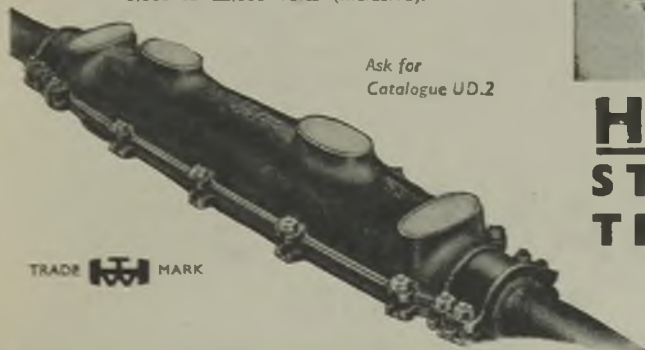
The finished joint is protected by a cast-iron box as shown below. "Cablegrip" type glands and armour clamps ensure efficient bonding of the lead sheath and armouring.

Suitable for working pressures from  
3,300 to 22,000 volts (inclusive).



Ask for  
Catalogue UD.2

## **HENLEY STRAIGHT THROUGH JOINT BOXES**



TRADE MARK

# HOUSING

*For the  
Housing Estate-Mansion-  
or Luxury Flat*




Sanders Quality electrical products provide everything that is required for the control of Electrical Equipment.

Compact Distribution Units  
Splitter Units • Fuseboards  
Switch Fuses • Cooker  
Control Units • Sockets  
Plugs • Switch Sockets

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WM. SANDERS & CO. (WEDNESBURY) LTD., WEDNESBURY, STAFFS.



**a post-war promise**

**for you**

**TRU-WEL**®  
ELECTRICALLY WELDED STEEL TUBES

Tru-Wel electrically welded steel tubes are mass-produced to your requirements; identical in lightness and strength; in concentricity and evenness of wall strength; identical in composition so that all can be manipulated with equal ease at full-power speed.

We have supplied over 25,000,000 feet of Tru-Wel tubes for the superstructures alone of military trucks. Our list of such achievements is formidable, the number of tubes produced astronomical. Many of our tubes have solved awkward and urgent problems; effected remarkable economies. This war-time effort holds a promise for you who have to effect a switch-over to post-war production. We produced the unusual in tubes by the million for the nation. We now place that same ingenuity, that same highly efficient production plant at your service. It may be that Tru-Wel electrically welded steel tubes can assist you considerably in recovering old and developing new markets.



A MEMBER OF THE  
TUBE INVESTMENTS GROUP

**TUBE PRODUCTS LTD**

OLDBURY, BIRMINGHAM



# IGRANIC MAGNETIC DEVICES

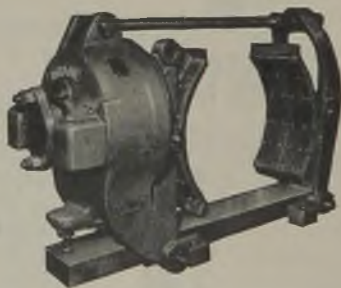


Igranic Magnetic Specialities have been tried and proved in some of the largest industrial plants in this country. They are built to withstand years of arduous service.

Igranic Magnetic devices include :

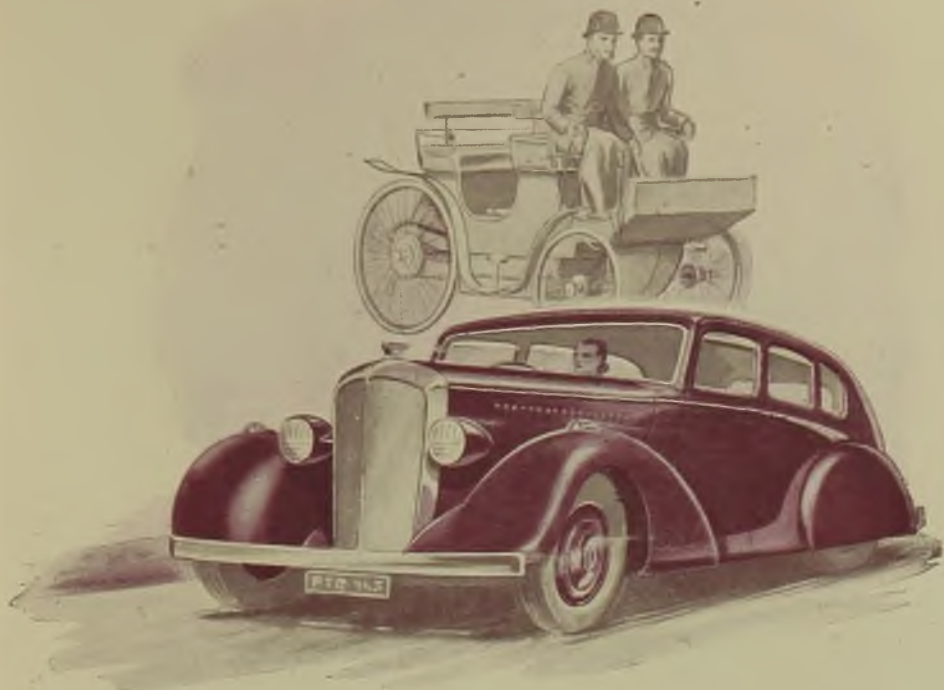
- Magnetic Brakes
- Magnetic Clutches
- Lifting Magnets
- Magnetic Separators
- Magnetic Solenoids, etc.

Illustration above shows  
Igranic Lifting Magnet.  
Below, Igranic Type "M"  
Magnetic Brake.



*Write for  
Detailed  
Leaflets*

**IGRANIC ELECTRIC CO. LTD**  
**LONDON & BEDFORD**

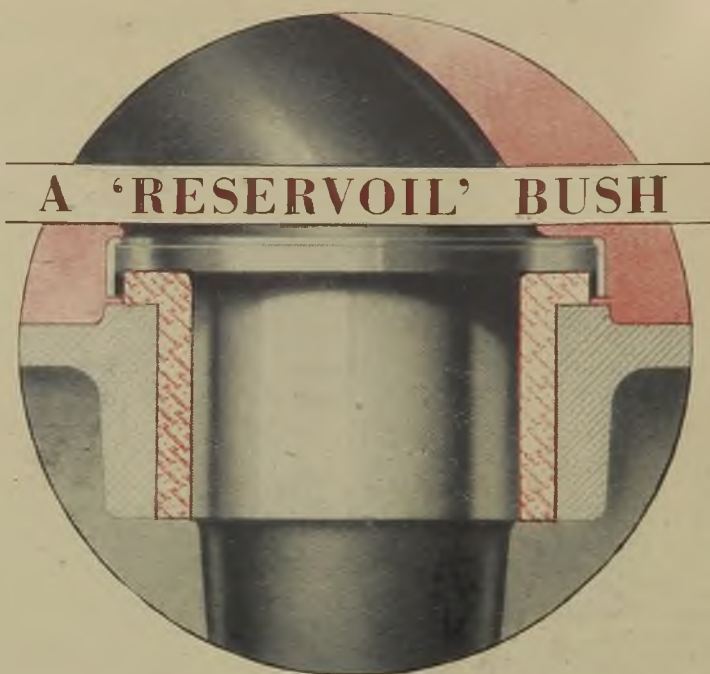


## MODERN DESIGN—TOTALLY ENCLOSED

All Newman Motors are totally enclosed against dust, dirt and moisture. Ball-bearings provided with grease gun lubrication. Three points which will save you many man-hours of maintenance during their long trouble-free life. Delivery from stock.



Head Sales Office : 32 VICTORIA STREET, LONDON, S.W.1 ABBey 2023



It may be an unusual application and with only limited or intermittent movement, or it may be a high-speed shaft, large or small.

But, if a plain bearing is needed, the probability is that a 'Reservoir' bush will give far better service, and will avoid the need for frequent lubrication.

Easily standardised — because an extensive range is available, held to close limits.

Self-lubricating for long periods — because the porous metal retains a large volume of oil.

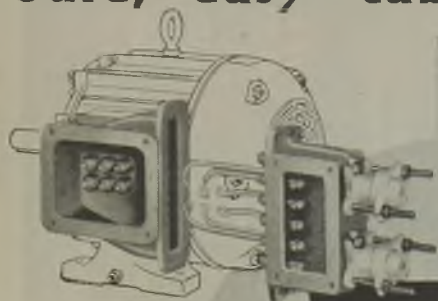
Easily fitted. Available in an extensive range of sizes.

**A MORGAN**  
product

THE MORGAN CRUCIBLE COMPANY, LTD., LONDON, S.W.11  
*Specialists in Powder Metallurgy since 1912*

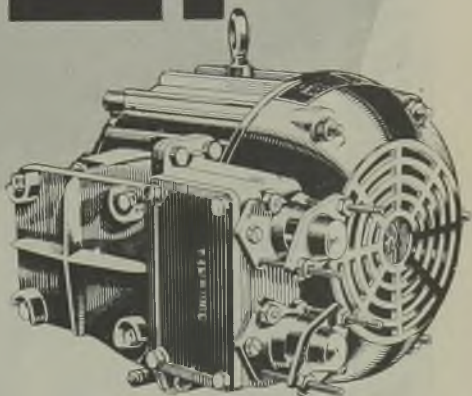


# Safe, easy cable connection



with this **FLAME-PROOF**

**MOTOR**



Here is the Parkinson Flame-proof Motor—a robust, Buxton-Certified Motor—with features that repay close examination. It has a remarkably efficient cooling system that allows high output and trouble-free running under the most difficult conditions. Note particularly the Parkinson design of cable box. The easily-connected detachable chamber allows remote cable sealing and the box can be turned in any ninety-degree direction. It is one of the 2,000 Parkinson types that form Britain's widest range of standardised A.C. motors.



**CROMPTON PARKINSON**  
LIMITED

# EDISWAN FLUORESCENT LIGHTING



TYPE A  
1 LAMP



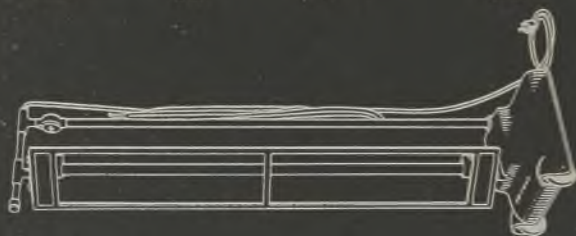
TYPE B  
1, 2 OR 3 LAMPS



TYPE C  
1 LAMP



TYPE D  
1 OR 2 LAMPS



THE PORTALUX



TYPE H



TYPE I



TYPE J



TYPE K  
2 LAMPS

Standard finish — glossy stoved enamel.  
(Type "D" Reflectors are also available with  
VITREOUS ENAMELLED finish.)

A SELECTION FROM THE RANGE OF  
EDISWAN FLUORESCENT LIGHTING FITTINGS

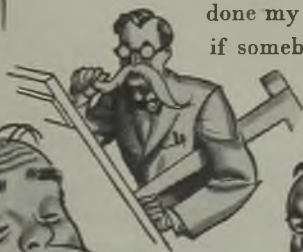
THE EDISON SWAN ELECTRIC CO. LTD.



155, CHARING CROSS ROAD, LONDON, W.C.2

## A distinguished visitor recently said—

*"there is a noticeable team spirit at Desoutters — almost a family atmosphere. One even seems to notice a likeness in the faces."*



IT may be true. They say ostlers grow like horses and shepherds like sheep. We asked our oldest employee if he would care to make a statement. He said he would. He said: "I've worked for this ruddy firm more years than I care to remember. I've taught thousands of snub-nosed brats that what *they* call good work *we* throw on the scrap heap. I've put up with the Guv'nor saying 'Not good enough' to anything I do just as if he was a blinking customer. In all these years I've never seen a Desoutter Tool yet that satisfied him. I've stuck it. I've done my best. I don't complain. But if somebody's going to tell me now, that I've grown like that be-whiskered old . . ."

*Quite, quite—we said.*

**DESOUTTER** *Specialists in Lightweight, Pneumatic & Electric Portable Tools*

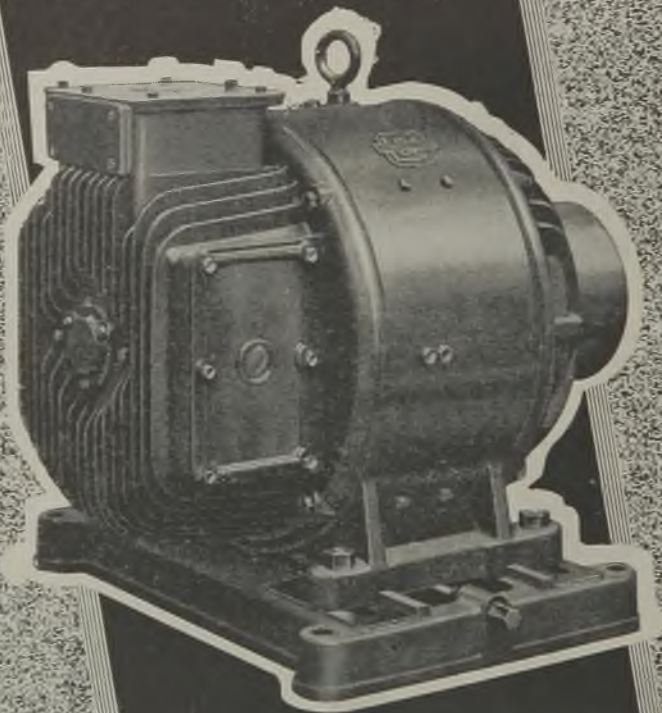
DESOUTTER BROS. LTD., (Dept. R), The Hyde, Hendon, London, N.W.9. Telephone: Colindale 6346-7-8-9.



# L·D·C

*Gasworks*

## MOTORS



**ABSOLUTE DUST-TIGHT  
CONSTRUCTION.  
FOR EVERY DIRTY SITUATION**

### LANCASHIRE DYNAMO & CRYPTO LTD

TRAFFORD PARK MANCHESTER, 17

Associated Companies :-

Foster Transformers & Switchgear Ltd.

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Crypton Equipment Ltd.

# NALDERS

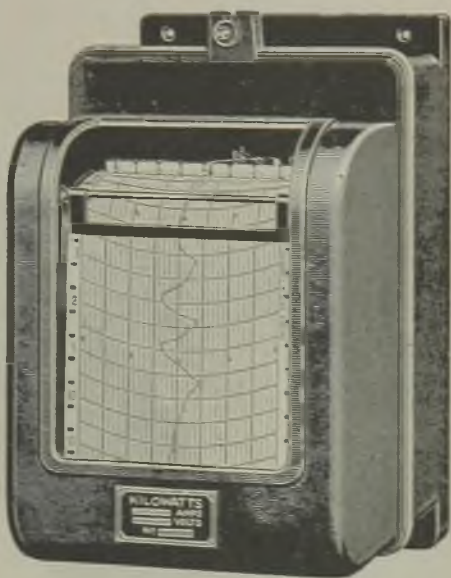
## IDEAL N.C.S. RECORDING INSTRUMENTS

The illustration shows an N.C.S. Switchboard Indicating and Recording Instrument. It is fitted with calibrated scale and indicating pointer for sight reading, and gives a clear view of the chart throughout. The complete range includes Ammeters, Voltmeters, Wattmeters, Frequency Meters, Power Factor Meters, etc.

Chart driving mechanisms are of improved type ensuring accurate timing. They are usually arranged to give a chart speed of 1 inch per hour, but can be adapted to any required speed up to 12 inches per hour. Clocks giving a higher chart speed or combination of speeds can be fitted if specified. The syphon pen supplied, fed from the ink reservoir, maintains a continuous flow of ink.

All N.C.S. Recording Instruments, Switchboard or Portable pattern, conform to the requirements of the British Standards Institution Specification.

*Let us quote to your requirements*



*Continuous flow of Ink from Ink Reservoir*

**NALDERS PRODUCTS** include Ammeters, Voltmeters, Wattmeters, Power Factor Meters, Synchronisers, Frequency Meters, Protective Relays, Circuit Breakers and Automatic Switches. All these and other Nalders Specialities are in the front rank, as guaranteed by the widely known N.C.S. Trade Mark.

## NALDER BROS. & THOMPSON LTD.


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Phone : CLISSOLD 2365 (3 lines).


Grams : OCCLUDE, HACK, LONDON

# GLOVERS PLIABLE ARMoured CABLES

Designed to reduce danger to workmen as recommended in circular No. 87 of H.M. Mines Dept.



Medium Pressure Trailers for use with "Temporarily Fixed" Apparatus such as Conveyors, Loaders, and the like



High Pressure Trailers for use in Quarries, Open-cast Workings, Gravel-pits, etc.

Head Office :

**W. T. GLOVER & Co. Ltd.**

TRAFFORD PARK

MANCHESTER 17



*That great mystery of Time—  
illimitable, silent, never-resting;  
rolling, rushing on, like an  
all-embracing ocean tide, on  
which we swim like apparitions,  
which are and then are not.*

CARLYLE  
*(Heroes and Hero Worship)*



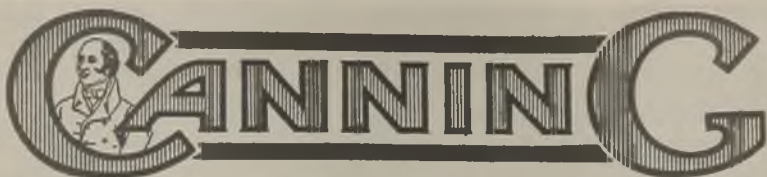
## Time and time again . . .

the immensity of time has  
impelled the expression of  
great thoughts.

With all deference to what  
has been written, may we  
append that for positive ac-  
curacy in time-keeping the  
Ferranti Clock is without peer.

**FERRANTI**  *Clocks*

**FERRANTI LTD.** Hollinwood, Lancs. London: Kern House, Kingsway, W.C.2.



## ELECTRO TINNING

The Modern Process, using Stannate Tin Solution, produces strictly controlled coatings, predetermined and uniform in thickness, even on articles of irregular shape.

Deposits of reasonable thickness may be built up which are not possible with a tin chloride bath.

The solution also permits of a faster speed of deposition.



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BIRMINGHAM 18**

**TANGENT**

SOUND SIGNALS

LUMINOUS

CALL SYSTEMS

MINING SIGNALS

TELEPHONES

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WATCHMAN'S CLOCKS

ELECTRIC IMPULSE &

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PROCESS TIMERS

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FIRE, BURGLAR &

BANK RAID ALARMS

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& TOLLING MECHANISM

LIQUID-LEVEL

INDICATING, RECORDING

& ALARM APPARATUS

IDLE MACHINE &

OUTPUT RECORDERS

SPECIAL APPARATUS

TRANSFORMERS

**GENTS' OF LEICESTER**  
ESTAB. 1872

"Tangent" Products have given unfailing service under the most exacting conditions of War, and a return to Peace-time conditions will result in an even greater demand for their services in the many spheres in which they are used.

**GENT & CO. LTD.**, *Faraday Works*, LEICESTER  
LONDON - NEWCASTLE-ON-TYNE - GLASGOW - BELFAST - DUBLIN





The 50-range Model 7 Universal AvoMeter.

The world-wide use of "AVO" Instruments is striking testimony to their outstanding versatility, precision and reliability. In every sphere of electrical test work they are appreciated for their

dependable accuracy, which is often used as a standard by which other Instruments are judged. There is an "AVO" Instrument for every essential electrical test.

Orders can now only be accepted which bear a Government Contract Number and Priority Rating.

Sole Proprietors and Manufacturers:

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and applied to essential needs with satisfaction to all concerned when work control is done by

## Gledhill-Brook TIME RECORDING AND COSTING SYSTEMS

*British made. Please enquire for particulars*

**GLEDHILL-BROOK TIME RECORDERS LTD.**  
Dept. 4 Empire Works Huddersfield



## ALL TYPES OF CAPACITORS

for

### Industrial Applications

including:

- Capacitor-start Motors
- Capacitor-start and run Motors
- Fluorescent Lighting
- Power Factor Correction, etc.

Full information available on request

**A. H. HUNT LTD.**

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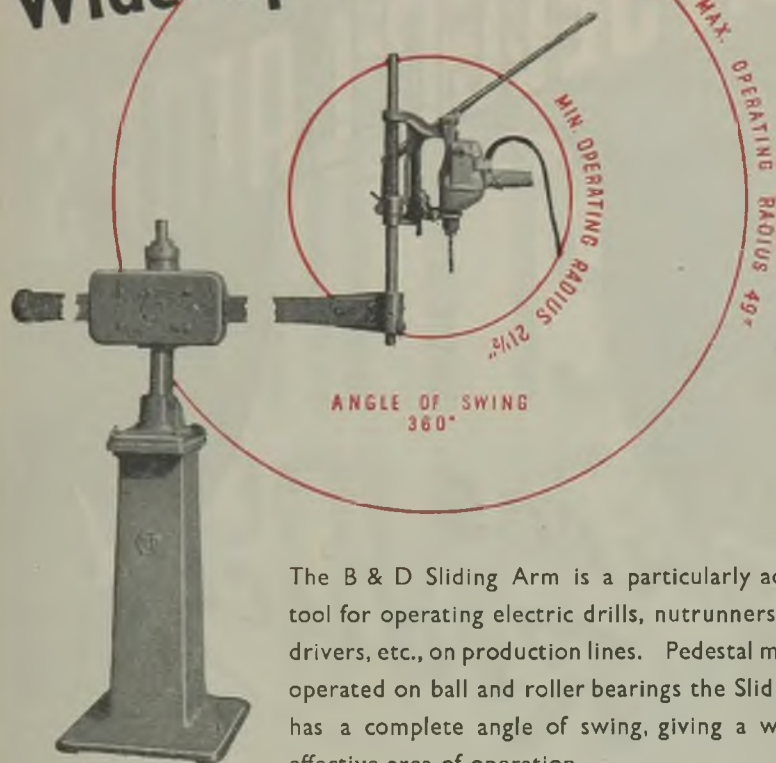


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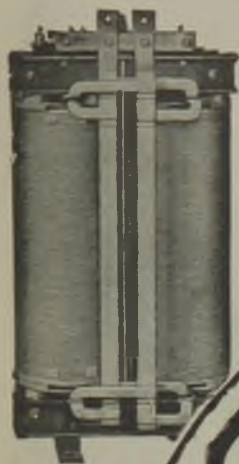


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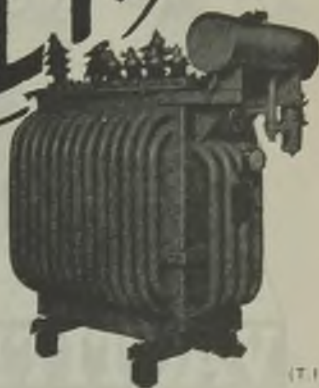




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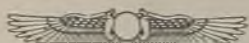
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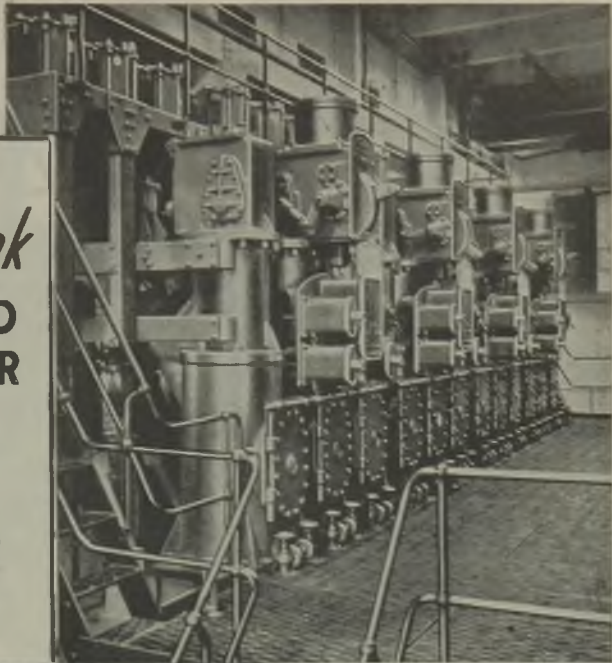
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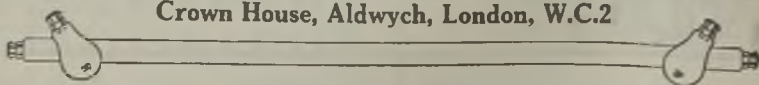


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# ELECTRICAL REVIEW

August 31, 1945

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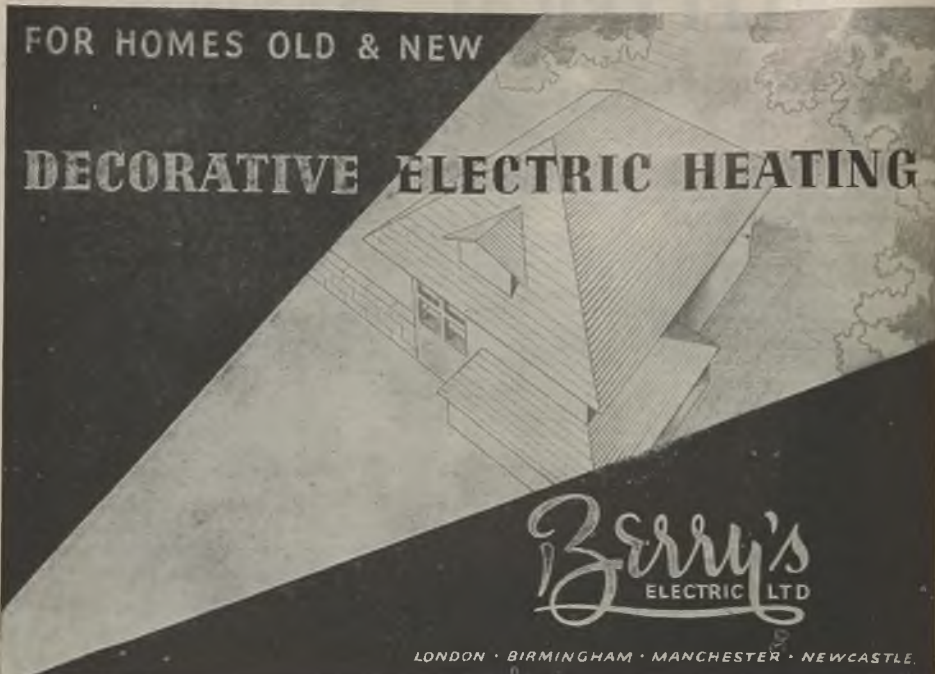
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THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872



Vol. CXXXVII. No. 3536.

AUGUST 31, 1945

9d. WEEKLY

## Now and Then

### Changes in Electricity Supply Practice

**A**N industry that has a scientific basis does not readily lend itself to comprehensive planning of a kind that envisages the dovetailing of each component into its appropriate place. Every discovery or invention tends to divert its course from that originally laid down. Had public electricity supply, for example, been closely organised in the light of the knowledge available when the earliest undertakings came into being, the country would no doubt have been saddled with a DC system that could not have coped with subsequent industrial developments and would have returned only a dusty answer to the rural electrification question. The cost of the changes necessary to meet modern developments would have been a serious obstacle to providing electricity everywhere at low prices.

#### Restriction not Encouragement

The inherent gradualism of electrical development was made more inevitable by legislative date-stamping of the localised generation and distribution that met the then prevailing technical conditions. Early Acts would appear to have been designed more to prevent excess of zeal on the part of a new public service than to encourage its activity. Arrangements were circumscribed within local government boundaries, and it was nearly twenty years before full advantage could be taken of high-voltage AC transmission. Power companies were then permitted to operate under special Acts over wide areas, but it took another twenty years for overhead lines to be officially accepted as essential.

In the meantime municipalities had shouldered the responsibility of serving the great majority of large towns, where the labours of the engineers and their committees to supply electricity at the lowest cost were frustrated by raids on any financial surplus with a view to relieving local rates. Steps had to be taken under the 1926 Act to impose a limit upon this abuse. By virtue of the "Bermondsey Clause," reciprocal relief was in many cases ruled out and generally the parochial view was in statutory favour.

In smaller towns, until the twenty-one years of franchise initially allowed to companies had been increased, there was little scope for private enterprise. Nevertheless good results were achieved, but only in the face of uncertainty of tenure and unfavourable terms of purchase by the local authority before the fruits of any long-term policy could be gathered.

#### High Prices for Poor Coal

In adopting methods of burning low-grade fuel for which there was no appreciable alternative demand, the electrical industry hoped to use it effectively by handing it on to consumers in the most convenient form at the lowest possible price. But this was not to be. For many years before the war the rise in the price of this coal was much steeper than it was for ordinary coal supplied to the home market. Subsequent identical increases in price per ton for all coal, irrespective of its heat value, have further weighted the scales against cheap electricity. In spite of such handicaps electricity was one of the



very few commodities the price of which was progressively falling in the pre-war years. Since the outbreak of war the smallness of the increase in charges for electricity can hardly be paralleled. An industry that has achieved so much against odds, natural and artificial, can be expected to continue to serve the public all the better for its accumulated experience, provided no further burdens are imposed on it.

**Electrical Accidents** PARTICULARS sent us by the Senior Electrical Inspector of Factories (Mr. J. W. Swan) indicate

an appreciable decline in the number of accidents caused by electricity last year in premises with which the Department is directly concerned. Not only did the total reportable under the Act decrease considerably—1,072 as compared with 1,255 in 1943, but also the number of fatalities fell more than proportionately—to 31 from 58—and were comparable with pre-war conditions. Unfortunately, there was an increase in the fatal casualty rate in other than factory premises which brought the total known number to 157 which, while twelve fewer than in the previous year, was thirty above the total returned for 1938. We propose to deal with the subject more fully next week.

**Contractor-Retailers** As we reported at the time, some derogatory remarks about electrical contractors were made in the

annual report of the Electrical Section of the National Federation of Ironmongers. They were accused of being uninterested in electrical retailing and of making little attempt to provide adequate display facilities for the public. We thought that these strictures were too sweeping, although we realised that many contractors merited them. We were apparently too easy on the generality of contractors for their own organisation, N.E.C.T.A., says in a recently-published pamphlet that the majority of them ("in a general sense") have concentrated on the contracting side of their profession and have taken little or no interest in retail business. The result has been to allow this business to drift to departmental stores and the general ironmonger. It is the purpose of the pamphlet to convince the electrical contractor that there is a great deal of

worthwhile business awaiting him if he will only take the trouble to play his part "as the rightful channel through which the majority of these goods are sold." It is pointed out that coinciding with the launching of a large-scale housing programme there will be an all-out effort to secure the total electrification of Great Britain.

**Public Inquiries** It was doubtless just as well that Lord Airlie (chairman of the North of Scotland Hydro-Electric Board) should have raised a fundamental

issue at the Tummel-Garry inquiry in his blunt question: "Do the people of Scotland want electricity or do they not?" Substituting Britain for Scotland, the question has a more than particular bearing. This is by no means to discourage a proper solicitude for the effect of electrical proposals on existing interests (which in the Highlands are the care of such statutory bodies as the Amenities Committee). If formal objections were fully considered beforehand under expert guidance, fewer mutually exclusive opinions and suggestions that are neither technically nor economically practicable would be put forward by witnesses. This would save the time of tribunals and also reduce the costs of inquiries chargeable to the objectors.

**Tummel-Garry Scheme** By dumping surplus energy on the grid from its major projects, the Hydro-Electric Board expects to

make enough profit to finance non-self-supporting installations to serve local needs. The Central Electricity Board in return has the more difficult task of meeting peak loads in the Highlands as and when required to do so. As the inquiry showed, without the aid of local water power, the position may become critical three years hence when the possibility of importing electricity from England at times of maximum demand may be lessened. The technical scheme makes full use of the flexibility and immediate availability of water power to meet such peaks. This necessitates provision for short-period storage only so that the estimated capital expenditure is no more than £41 per kW, the annual charges on which include the equivalent of fuel at a coal-fired station.

# Making Power Cables

## Impressions of a Works Visit

**B**Y the courtesy of Enfield Cables, Ltd., we are able in this article to show in outline the processes involved in the manufacture of cable. Of course we saw in the works very many types being manufactured, some of a special character, but in this article our main object is to depict to electrical men of all grades how equipment with which they are very familiar as finished products is made. We therefore confine our attention, for the present, to one particular class of cable, *i.e.*, standard paper-insulated, lead-covered, wire-armoured or steel-tape-armoured cable normally used for underground transmission, distribution and services, and the processes described are generally applicable to cables for all voltages up to, say, 132 kV. We have not concerned ourselves with any of the many kinds of special-purpose machinery which we saw throughout the shops, and the machines which we refer to and illustrate were chosen simply for convenience of photography and the manufacturing conditions at the time of our visit.

The first class of raw material to be handled is  $\frac{1}{4}$ -in. diameter copper rod, which is received from the adjacent rolling mills of the associated company, Enfield Rolling Mills, Ltd., in coils, each containing 440 yards of rod. These coils are first "pickled," *i.e.*, they are immersed in a dilute solution of sulphuric acid in order to remove any copper oxide from the surface of the rod. The acid solution is contained in brick tanks with special acid-resisting linings. Each tank accommodates twenty or

more coils in batches that are suspended from lifting slings. The batches are lowered into and lifted from the acid bath by means of an overhead crane.

During the pickling process a certain amount of the copper is dissolved by the acid, and this is reclaimed by means of a recovery plant consisting of an arrangement of anodes and cathodes similar to that of electro-plating equipment. The solution is kept in constant circulation between the pickling tanks and the copper reclaiming tanks. The reclaimed copper is deposited on the cathode plates as pure electrolytic copper.

The anode and cathode system is served with DC by suitable rectifying plant.

The cleaned copper rod is next reduced in size by drawing it through tungsten-carbide dies. Reduction through a series of dies of different sizes is effected progressively as one operation in one machine, and a good example is an 11-die machine with a suitable set-up to reduce the  $\frac{1}{4}$ -in. rod finally to 0.052-in. diameter wire. As soon as the material is drawn initially it is wire, the line of demarcation between rod and wire being that between rolling and drawing. The drawing process is effected



The coils of copper rod are first "pickled" in a dilute solution of sulphuric acid; lifting operation

on the controlled elongation principle. After each die along the machine there is a drum which takes a few turns of the rod and effects the necessary pull on the wire at its associated die to allow for the difference of the wire speed consequent on its reduction in size.

The drums are individually driven from

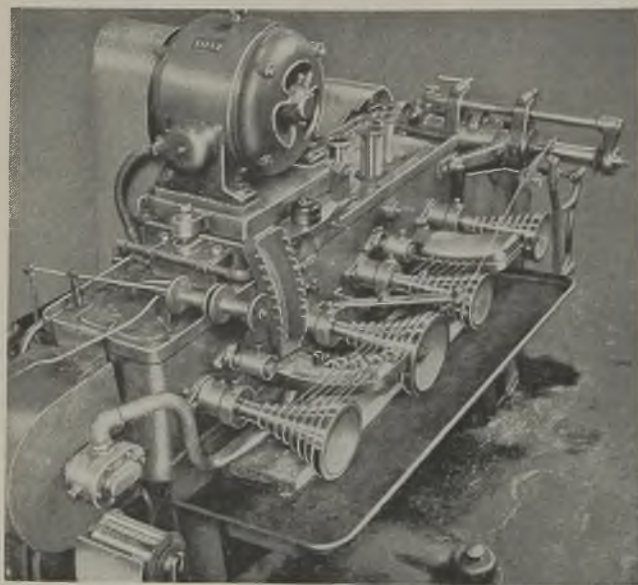
the common shaft through suitable reduction gearing in each case. From the final die on the drawing machine the wire is received by, and coiled on, a revolving block which is fitted with a spider to facilitate removal of the finished coil from the block. The copper rod is introduced to the drawing machine with the dies first threaded on to the rod, the threaded dies being slipped into suitable die housings along the production line of the machine.

To enable the dies to be threaded on to the rod appropriate lengths of this are first passed through a pointing machine and

further stages of manufacture). During the drawing operation both the dies and the rod are submerged in a drawing lubricant.

Many sizes of wire are required, of course, for different sizes and types of cable, and where sizes smaller than 0.052-in. diameter are needed the wire is subjected to further drawing operations on the same principle of controlled elongation. For drawing the finer sizes of wire diamond dies are used, and although the diamond-die drawing machines and the dies are smaller, and the arrangement of the drawing drums and dies is different, the principle of operation is the same as that for the larger wires.

The greatest accuracy of die sizes is called for, particularly with regard to the angle of the bell or point of wire entry of the die where the reduction is actually effected. Polishing or extremely fine grinding of the die bores is the method employed for obtaining the correct die sizes, and except for the polishing mediums used—rouge in the case of steel dies and diamond powder for the diamond dies—the principle of



Although the diamond-die drawing machines are smaller, and the arrangement of pulleys and dies is different, the principle of operation is the same as that for the larger wires

stringing-up block to reduce the rod to the correct size to accommodate the dies for the various stages of the drawing process. As the far end of the length of rod approaches the drawing machine it is electrically butt-welded to the fore end of another rod length to obtain continuous running. A 440-yd. length of  $\frac{1}{4}$ -in. diameter rod, after reduction, becomes about 10,220 yd. of 0.052-in. diameter wire (but usually lengths of 4,000 yd. are delivered to the shops for



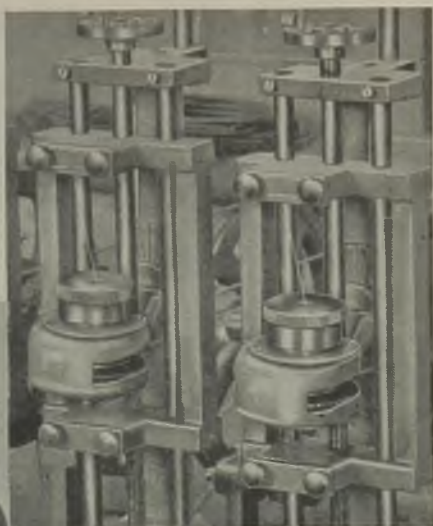
From the final die on the drawing machine the wire is coiled on a revolving block

polishing is the same for all classes of dies. In each case the powder is mixed with olive oil. We saw several different ways of applying the polishing mediums, but we think that a brief reference to one of them is sufficient for the purpose of this article.

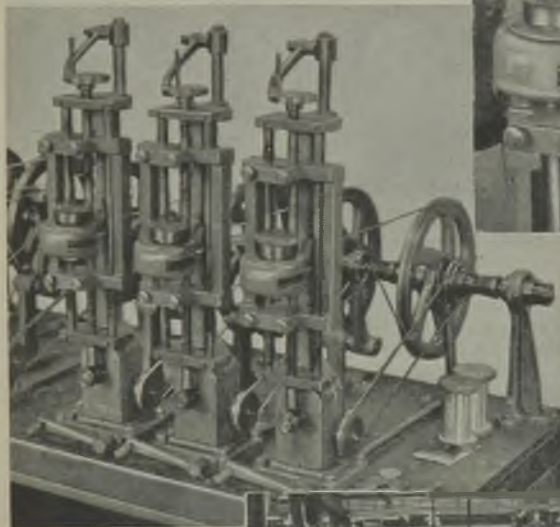


The most modern general-purpose method of diamond-die polishing is that in which a wire served with the polishing mixture is drawn up and down through the revolving die and bearing on the bell of the die at the correct angle to effect the reduction. The angle and the superfine polish are the two important features of this process. The smallest size of die used is 0.002-in. diameter.

An effect of the drawing processes is hardening of the wire which must be annealed



The most modern general-purpose method of diamond-die polishing is that in which a wire served with the polishing mixture is drawn up and down through the revolving die



before it is subjected to the subsequent cable-making processes. Bright annealing is employed and is carried out in "Birlec" dry bright annealing furnaces using burned cracked ammonia as a neutral atmosphere. In each furnace the coils are placed in the two-ton capacity container which is

Bright annealing is effected in electric furnaces. Front: a loaded container on hearth; centre: bells over two containers; rear: furnace complete with resistance chamber



loaded on to the hearth of the furnace. Over this container is lowered a bell, i.e., a chamber similar to the container, but larger and inverted, which is water-sealed at the bottom. Finally, over the bell is lowered the outer chamber or furnace proper, which is equipped with heating resistances loaded to a total of 115 kW. The elements are thermostatically controlled to give operating temperatures from 350 deg. C. to 600 deg. C. Under the furnace hearth is a fan which circulates the neutral gas through the container a process which is essential to this method of bright annealing. The neutral gas produced on site in suitable

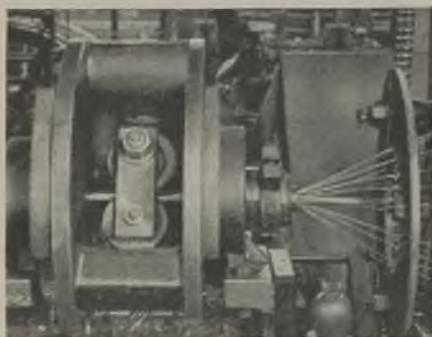
apparatus is, after use, returned to a small gasholder and re-circulated in subsequent operations. When gas circulation through the furnace containers is first started the complete mixture, with the normal atmospheric oxygen, is removed from the containers and passed through the gauzes of a gas burner, in which the oxygen is removed. The remaining gas mixture is passed to a holder, from which the container is then fed by a continuation of the process with the correct mixture of hydrogen and nitrogen.

All the wires, tinned and otherwise, are stranded according to the size and type of cable required. To effect economy in the size of the finished multicore cables and to ensure electrical stability of very high voltage cables—single-core or multicore—a shaped conductor is used. In the case of a multicore cable, the conductor is pre-spiralled to ensure that when the conductor is laid up



Perfect registration of the layers of insulating paper is an essential feature of the paper-lapping process

in the rollers, is separately driven about the travelling conductor, and its correct speed of rotation imparts to the conductor the required degree of spiralling. The stranding machine has two or more carriages running alternately in opposite directions, and each carriage has the appropriate number of bobbins of wire. As the carriage revolves the wires are fed through holes in a lay plate near the final converging point. The relative speeds of rotation of the carriages and the forward movement of the strand determine the necessary "lay" of the conductor. The



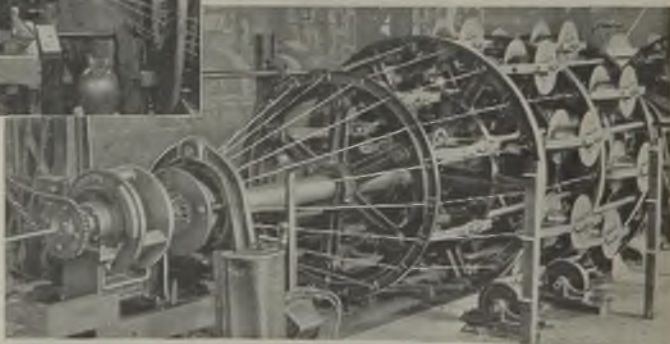
The stranding machine has two or more carriages running alternately in opposite directions; the pre-spiralling head is separately driven about the travelling conductor

after being paper insulated it readily takes up its correct

position in relation to its fellows in the cable. On the stranding machine is a pre-spiralling head in which the conductor passes through two shaping rollers. The pre-spiralling head, with the conductor "locked"

second and subsequent carriages build up other layers of wires according to the required size of cable.

Insulation of the stranded conductor is effected by feeding ribbons of papers on to



the conductor as this passes through the centre of the lapping machine. In roll form the ribbons are held in a carriage which revolves around the conductor. Each carriage accommodates a number of rolls of paper and the number of carriages along the cable line varies according to the class of cable. Perfect



drums are loaded into the carriages of a laying-up machine. The carriages are rotated at suitable speeds conforming to the lay of the cores as the cores are drawn from

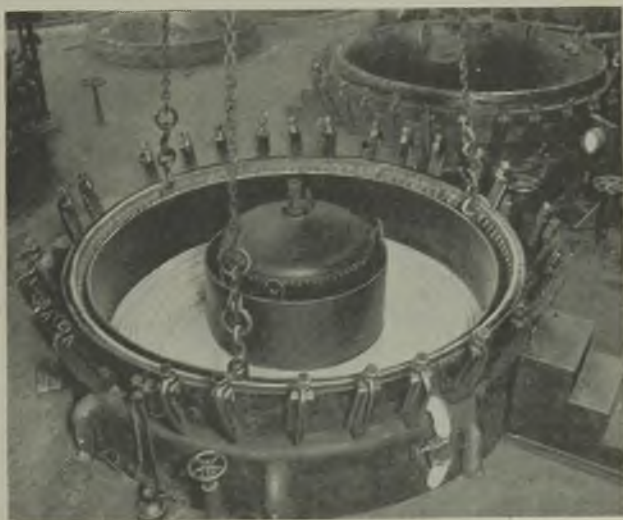


The carriages are rotated at suitable speeds conforming to the lay of the cores as these are passed through the die plate

registration of the layers of specially prepared dry paper is an essential feature of the paper-lapping process. The machine illustrated can apply up to 150 papers in one operation at high speed, and coloured or numbered papers are finally applied to afford a ready means of identification to the users. The radial thickness of the dielectric depends, of course, upon the working voltage of the cable. The average thickness of the individual paper is five mils. For a screened type of cable the metallised paper or thin brass or copper tape is lapped over the insulation on the same machine.

The insulated conductor, now the core, is drawn off the machine on to drums, and the appropriate number of

the drums and passed through a lay plate near the converging point at the centre line of the machine. Jute or paper wormings from bobbins on the carriage are also passed at the same time into the core assembly for filling purposes. For unscreened power cables more ribbons of paper from rolls on another carriage are applied during the same operation to form a belt round the core assembly. The lay of the cores ensures perfect flexibility in a cable with any required number of cores. On other machines we



The unsheathed cable is coiled into a circular tray which is then lowered into the oil-heated impregnation tank



saw lighter types of cable being laid up—from two to thirty or more cores—for pilot or signal cables to work at very low voltage.

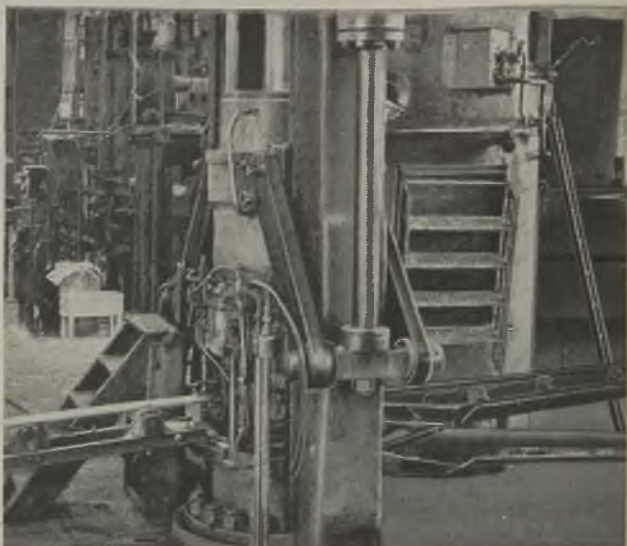
Next the unsheathed cable must be impregnated with insulating compound. For this purpose it is coiled into a circular tray which is then crane-handled into one of the impregnation tanks, a number of which are heated by hot oil and others by hot water circulated through the impregnation tank jacket. For the latter method the water is heated by the hot circulating oil, and has the advantage that the tanks can readily be cooled when required by the circulation of cold water. The impregnating oil that is passed into the tanks after the cable is dried is supplied from adjacent vertical storage tanks which are also equipped for heating with hot-oil coils, and these coils are served from an "oil-tube boiler" equipped with an oil-fired furnace.

From the impregnation tank the cable passes through the lead press which forms a continuous covering of seamless sheath all round the impregnated paper, thus effectively sealing the cable from air and moisture. In the vacuum type of press, after the first melting pot, the molten lead is kept and passed into the container of the press under vacuum. Thus there is no oxidised layer at the union of the charges.

Some cables pass into service as plain lead-covered cables, or protected with light impregnated preservative servings, while others which have to face severer conditions are heavily armoured as a precaution against external damage. The armouring wires are applied to the cable on a principle similar to that of stranding—wire bobbins loaded carriages revolving about the travelling cable—and various finishes to meet specified conditions are applied to the cable during the same operation. For instance, as protection against chemical action two bitumenised paper layers are directly lapped over the lead sheath, while preservative-impregnated dressings are applied both under and

over the armour. Finally, the cable passes through a whitewash pot to prevent the cable surface from sticking.

Every cable, large or small, and for high or low voltage, is thoroughly tested before it leaves the factory. Tests are carried out strictly to British Standard or customers' specifications. Under tests an 11-kV centre-



Press in which the lead is kept under vacuum

point-unearthed cable is subjected to 24 or 25 kV between all the cores and between all cores and earth, while a 66-kV cable is tested at 105 kV to earth.

We are indebted to Mr. F. W. Main, technical director, Enfield Cables, Ltd., for facilities to collect the above information and to obtain the photographs during our visit.

### New Electronic Seal

THE development of a method of fusing glass to steel to make an airtight seal for metal electron tubes is announced by the Radio Corporation of America. The method is said to permit the use of a staple metal for the glass to metal seal in place of special alloys, which are more costly and sometimes scarce. The new method depends upon the control of processing so as to secure good "wetting" of the steel by the glass, and it also incorporates a mechanical design which provides compression strains at the glass-metal boundary, thus compensating for the difference in expansion of the two components.—*Reuter*.

# Transformer Loading

## Securing Minimum Losses

**F**OR a self-cooled transformer most economical operating conditions are those which give the lowest cost of each kWh delivered during its physical lifetime. Lowest capital charges may be obtained by utilising the transformer capacity by reference to thermal limits which—for a given life-expectancy—permit daily peak overloads exceeding rated load by amounts determined by ambient temperature and load factor.\* This method of utilisation enables a given system load to be carried with less capacity than would be required otherwise. Since overloading reduces the useful life period of a transformer, the depreciation charges are greater. Although this factor must be taken into account, earlier replacement may prove economical if the capital accumulated purchases a new unit with lower running costs. This advantage may justify replacing a unit before the end of its physical life or even before the end of its economical life if the additional capital used can be redeemed.

Since overloading may increase running costs due to higher losses, poor regulation and more maintenance, it is not advantageous if there is adequate transformer capacity, the amount of which in use can be controlled to achieve the most economical loadings. If control is not practicable, peak overloading may reduce the total losses by avoiding the use of a total transformer capacity not required for the greater part of the day.

### Maximum Group Efficiency

Where it is convenient to switch transformers as the total load changes, the number of units in parallel at any time should be such as will ensure the maximum group efficiency. During certain periods the number of transformers supplying a particular network or section of a network may be decided by considerations of continuity, voltage regulation, and transformer temperatures; but generally it should be practicable to operate a group of transformers for the greater part of the time so as to ensure minimum total loss. This entails successive switching in and out of transformers with increasing or decreasing load at specific

values of total group output. These values are easily determined when the units of a group are identical.

When only two identical transformers are involved, the total losses are minimised by using one unit if the load does not exceed a certain value greater than the output at which the transformer efficiency is a maximum. Maximum efficiency, *i.e.* minimum percentage losses, is attained when the iron and copper losses are equal. The output at which it occurs,  $L = K\sqrt{\frac{W_i}{W_c}} \dots (1)$ , where  $K$  is the normal rated kVA or ampere output,  $W_i$  = iron loss in watts, and  $W_c$  = copper loss in watts at rated kVA or ampere output.

At outputs greater than  $L$  the efficiency decreases due to the copper loss increasing as the square of the current. The iron loss is substantially constant.

It is clear that at some specific output exceeding that for maximum efficiency the two transformers may be paralleled for, although the total iron losses are doubled, the total copper losses are halved—since each unit carries half the total current—hence the total losses are the same with either one or two transformers on load. Above the output for equal losses, the total losses are less with two transformers than with one. With one unit on load, the second unit should be switched in when the output is  $L_a$  and the load is increasing and switched out at the same output if the load is decreasing.

The value of  $L_a$  is found by equating the total losses of one transformer with the sum total losses of two transformers for a total output  $L_a$ . Thus,  $W_i + \left(\frac{L_a}{K}\right)^2 W_c =$

$$2\left[W_i + \left(\frac{L_a}{2K}\right)^2 W_c\right] \dots (2)$$

$$\text{and } L_a = K\sqrt{\frac{2W_i}{W_c}} \dots (3),$$

where  $K$  is the rated kVA of each transformer.

With three identical transformers and load increasing above the minimum total-loss output of two transformers, the third unit should be switched in when the total output

$$L_a = L\sqrt{\frac{6W_i}{W_c}} \dots (4)$$

\* "Transformer Operation," by C. H. Pike, *Electrical Review*, October 20th, 1944.

By C. H. Pike,

Graduate I.E.E.

For any number of identical transformers and increasing load, the group should be changed from  $n$  to  $n + 1$  units at an output

$$L_x = K \sqrt{\frac{n(n+1)W_t}{W_e}} \dots \dots \dots (5)$$

As the load decreases a transformer should be switched out at a total load  $L_x$ , the value of which is given by expression (5), when  $n + 1$  is the number of transformers actually on load. Considering, for example, three identical 3,000-kVA transformers with iron loss 9.4 kW, and copper loss 26.0 kW. The load for maximum efficiency of one unit is, from (1), 1,800 kVA. The load at which, with increasing load, the second unit should be switched in is, from (5), 2,550 kVA and for the third unit is 4,500 kVA. The method of determining the minimum-loss load with dissimilar transformers is more involved though the same in principle.\*

If the known values of the losses are those for a mean winding temperature of 75 deg. C. (as specified by B.S.S. 171), they need not generally be corrected to the actual operating temperature, which is not likely to vary sufficiently to affect the values substantially. With loss values computed for 15 deg. C. the correction should be made.

#### Seasonal Changes in Number of Transformers

In addition to reducing the kWh loss, the operation of a group of transformers to ensure maximum group efficiency also reduces the kVA demand. This may sometimes prove economically advantageous.

Where individual units of groups of transformers cannot conveniently be switched daily, some economy in operation may be obtained by seasonal changes of the total transformer capacity in use. Even if this results in short-time overloading there may still be a definite reduction in the cost of the losses during a particular period, though the effect of increased kVA demand—due to the comparatively higher copper loss during periods of overload—should be taken into consideration. The occasion for changing the number of transformers in operation is decided by the group output of energy during a representative period (e.g. a load cycle) at which the total losses in the period are the same with either  $n$  or  $n + 1$  transformers, the number being then adjusted according to the likelihood of the load increasing or decreasing in the immediate future.

If the load is practically constant, the

occasion for re-grouping can be determined directly from expression (5), but with the usual cyclic load the permissible peak will be higher than the value which, with constant load, gives equal losses with either  $n$  or  $n + 1$  transformers. Now a cyclic load can be expressed as an equivalent constant load (i.e. a load which would produce the same copper losses during the cyclic period) by analysing the load curve into ordinates, each representing the load for a particular period of time, and obtaining their r.m.s. value. Thus the equivalent load  $L_E =$

$$\sqrt{\frac{L_1^2 t_1 + L_2^2 t_2 + \dots + L_n^2 t_n}{t_1 + t_2 + \dots + t_n}} \dots \dots \dots (6),$$

where  $L_1$  is the load in kVA or amperes during the time interval  $t_1$ , and so on.

If approximate load curves can be obtained periodically, by deriving the equivalent loads, the expression (5) can be applied to determine when transformers should be switched to meet changing load conditions. If the only value readily available is the peak load during a certain period, this can be used to obtain approximate equivalent loads which, although probably on the high side, will indicate when transformers should be switched. It can be assumed that the peak load is maintained for a period, determined from the general loading conditions, long enough to ensure that the equivalent load derived from the peak-load value will not be less than the value that would be derived from a load curve.

#### Application of Equivalent Load Value

To demonstrate the use of the equivalent load value, consider first a cyclic load which can be analysed into:—600 kVA for two hours, 500 kVA for four hours, 400 kVA for six hours and 200 kVA for twelve hours. The equivalent load  $L_E =$

$$\sqrt{\frac{600^2 \times 2 + 500^2 \times 4 + 400^2 \times 6 + 200^2 \times 12}{2 + 4 + 6 + 12}}$$

$\approx 360$  kVA continuous load for twenty-four hours. Assuming that the load is shared by two identical 500-kVA transformers of iron loss 1.9 kW and copper loss 5.7 kW; from (5) the losses are equal with either one or two transformers at a load of 412 kVA. Thus since the equivalent load is only 360 kVA, one transformer is more economical than two, even if the loss with it is corrected for the higher temperatures resulting from the greater loading.

If the peak value 600 kVA of the load cycle is considered to exist for twelve hours, with no load for the other twelve hours,

\* See "The J & P Transformer Book," Seventh Edition, 1937, Chap. 25.



$L_E = \sqrt{\frac{600^2 \times 12}{24}} = 425 \text{ kVA}$ . The value thus obtained is high but sufficiently accurate to indicate when transformers should be switched to secure some reduction in losses. In practice reasonably close estimates of the equivalent load in terms of peak load can often be made from the available data.

Since the daily equivalent load can be expressed in general terms of the peak load  $L_p$  and the assumed time interval  $t$  of its duration,  $L_E = \sqrt{\frac{L_p^2 \times t}{24}}$  .....(7)

If the equivalent load is equal to the load  $L_x$ , given by (5), at which the losses are equal

with either  $n$  or  $n + 1$  transformers, it follows

$$\text{that } L_p = \sqrt{\frac{L_x^2 \times 24}{1}} \dots\dots\dots(8)$$

Hence given  $L_x$  and  $t$ , transformer switching can be carried out by reference to observed values of peak load.

It should be noted from the above examples based on a load cycle with a 20 per cent, peak overload that, in addition to reducing the amount of transformer capacity required to carry a given load, overloading can also reduce the losses in favourable circumstances. The possible objections are higher operating temperatures leading to higher rates of deterioration of solid insulation and oil.

## Contractors' Notes

### Securing Electrical Retail Business

THE National Electrical Contractors' Trading Association (N.E.C.T.A.) has circulated to its members (who are also members of the Electrical Contractors' Association) a pamphlet entitled "Reach for the Stars" in which they are urged to ensure that they take their rightful place as retailers of electrical appliances. A brief survey is made of the remarkable progress of electricity since 1910 particularly in its domestic applications. It is contended that the prospects for the future are immense but if N.E.C.T.A. is to expand and develop to meet these transformed conditions, its members must make essential adaptations.

In the past, in a general sense, says the pamphlet, the majority of electrical contractors have concentrated their efforts on the contracting side of their profession and have taken little or no interest in retail business. The result has been a steady drift of the business to the departmental and multiple store and to the general ironmonger. This must be reversed and "the electrical contractor must retail electrical equipment with modern counter sales appeal as the trained pharmacist vends his branded goods." The Association calls for the radical reform of present methods of salesmanship which are said to be generally unprogressive, out-of-date, and unsuccessful as against the departmental and chain store.

#### Holiday Lodging Allowance

In a letter to his members, Mr. L. C. Penwill, Director of the E.C.A., says that the Electrical Trades Union recently raised a point with regard to the necessity for its members to pay retaining fees for their lodgings while they were on holiday. It was said that if such fees were not paid the members would lose their lodgings at a time when the demand was greater than the supply. The matter has been considered and it has been agreed that an allowance of 10s. 6d. shall be

paid "for the war period only" to employees taking their week's paid holiday if they are in receipt of country allowance but only in respect of holidays commenced after August 17th; there will be no retrospective payment.

#### Operatives Sent Abroad

Consideration is being given by the National Joint Industrial Council for the Electrical Contracting Industry to the conditions of service for men who are required by their employers to travel abroad. An endeavour is being made to arrive at an agreement but in the meantime any member of the E.C.A. who is contemplating work which would necessitate sending employees abroad is asked to communicate with the Association's head office. The N.J.I.C. has expressed the opinion that no employer should compel labour under the age of twenty years to work on contracts outside the United Kingdom. Such labour should only be sent abroad if the lad or his parents, on his behalf, express their willingness.

#### American Diesel-Electric Locomotives

WITH the recent delivery of the last of a fleet of sixteen Diesel-electric locomotives to the New York, Susquehanna and Western Railroad that line becomes the first all-Diesel-electric Class I railway in the country. The sixteen engines are reported to be able to handle much more freight and passenger traffic on faster schedules than the thirty-two steam locomotives they replace. The operating cost of the new units on passenger runs is placed at 49c. per locomotive-mile as compared with \$1 for the steam units. In addition, in 1945 the sixteen units are expected to handle about 113,000,000 freight-ton-miles at an operating cost of 60c. per locomotive-mile compared with \$1.14 in the case of steam haulage. Altogether, more than \$400,000 a year will be saved.

# Views on the News

## Reflections on Current Topics

**I**T is very unfortunate that the seriousness of the coal situation should make it necessary for the Minister of Fuel and Power to ask for economies in street lighting almost before we have got used to having it at pre-war strength. Still the extinguishing of lamps at midnight will inconvenience only a very small minority and, as an official of the Ministry said last week, "there is good reason to believe that the public will welcome a request which may help to relieve the domestic fuel situation during the coming winter, many householders having already protested against powerful illumination of deserted streets, and lights on during comparative daylight while they are asked to economise on fuel." I cannot help thinking, however, that an announcement to the effect that coal output was on the upgrade would receive an even more enthusiastic welcome.

\* \* \*

Although the coal situation at the moment still requires the utmost economies in the use of electricity, it is not to soon to contemplate the great advance in the illumination values that is to be expected in the home when conditions improve. In industrial and commercial premises standards of illumination have been raised considerably during recent years largely as a result of the introduction of the 80-W fluorescent tube and it is to be expected, quite apart from other reasons, that the availability of a range of smaller tubes for domestic use will result in the more lavish use of electric lighting.

\* \* \*

Some idea of the lighting intensities to be aimed at in the home of the future is given in the June issue of *Illuminating Engineering*, published by the Illuminating Engineering Society of America. For general lighting of living-rooms, etc., (5 foot-candles) and the kitchen (10 foot-candles) the figures recommended are not appreciably higher than those recommended in this country before the war; in fact they are rather lower than those suggested here for the living-room and bathroom (both 6-10 foot-candles). When it comes to special situations, however, the figures go up with a jump. For reading for prolonged periods (small type), the kitchen table, cooker and sink, the laundry and the bathroom mirror 40 foot-candles is recommended, while for fine sewing on dark cloth an intensity of 100 foot-candles or more is not considered too much. Even these high figures will, I venture to forecast, be further advanced in a few years' time. In making such recommendations as this account must,

of course, be taken of the degree of contrast to be found in the objects to be viewed and it is in this direction that investigations being undertaken in this country are largely proceeding.

\* \* \*

Reference has already been made in the *Electrical Review* to the probable reluctance of people who have been working in modern munition factories, with all kinds of amenities, to return to the ill-equipped works from which they came. Recently Ferranti's found that a large number of girls from the cotton industry who had been employed by them during the war were by no means anxious to go back to the mills and last week the President of the Board of Trade said that shortage of labour in the textile industry was the reason for the trimming of the already meagre clothing ration.

\* \* \*

Sir Stafford Cripps said that the only way to remedy the position was to make the industry more attractive. This, I think, is where the electrical industry steps in, for only electrification can effect the necessary transformation. During the years of depression the textile industry had no funds for improvement and conditions have remained pretty primitive in a large proportion of mills. In some of them gas lighting still persists (in 1945!) and many more rely on antiquated driving systems. Several of the electricity supply engineers in Lancashire have been doing their best to improve matters and they have had some success, but there is an immense amount of work waiting to be done. All this will take time, however; can the workers be attracted back by mere hints of better conditions? I think that definite plans will have to be made to give the necessary reassurance.

\* \* \*

Of course, the textile industry is only one sphere in which modernisation is desirable and necessary. The Minister of Labour has just set up a committee to inquire into the conditions prevailing in foundries. Many other branches of industry are largely dependent upon castings and yet there is a shortage of labour said to be due to a great extent to the unattractive nature of most existing foundries. Here is another direction in which electricity can help to raise the "standard of living" and at the same time improve productive efficiency. The work will involve considerable expenditure but I consider that in most cases the return will provide ample justification.—REFLECTOR.

# PERSONAL and SOCIAL

## News of Men and Women of the Industry

**T**HE accompanying picture was taken at a recent meeting of the Consultative Technical Committee for the South West England and South Wales Area of the Central Electricity Board held in Bristol. Almost without exception the towns of the area which received heavy damage during the war are represented in the photograph. Mr. F. H. Corson, until recently chief engineer and manager at Gloucester, was also present, but is not in the picture. Messrs.

released and Mr. Shinwell, the new Minister, has reluctantly agreed to his resignation. Mr. John Innes, who has been in the Ministry since 1942, is now to take charge as controller, with the rank of deputy secretary. Sir Charles Reid becomes production and technical adviser, and Mr. J. Armstrong labour adviser.

Sir Hugh Beaver, Controller General, Ministry of Works is, at his own request, being released from his present appointment at the end of



**Engineers of the C.E.B. South-West England and South Wales Area**

*Front Row (left to right):*—Messrs. W. G. Turner (Southampton), L. Howles (South Wales Electric Power Co.), J. T. H. Legge (Area manager), B. Handley (Portsmouth, chairman of Consultative Technical Committee), E. Jones (Cardiff), and A. J. Newman (formerly of Bristol). *Standing (left to right):*—Messrs. H. K. B. Lund (chief accountant), R. W. Biles (chief operation engineer), H. G. Fraser (Oxford), T. H. Wood (Newport, Mon.), J. W. Spark (Bath), H. Midgley (Plymouth), I. A. D. Pedler (Bristol), E. Braathen (Gloucester), T. S. Andrew (chief technical engineer), C. McCausland (Bournemouth & Poole E.S. Co.), G. J. Hollyer (Torquay) and H. F. R. Taylor (second assistant operation engineer)

H. E. Blackiston (Swansea), H. S. Ellis (West Gloucester), A. L. Keet (Exeter), H. G. Merrick (Llanelli), A. Nicklin (Swindon), and A. C. Owen (Cornwall Power Co.) all members of the Committee, were unavoidably absent.

In the House of Commons last week the Prime Minister announced that the Government had decided to appoint an Advisory Committee to assist it in dealing with questions raised by the discovery of atomic energy. The chairman of the Committee is to be Sir John Anderson and the members include Sir Edward Appleton (Director of the Department of Scientific and Industrial Research), Sir Henry Dale (President of the Royal Society), Professor P. M. S. Blackett, Sir James Chadwick and Sir George Thomson.

Mr. D. E. Taylor, of Swinton, has been appointed borough electrical engineer of Bacup, Lancs.

Sir Hubert Houldsworth, who has been controller-general at the Ministry of Fuel and Power since its inception has asked to be

September. To facilitate the reorganisation of the Ministry of Works, General Sir Frederick Pile, Director-General, has resigned.

Following the appointment of Mr. J. A. Ogden as deputy chief electrical engineer of Oldham, Mr. C. A. Cross, assistant mains engineer, becomes senior assistant, and Mr. H. W. Mellor has been appointed assistant.

The Radio Communication and Electronic Engineering Association entertained the delegates to the Third Commonwealth and Empire Conference on Radio for Civil Aviation at a cocktail party at the Dorchester Hotel on August 17th.

On August 18th the engineer and manager of the Brighton Corporation Electricity Department (Mr. H. Pryce-Jones) made a presentation to Mr. G. W. King, who has retired after forty-four years' service with the undertaking.

Mr. R. H. Ellis, depot manager for Crompton Parkinson, Ltd., for Nottingham, has been elected chairman of the Nottingham branch of



the Incorporated Sales Managers' Association, of which he has been awarded a fellowship.

**Miss Caroline Haslett, C.B.E., Comp.I.E.E.,** director of the Electrical Association for Women, has been elected a vice-president of the Royal Society of Arts, the first woman to be so appointed.

**Major C. V. Wattenbach** has been released from the Army and will be rejoining the board of Dictograph Telephones, Ltd., as an active director on September 1st.

**Mr. W. S. Kelly, B.Sc., A.M.I.E.E.,** mains engineer and assistant to the burgh electrical engineer at Greenock since August, 1939,



**Mr. W. S. Kelly**

has been appointed deputy borough electrical engineer at Great Yarmouth to succeed **Mr. R. C. Golding**, recently appointed borough electrical engineer at Wallasey. During the war **Mr. Kelly** was engaged in the electrical development of Greenock and Port Glasgow as ship-building centres and Admiralty ports. His early training was obtained with the Macfarlane Engineering Co., Ltd., and for a short period he was on the power station staff of Glasgow Corporation Transport Department. In 1931 he was appointed assistant district engineer to the Dumfries County Council at the commencement of its extensive rural development scheme which was followed by a period as assistant mains engineer at Dundee with later promotion to senior assistant distribution engineer. **Mr. Kelly** obtained his theoretical training at Glasgow University and graduated in 1929 with first-class honours in electrical engineering. He has taken an active interest in the Electrical Power Engineers' Association, being a past chairman of the Northern Section.

**Mr. G. W. King**, a former chief assistant engineer to the Brighton electricity undertaking, was recently presented with savings certificates on his retirement after forty-four years' service with the undertaking. The presentation was made by **Mr. H. Pryce-Jones**, engineer and manager.

Cheques from their colleagues were presented by **Mr. F. W. Godden**, electrical engineer and manager of Coventry, to **Messrs. R. Goode, J. Keeves, A. Dalton and W. Givens** who have recently retired on reaching the age of sixty-five and between them have totalled 110 years of service.

**Mr. A. G. L. Anderson**, general manager of the Shotley Bridge and Consett District Gas Co., Co. Durham, has been appointed engineer and

general manager of the Bognor & District Gas & Electric Co., Ltd.

**Mr. A. J. C. MacLeod, A.M.I.E.E., Assoc. M.C.T.,** has resigned his position with the Metropolitan-Vickers Electrical Co., Ltd., to take up an appointment as technical sales engineer at the London office of the Electric Construction Co., Ltd. **Mr. MacLeod** received his technical education at the Manchester College of Technology and after serving his apprenticeship at the Metropolitan-Vickers Trafford Park Works, was given a position on the design staff, being later transferred to the company's Birmingham office and appointed frequency change engineer. On completion of the frequency change-over in the Midland area, **Mr. MacLeod** took up a position as technical sales engineer for the company in London.



**Mr. A. J. C. MacLeod**

**Mr. S. K. Reeves, A.M.I.E.E.,** who served throughout the war with the R.A.F. as a technical officer, has recently been released, and has rejoined the London sales staff of the Electric Construction Co., Ltd.

**Dr. G. E. Haefely, M.I.E.E.,** chief engineer to the Micanite & Insulators Co., Walthamstow, has severed his connection with the company and intends to establish himself as a consultant on plastics.

**Sir Leonard Browett** has been appointed director of the National Union of Manufacturers in succession to **Sir Charles Hipwood**, who has retired through ill health.

**Mr. T. S. Parkinson, A.M.I.E.E.,** deputy borough electrical engineer and manager of St. Helens, has been appointed to succeed

**Mr. J. B. Hudson, A.M.I.E.E.,** the retiring borough electrical engineer and manager of Leigh (Lancs). **Mr. Parkinson** received his technical training at the Barrow Technical College and Manchester College of Technology, and after serving his apprenticeship at Barrow held important positions at Barrow, Salford, Blackburn and St. Helens. During his service with St. Helens, **Mr. Parkinson** has taken a leading rôle in the development of the electricity undertaking and was responsible for the successful rural electrification scheme. He was a pioneer in the development of the all-electric method of



**Mr. T. S. Parkinson**

grain-drying on the farm, and other agricultural applications of electricity. He serves on the Committee of the Mersey and North Wales Centre of the Institution of Electrical Engineers.

**Councillor J. W. Mayall**, managing director of Mayall & Co., Ltd., electrical wholesalers, Birmingham, has accepted an invitation to be the next mayor of Sutton Coldfield.

**Mr. C. H. Brearley**, charge engineer with the Rawtenstall electricity undertaking, who has just retired on superannuation after forty years' service in the industry, has been presented with an electric radiator by the staff of the Electricity Department.

To meet the requirements of its extensive programme of works, including rural electrification, the development of the River Erne, co. Donegal, and peat generation of current, the Irish Electricity Supply Board is inviting applications for about a dozen positions on its engineering staff, carrying salaries from £350 to £500 per annum.

The City of Coventry is advertising for a power station electrical maintenance engineer (£509-£534); Huddersfield requires a chemist for its St. Andrew's Road power station (£393-£404); and the Lanark County Council wants an assistant county lighting engineer.

## Obituary

**Mr. J. S. Highfield.**—A memorial service for the late Mr. J. S. Highfield was held at St. Mary Abbots, Kensington, on Friday last, Prebendary A. E. Smith officiating. In addition to members of the family there were present many representatives of his firm, of all branches of the electrical industry and of organisations with which Mr. Highfield was connected.

**Mr. J. A. E. Wells**, a director and foundry manager of Edgar Allen & Co., Ltd., died last week at the age of fifty-nine.

**Mr. R. Ferguson.**—The death is reported from Glasgow of Mr. Robert Ferguson, who was for many years secretary to Kelvin, Bottomley & Baird, Ltd., and was latterly a director of the company. He was seventy-five.

## I.E.E. Notes

**THE** Council of the Institution of Electrical Engineers has decided to continue the scheme for making the technical meetings of the Institution accessible to those who may be interested in the proceedings but who may consider that their technical experience and educational attainments do not suffice to admit them to any form of Institution membership. A fee of 10s. is charged to cover administrative costs.

In the event of sufficient support being forthcoming the committee of the I.E.E. North-Eastern Centre proposes to organise one or more specialist groups. It is suggested that to begin with one with the title of "Radio and Measurements (and Light Engineering) Group" might be formed.

## CORRESPONDENCE

*Letters should bear the writers' names and addresses, not necessarily for publication.*

*Responsibility cannot be accepted for correspondents' opinions.*

### Education of Graduates

**THE** article by Mr. E. G. Ross in the current issue of your journal is of very great interest. In particular the reference to the fact that no university, or equal institution, will permit the completion of a degree course, subject by subject is a matter of keen regret to many graduates of the Electrical and Mechanical Institutions who, having done several years of hard and exacting training (usually at evening classes), find it impossible to achieve the advantages of an external degree.

Their case is worthy of careful consideration by educational bodies because, having qualified as a graduate of one of the Institutions referred to, they have already completed much of the work necessary for a degree and the existing regulations will not exempt them from any part of the degree course. Further progress is impossible unless the student is willing to sacrifice most of his very limited spare time in repeating work in which he has already been examined.

In view of the present shortage of trained engineers, it is also important that schemes of further education should be developed quickly so as to remove the strong feeling of injustice referred to in the article.

Ilford.

C. C. BARNES, Grad.I.E.E.

### Concerning Trams

**I**N your issue of August 17th there appear some admirable remarks by "Reflector" on the subject of tramcar replacement. His remarks, I think, partly form an answer to Mr. N. H. Bett and "Fairplay."

Surely these gentlemen must now realise that they are only "flogging a dead horse" and cannot alter the preference of responsible bodies of this country for alternatives to the tramcar.

The allegation of "Fairplay" that non-tracked vehicles swerve from one side of the road to the other is surely an example of bias. Are members of the public biased because they complain of noise? Does "Fairplay" really consider that the cacophony caused by trams on a cobbled street should be endured by hard-working British men and women, who the noise chiefly effects?

Watford.

A. R. GRIERSON.

## Tummel-Garry Scheme

Tribunal's Report : Confirming Order Made

**A** REPORT by the Tribunal (of which Mr. John Cameron, K.C., is chairman) appointed by the Secretary of State for Scotland to adjudicate on objections to Constructional Scheme No. 2 of the North of Scotland Hydro-Electric Board has now been issued with an explanatory memorandum (Stationery Office, 4d. net). This Scheme covers the provision of 150,000 kW from the Tummel-Garry project and 3,000 kW from the Gairloch project. The latter, which would cost £276,000, is designed purely for the benefit of local consumers and is not expected to be remunerative, at least initially; this part of the Scheme was not opposed.

The larger project allows for three stations at a capital cost of £6,174,000. These comprise: 16,000 kW at Pitlochry (50 ft. head) to run at 40 per cent. annual (rising to 90 per cent. daily) load factor; 57,000 kW at Clunie (170 ft.) at 22 per cent.; 75,000 kW at Tummel (610 ft.) at 12 per cent. The Clunie and Pitlochry portions are to be completed in 2½ years and the whole in 3½ years from the start of the work. Labour required would be up to 4,000 persons.

The Tribunal finds that the only practicable way in which the Hydro-Electric Board could comply with the provisions of the Act of 1943 to meet the prior local claims for electricity and to balance its budget over a term of years is to sell its output to the Central Electricity Board. No other suitable alternative scheme was

available that could be brought into use within a comparable period and, in view of the urgency of meeting peak loads in Central Scotland, the promotion of the whole Scheme was held to be in the public interest.

The price payable by the Central Electricity Board varies with the price of coal in Central Scotland. The profits of the scheme were based upon 35s. per ton, and each 1s. difference would affect the Hydro-Board's estimated net profit by £10,000. Subsidies to uneconomic projects would require £28,000, but it was held that the price of coal would be unlikely to drop to such a figure as seriously to diminish the expected margin of profit.

"Upon the question of amenity there was a complete conflict of evidence" and the Tribunal considers that any loss of this kind would not be sufficient to counterbalance the advantages of the project. For instance, the Pass of Killiecrankie would not be adversely affected and a minimum daily flow in the Tummel has been guaranteed. Tourist traffic should not be substantially diminished. Agriculture would not be materially affected and any probable damage to fisheries would be insufficient to bar the hydro-electric development of the Tummel and Garry. The technical merits of the Scheme were not seriously contested.

The Order confirming the Scheme has now been made and will have effect after it has lain before Parliament for forty days, if no annulling resolution is passed by either House.

## The Durham Project

Decision Against Kepier Site

**L**AST week the Ministry of Town and Country Planning issued a statement in which it recalled that in December, 1944, the Ministry and the Electricity Commissioners held concurrent inquiries into the application of the North-Eastern Electric Supply Co., Ltd., to the Commissioners for permission to erect a power station at Kepier, near Durham. The Electricity Commissioners were satisfied as to the technical suitability of the company's proposals, but the Minister of Town and Country Planning (then Mr. W. S. Morrison) found them open to objection on planning grounds and decided, in consultation with Major Lloyd George (Minister of Fuel and Power at the time) that, if the occasion arose, he would on those grounds feel bound to refuse his consent to the proposal. The Minister of Town and Country Planning had now been informed by the company that, in an endeavour to mitigate the effects of the delay the company had already taken steps to meet the present demand for additional electricity supply by the

installation of plant elsewhere than at Kepier.

Following this statement Col. S. E. Monkhouse, managing director of the North-Eastern Electric Supply Co., explained that the company was erecting new plant at the Dunston works at a cost of nearly £2,000,000, but that the extension was not an alternative to the £3,500,000 Kepier (Durham) scheme. An alternative to the Kepier site would be considered by the directors.

The Dean of Durham (Dr. C. A. Alington), welcoming the decision against the Kepier site, said that he did not believe the scheme would have increased the prosperity of Durham County and he was sure it would have ruined the future of Durham City. On the other hand Mr. S. Watson (general treasurer, Durham Miners' Federation), said that his organisation regretted the decision which (in view of the coming intensified drive for increased coal production, which would necessitate the complete electrification of the Durham coalfield) would militate against the production policy laid down by the Minister of Fuel and Power.



# Mining Machinery Exhibition

## Electrical Equipment at Moira Colliery

**T**HE South Midland Sub-branch of the Association of Mining Electrical and Mechanical Engineers recently arranged an exhibition of mining machinery in the new Central Workshops of the Moira Colliery Co., Ltd., near Burton-on-Trent. The British

protection is a new feature developed for the "ETJ" switch fuse to facilitate compliance with the draft regulations on surface installations. The unit is suitable for assembly on busbars to form l.v. distribution switchboards, and has an interrupting capacity up to 25 MVA.

The earth leakage trip is obtained by means of an explosive cartridge and toggle mechanism, and has a standard sensitivity of  $12\frac{1}{2}$  per cent.

In addition to a typical flameproof thruster on the stand, there was erected outside the exhibition building a thruster-operated air-lock door of novel design forming part of a complete photo-electrically controlled air-lock equipment for underground main road installation. Other exhibits included the ML10 "joint box" 50-VA flameproof lighting transformer;

"Fabroil" silent pinions and "Fabroil A" laminated fabric sheet; various lighting fittings, miner's lamp bulbs and the pneumatic electric discharge lamp; a 400-W "Mercra" lamp with reflector, which is a valuable aid in dis-



Mining gear shown by the British Thomson-Houston Co., Ltd., in association with the Metropolitan-Vickers Electrical Co.

Thomson-Houston Co., Ltd., showed a comprehensive range of flameproof equipment made by itself and its associated company, the Metropolitan-Vickers Electrical Co., Ltd. Representative of the wide range of mining motors were an all-steel conveyor motor and a general-purpose mining motor. Among recent developments there was a display of gate-end control gear consisting of an automatic gate-end box for control of coal cutters and conveyors, up to 60 HP, a 150-A section switch, a 24-kVA lighting transformer unit, and a high-frequency double drill supply unit.

Examples of flameproof general-purpose control gear comprised 7½- and 10-HP direct-on-line contactor starters, a 6-HP reversing starter, a 60-HP self-contained haulage control unit and a 75-HP flameproof resistance of the tubular type. The provision of earth leakage



Display of Ellison equipment

tinguishing dirt and impurities in the picking operation; and a "Mazdalux" fluorescent flameproof fitting.

Another electrical manufacturing company, George Ellison, Ltd., showed a range of its mining electrical switchgear including air gate-end circuit-breakers, oil-break circuit-breakers, oil-cooled rotor starters, oil-cooled auto-transformer starters, lighting fittings and cable couplings, a transformer for lighting circuits, and several specimens of gear for surface installations.

The air-cooled rotor starter is one of the most recent additions to the Ellison range and is designed for motors of up to 260 HP. The cable fittings available for this starter allow the main and auxiliary cables to be brought in without awkward bends. Auxiliary terminals provided enable fine wiring for electrical inter-

locks to be made conveniently at any time. The roller contacts, which are self-aligning and self-seating, ensure smooth movement.

The flameproof transformer unit for low-voltage lighting can either be air or oil cooled. Connection to the mains is made through Ellison power cable end couplings, while the low-voltage circuit is connected through an Ellison lighting cable end. Ellison flameproof cable end couplings are made for single ends and for one, two or three-way distribution. Links join each section of cable so that a third or fourth cable can be "teed" off without disturbing the straight-through connection. The lighting fittings shown are designed for use in conjunction with the lighting cable coupling.

## Workmen's Compensation

### Comparison of Existing and Proposed Arrangements

By F. E. Sugden, A.C.I.S., Barrister-at-Law

**T**HE White Paper on Social Insurance suggested some revolutionary changes in workmen's compensation. Speaking as a lawyer, with experience of workmen's compensation cases, I am sure that the legal profession and industrialists will welcome these changes because the present Workmen's Compensation Act has become more and more costly and complicated to administer.

One difference between the proposed Act and the present Workmen's Compensation Act is that it will cover all persons working under contract of service or apprenticeship, except those under school leaving age, including office workers. It will not provide for "contracting out schemes," which enable firms to institute other compensation arrangements. The Act will apply to accidents arising out of and in the course of employment and to specified industrial diseases.

#### Central Fund

In the past liability has been upon each individual employer; it is now proposed to establish a central fund from which all benefits, both in disablement and fatal cases, and administrative charges will be paid. The fund will be maintained by weekly contributions from employers and workmen, collected by the usual methods, supplemented by contributions from the Exchequer. The weekly rate of contribution will be 6d. for adult men and 4d. for women, to be shared equally between the employer and workman. The rates for juveniles will be half these rates, and it will not be necessary to have contri-

buted for a specific period to obtain benefits, which will be payable immediately.

Under the existing arrangements each individual employer voluntarily covers himself against compensation through an insurance company. The new scheme will be under the general charge of the Minister of Social Insurance and provision will be made for the collaboration of industry in the following manner: (1) an Advisory Committee or Council will be set up on which employers and workmen will be equally represented, to advise the Minister on important matters of policy and administration referred to them; (2) employers and workmen will be equally represented on local appeal tribunals.

In the past, the employee claimed against his employer through the local County Court, the Judge acting as arbitrator between the parties. This method is to be superseded by a system under which claims will be dealt with by a pensions officer subject to appeal to local tribunals, with a further right of appeal to an industrial injury insurance commissioner, against whose decision there will be no further appeal.

At the present time injured workmen receive only half wages, subject to a maximum in the case of total disablement and *pro rata* for lesser disablement. Under the new scheme benefits in disablement cases will be at a uniform flat rate. They will consist of an industrial injury allowance payable for an initial period, while the workman is incapacitated for work followed, where disablement is likely to be permanent or prolonged, by an

industrial pension, which will be supplemented by a special allowance if the prospective pensioner is unemployed. In addition allowances will be given for family responsibilities. Treatment allowances and allowances for constant attendance by a medical practitioner may also be provided.

The present Act bases the amount of compensation upon the loss of earnings and on the degree of disablement. In the new scheme the degree of disablement will be assessed by a medical board subject to certain rights of appeal to a special tribunal, on a comparison of the employee's condition with that of a normal healthy person of the same age and sex. The pension will be unaffected by subsequent earnings. No provision will be made for commutation of the pension by a lump sum payment, but where the injury results only in a minor degree of disability, provision will be made for a final settlement by an award of a gratuity or of a temporary allowance at a special rate, with or without a final gratuity.

In fatal cases, provision will be made for the payment of a pension to the widow with an allowance for the first child. Where the first child is an orphan, a higher rate of allowance will be payable. In addition, provision will be made in certain circumstances for the payment of a pension to one or both parents, or where no widow or

parent's pension is payable, to one adult dependent member of the deceased workman's family. Provision will be made for payment of temporary pension or benefit in other cases, for instance, the widow of a deceased workman will receive (a) if she is fifty years of age or over or being under that age has the care of a child of the workman a pension of 30s. weekly and (b) in other cases a pension of 20s. weekly. An allowance of 7s. 6d. weekly will be made in respect of a first child of the workman. There will be a weekly allowance of 12s. (of which 5s. will be provided by the Exchequer) for each child who becomes an orphan (a child whose parents are both dead) by the death of the workman.

Where no pension is payable to a widow or a parent, one other adult member of the deceased workman's family who was residing with him at the time of the injury, will be eligible for a pension if incapable of self-support. The maximum rate of pension will be 20s. weekly. Any adult member of the deceased workman's family who is not eligible for any pension under this scheme will be eligible for a temporary allowance of 36s. weekly for thirteen weeks.

These proposals (with minor amendments) were embodied in a Bill introduced on June 11th, but subsequently withdrawn on account of the imminent dissolution of Parliament.

## Municipal Reports

### Kingston-upon-Thames

IN a report covering the years 1940-45 the borough electrical engineer of Kingston-on-Thames (Mr. E. J. Jarvis) records the progress which is being made in the erection of the new generating station which is to serve the whole of the Thames Valley area. The Corporation received a direction from the C.E.B. to construct the station in 1939, the ultimate capacity to be 120,000 kW, and Messrs. Preece, Cardew & Rider were appointed consulting engineers. Due to the war the necessary permit to commence could not be given until August last year, but contracts for the turbo-alternators and boiler-house plant were arranged. Work started in December last. Mr. Jarvis states that the estimated date for completion is unlikely to be achieved unless more labour is forthcoming at an early date. The old generating station will eventually be dismantled and the agreement with the London J.E.A. will cease, the Corporation taking a supply direct from the Board.

The report shows that although Government restrictions caused a reduction of 18 per cent. in electricity sold for business and public lighting purposes, in the aggregate there has been a steady increase in sales equal to 3.5 per cent.

per annum. Installations which have been carried out by the Department include the cooking equipment at the British Restaurant.

As regards the past year's working, the accounts of the borough treasurer (Mr. A. R. Norris) record a revenue of £145,192 from the sale of 26.4 million kWh compared with £139,123 and 25.9 million kWh in the previous year. Total income was £148,561 and working expenses were £126,634, and after meeting all charges there was a net profit of £627 (against £4,633).

### Leigh

The 1944-45 annual report of the Leigh (Lancs.) electricity undertaking signed by Mr. J. B. Hudson records a reduction in total sales from 27.1 million to 26.3 million kWh as a result of the Government direction for a 10 per cent. cut in industrial consumption. Gross income was £113,579 (against £116,587) and working costs were £95,010 (£96,818) and there was a profit on the year's working, after payment of interest and other charges, of £3,463 (£5,673). An analysis of working costs shows that the inclusive cost per kWh sold advanced from 0.970d. to 0.993d., while the average revenue was 0.01d. higher at 1.02d.



# Spain's Imports

## Growth of Switzerland's Share in 1943

THE demands of Spain for imported electrical materials continue to increase. The following table gives the values of the imports of the principal items in 1943 with a note of changes compared with 1942. The figures are in gold pesetas, the rate being between 11 and 12 to the £. It will be seen that there were increases of between 30 per cent. and 50 per cent. in nearly all groups, notably power installations and domestic appliances. A larger share was taken by Switzerland, while Sweden also was well represented. At the same time German business was maintained.

While the absence of foreign competition has stimulated the establishment of numbers of

small factories the larger concerns have not benefited fully from the increase in domestic demand because they have not always been able to obtain needed raw materials and replacements for their machinery. Industrial expansion, combined with shortage of imported coal and coke of high grade, brought a great increase in the demand for electric power. A plan for something in the nature of a grid has been approved and when the necessary equipment can be obtained from abroad the connecting lines will be taken in hand together with the installation of new power plant under a five-year plan. Both hydraulic and thermal stations are proposed.

| Class  | 1943<br>Pesetas<br>(000) | Inc. or<br>dec.<br>on 1942<br>Pesetas<br>(000) | Class  | 1943<br>Pesetas<br>(000) | Inc. or<br>dec.<br>on 1942<br>Pesetas<br>(000) |
|--|--------------------------|--|--|--------------------------|--|
| <i>Dynamos, motors, fans, alternators,<br/>transformers, starters, rheostats<br/>and parts up to 5 kg.</i> | 1,466                    | + 576  | <i>Electric meters, voltmeters, am-<br/>meters and electro-medical<br/>apparatus</i> | 4,394                    | + 2,584  |
| From Germany ..  | 1,102                    | + 462  | From Germany ..  | 1,370                    | —  |
| " Switzerland ..   | 174                      | + 64   | " Switzerland ..   | 1,130                    | + 880  |
| " Britain ..   | 50                       | + 10   | " Sweden ..  | 226                      | + 226  |
| " United States ..   | 44                       | + 32   | <i>Switchboards</i>  | 172                      | + 92   |
| " Italy ..   | 43                       | — 4  | From Germany ..  | 42                       | + 27   |
| <i>Ditto from 5 to 25 kg.</i>  | 1,140                    | + 500  | " Switzerland ..   | 79                       | + 47   |
| From Germany ..  | 376                      | + 96   | " Britain ..   | 25                       | + 23   |
| " Switzerland ..   | 441                      | + 261  | <i>Heaters, cookers, hotplates, etc.</i>   | 506                      | + 406  |
| " Sweden ..  | 44                       | + 42   | From Germany ..  | 353                      | + 263  |
| " United States ..   | 12                       | — 4  | " United States ..   | 78                       | + 75   |
| <i>Ditto from 25 to 100 kg.</i>  | 1,797                    | + 937  | " Switzerland ..   | 41                       | + 33   |
| From Germany ..  | 895                      | + 415  | <i>Accumulators</i>  | 127                      | + 115  |
| " Switzerland ..   | 539                      | + 259  | From Germany ..  | 54                       | + 46   |
| " Britain ..   | 6                        | + 4  | " Sweden ..  | 56                       | + 54   |
| " United States ..   | 4                        | — 6  | <i>Dry batteries</i>   | 211                      | + 97   |
| " Sweden ..  | 46                       | + 17   | From Germany ..  | 211                      | + 141  |
| <i>Ditto from 100 to 500 kg.</i>   | 1,493                    | + 713  | <i>Lamps, complete</i>   | 681                      | + 256  |
| From Germany ..  | 717                      | + 502  | From Germany ..  | 537                      | + 172  |
| " Switzerland ..   | 570                      | + 380  | " Britain ..   | 2                        | — 8  |
| " Britain ..   | 8                        | — 1  | <i>Mercury-vapour lamps</i>  | 422                      | + 122  |
| " United States ..   | 59                       | + 55   | From Germany ..  | 307                      | + 137  |
| " Sweden ..  | 60                       | + 34   | " United States ..   | 1                        | — 6  |
| <i>Ditto from 500 to 1,000 kg.</i>   | 492                      | + 187  | <i>Cables over 1 cm. diam.</i>   | 380                      | + 40   |
| From Germany ..  | 204                      | + 84   | From Germany ..  | 155                      | + 125  |
| " Switzerland ..   | 197                      | + 57   | " Britain ..   | 208                      | — 92   |
| " Sweden ..  | 47                       | + 38   | <i>Cables not exceeding 1 cm. diam.</i>  | 110                      | + 10   |
| <i>Ditto from 1,000 to 3,000 kg.</i>   | 1,233                    | + 843  | From Germany ..  | 35                       | — 19   |
| From Germany ..  | 584                      | + 394  | " Britain ..   | 59                       | + 49   |
| " Switzerland ..   | 459                      | + 359  | " Sweden ..  | 11                       | — 4  |
| " Sweden ..  | 24                       | + 15   | <i>Insulated wire less than 0.5 mm.</i>  | 41                       | + 1  |
| " Britain ..   | 14                       | — 8  | From Germany ..  | 40                       | + 32   |
| <i>Ditto from 3,000 to 5,000 kg.</i>   | 876                      | + 104  | <i>Telegraph and telephone apparatus</i>   | 3,542                    | + 1,632  |
| From Germany ..  | 73                       | + 65   | From Germany ..  | 2,076                    | + 1,246  |
| " Switzerland ..   | 803                      | + 167  | " United States ..   | 50                       | — 14   |
| <i>Ditto over 5,000 kg.</i>  | 3,351                    | + 2,691  | " Britain ..   | 12                       | — 48   |
| From Germany ..  | 1,897                    | + 1,707  | " Sweden ..  | 605                      | + 399  |
| <i>Generating sets and rotary con-<br/>verters up to 1,000 kg.</i>   | 374                      | + 289  | <i>Switches, circuit-breakers, lamp-<br/>holders, etc., up to 1,000<br/>grammes</i>  | 584                      | + 269  |
| From Germany ..  | 141                      | + 121  | From Germany ..  | 418                      | + 168  |
| " Sweden ..  | 79                       | + 59   | " United States ..   | 6                        | —  |
| " Switzerland ..   | 152                      | + 116  | " Britain ..   | 1                        | — 7  |
| <i>Ditto from 1,000 to 5,000 kg.</i>   | 81                       | — 59   | " Switzerland ..   | 125                      | + 115  |
| From Germany ..  | 12                       | + 10   | <i>Ditto, 1-100 kg.</i>  | 1,580                    | + 720  |
| " Britain ..   | 25                       | + 15   | From Germany ..  | 703                      | + 153  |
| " Switzerland ..   | 44                       | — 82   | " Switzerland ..   | 710                      | + 470  |
| <i>Ditto over 5,000 kg.</i>  | 187                      | — 533  | " Sweden ..  | 43                       | + 23   |
| From Switzerland ..  | 100                      | + 100  | <i>Ditto, 100 kg. and over</i>   | 1,140                    | + 800  |
|  |                          |  | From Germany ..  | 650                      | + 520  |
|  |                          |  | " Switzerland ..   | 392                      | + 207  |

# COMMERCE and INDUSTRY

## Chancellor and Purchase Tax. Trolley-bus Contract.

### Purchase Tax on Appliances

IN the House of Commons on August 21st, Mr. H. Hynd asked the Chancellor of the Exchequer whether he would consider rescinding purchase tax on all articles required for re-housing purposes, and Mr. Keeling asked to what extent cookers, water heaters and refrigerators supplied to Government-built houses were exempt from purchase tax; and whether he would place Government-built houses and houses built by local authorities and private enterprise all on an equal footing in this respect.

A further question by Major Boyd - Carpenter asked the Chancellor of the Exchequer whether he had considered the request made to him by letter by the Kingston-on-Thames Borough Council that purchase tax be remitted on domestic electrical apparatus required to equip new houses built in the borough; and what action he proposed to take on the request.

Sir Wavell Wakefield asked the Chancellor if, in view of their essentiality, he would remove the purchase tax on electric cookers.

Mr. Dalton said that he had received suggestions from local authorities and from other quarters that domestic electrical apparatus and other articles of household equipment should be exempted from purchase tax. He would consider those and other suggestions for relief from purchase tax in the course of the general review, which he was now making, of the present levels of all forms of taxation.

### Resettlement Advice Offices

Almost all of the 371 Resettlement Advice Offices planned by the Ministry of Labour and National Service for the use of men and women released from service in the Forces or from other forms of war service have now been opened.

### East African Association of Engineers

The East African Association of Engineers has recently been formed, primarily at the request of a number of chartered engineers and allied scientists, with the object of encouraging the development of engineering in East Africa and the interchange of technical knowledge between members of the engineering profession. The first president of the Association is Mr. G. P. Willoughby, M.Sc.Tech., M.I.E.E. Mr. J. C. V.

Buckhurst, P.O. Box 1191, Nairobi, Kenya, is the honorary secretary.

### Blackburn Electrical Exhibition

As reported last week an "Electricity Looks Forward" exhibition, organised by the British Electrical Development Association, has recently been held at Blackburn Public Halls. The Blackburn, Bacup, Accrington and Rawtenstall Electricity Departments and the Lancashire



Examining a kitchen equipped by Moffats, Ltd., at the Blackburn exhibition

Electric Power Co. co-operated. The accompanying picture shows Mrs. Moffat (of Moffats, Ltd., who equipped one of the kitchens), Councillor G. B. Eddie (chairman of the Blackburn Housing Committee), Alderman C. A. Critchley (chairman of the Blackburn Electricity Committee), Mrs. R. H. Harral and Mr. R. H. Harral (Blackburn's electrical engineer and manager).

### Radio Industry's Achievements

The story of the British radio industry's outstanding achievements during the war and its plans for the future is contained in a booklet entitled "The British Radio Industry in War and Peace," prepared by the Radio Industry Council, 59, Russell Square, London, W.C.1.

### Trade with the Continent

The Board of Trade wishes to make it clear to traders that there is full freedom of business communication with Holland, Norway, Greece, Yugoslavia, Czechoslovakia and Poland subject to the requirements of Trading with the Enemy legislation. This means in practice that it is not possible to enter into firm commitments regarding the exchange of goods or the making of payments, but that correspondence is

permitted regarding such matters as prices and terms of delivery in anticipation of the resumption of trade.

### Trade with Finland

Three Orders made under the Trading with the Enemy Act signed on August 20th, permit trade with Finland and remove Board of Trade and Custodian control over money or property accruing in consequence of this authorisation. Trade will normally be handled through normal commercial channels, and payment both for United Kingdom exports and for imports from Finland will be made in sterling through banking channels. Application for shipping space should be made to the shipping agencies in the normal way. The Finnish Government has appointed as trade representative, Mr. H. Kregius, 10, Arthur Street, Cannon Street, E.C.4 (telephone: Mansion House 8804), who will act as purchasing agent.

### Trolley Buses for South Africa

One of the largest orders for trolley buses received in this country from overseas, has just been placed by the City of Durban. The order is for the supply of fifty-two Sunbeam-BTH large type, three-axle chassis, forty-two of which will be fitted with English built M.C.W. all-metal 70-seater bodies, and the remaining ten with bodies of South African manufacture. The total value of the order is over £180,000. All the chassis will be fitted with B.T.H. electrical equipment. This is the fourth order for trolley buses placed by Durban Corporation with Sunbeam Commercial Vehicles, Ltd., who also have in hand large contracts for Johannesburg and Cape Town.

### Turbo-electric Tanker

Swan Hunter & Wigham Richardson, Ltd., Wallsend, have received an order from the Anglo-Saxon Oil Co., Ltd., for a 17,600-ton turbo-electric-driven oil tanker. The total power output will be 13,000 SHP on a single shaft, which it is believed is the highest ever attempted in a single-screw vessel of this type.

### Plastics and Zinc Alloys

A technical leaflet entitled "Plastic Mouldings and Zinc Alloy Die Castings," published by the Zinc Alloy Die Casters' Association, Lincoln House, Turl Street, Oxford, should be of considerable interest to designers of peacetime products. It contains a comparison of the uses and possibilities of plastic materials and zinc and shows the extent to which they are complementary.

### Fluorescent Carriage Lighting

Reference was made in our last issue to the fluorescent lighting which the Great Western Railway Company intends to install in its new coaches. The system has been developed by the British Thomson-Houston Co., Ltd., which supplied the equipment for a trial installation. The lighting layout was prepared jointly by G.W.R. and B.T.H. engineers.

Power is taken from the existing lighting set and battery, which feeds a motor-alternator set generating at 400 cycles. One of the advantages of this high frequency is the reduction in weight and size of gear as compared with a normal

50-cycle supply. Some improvement in lighting intensity is obtained by the use of fluorescent lamps, but the most marked advantages of this type of lighting lie in the reduction of glare and shadow, and the attractive quality of the general lighting effect.

### U.S. Electrical Appliance Market

With the relaxation of wartime production controls the American electrical appliances industry is making rapid strides towards full peacetime production. All controls have been removed from the manufacture of radios, electronic equipment, refrigerators, electric fans and laundry machines, and the industry is looking forward to 2,000 million dollars of business in the first year of normal production. For the time being, most of the appliances will be of pre-war design. The public is not expected to be able to obtain television sets until about the end of this year, manufacturers wishing first to ease the demand for radio sets. The General Electric Company intends to concentrate on one or two types of such articles as washing machines, refrigerators and ranges in an effort to get production under way as quickly as possible. The first complete assembly line for the production of household refrigerators got under way at the Corporation's Erie, Pennsylvania, plant at the beginning of August. Westinghouse Electric and the Radio Corporation of America both anticipate speedy achievement of normal production, the latter expecting to be turning out civilian radio sets by the middle of November.—*Reuter's Trade Service.*

### Radar Production in the U.S.A.

The General Electric Company has received an order to build commercial radar sets for installation on passenger ships now being built for the United States Maritime Commission. Called the "G.E. Electronic Navigator," the device detects through darkness, fog and storm the position of any above-water obstacles at distances up to thirty miles.—*Reuter.*

### Cambridge Instrument Conference

It was the custom for a quarter of a century, preceding the war, for the Cambridge Instrument Co., Ltd., each year to hold a conference of representatives and resident engineers from all over the world, to study new developments and processes of manufacture. The function was revived during the week following the August holiday. The conference included visits to the works at Cambridge and Muswell Hill where demonstrations were arranged of new and improved instruments with post-war applications and new methods of production. The engineers attending were all from various centres of the British Isles, but it is hoped soon to arrange a more comprehensive conference which overseas representatives may attend.

At a dinner which terminated the proceedings, Mr. Frank Wakeham, joint managing director, reported that communications had already been received from most of the overseas representatives including those in liberated countries, and that they all were anxious to renew relations and get to work as quickly as possible.

Mr. W. H. Apthorpe, joint managing director, remarked on the difficulties of the man-power situation and hoped that these would soon be removed so that post-war production of



standard equipment could proceed and foreign markets be re-opened.

During the evening an interesting brochure, based upon a reprint from *Engineering*, entitled "Fifty Years of Scientific Instrument Manufacture," was circulated. This brochure, which gives particulars of the organisation and personnel, marks the occasion of the jubilee of the company and copies are available from the company's publicity department, 13, Grosvenor Place, S.W.1.

### Tribute to British Workers

A 25,000-kW turbo-alternator built by C. A. Parsons & Co., Ltd., during the war for installation at the Bulimba power station of the City Electric Light Co., Ltd., Brisbane, Queensland, has now been in service for a year. The chairman of the company has announced that it has considerably improved the power station efficiency, and that it is proposed to affix to the machine a plate inscribed as follows:—"This machine is a tribute to British steadfastness and courage. British workmen made it while Britain was being ruthlessly bombed; and in 1941 British seamen carried it to us through many perils. En route they brought succour to Malta."

### E.A.W. Examination Results

The Electrical Association for Women's electrical housecraft certificate examination for demonstrators was held at eleven centres this year. Seventy-two candidates sat for the examination (double last year's figures) and fifty-one were successful, five gaining distinction. Of the 130 candidates sitting for the similar examination for teachers, held at nine centres, 104 were successful, twelve gaining distinction.

### Refresher Courses for Demonstrators

Miss H. M. M. Minoprio, principal of the London School of Electrical Domestic Science, Ltd., hopes to be able to re-open the school in January for the immediate purpose of running one 2-term and one 3-term refresher courses for women wishing to become demonstrators in the electrical industry. Miss Minoprio's temporary address is c/o E.D.A., 2, Savoy Hill, London, W.C.2.

### South African Electrical Industry

It is reported by *South Africa* that a South African electrical concern is to erect a factory at Benoni for the production of electrical equipment including domestic appliances and radio sets. About 5,000 men, including natives, will be employed.

### List of E.W.F. Members

A new edition of the Electrical Wholesalers Federation's "List of Members" is divided into two sections, showing membership alphabetically, and the other under towns. Copies may be obtained from the Director at 5, Vicarage Road, Henley-on-Thames.

### Spanish Factory Fire

Fire was raging last week at the Sociedad Electro-Mecanica factory, two miles outside Cordoba, which produces electrolytic copper and housing stocks of inflammable chemicals. A tremendous pall of smoke hung over the

town and difficulty in controlling the fire was increased by drought conditions. It was feared that the fire might spread to the adjoining Pirelli tyre factory.—*Reuter*.

### Steelworks and the Factories Act

Those sections of the Factories Act, 1937, which relate to iron and steel works are admirably summarised in a 39-page booklet written by Mr. E. L. Macklin, O.B.E., consulting safety and welfare officer to the United Steel Companies, Ltd., 17, Westbourne Road, Sheffield, 10. This group is prepared to supply copies, in bulk only, to other interested concerns, the cost being 2s. 6d. per copy in "Rexine" binding or 1s. 3d. in paper covers.

### Trade Announcements

The head office of W. T. Henley's Telegraph Works Co., Ltd., will be transferred back to London next Monday, to 51-53, Hatton Garden, London, E.C.1 (telephone: Chancery 6822; telegrams: Henletel, Smith, London). Henley's previous premises in Holborn Viaduct were totally destroyed by enemy action. The Hatton Garden premises are not large enough to accommodate the whole of the staff and certain departments will, for the time being, continue to operate from Milton Court, Dorking.

The postal area number of the Newcastle office of George Ellison, Ltd., has been changed and the address is now:—Victor Buildings, 15, New Bridge Street, Newcastle-on-Tyne, 1.

### Trade Publications

**Cambridge Instrument Co., Ltd.**, 13, Grosvenor Place, London, S.W.1.—Illustrated publication describing the Cambridge micro-thickness gauges for rolling mills, metal, and also the rubber industries.

**Runbaken Electrical Products**, 71-73A, Oxford Road, Manchester, 1.—Leaflet giving details of a new electric engine timer.

Applicants for copies of these publications should write on business letter-headings.

## TRADE MARKS

**T**HE following applications have been made for trade marks. Objections may be entered within a month from August 22nd.

**HERMDEL** (design). No. 611,184. Class 9. Luminous and mechanical advertising apparatus, flashlight signalling apparatus, searchlights, etc. Also No. 611,186. Class 11. Anti-dazzle devices for motor-car lamps, electric heating apparatus, lighting apparatus, etc.—F. J. D. and W. Hermens, Neuville (Seine). Address for service:—c/o W. P. Thompson & Co., 12, Church Street, Liverpool.

**SENTERCEL**. No. B633,285. Class 9. Electric current rectifying instruments and apparatus.—Standard Telephones & Cables, Ltd., Connaught House, 63, Aldwych, London, W.C.2.

**TIKO**. No. 633,947. Class 11. Electric lighting and heating fittings, etc., not included in other classes, none being of precious metal or imitation precious metal.—Blakey's Boot Protectors, Ltd., Armley Malleable Ironworks, Modder Place, Armley, Leeds.

## RECENT INTRODUCTIONS

### Notes on New Electrical and Allied Products

#### Domestic Iron

**A** NEW large type streamlined domestic smoothing iron fitted with variable heat thermostatic control will shortly be marketed by the ROCKMAN ENGINEERING CO., LTD., 16-18,



"Rockman Baby" iron

Russell Street, Manchester. In the meantime the "Rockman Baby" iron is being introduced weighing just over 5 lb. and loaded at 450 W. With a plated finish, it has an attractive red wooden handle with a comfortable thumb rest. The back rest could with advantage be strengthened slightly and modified to avoid pressure on the connector.

#### Neon Testers

To the range of "Pyrobit" products of the ACRU ELECTRIC TOOL MANUFACTURING CO., LTD., 123, Hyde Road, Ardwick, Manchester, 12, there has been added a neon tester in a cylindrical moulded case with a vest-pocket clip, which can be used for several purposes. It is a two-pole model with two flexible extension leads suitable for 100 to 400 V. Faults causing leakage are indicated by a glow when one lead is connected to "earth" and the other to the frame of the apparatus being tested; similarly polarity is indicated by a glow when one lead only is connected and the other is touched by the operator's finger. Connection of both leads will indicate continuity of a circuit, while if the user's head is shaken slowly when viewing the glow the presence of AC will be indicated by flicker, which is absent in the case of DC.

#### Compact Salt Baths

Smaller electrode salt baths of simpler design than those normally employed for the continuous heat-treatment of metals on a large scale are announced under the trade name of

"E.S.B. Minor" by WILD-BARFIELD ELECTRIC FURNACES, LTD., Watford By-pass, Watford, Herts. They are of unit construction, self-contained and complete for installation singly or as multi-unit batteries. The temperature range is from 550 to 1,380 deg. C. required for hardening high-speed cutting steels, within which limits other treatments can be carried out.

Open bearings on a front extension of the welded frame support the trunnions of an oval bath into which components 3.5 in. in diameter and 4.5 in. long can be inserted for treatment. It is lined with refractories, surrounded with insulating material in a rolled steel case having two lifting handles. Two electrodes mounted in recesses in the refractories are suitably connected for a vertical or tilting bath. The input of heavy current at low voltage is derived from a single-phase double-wound transformer for 200/250 V input, with a rotary output tapping switch interlocked with the main contactor to furnish the equivalent of "on-load" operation, in conjunction with an energy controller for closer regulation of the bath temperature. The latter reaches 900 deg. C. in 50 minutes,



Battery of three "unit" type electrode salt baths

subsequently remaining stable for an expenditure of 2 kWh. The bath body, weighing 100 lb., can be lifted out of its trunnion bearings to facilitate the use of separate baths for different salts to avoid contamination.

The "Henley Telegraph."—The summer number of the "Henley Telegraph" appears in an unusual cover. The contents include articles on the "Pluto" operation and the mine-sweeping cable in which Henley's played an important part, as well as reports of the staff's varied activities—including choral, dramatic and athletic events.

# Ships' Telephone Service

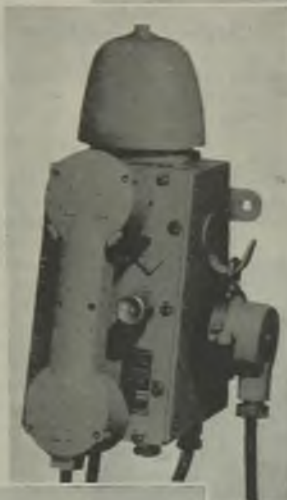
## New Instrument Designs and Testing Van

**A** FEATURE of "Pharos" intercommunicating telephones for ships, made by Alfred Graham & Co., Ltd., is that cabling with not more than two cores is needed to provide speech in both directions as well as lamp signalling with hoot- and bell-calling.

The latest cabin model is moulded of reinforced shock-resisting material. The cradle is so shaped as to prevent the hand-set falling out or causing clicking noises when the ship is rolling. Instruments for installation in engine rooms have an integral loud-sounding bell, extra receiver and additional terminals for an extension bell or signal lamp. The case of recent design has been elongated and inclined in front to be more roomy for connecting incoming cables. The Mark III series will serve up to four out-stations. A second caller can signal on the switch indicator his desire to break into the conversation, after which the original talk may be resumed without further calling. For four-way intercommunication there are "Ogden" desk and bulk-head instruments which prevent the possibility of conversation being overheard; visual indication of engaged station is provided. For non-secret circuits there are "Ripon" instruments with rotating dials for serving

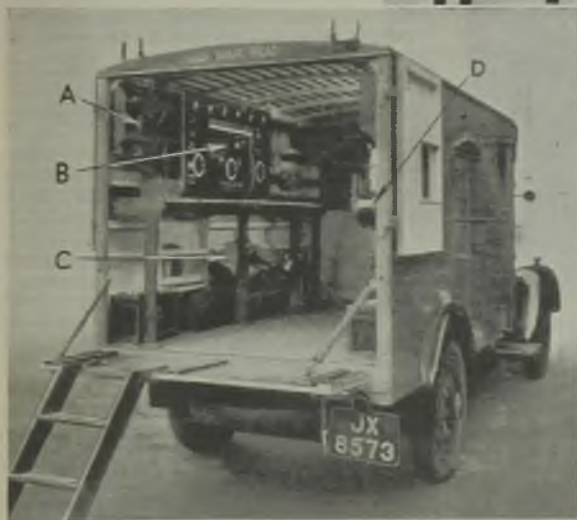


All-moulded cabin-type telephone, and (left) instrument for engine-room use



up to 30 out-stations. All these telephones are contained in sheet steel cases, which are copper plated and enamelled to minimise corrosion.

A two-ton motor van equipped as a mobile test-room and workshop has been designed by the company for servicing ships' equipment alongside docks, etc. The company specialises in telephone and other communication apparatus, sound signalling and audio-frequency reproducers of many kinds for Royal Navy and Merchant Marine service in all climates at sea. The van is therefore fitted out specifically for testing this kind of equipment; it includes a universal testing panel and



### Ship-side service van

A. Reels for portable leads; B. Universal test panel; C. Spare instruments; D. Charging equipment and DC supply

several additional standard circuits are designed to check the operation of particular instruments, thereby avoiding the necessity of stripping them for visual examination. Two large data sheets give details of standard tests which can be carried out by comparatively unskilled workers, or people



quite unacquainted with the circuit conditions of the apparatus in question.

The van carries batteries for furnishing DC at 12 and 24 V, while high voltage DC is derived from vibrators driven at 12 V. The switching and wiring enables the switchboard contained within the van to be connected to local 230-V 50-cycle AC mains in order to trickle charge the accumulators, which would normally be done at night between jobs or when the van was back at the works awaiting further call. Fixed on the rear of the van under the entrance are four reels for twin flexible cables which can be run out and slung aboard the ship for telephone communication between the van and the service engineer aboard, while two, three or four of the remaining leads serve to carry out tests of

instruments fixed to bulkheads, so avoiding the necessity of breaking glands and disconnecting instruments for testing in a shore establishment.

In the van is a 20-W amplifier of the push-pull class—a type for use when testing marine type loudspeakers and to enable the engineer in the van to call by voice signal his associate on the ship being serviced. The van carries spares for all standard instruments of the company's manufacture and small bench repairs can be made. That part of the equipment not required for testing forms a modest display of the company's standard instruments, all connected to a multiway plug board for demonstration of their actual operation under working conditions. The normal crew of three are all experienced drivers.

## Street Lighting Fittings

**S**EVERAL new lighting fittings are now being produced by the Engineering & Lighting Equipment Co., Ltd., Sphere Works, St. Albans, Herts.

The "Welwyn" lantern, a small hexagonal type with domed refractor glass, is the first of a series of these fittings for use with tungsten filament lamps of 60/200 W or mercury discharge

filament lamps. The whole series will be available for top or side suspension, and will be further developed later to incorporate an enclosing globe, so as to make the entire fitting dust-proof.

The "Orbital" lantern, a popular pre-war model, has been improved in many respects. The refractor plate has been redesigned to give even greater efficiency. The one-piece body is special aluminium alloy, and the top is cast solid right across and domed and provided with two substantial mica insulated terminals, wired from the underside to the lampholder by means of asbestos covered flexible. As the top is cast solid, there can be no possibility of water entering the fitting, as moisture from condensation, etc., will pass out of four drain holes at the corners of the top. A large door 11 in. by 8 in. is provided for easy access to the interior.

Side entry fitting "DRG 109," an entirely new design suitable for 250/400-W mercury discharge lamps, is adjustable so that it can be correctly lined up with the road surface.



The "Orbital" lantern with the "Welwyn" and "DRG 109" units above

lamps of 80/125 W. The aluminium alloy body is in one piece, the refractor being of an entirely new design giving two-way distribution at 170 deg. in the horizontal plane. The second size of this fitting, available shortly, is for 300/500-W lamps, while another for 750/1,500 W will complete the range for all sizes of tungsten

## Export Inquiries

**I**NQUIRIES are frequently received from firms and individuals overseas who wish to secure agencies for, or to purchase, British electrical equipment and appliances and ask us to put them in touch with manufacturers. Some recent inquiries of this kind are mentioned below. We do not vouch for the standing of inquirers and manufacturers replying to them will no doubt require the usual references. Correspondence should be sent to the Editors and should bear the reference number given in parentheses:—

**East Africa.**—Agency for small generating sets, driven by pelton-wheels or water turbines. (X.107.)

**Malta & Gozo.**—Sole agency for chandeliers in plastic, bakelite, with nickel-plated rods, with and without shades. (X.108.)

# ELECTRICITY SUPPLY

## Chesterfield Order Application. "Shadow" Thanet Board.

**Aberdeen.**—INCREASED CHARGES PROPOSED.—The City Electricity Committee is applying to the Electricity Commissioners for permission to increase charges for electricity.

**Chesterfield.**—SUPPLY TO RURAL AREA.—The Rural District Council has decided to support an application to the Electricity Commissioners for a Special Order authorising the Corporation to supply electricity within parts of the urban district of Staveley and the rural districts of Chesterfield and Clowne. The resolution has been described as the positive aspect of the opposition by local authorities to the application of the Derbyshire & Notts Electric Power Co., which was the subject of a recent inquiry. The Clowne Rural District Council has decided not to support the Corporation's application.

**Clitheroe.**—EXTENSIONS.—The Electricity Department is to supply electricity to Gisburn Hall and Tower House at a cost of £1,954.

**Darlington.**—SUPPLY TO TEMPORARY HOUSES.—Application has been made by the Electricity Committee to borrow £438 for extending mains to the temporary housing site in Burnside Road.

**Dundee.**—SODIUM LIGHTING.—The Corporation Lighting Committee is to install sodium lamps in a number of streets.

**Glasgow.**—DEPARTMENT'S ACCOUNTS.—The Corporation Electricity Department accounts for the year ended May 31st show that gross revenue amounted to £2,137,018 and working expenses were £1,684,677. The result of the year's working was a surplus of £62,158. A total of 672.7 million kWh was generated and 70.1 million imported. Sales aggregated 668.4 million kWh.

**Isle of Thanet.**—PROPOSED BOARD.—Margate Town Council has appointed Aldermen Farrar, Linington and Redman, and Councillors Curtis, Hosking and Pearce as their representatives on a "shadow" board which will operate pending the constitution of the Margate, Broadstairs and District Electricity Board, which will follow the acquisition of the electricity undertaking of the Isle of Thanet Electric Supply Co.

**London.**—BATTERSEA POWER STATION.—On August 23rd Mr. Douglas asked the Minister of Fuel and Power whether he could make a statement as to the present position of the application of the London Power Co., Ltd., to the Electricity Commissioners for consent to the further extension of the Battersea power station by the installation of 65,000 kW of generating plant and associated boiler plant. Mr. Shinwell said that the Minister of Health, the Minister of Works and the Minister of Town and Country Planning concurred with him that there was no objection to the proposed further extension of the power station, subject to the observance of the same conditions in regard to gas washing as were imposed in connection with previous extensions, and he had so informed the Electricity Commissioners.

**Middlesbrough.**—LOAN SANCTIONED.—Sanction has been received by the Town Council to borrow £2,500 for electric mains and services.

**Newport Pagnell.**—IMPROVED STREET LIGHTING.—Following trials in the High Street the Urban District Council has decided to have fifty-nine gas-filled lamps replaced by sodium units.

**Oldham.**—YEAR'S WORKING.—The annual report of the electricity undertaking for the year ended March 31st last, records a net surplus of £34,767 on the sale of 123,880,000 kWh (excluding designated war factories), compared with 124,022,000 kWh in the previous year. A fall in the power sales was practically neutralised by the combined increases of private lighting and domestic sales.

**Scarborough.**—MAINS FOR TEMPORARY HOUSES.—The Housing Committee has agreed to reimburse the Electricity Committee in respect of any debt outstanding on the laying of electric mains to temporary houses which may become redundant in the event of the houses being removed at a later date.

**SUBSTATIONS.**—The Electricity Committee is to provide a substation at Valley Bridge and extend the Filey substation for housing on-load tap-changing transformers.

**South Shields.**—NEW TRANSFORMER.—The Town Council is to install a 1,500-kVA transformer at the substation in Quay Lane in place of the present 600-kVA unit.

**Stockton-on-Tees.**—FACTORY SUPPLIES.—Electricity is to be supplied by the Town Council to prospective industrial sites in Dog Hill Farm Lane at a cost of £600.

**Wood Green.**—STREET LIGHTING CHARGES.—At a meeting of the Highways Committee a letter was read from the Northmet Power Co. asking the Council to agree to the application of adjustment clauses to the pre-war running charges for street lighting, providing for an increased payment to the company to cover the higher running costs with effect from January 1st, 1946. The pre-war running charges amounted to £749 per quarter, and as a guide to the effect of the adjustment clauses, the total adjustment, based on the costs of coal, labour and lamps for the March quarter, 1945, would amount to £173, an increase of approximately 23 per cent. As soon as prices became reasonably stabilised it was the company's intention to offer revised public lighting charges for a long-term contract. The Committee has recommended the Council to approve the variation in charges.

## Overseas

**Australia.**—QUEENSLAND PROJECT.—The chairman of the Queensland State Electricity Commission referred recently to a proposal to erect a new generating station at Maria Creek, near Howard, subject to favourable surveys. The station would be in the area of the new Wide Bay Regional Board which, under the supervision of the State Commission, is to begin operations next January for the control of the undertakings at Maryborough, Bundaberg, Pinalba, Childers and Gayndah. A 66-kV line is to be constructed between Maryborough

and Bundaberg and it is later proposed to erect a similar line to link with the City Electric Light Co.'s system.

**Brazil.**—**IRRIGATION AND HYDRO-ELECTRIC SCHEME.**—Brazil is planning an ambitious irrigation and hydro-electric project as part of its programme of large-scale industrialisation. It is reported that the scheme will be modelled in some respects after the Tennessee Valley Authority. Plans call for the organisation of the Companhia Hydro-Electric Nacional de Sao Francisco, with a capital of \$20,000,000, of which the Brazilian Government is to contribute half. The power plant will have an initial capacity of 110,000 kW, to be expanded later to 440,000 kW if necessary. According to the plan, the first installation will consist of two 55,000-kW generators and about 550 miles of high-voltage transmission lines.—*Reuter's Trade Service.*

**Canada.**—**HYDRO-ELECTRIC SCHEME.**—The Government of British Columbia has authorised the B.C. Power Commission to proceed at once with the development of Campbell River as a power site. The project provides for an initial 50,000 HP of plant with transmission lines, transformer stations and other requirements costing an estimated total of \$7,014,915.—*Reuter's Trade Service.*

**France.**—**PYRENEES WATER POWER.**—The hydro-electric station on Lac Portillon in the Pyrenees, on which work was started in 1938, was completed about the middle of 1940. It contains a single 50,000-kVA generating unit.



Generator at the Lac Portillon station in the Pyrenees

A number of other, smaller, lakes is connected with Portillon, which has a capacity of 51 million cubic metres (equivalent to 115 million kWh), including Lac Glace of 2.75 million cubic metres, and Lac Bleu, from which water is pumped to Portillon through a 770-metre conduit.

**India.**—**HYDRO-ELECTRIC SCHEME.**—A £40,000,000 scheme now being considered to use the waters of the River Damodar, running through the Southern Bengal and Bihar Pro-

vinces, would irrigate 760,000 acres of land and produce 65,000 kW of hydro-electric power continuously with an equal amount of intermittent power.—*Reuter.*

**New Zealand.**—**POWER SHORTAGE PROBLEM.**—The annual report of the Hutt Valley Electric Power Board for the year ended March 31st, 1945, a copy of which we have received, speaks of the acute difficulty caused by the power shortage on the one hand and the "tremendous housing and industrial development" on the other. In spite of restrictions placed on the use of electricity it was found impossible to keep within the allocation. Comparative statistics covering twenty years show that the total quantity of electricity sold has risen from 3.7 million to 78.2 million kWh, the total annual cost per kWh sold falling from 1.7d. to 0.583d.

**Portugal.**—**HYDRO-ELECTRIC SCHEME.**—Dr. Luiz Supico Pinto, Portuguese Minister of National Economy announced recently that two companies had been formed to start work on the Zezere, Cavado and Rabagao Rivers, as the first step towards an ambitious scheme of hydro-electricification. The first part of the plan involves the expenditure of £9,000,000 in eight years, the second stage costing £4,000,000.—*Reuter.*

**United States.**—**FARM ELECTRIFICATION.**—Practically all California's farms are expected to be electrified within the next three years. New lines will bring power to an estimated additional 12,000 rural customers scattered over the state. Already 95 per cent. of all holdings have electricity.

## TRANSPORT

**Glasgow.**—**DEFICIT ON YEAR'S WORKING.**—The Corporation Transport Department's accounts for 1944-45 show that income from the tramways was £3,211,555 and expenditure £2,945,531. The revenue from the motor-buses was £1,156,719 and expenditure £1,197,641, and from the Underground system £207,856 and £179,768 respectively. There was a deficit for the year amounting to £376,983 after appropriating the sum of £395,772 to depreciation, etc.

**MANAGER'S TROLLEY-BUS INVESTIGATION.**—The Corporation transport manager has been asked to submit a report on the applicability of the trolley-bus to city traffic, and it is intended to ascertain from other towns their experience in the running of trolley-buses.

**Oldham.**—**TROLLEY-BUSES.**—Representatives of the Electricity Committee are to attend a meeting of the local Passenger Transport Committee to state the case for the introduction of trolley-buses.

**Sunderland.**—**YEAR'S WORKING.**—During the year ended March 31st last the Corporation Transport Department's trams carried 49.7 million passengers and the omnibuses 25.1 million. The accounts of the two sections are given separately and show that the total revenue from the trams was £210,784 (against £200,223 in 1943-44), there being a net balance of £42,805 (£53,048). Revenue from the buses was £133,702 (£123,038) and the net balance was £32,638 (£31,784).



# Manufacturers' War Work—XI

## Wide Range of Products

**Partridge, Wilson & Co., Ltd.**

**I**MMEDIATELY following the declaration of war the shops of the original Davenset Works of Partridge, Wilson & Co., Ltd., were cleared for war production and re-planned for mass manufacture of battery charging equipment for the Ministry of



Nearly 900 of these heavy-duty 3-circuit battery charging rectifiers have been produced for the Ministry of Supply for use "in the field" on A.A. sites

Supply. Subsequently this production was undertaken at seven of the company's plants dispersed in and near Leicester, where battery charging rectifiers, switchboards, DC control panels and a great variety of other associated electrical equipment have been and still are being made.

Many of the early Service designs were revised and modernised by the company, whilst much of the equipment produced later was based on the company's own design and experience in this specialised equipment. The company has produced about 134,000 battery chargers of many types, which have required 2,573 tons of steel in their construction. The output of the works, during the peak of production, was over 100 complete equipments per day.

In addition to this, the company has made 122,000 handlamps which alone required 120 tons of steel, whilst in its transformer factory nearly one million miles of wire has

been employed during the war years in winding coils varying in size from those weighing  $\frac{1}{2}$  oz. and carrying three milliamps to coils weighing 80 lb. and carrying 10,000 A. The quantity of wire actually used in this work would make up a 3-core cable, of sufficient length, with some to spare, to cover the distance from the earth to the moon.

**Santon, Ltd.**

From the manufacture of electric water heaters to the production of marine safety appliances was a step very successfully undertaken by Santon, Ltd., in the first stages of the war. The appliances manufactured consisted of short-range buoyant lights for use in ships, rafts and dinghies, with a morse signalling unit which proved an efficient means of day and night communication and was used in commando raids, both as a life preserver and as part of the "Beach Master" signalling equipment. Further assistance to the Services was rendered by the design and production of illuminated and wand lights of the bat pattern, used for the guidance of aircraft landing on carriers at sea. Another line manufactured by this firm was an automatic lamp box which controlled the gunfire of our warships.

The extensive water heating experience of the company was of valuable assistance in the production of special heating elements, 8 ft. in length, which were fitted to the torpedo tubes of submarines for the prevention of condensation after firing, together with a smaller portable type of heater for use in the periscope well to ensure clear vision by preventing steaming of the mirrors.

The great volume of war work trebled the number of employees normally engaged, and the company was able to continue its standard water heater production, in the form of automatic water boilers which



Santon lightbuoy afloat

were in great demand for Royal Ordnance Factories throughout the country, thermal storage heaters of all kinds for field hospitals and works toilets and surgeries, while the the company's standard immersion heater found many applications in the industrial heating of oils, wax, fats, acids and solutions of all kinds.

The rotary switch section of the works produced during the war years a million switches, which represents several years' pre-war output. The demand for these rotary switches arose through their adaptability, and all the Services had to be kept fully supplied for the purpose of battery-charging for aircraft and tanks, radiolocation equipment, aircraft predictors and radio-telephony gear. This type of switch also formed part of the equipment controlling the one-man submarine.

#### **United Ebonite & Lorival, Ltd.**

Lorival Plastics have been engaged during the last five years entirely on priority work for the Services. Amongst a wide variety of plastic and rubber components which have been supplied for aircraft, electrical equipment, telecommunications and ammunition can be mentioned plastic grenade parts, telephone line insulators, battery boxes and aircraft control pulleys. In size the products have ranged from battledress buttons to large submarine battery containers standing 3 ft. high and weighing 80 lb.

#### **Midland Electric Manufacturing Co., Ltd.**

With so many new as well as old applications for the company's switch, fuse and motor control gear the Midland Electric Manufacturing Co., Ltd., has been kept fully occupied with producing its normal types of products, often modified to meet special requirements and operating conditions. Large orders for standard lines have included one for over 260,000 all-insulated switches and fuses for lighting control in Army camps and Nissen huts, over 10,000 "Auto-Memota" direct-on-line starters for re-equipping Russian factories, and large numbers of 100-A and 200-A switch-fuses for the M.A.P.

One order, for over two thousand "Memlok" change-over switches used for degaussing, represented six and a half years' normal output, but the order was cleared through the works in six and a half weeks. Mobile laundries and bakeries for the Army were equipped with M.E.M. gear. M.E.M.

switch, fuse and motor control gear has been dispatched to all parts of the world from Gibraltar to Ceylon, Australia, New Zealand, South Africa, etc., either on direct Government indents or sponsored by overseas Governments as being essential to the war effort.

Apart from these normal products the company has undertaken the production of switches for intercommunication sets on aircraft and other components used in Lancasters. A new extension to the works was devoted to the manufacture for the Admiralty of mines for laying by means of submarines. Throughout all this extremely busy period the company has concentrated on rendering the best possible service to the electrical industry through normal trade channels, from which came a tremendous volume of orders for the equipping of factories for war production, machine tools, hostels, canteens, etc.

#### **Falk, Stadelmann & Co., Ltd.**

All the works of Falk, Stadelmann & Co., Ltd., were placed at the disposal of the Government from the commencement of the war and several were subsequently greatly extended. The great variety of materials produced included highly specialised types of sheet metal work for Spitfire, Hurricane, Wellington, Lancaster, Barracuda, Tempest and Firefly aircraft; radiolocation equipment; primers; primer bodies; magazines (an original method of manufacture was devised at the company's works and generally adopted by other contractors); plastic detonator holders; delayed-action fuses; components for insecticide sprayers; sea markers; ammunition boxes of various types; valve cases; switchboards for travelling workshops; degaussing and other special types of cable; and lighting equipment, including a wide range of naval lighting and signalling lamps.

Among the heavier items were canteen equipment; heating and cooking stoves; mine contacts; cylinder cartridges and ammunition containers; depth controllers for torpedoes; hydrostatic switches for mines and detonator releases; h.v. oil-immersed switchgear for aerodromes, ordnance factories, military camps, hospitals, and general supply purposes; and 110-kV switches for overhead transmission lines in Russia.

At one factory alone no fewer than 135,000,000 components were produced.

# CONTROL

*Immediate  
Despatch*



## VERITYS LTD.

ASTON, BIRMINGHAM 6

Air Break  
Star-Delta Starter

Sales Headquarters:

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## MARTINDALE COMMSTONES

● Cut copper, brass and steel without clogging. Edges of every bar left clean; no dragging of copper. Save 75% of time and cost of turning commutator in lathe. Give longer life to motors, etc.

Over 50 sizes in stock, in 3 grades: coarse, medium and fine. 20 different types of handle.  
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This illustration shows a W & G Ceiling Rose, one of many types supplied with and without porcelain interior.

A wide and comprehensive range of electrical accessories is available for essential requirements.

**WARD & GOLDSTONE LTD. PENDLETON, MANCHESTER. 6.**

ESTABLISHED OVER HALF A CENTURY

# FINANCIAL SECTION

## Company News. Stock Exchange Activities.

### Reports and Dividends

**Newton Brothers (Derby), Ltd.**—Presiding at the annual general meeting last week, Col. P. C. Cooper-Parry said that whilst the company's normal products alone would have played an important part in the technical achievements of the war, they were particularly proud of a new development, the "Newton-Derby" carbon pile automatic voltage regulator, which had a much wider field of application, less bulk and weight, fewer working parts, and was capable of being produced in very large quantities at low cost. This piece of apparatus had been an integral and essential part of almost every aeroplane, warship, radar and gunsight installation. It had not been possible to manufacture more than a small proportion of the total requirements of the voltage regulator and other equipment at their works and that small proportion had strained their capacity to the utmost, the production for the past four years having averaged ten times that of 1937-38 without any major structural extension.

**Associated British Engineering, Ltd.**, reports a net revenue for 1944-45 of £14,839, as compared with £20,194 for the preceding year. The ordinary dividend is raised from 7 to 8 per cent. and £2,000 (against £8,000) is transferred to dividend equalisation account, a balance of £5,734 (£5,497) is carried forward. During the year the company acquired the goodwill and assets of the Diesel engine business of Mirrlees, Bickerton & Day, Ltd. The purchase price (£372,370) was provided by the sale of a substantial proportion of the company's holding in the Brush Electrical Engineering Co., Ltd., at a price above the written-down book value. It is proposed to issue the 13,553 unissued preference shares at 21s. each and 17,500 ordinary shares at 40s. each; the directors say that these amounts are too small to offer to the present shareholders.

**The Anglo-Portuguese Telephone Co., Ltd.**, which is controlled by the Telephone & General Trust, Ltd., reports a net profit of £52,338 for 1944 (against £52,126). The dividends on the ordinary and "A" ordinary capital are maintained at 8 per cent. and £39,600 (£39,237) is carried forward.

A statement by the chairman, Sir Alexander Roger, says that the company has a waiting list of over 8,000 applicants for service. Some months ago it was permitted to place orders in Great Britain for substantial quantities of exchange plant and telephone instruments, and delivery is expected in about six months. Over the next few years the company will need to spend approximately £2,000,000, involving fresh money to the extent of £1,500,000.

**The Anglo-Argentine Tramways Co., Ltd.**, states that there was a worsening of the position of the Buenos Aires Transport Corporation (which took over the company's main assets in 1939) and the accounts show a loss of £11,173 in 1944 (against £6,645 in 1943). The Transport Corporation had paid no interest on its debenture loan or dividend on its share capital, and consequently the company's revenue was again

limited to receipts from transfer fees and a dividend from a subsidiary company and its obligations have again to be postponed.

**The Kalgoorlie Electric Power & Lighting Co., Ltd.**, in its report for 1944, says that the constant rise in fuel cost has not been compensated by the increase allowed during the year in power rates, but it is hoped that permission for an advance will be received before long. But for taxation reserve no longer required it would not have been possible to pay the 5 per cent. dividend. Since December there has been some recovery in sales of electricity, but it is still too early to forecast the result for the full year.

**A. C. Cossor, Ltd.**—Mr. T. A. Macauley, the chairman, said at the annual general meeting last week that the peacetime application of radiolocation, after their long experience in research, development and manufacture, opened new avenues of expansion in their industry, in which the possibilities were great, more especially in aviation and shipping. He had nothing to add regarding the company's negotiations with certain United States interests.

**James Howden & Co., Ltd.**—In his speech at the annual meeting on Friday last Mr. C. W. Hume (chairman) showed that although the company had been engaged upon special war work during the last few years, two-thirds of this work was in connection with its normal products. These were for warships and merchant ships, power stations in this country, the Empire and Russia, as well as for mobile power stations for use on the Continent.

**The Amazon Telegraph, Ltd.**—As there is no possibility of the Brazilian Government agreeing to a further extension of the company's concession, which expired on April 2nd last, a meeting of the company is to be held at 69, Old Broad Street, E.C.2, on September 19th to consider a resolution providing for the voluntary liquidation of the company. It is proposed to pay the directors £2,500 for loss of office.

**Vactric, Ltd.**, records a net profit of £37,774 for the year ended March 31st last, as compared with £43,325 for 1943-44. Including profits from subsidiary companies the total was £55,439 (£68,804). A final dividend of 15 per cent. is to be paid, again making 22½ per cent. for the year.

**W. H. Dorman & Co., Ltd.**, show a profit for the year ended March 31st last amounting to £82,723 (£123,637). Income tax and E.P.T. require £68,000 (£109,000) and £5,000 (£5,516) is placed to general reserve. The ordinary dividend is again 16½ per cent. and £7,616 (£7,226) is carried forward.

**Thorn Electrical Industries, Ltd.**, is to pay a dividend of 20 per cent. (same). The profit for the year ended March 31st last was £80,062, as compared with £84,850 in the previous year.

**West London & Provincial Electric & General Trust, Ltd.**, is again to pay an interim dividend of 2 per cent., less tax at 9s. 8d.

**West of England Electric Investments, Ltd.,** reports an income from subsidiaries of £91,792 for 1944-45 (against £86,192) and a total income of £97,418 (£90,882). The dividend is again 7 per cent. The report shows that the subsidiaries sold 57 million kWh in 1944, excluding bulk supplies; in 1939 the total was 26 million. Supplies to camps, aerodromes, etc., accounted for a substantial part of the increase. The companies have a post-war programme, involving large expenditure, designed to raise the proportion of connected premises from 70 per cent. in 1939 to 85 per cent.

**The Bognor & District Gas & Electricity Co.** announces interim dividends of  $3\frac{1}{2}$  per cent. on the "A,"  $4\frac{1}{2}$  per cent. on the "B" and  $3\frac{1}{2}$  per cent. on the new consolidated stock. Similar interim dividends were paid last year.

**The Cawnpore Electric Supply Co., Ltd.,** is still prohibited from publishing its accounts. Its annual meeting is on September 3rd.

**The East African Power & Lighting Co., Ltd.,** is again paying a final dividend of 4 per cent., making 7 per cent. (same) for the year.

**Telephone Rentals, Ltd.,** is paying a final ordinary dividend of 6 per cent., making 10 per cent., for the year ended May 31st last (same).

**W. Canning & Co., Ltd.,** are maintaining their interim dividend at 5 per cent.

**Davis & Timmins, Ltd.,** are maintaining their interim dividend at 10 per cent.

## New Companies

**Techna (Gt. Britain), Ltd.—**Private company. Registered August 8th. Capital, £2,000. Objects: To carry on the business of manufacturers, engineers, contractors, dealers in electronic, radio, television and electrical goods, etc. M. E. Gray, 22, Longspears Avenue, Cardiff, is the first director. Solicitors: Nicholas & Evans, Cardiff.

**F. J. W., Ltd.—**Private company. Registered August 9th. Capital, £1,000. Objects: To carry on the business of dealers in, and manufacturers of, radio, television and electrical apparatus and materials, etc. Directors: R. F. Furber, 6, Radlett Park Road, Radlett; B. J. Jenkins, Woolwards, Letchmore Heath, near Watford; and G. S. Wiggs, 29, Newlands Avenue, Radlett. Registered office: 68, Watling Street, Radlett, Herts.

**Kirk Electrical Industries, Ltd.—**Private company. Registered August 10th. Capital, £2,500. Objects: To carry on the business of wholesale and retail factors and sales agents in lighting, heating, cooking, power and other electrical units, fittings and equipment, motor and other lamps, wireless and television goods, etc. Directors: K. A. Kennedy, Oakdene, Deepdene Park, Dorking; J. L. Graham, 108, Crowstone Road, Westcliff-on-Sea; and J. P. Ryan, 50, Stonards Hill, Loughton, Essex. Registered office: 16-24, Fulford Street, S.E.16.

**G. R. Scott (Electrical), Ltd.—**Private company. Registered August 11th. Capital, £1,000. Objects: To carry on the business of electricians, electrical and wireless engineers, etc. Subscribers: H. W. Rock, Cleddon, St. Peter's Road, and Phoebe B. Morris, Manor

House Hotel, both Bournemouth. Registered office: 32-34, Old Christchurch Road, Bournemouth.

**Philips Hamilton Works, Ltd.—**Private company. Registered August 17th. Capital, £100,000. Objects: To carry on the business of manufacturers of, dealers in and agents for, radio valves and apparatus, electric lamps, discharge tubes and signs, cinematograph, X-ray, electro-medical, scientific and domestic apparatus and components, etc. Directors: W. J. Harris, 12, Newlands Road, Newlands, Glasgow; and C. F. Cogswell, C.A., 40, The Knoll, Hayes, Bromley, Kent. Registered office: Spencer House, South Place, E.C.2.

**Electronic Manufacturing & Development Co., Ltd.—**Private company. Registered August 18th. Capital, £5,000. Objects: To carry on the business of radio and electrical repairers and dealers, etc. Directors: H. C. Rylatt, 8, Boultham Park Road, Lincoln; H. J. Gledhill, Glenara, Newark Road, North Hykeham, Lincs.; J. Spencer, 61, St. Catherine's, Lincoln; and Barbara A. A. Rylatt, 8, Boultham Park Road, Lincoln. Registered office: Tanners Lane, High Street, Lincoln.

**Norman Bowden (Rochdale), Ltd.—**Private company. Registered August 14th. Capital, £100. Objects: To acquire the business of a radio and electrical goods dealer carried on by N. Bowden at Rochdale. Directors: N. Bowden, 18, Cheetham Street, and F. Clough, 8, Toad Lane, both Rochdale. Registered office: 18, Cheetham Street, Rochdale.

## Liquidations

**The Colombo Electric Tramways & Lighting Co., Ltd.—**Winding up voluntarily. Liquidator, Mr. A. W. Turner, Adelaide House, London Bridge, E.C.4.

## Bankruptcies

**T. R. W. Wyness and G. W. Bale,** trading together in co-partnership under the style of Wyness & Bale, electrical engineers, 13, Commercial Street, Brighouse, Yorks. (Separate application of G. W. Bale.)—An application for discharge was heard recently at the County Court, Prescott Street, Halifax, and was granted, subject to one week's suspension.

**A. C. W. Wilson,** electrical engineer, Wepre, Higher West Cross Lane, Swansea, Glam.—Discharge granted recently at the Law Courts, Guildhall, Swansea, subject to the payment of £25.

**J. Boulton and J. H. Boulton,** electricians, trading as John Boulton, 3, Grosvenor Street, Chester.—Proofs for dividends by August 31st to the trustee, Mr. A. H. Ward, Official Receiver, Hunter Street (Friends' Meeting House), Liverpool, 3.

Separate estate of J. Boulton.—First and final dividend of 20s. in the £ payable at the Official Receiver's offices at above address.

**D. A. M. Trew,** electrical dealer, carrying on business as Trew Electrical Service, 59, Primrose Hill Street, Coventry.—Proofs for dividends by September 3rd to Mr. R. K. Clark, Official Receiver, Somerset House, 37, Temple Street, Birmingham, 2.



## STOCKS AND SHARES

TUESDAY EVENING.

**S**TOCK Exchange prices were not greatly disturbed by the grave statement of the Prime Minister respecting the forthcoming termination of the Lease-Lend agreement with the United States. One of the recently outstanding features has been a substantial rise in the price of Consols, on the expectation that the Government may offer a long-term loan at a low rate of interest. Hopes of taxation relief to be given in an autumn Budget have somewhat waned, although optimism cherishes a vague hope of alleviation before next spring. Tokyo sixes are an outstanding feature of strength with a rise of  $12\frac{1}{2}$  points to 50. At the beginning of this year, the price was 25.

### The Week's Changes

After chronicling a dire catalogue of falling prices in last week's issue, it is a mild relief to be able to report steadier quotations. Some prices are better. London Passenger Transport  $4\frac{1}{2}$  per cent. regained its 3 points, and the "C" Stock put on 2, to  $118\frac{1}{2}$  and 63 respectively. Southern Railway 5 per cent. preference has recovered a point, at 111, of its previous slump of 10. British Electric Traction preferred is 10 up, at 180, but the deferred at 1025 is similarly lower. Thomas Tilling are 1s. higher at 51s. 6d. In the manufacturing group, Electric Constructions fell back to 57s. 6d. and Christy Bros. to 75s., both being 2s. 6d. down. Arons rose to 63s. 9d., Johnson & Phillips to 75s., Murex to 97s. 6d. Other improvements include Crompton Parkinsons, 33s., Hopkinsons, 83s. 9d. and Ransome & Marles 86s. 3d.

### Miscellaneous Movements

In the Home electricity group, Electric Finance & Securities at 56s. 3d. are 1s. 3d. lower. Of the London shares, Metropolitanans hardened a trifle to 38s. 6d. Lively dealings in radio shares centred mainly around Cossor, in which a large demand has lifted the price 2s. to 42s. At the meeting last week, the chairman stated that he had nothing fresh to add to the announcement already made in the Press as to negotiations being in progress with American interests. E. K. Cole have also been an active market, the price here being 37s. 6d. Philco went back to 13s. 6d. Electric & Musical are 9d. up at 33s. 9d. Victoria Falls ordinary at 96s. 3d. compare with 88s. 6d. in the General Election slump. Calcutta Trams have recovered to £4.

### Home Electricity Supply

The past week has brought few changes in the prices of the ordinary shares of Home electricity supply companies. Just after the General Election result was announced prices were severely shaken. Falls ranging from 2s. 6d. to 5s. occurred throughout the list. From these low levels recovery set in, and to-day's

quotations are about half-way between the lowest and the prices which ruled just before the election result was declared. The market has settled down to a quiet condition. From this it is tolerably evident that holders of the ordinary shares are willing to keep them as investments, and to risk nationalisation.

### A.B. Engineering

Associated British Engineering ordinary remain at 54s. in spite of a rise of 1 per cent. to 8 per cent. for the year, in the dividend. The increase had been discounted to some extent in the rise which had previously occurred. The company sold a large slice of its holding in Brush Electrical Engineering in order to obtain the money required for the purchase of the Diesel business of Mirrlees, Bickerton & Day. It now proposes an issue of ordinary shares at 40s. and this, with a further amount of preference at 21s. will bring the issued capital to £420,000. Kalgoorlie Electric Power ordinary improved to 11s. on the issue of the report. The company supplies electric light and power to gold mines and other undertakings at Kalgoorlie, Western Australia. In the renewed attention now being turned to Australian mining companies, the shares of the Corporation are also participating.

### Vactric

Vactric, Ltd., is again paying  $22\frac{1}{2}$  per cent. for the year, and the price of the shares remains steady at 21s. The present dividend is 15 per cent. an interim of  $7\frac{1}{2}$  per cent. having been paid on March 26th last. It will be remembered that a year ago the capital was increased to £400,000 by the creation of 600,000 new ordinary shares of 5s. each, ranking in all respects with the existing shares. The company has had a chequered career, and in the years 1939 to 1943, inclusive, the ordinary shares went without a dividend. In the war years, the price of the shares at one time fell to 1s.  $7\frac{1}{2}$ d. The company was incorporated to acquire Vacuum Sweepers, Ltd. The yield at the present price is a little over 5 guineas per cent. on the money.

### Anglo-Portuguese Telephone

The post-war programme of the Anglo-Portuguese Telephone Company includes the expenditure of about £2,000,000 in order to cope with the demands made upon the undertaking for plant and instruments. The company's revenue improved in the year recently ended and the dividend is maintained at 8 per cent. There are more than 8,000 prospective new customers waiting for their orders to be fulfilled. In common with other similar concerns the company finds difficulty in obtaining apparatus.

**Correction.**—In our Electrical Investments table last week the price of the E. K. Cole 5s. shares on August 17th was given as 8s. 3d. instead of 38s. 3d.

# 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.*

**A**KT.-GES für Technische Studien.—“Rotors for multi-stage turbo machines.” 2417/44. February 9th, 1943. (571205.)

H. Allday & Son (1922), Ltd., and R. Bain.—“Securing means for flexible electrical conductors.” 19723. November 25th, 1943. (571189.)

Asea Electric, Ltd. (Allmänna Svenska Elektriska Aktiebolaget).—“High-tension electric current transformers.” 21447. December 22nd, 1943. (571119.)

Automotive Products Co., Ltd., and D. T. Brock.—“Indicating means for measuring devices.” 13211. August 14th, 1943. (571219.)

G. Blount.—“Outdoor low-tension fuse-box.” 12178. July 27th, 1943. (571153.)

British Thomson-Houston Co., Ltd.—“Electric current limiting fuses.” 17784/43. October 31st, 1942. (571081.) “Electromagnetic relays and electric coil structures therefor.” 21520/43. December 29th, 1942. (571121.) “Thermal electric switches.” 21904/43. January 4th, 1943. (571125.)

“Electric switches suitable for heavy currents.” 131/44. January 11th, 1943. (571126.) “Electric induction apparatus.” 444/44. January 12th, 1943. (571198.) “High frequency communication systems.” 11150/43. July 11th, 1942. (571214.)

British Thomson-Houston Co., Ltd. (General Electric Co.). “Method of brazing metals.” 21522. December 23rd, 1943. (571122.)

British Thomson-Houston Co., Ltd., and P. Durnien.—“Machine tool guards.” 20703. December 10th, 1943. (571116.)

N. E. Brookes (Tobe Deutschmann Corporation).—“Electric wave filter mounting.” 20943. December 14th, 1943. (571117.)

Carlisle Electrical Manufacturing Co., Ltd., and J. Burns.—“Electrical switchgear.” 2774. February 15th, 1944. (571236.)

T. Deutschmann.—“Apparatus for and method of winding electrical capacitors.” 2552/44. July 20th, 1943. (571206.)

E. I. Du Pont de Nemours & Co., and A. G. Gray.—“Electrodeposition of zinc.” 20680. December 10th, 1943. (571115.)

English Electric Co., Ltd., J. K. Brown, J. A. Prescott and F. G. Rowland.—“Electric circuit-breakers.” 21116. December 16th, 1943. (571118.)

T. G. Farish.—“Electric switches.” 21648. December 24th, 1943. (571196.)

L. Holland.—“Electric water heaters.” 19762. November 26th, 1943. (571100.)

P. L. Hunting, F. C. Bowring and R. H. F. Boot.—“Electrode holders for arc welding.” 21053. December 15th, 1943. (571172.)

Igranic Electric Co., Ltd.—“Electrical contacts.” 18768/43. November 12th, 1942. (571228.)

D. Johnstone and J. L. Bradley.—“Electric

water heaters of the immersion type.” 830. January 17th, 1944. (571202.)

Maschinenfabrik Oerlikon.—“Bipolar electrolyzers for the production of hydrogen and oxygen.” 17575/43. October 28th, 1942. (571179.)

J. P. Moulson.—“Electric cut-out or other switches.” 1161. January 21st, 1944. (571136.)

Mullard Radio Valve Co., Ltd., and C. F. M. Hayes.—“Electric resistance furnaces.” 19390. November 19th, 1943. (571096.)

Revo Electric Co., Ltd., and F. H. Reeves.—“Mounting for an electric hotplate or like unit.” 18496. November 8th, 1943. (571088.)

S. H. Sershall.—“Means for preventing the theft of an electric lamp from its socket or holder.” 18730. November 11th, 1943. (571090.)

S. Smith & Sons (England), Ltd., and E. B. Moss.—“Electric buzzers, and particularly buzzers employed in electric clocks.” 17844. October 28th, 1943. (571082.)

Standard Telephones & Cables, Ltd.—“Telephone sub-set assemblies.” 17802/43. October 30th, 1942. (571083.)

Standard Telephones & Cables, Ltd. (trading as Stanelco Products), and J. Handley.—“Electric soldering irons.” 19096. November 16th, 1943. (571093.)

Standard Telephones & Cables, Ltd., and S. J. Powers.—“Electric discharge tubes.” 19381. November 19th, 1943. (571187.)

A. V. Tomlinson (Union Switch & Signal Co.).—“Railway track circuit apparatus.” 14683. October 20th, 1942. (571112.)

Traylor Vibrator Co.—“Means for the automatic control of electromagnetic vibrating apparatus.” 4668/43. March 6th, 1942. (571147.)

R. Trist & Co., Ltd., and D. S. Prince.—“Sealing discs for electrical condensers.” 19847. November 27th, 1943. (571101.)

Westinghouse Electric International Co.—“Fluid-blast electric circuit interrupters.” 18790/43. November 11th, 1942. (571091.)

20898/44. November 11th, 1942. (Divided out of 571091.) (571108.) “Electric circuit interrupters having arc-extinguishing arrangements.” 5777/45. November 11th, 1942. (Divided out of 571091.) “Electric circuit interrupters having arc-extinguishing arrangements.” 5778/45. November 11th, 1942. (Divided out of 571091.) (571110.) “Induction heating coils.” 17293/43. November 5th, 1942. (571170.)

## Melchett Lecture

**T**HE Institute of Fuel is to hold a meeting at the Royal Geographical Society on October 17th, when the Melchett Lecture will be presented by Professor C. H. Lander. The lecture will deal with the importance of teamwork in the acquisition of knowledge, and reference will be made to heat transference problems generally, gas turbine and jet propulsion, flame throwing, fog dispersal and other wartime developments.

# CONTRACT INFORMATION

## Accepted Tenders and Prospective Electrical Work

### Contracts Open

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

**Australia.**—November 2nd. Melbourne and Metropolitan Tramways Board. Pumps rectifier equipment. Tender No. 1251. Controller of stores.

December 19th. Victorian Electricity Commission. Three water-driven turbo-generators and accessory plant for Kiewa. Spec. 45-46/3.

**Birmingham.**—September 12th. Electric Supply Department. Domestic apparatus. (August 17th.)

**Brierfield.**—September 20th. Electricity Department. Switchgear equipment and transformers. (August 17th.)

**Bristol.**—September 28th. Mental Hospital. Installation of a private automatic telephone and fire alarm system. (See this issue.)

**Burton-upon-Trent.**—September 19th. Electricity Department. Cables. (See this issue.)

**Fire.**—December 14th. Electricity Supply Board. Civil construction work in connection with the hydro-electric development of the Erne, including dam, power station, etc., at Cathleen's Falls (40,000 kW) and Cliff (10,000 kW). Specification, etc., from the Board's secretary, Mr. P. J. Dempsey, 60-62, Upper Mount Street, Dublin.

**Manchester.**—September 12th. Electricity Department. Four coal wagon tippers for Stuart Street generating station. (See this issue.)

**Plymouth.**—September 14th. Town Council. Wiring sundries for various institutions and departments for the period commencing October 1st. Particulars from the Stores Department, Mill Street.

**Scotland.**—October 15th. North of Scotland Hydro-Electric Board. 132-kV transmission lines. (August 10th.)

**Woolwich.**—October 9th. Electricity Department. One 750-kW Diesel alternator and four 30-MVA outdoor reactors. (See this issue.)

### Orders Placed

**Manchester.**—Electricity Committee. Accepted. Re-blading of No. 1 turbo-generator at Barton power station.—Metropolitan-Vickers.

### 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.

**Allesley.**—Houses, Hollyberry Hill Estate, Ideal Benefit Society; H. W. Weedon, architect, 84, Newhall Street, Birmingham, 3.

**Alnwick.**—Offices for U.D.C., Bondgate Hall; surveyor.

**Ardwick.**—Works extensions, Bennett Street, for J. Garland & Co., Ltd.; R. Broadbent, architect, 4, Kiln Hill Lane, Chadderton.

**Barnsley.**—Twelve houses; W. Dunk & Sons, Ltd., builders, Peel Street.

**Bedfordshire.**—Alterations, etc., Mogerhanger Sanatorium (£6,000); county architect, Shire Hall, Bedford.

**Bishop Auckland (Co. Durham).**—Alterations and additions, Junior Technical School; F. Willey, 34, Old Elvet, Durham City.

**Bradford.**—Reconstruction of bomb-damaged property, Northgate and John Street, for the T.C. (£50,000); city engineer.

**Broseley.**—Houses (22), Dark Lane; J. Brian Cooper, architect, Coleridge Chambers, 177, Corporation Street, Birmingham, 4.

**Buckingham.**—Houses (62), for R.D.C.; Scherrer & Hicks, architects, Remo House, 310-312, Upper Regent Street, London, W.1.

**Burnham-on-Sea.**—Houses (120), Highbridge and Burnham-on-Sea, for U.D.C.; Gallanaugh & Nicholls, architects, 30, High Street, Bridgewater.

**Cambridge.**—Houses (54), for South Cambs R.D.C.; housing officer, County Hall, Hobson Street.

**Cockermouth.**—Houses (30) for the North-Eastern Housing Association; Oldfield, Simpson & Saul, architects, Workington.

**Corby.**—Catholic junior school (200 places) for managers; priest-in-charge, Catholic Church.

**Cornwall.**—Extensions to Sanatorium at Tehidy; county architect, County Hall, Truro.

**Darfield (Yorks).**—Temporary houses (20), U.D.C.; surveyor.

**Darley Dale.**—Maternity hospital, Darley Hall Farm and Lodge; county architect, St. Mary's Gate, Derby.

**Darlington.**—Houses (15), Hurworth for T.C.; J. F. Sweeten, 43, Geneva Road.

**Denholme.**—Extensions, Foreside Mills; Denholme Silk Weavers (British), Ltd.

**Edmonton.**—Houses (64), Hoe Lane, Enfield; borough engineer, Town Hall, Edmonton, N.9.

**Ellesmere Port.**—Houses (120), Wolverham estate, for U.D.C.; surveyor, Queen Street.

**Ely.**—Houses (60), several parishes, for R.D.C.; L. J. Godden, surveyor, Lynn Road, Ely, Cambs.

**Exeter.**—Houses (176), Wonford; F. R. Steele, city architect, 2, Southernhay West.

**Felling (co. Durham).**—Houses (40), Holly Hill site; U.D.C. architect.

**Feltham.**—Houses (14), Feltham and Hanworth, for U.D.C.; surveyor, Council Offices, Feltham, Middlesex.

**Gorton.**—Extensions, engineering works; Kendall & Gent, Ltd., Sunny Brow Road.

**Gosforth (Northumberland).**—Houses (54); Cussins, Ltd., builders, Moor Court.



**Guildford.**—Houses (70), Stoke Hill; G. H. R. Wilson, town clerk, Municipal Offices.

**Guiseley.**—Engineering works; G. H. Langley, Ltd., Town Street.

**Heywood.**—Houses (15), Cowburn Street; F. K. Miles, builder, Heywood Hall Road.

**Hulme.**—Chair and upholstery factory, Clopston Street; C. Allcock, 170, Cross Street, Sale.

**Langley Moor (Durham).**—Milk pasteurising station; G. Lazenby & Sons, Ferryhill, Darlington.

**Liverpool.**—Dining room and kitchen, Quarry Bank municipal school, Anfield Road; city architect, Blackburn Chambers, Dale Street, Kingsway.

**Lochgelly.**—Houses (42), Lumphinnans scheme, with electrical work, for T.C.; A. A. Watson, architect, 24, Queen Anne Street, Dunfermline.

**Manchester.**—Rebuilding and extending factory; C. A. Simpson & Co., Ltd., leather cloth manufacturers, Boardman Street, London Road.

**Middlesbrough.**—Houses (22), Southwell Road, etc.; R. H. Bailey & Son, builders, 15, Denmark Street.

Extensions to bus depot (£13,202), for T.C.; S. Coates, Ltd., builders, Middlesbrough.

**Newcastle-on-Tyne.**—Flats (28), Benfield Road, etc.; Hadden & Hillman, builders, New Bridge Street.

Alterations and improvements, pickle factory, Condercum Street, for E. Hudspeth; T. E. Cornelius, Elmfield Gardens, Gosforth.

**Oldham.**—Works additions, Cromwell Street; Phenix Cotton Doubling Co., Ltd., Charles-town Street.

**Plymouth.**—Houses (102), Efford and North Prospect areas, for T.C.; city architect, Compton Park House, Tavistock Road.

**Pontyclun (Glam.).**—Factory, near Loftus Terrace; Royal Sovereign Pencil Co., Ltd., Britannia Pencil Works, Neasden Lane Willesden, London, N.W.10.

**Radcliffe.**—Houses (22), Bolton Road, for Corporation; John Webster & Co. (Builders), Ltd., 51, Park Lane, Whitefield.

**Repton.**—Secondary school, Woodville, for Derbyshire C.C.; county architect, St. Mary's Gate, Derby.

**Royston (Yorks).**—Houses for U.D.C.; Dyson, Crawthorne & Coles, architects, 25, Regent Street, Barnsley.

**Ruthin.**—Houses (84), for T.C.; F. A. Roberts, architect, Earl Chambers, Mold, Flintshire.

**St. Ives.**—Houses (10), Warboys (£12,159), for R.D.C.; W. Canham, builder, Somersham.

**Saltburn & Marske (Yorks).**—Temporary houses (36), Meadow Road; U.D.C. surveyor.

**South Shields.**—Houses (46); acting borough engineer.

**Stretford.**—Extensions, Girls' High School, for Lancs E.C.; W. Lionel Gray (1933), Ltd., builders, Hospital Road, Farnworth.

**Surrey.**—Sanatorium at Shabden Park, Chipstead; county architect, County Hall, Kingston-on-Thames.

**Syston.**—Houses (24); J. E. Souter, builder, Milton Road.

**Tonbridge (Kent).**—Houses (38), four sites, for R.D.C.; surveyor, 48, Pembury Road.

**Truro.**—Houses (91), several sites, for R.D.C.; A. J. Cornelius, architect, 13, Lemon Street.

**Tynemouth.**—Conversion of Chirton Cottage into factory for Great Northern Knitwear Co., Ltd.; W. Stockdale, architect, 73, Howard Street, North Shields.

**Walker-on-Tyne.**—Houses (28), Benfield Road; Hadden & Hillman, 123, New Bridge Street, Newcastle.

**Welwyn Garden City.**—Houses (70), Scheme No. 11, for U.D.C.; C. W. Fox, architect, Council Offices.

**West Sussex.**—Maternity unit, St. Richard's Hospital (£22,000); county architect, County Hall, Chichester.

## Forthcoming Events

**Saturday, September 1st.**—*Hebburn.*—I.E.E. North-Eastern Students' Section. Visit to the shipbuilding yard of R. & W. Hawthorn Leslie & Co., Ltd. (2.30 p.m.).

**Tuesday, September 4th.**—*Coventry.*—Electricity Showrooms, Corporation Street, 6 p.m. Coventry Electric Club. Open forum on "The Future of the Electrical Industry." Supply: F. W. Godden, A.M.I.E.E. Contracting and installation: G. S. Nott. Retailing and marketing: G. R. Marson. Manufacturing: N. M. Hill, M.I.E.E.

**Wednesday, September 5th.**—*London.*—At Institution of Mechanical Engineers, Storey's Gate, 6 p.m. Institution of Heating and Ventilating Engineers. "Thermionic Valve Control of Heating and Ventilating Installations," by S. B. Jackson.

**Saturday, September 8th.**—*Wakefield.*—Strafford Arms, 5 p.m. Association of Mining Electrical and Mechanical Engineers (Yorkshire N.W. Branch). Presidential address by J. M. Langley.

**Tuesday, September 11th.**—*Bristol.*—I.E.E. Bristol Students' Section. Visit to C.E.B. control room at Clifton. Meet 6.55 p.m. at 26, Oakfield Road, Clifton.

**Tuesday-Thursday, September 11th-13th.**—*Glasgow.*—Association of Public Lighting Engineers. Conference.

**Wednesday, September 12th.**—*London.*—At Institution of Mechanical Engineers, Storey's Gate, 10 a.m. Institute of Metals. Annual autumn meeting.

**Saturday, September 15th.**—*Manchester.*—Engineers' Club, 3 p.m. Association of Supervising Electrical Engineers (Manchester Branch). "Motor Control Gear," by Mr. Mathieson.

**Saturday and Sunday, September 15th-16th.**—*London.*—Portland Hall, Little Titchfield Street, W.C.1. Association of Special Libraries and Information Bureaux. Annual conference.

**Friday, September 21st.**—*Manchester.*—Reynolds Hall, College of Technology. Institution of Electronics (N.W. Branch). "Theory, Design and Application of Magnetron Valves," by R. G. B. Gwyer, M.A.

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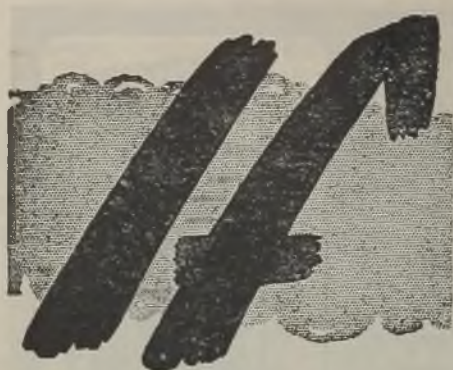
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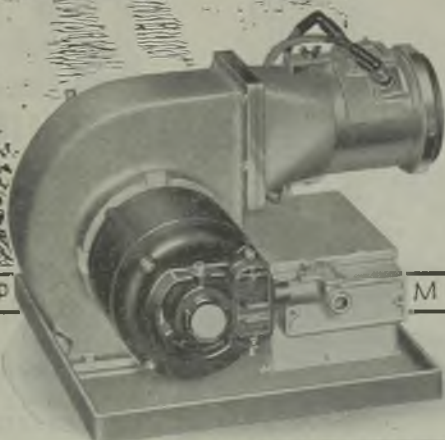


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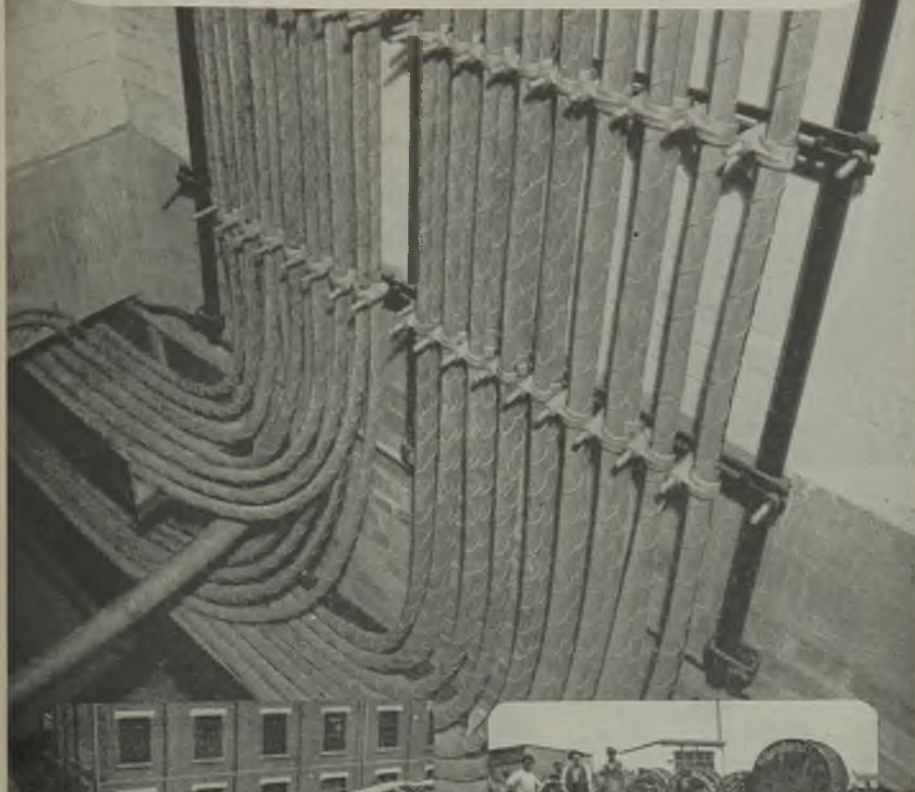
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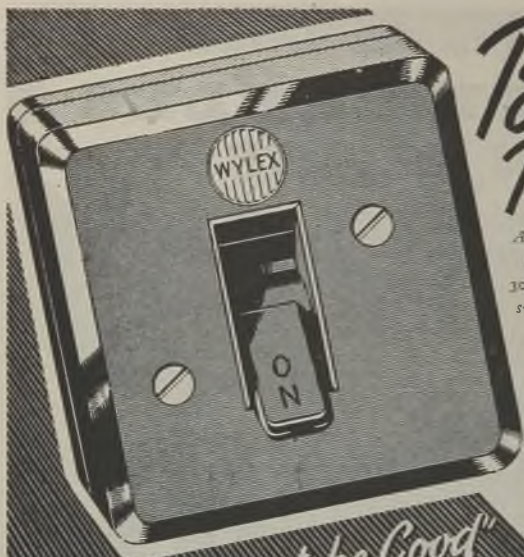
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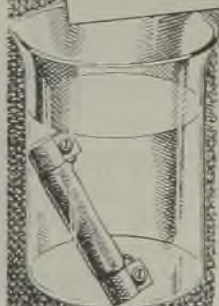
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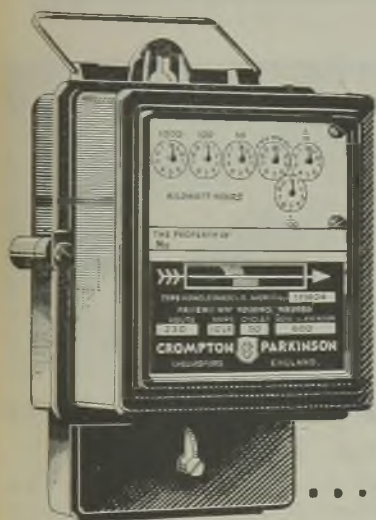
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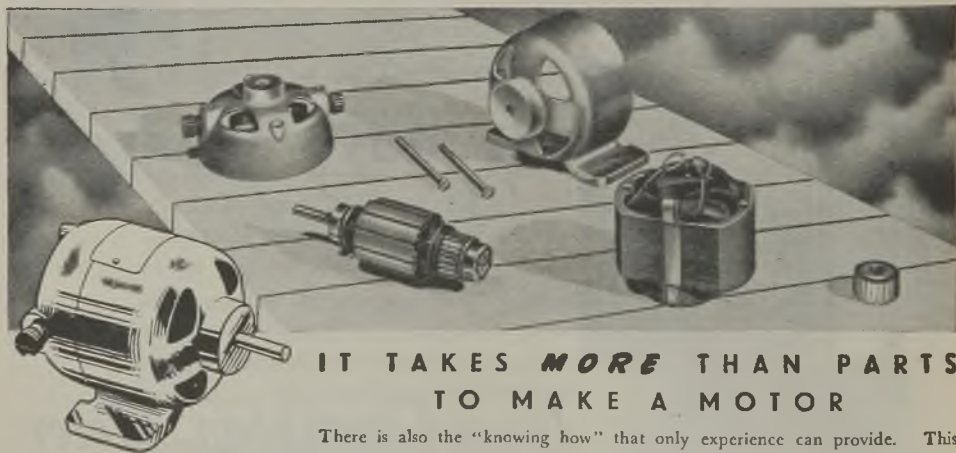
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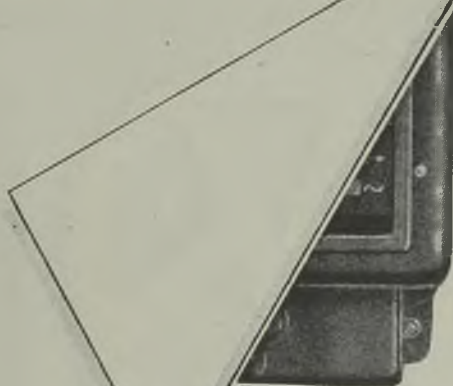




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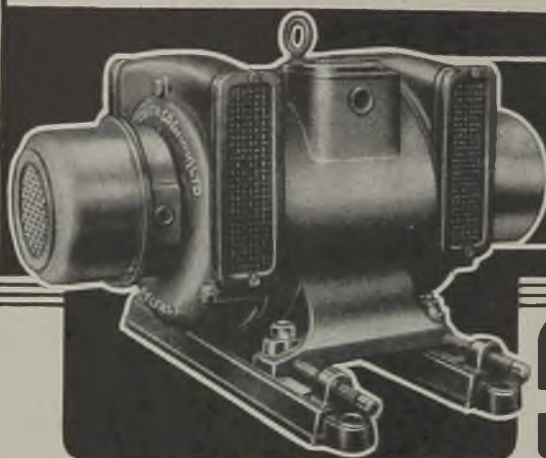
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V.I.R. & THERMOPLASTIC. BRAIDED. LEAD COVERED & SHEATHED

**WILLIAM GEIPEL LTD.** Head Office: 156-170 Bermondsey Street, LONDON, S.E.1  
Cable Works: WEMBLEY, MIDDLESEX

# WIRE CARRIES YOUR POWER AND COMMUNICATIONS

Every type of wire produced by Richard Johnson & Nephew Ltd., is the very best for its purpose that modern methods and science can produce. Richard Johnson & Nephew Ltd. have a proud record of unfailing service worthy of confidence now, and in the future.

**RICHARD JOHNSON & NEPHEW LTD.**  
BRADFORD IRONWORKS, FORGE LANE, MANCHESTER, 11.

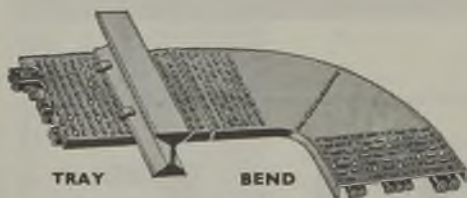
## PERFORATED METALS

FOR ALL ELECTRICAL REQUIREMENTS

Perforated Lead for Batteries

CABLE-TRAYS AND BENDS

FOR ELECTRICAL WIRING



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BEND

## W. BARNES & SON

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GLOBE WORKS, QUEENSLAND ROAD  
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TERMINAL BLOCKS

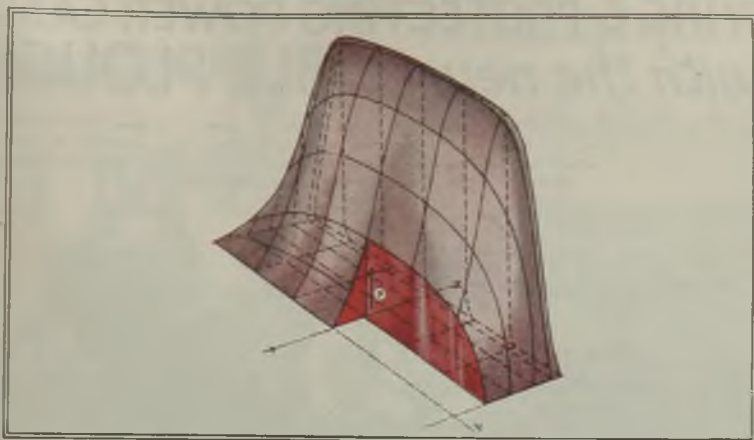
Best quality, black bakelite, Terminal Blocks or Connectors. Used extensively for telephones, telegraphs, radio, bells, signals, relays, traffic signals, etc., 2, 3, 4, 5, 6, 8, 10 and 12 way in Four Types.

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GRELCO Ltd., Grelco Works, Hoptcott, Minehead, Somerset

Manufacturers of  
**BATTERY CHARGERS**  
RECTIFYING EQUIPMENT  
TRANSFORMERS

**Leqq** (INDUSTRIES) Ltd.  
WILLIAMSON ST,  
WOLVERHAMPTON.



## *The theory of bearing lubrication*

THE diagrammatic model illustrated above represents the three dimensional picture of the oil pressure wedge developed by a rotating shaft in a bearing in accordance with the Hydro-dynamic theory of Lubrication. When OSBORNE REYNOLDS proved by mathematics that, given certain conditions, the rotational effect of a shaft in a bearing will generate an oil film that will support the shaft he gave Engineers a positive clue for bearing design. Practice shows that the oil film can be developed in accordance with the Theory, but the maintenance and continuity of this film depends mainly upon the method employed to feed fresh lubricant to the bearing surfaces. POWDER METALLURGY approaches this problem by making it possible to construct a strong bronze bearing with porous walls through which the lubricant can be fed direct to every part of the bearing surface including the point of maximum load. The 'COMPO' oil-retaining bronze bearing made by the Powdered Metal process possesses a micro-porous structure which is charged with lubricant. Thus the oil supply is retained in exactly the right place to generate, not only the required oil film but to ensure also the maintenance and continuity of it, since the film is superimposed upon, and forms an integral part of the oil reservoir in the body of the bearing. This constitutes a highly efficient method of lubrication. 'COMPO' solves innumerable bearing problems from slow intermittent or oscillatory motion to high speed rotary motion.

# COMPO

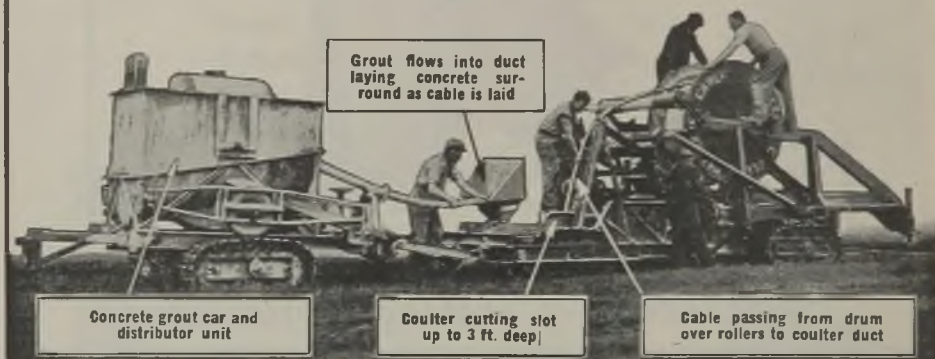
Bound Brook Bearings (G.B.) Ltd. Birch Road, Witton, Birmingham, 6  
(A Birfield Company)



# LAYING & PROTECTING POWER CABLES *with the new* CABLE PLOUGH

The Clough Smith Plough Cable Laying Service has laid miles of cable, of all sizes, over tracts of varying land throughout the country. The method successfully solves many problems of labour, time and cost, and is suitable for practically all electrical distribution schemes at home and abroad.

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**CLOUGH SMITH & CO. LTD. ENGINEERS & CONTRACTORS**  
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**Pressed Steel  
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**BRAITHWAITE & CO. ENGINEERS, LTD.**

London Office (Temporary Address) :

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Telephone : WHI 3993

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*Trustworthy  
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Oil Proof Petrol Proof Non-Flammable Non-Ageing  
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Fagen Road - FELTHAM - MIDDLESEX

*Quality*

*Sheet Metal Work  
for  
The Electrical Trade*

*Inquiries to:  
Morris Heating Appliances Ltd.  
5, Netherlon Grove, London S.W.10.*

*Telephone: HAXman 8423*

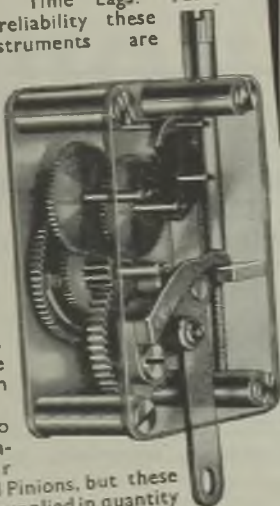
# TIME LAGS

The important part in so many processes played by delayed action timing mechanisms has led to a demand for much greater accuracy than is afforded by the Oil Dash Pot method. Many engineers have found such problems completely answered by Rotherham Time Lags. For accuracy and reliability these ingenious instruments are

worthy products of the famous House of Rotherham & Sons of Coventry.

Details of the various types available, and also of Instruments, Recording Clocks, etc., will gladly be supplied on request.

We also welcome enquiries for Wheels and Pinions, but these can only be supplied in quantity to customers' own designs, as no stock lines are held.



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OF COVENTRY

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From the ashes of war will spring opportunities for the future. Many of the lessons learned in the war production race—increased speed of output, better use of materials and plant, intensified research—will need to be applied in the rapid reconstruction of a world at peace. If in your post-war programmes non-ferrous metals will play a part, seek the advice of the Metals Division of I.C.I.—you will find their recommendations for design or fabrication of real value to you in the early stages of reconstruction. Please address enquiries to:



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INDUSTRIES LTD.**  
LONDON, S.W.1

# CREOSOTED POLES

*for*  
**POWER  
LINES**

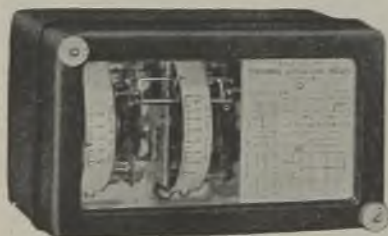
Telegraph Poles,  
Engineering and  
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Timbers of Every  
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Telephone Temple Bar 5801 (5 lines) Telegrams, Burboul, Rand, London

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## P & B—GOLDS THERMAL OVERLOAD RELAY

**FOR THREE-PHASE MOTORS**

Accurate and close protection against overloads and phase failure at all loads. Fully compensated for high and low ambient temperatures

MAKERS OF  
MAXIMUM DEMAND  
INDICATORS

*The* **P & B** ENGINEERING Co. Ltd.

TAMWORTH LANE WORKS, MITCHAM, SURREY

## Capstan

**CAPACITY  
AVAILABLE**

UP TO 1½" BAR AND 6"  
DIAMETER CHUCKING

Send prints for quotations to

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*J.S. Ratcliffe*

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**AID  
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# Always Reliable

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TEL. MUSEUM 3132/3

WORKS

THE UNION CABLE CO. LTD.

DAGENHAM DOCK  
ESSEX

TEL. RAINHAM 25



# UNION CABLES

## IMPORTANT NOTICE

# Hotpoint

REGD TRADE MARK

Due to our existing premises having been damaged by enemy action and the fact that they are inadequate for our post-war needs, it has been decided to transfer our Head Office and Showrooms to

**CROWN HOUSE, ALDWYCH  
LONDON, W.C.2**

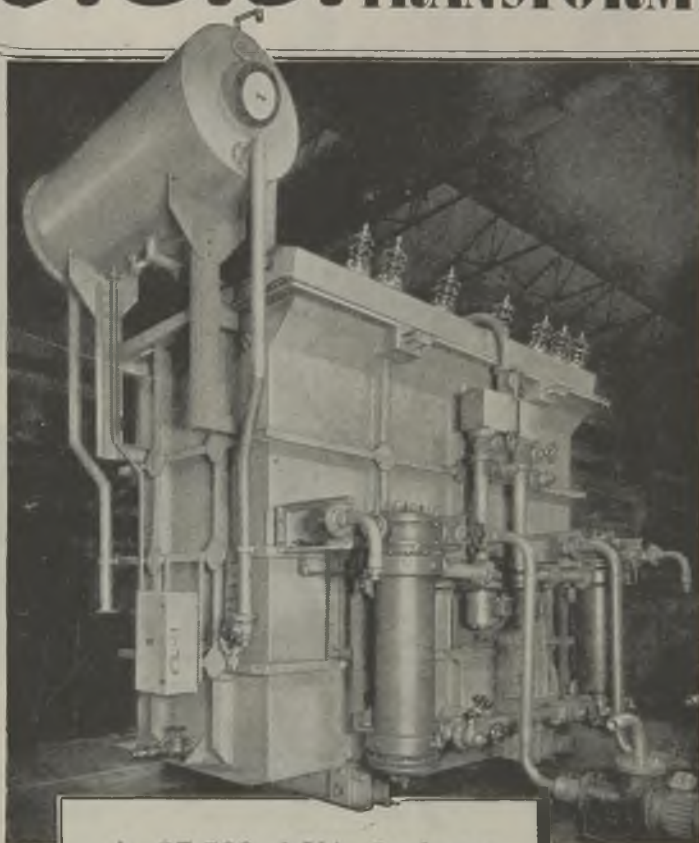
Telephone : TEMPLE BAR 9973-8

Telegrams : "HOTPOINT, ESTRAND, LONDON"

As soon as circumstances permit, Showrooms will be equipped, so that we may render the same service to our customers as in the past. You are, therefore, requested to address all communications to the above address.

**THE HOTPOINT ELECTRIC APPLIANCE CO. LTD.**

# G.E.C. TRANSFORMERS



A 37,500 kVA 3-phase transformer, forced oil circulation with water cooling, supplied to an important municipality for outdoor service.

The **G.E.C.** manufactures Transformers of every type required in modern practice.

WRITE for illustrated Technical Description No. 327.

Advt. of The General Electric Co., Ltd. Head Office: Magnet House, Kingsway, London, W.C.2

# 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. 8 words) per insertion, minimum 2 lines 4/-, or for display advertisements 30/- per inch, with a minimum of one inch. Where the advertisement includes a Box Number 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.

## OFFICIAL NOTICES, TENDERS, ETC.

### CITY AND COUNTY OF BRISTOL

Bristol Mental Hospital, Fishponds

Automatic Telephones and Fire Alarms

**THE** Visiting Committee of the Bristol Mental Hospital invite tenders from electrical contractors for the provision and installation of a Private Automatic Telephone and Fire Alarm System at the above-mentioned Hospital.

The scope of the contract will cover the removal of the existing telephone installation and the complete installation, including all wiring, provision of special equipment, etc., in accordance with the specification and drawings prepared by the Consulting Engineers, Messrs. Hoare Lea & Partners, of 39, Broad Street, Bristol.

Applications to tender must be received by the Consulting Engineers not later than Monday, the 3rd September, and must be accompanied by a deposit of £5 5s., which will be returned on receipt of a bona fide tender. Specifications and drawings will be despatched to applicants as soon as possible after the 3rd September.

Tenders must be delivered to the undersigned in the envelopes provided not later than 10 a.m. on Friday, the 28th September.

The successful tenderer will be required to provide approved security for the due performance of the contract in a sum not exceeding 25% of the contract sum.

The Visiting Committee do not bind themselves to accept the lowest or any tender.

GEOFFREY KNOWLES,

Deputy Town Clerk.

The Central Library,  
College Green, Bristol, 1.  
20th August, 1945.

2622

### COUNTY BOROUGH OF BURTON-UPON-TRENT

Electricity Department

**TENDERS** are invited for the following underground mains:—

- Supply and laying of 18,600 yards .25 sq. in. 11,000-volt Cable.
- Supply and laying of 6,750 yards .3 sq. in. 3,300-volt Cable.
- Supply of 6,500 yards .25 sq. in. L.T. Cable.

Specification, plans and form of tender may be obtained from Thomas Hall, A.M.I.E.E., Borough Electrical Engineer and Manager, Electricity Offices, Horninglow Street, Burton-upon-Trent.

Tenders in plain sealed envelopes, endorsed "Tender for Underground Mains," must reach the undersigned not later than noon on Wednesday, the 19th September, 1945.

The acceptance of a tender will be subject to the standarding orders with respect to contracts made by the Council on the 13th June, 1934 (a copy of which may be obtained upon application) and to the execution of a formal contract. The Corporation do not bind themselves to accept the lowest or any tender, and persons tendering must do so at their own expense.

H. BAILEY CHAPMAN,

Town Clerk.

Town Hall,  
Burton-upon-Trent,  
24th August, 1945.

2675

### METROPOLITAN BOROUGH OF WOOLWICH

Electricity Department

**THE** Electricity Committee of the above Council invite tenders for the supply, delivery and erection of the following plant:—

- One 750-kW Diesel Alternator, and
- Four 30-MVA Outdoor Reactors.

Specifications and form of tender in duplicate may be obtained from the Borough Electrical Engineer, Electric House, Powis Street, Woolwich, S.E.18, upon receipt of a deposit of £1 1s., which will be refunded within one month of the receipt of a bona fide tender.

Tenders should be submitted in a plain envelope sealed and endorsed "Tender for Diesel Alternator" or "Tender for Outdoor Reactors" as the case may be, and must reach me not later than 12 noon on Tuesday, October 9th, 1945.

The Council do not bind themselves to accept the lowest or any tender.

DAVID JENKINS,

Town Clerk.

Town Hall,  
Woolwich, S.E.18.  
August, 1945.

2627

### CITY OF MANCHESTER

**THE** Electricity Committee invites tenders for the supply, delivery and erection at Stuart Street Generating Station, Bradford, Manchester, 11, of FOUR COAL WAGON TIPPERS (RAM TYPE). Specification No. 834.

Specification, etc., may be obtained from Mr. R. A. S. Thwaites, Chief Engineer and Manager, Electricity Department, 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 Wednesday, 12th September, 1945.

PHILIP B. DINGLE,

Town Clerk.

Town Hall,  
Manchester, 2.  
23rd August, 1945.

2661

## SITUATIONS VACANT

None of the vacancies for women advertised in these columns relates to a woman between 18 and 40 unless such woman (a) has living with her a child of hers under the age of 14, or (b) is registered under the Blind Persons Acts, or (c) has a Ministry of Labour permit to allow her to obtain employment by individual effort.

**A** leading firm of manufacturers of electrical rotating machinery in S.E. England have an exceptional vacancy for Managerial Technical Executive. Applicant, whose age should not exceed 45, must have sound mechanical and electrical qualifications, with experience of modern methods of works organisation, production and management control for similar class of work, involving wide variety. Salary of £2,000, with possibility of participation in profits, will be paid to man of outstanding energy and ability not afraid of responsibility. Write, quoting C.U. 26X, to Ministry of Labour and National Service, Appointments Department, Technical and Scientific Register, Room 670, York House, Kingsway, London, W.C.2, for application form, which must be returned completed by 21st September, 1945.

2667



### CITY OF COVENTRY ELECTRICITY DEPARTMENT

#### Appointment of Power Station Electrical Maintenance Engineer

**A**PPPLICATIONS are invited for the position of Electrical Maintenance Engineer at the Langford Generating Station, from suitably qualified Engineers.

Candidates must have had practical experience in the installation and maintenance of the whole of the Electrical Plant and Equipment, including protective relays, of a modern Power Station, and the person appointed will be responsible for preparing and maintaining a programme of inspection, testing and repairs for such plant.

Experience in modern methods of Bus Zone Protection will be an advantage.

The salary and conditions of service will be in accordance with the National Joint Board Schedule, Class "J," Grade 7 (at present £509/£534 per annum).

The successful candidate will be required to pass a medical examination, and the appointment will be subject to the provisions of the Local Government and other Officers' Superannuation Act, 1937. He will also be required to contribute to the Staff Widows' and Orphans' Pensions Scheme.

Applications, stating age, and giving full particulars of technical qualifications, training and experience, accompanied by not more than three testimonials, are to be endorsed "Maintenance Engineer," and received by the undersigned not later than 5th September, 1945.

The Ministry of Labour and National Service (Technical and Scientific Register) have given permission, under the Control of Engagement Order, 1945, for the advertisement of this vacancy.

F. W. GODDEN, A.M.I.E.E.,  
Electrical Engineer and  
Coventry. Manager.

2614

### DORCHESTER CORPORATION

#### Electricity Department

#### Charge Engineer

**A**PPPLICATIONS are invited for the above position from engineers with the necessary experience for E.H.T. and L.T. Switchboard operation in a Static Substation.

The conditions of employment will be in accordance with the N.J.B. Schedule, Grade b, Class B, with commencing remuneration at the rate of £277 per annum.

The position will be a superannuated post and the successful candidate will be required to pass a medical examination.

Applications, endorsed "Charge Engineer," giving full particulars of training and experience, age, if married or single, together with copies of recent testimonials, should be sent to W. J. Smither, A.M.I.E.E., Borough Electrical Engineer, Electricity Offices, Trinity Street, Dorchester, not later than 7th September, 1945.

The Ministry of Labour and National Service, Technical and Scientific Register, have given permission under the Control of Engagement Order, 1945, for the advertisement of this vacancy.

2621

### WINWICK HOSPITAL, WARRINGTON

**A**PPPLICATIONS are invited for the post of temporary Assistant to the Chief Engineer at a salary of £300 10s. per annum, plus bonus of £1 3s. per week at present, a total of £360 per annum. The successful candidate will be required to occupy the house provided, for which a rent of 11s. per week inclusive of rates is charged.

Candidates should have served an apprenticeship as a Mechanical and/or Electrical Engineer and are expected to hold a Board of Trade or National Certificate in Engineering or other equivalent qualification, and have had experience in the maintenance of steam raising and electrical power plant. Some drawing office experience is desirable. The forms of application may be obtained from the undersigned, to whom they should be returned on or before 9 a.m., 8th September, 1945.

This advertisement is published by permission of the Ministry of Labour and National Service under the Control of Engagement Order, 1945.

C. R. HOYLE,  
Clerk to the Committee.

2631

### COUNTY BOROUGH OF HUDDERSFIELD

#### St. Andrew's Road Power Station

#### Power Station Chemist

**A**PPPLICATIONS are invited for the position of Power Station Chemist from suitably qualified persons. Candidates should possess a University degree or equivalent, and have had general chemical and metallurgical experience with Boiler Feed Treatment.

The salary and conditions of service will be in accordance with the National Joint Board Schedule, Class G, Grade 8a (at present £393/£404 per annum). The station should be transferred to Class H during 1946.

The selected candidate will be required to pass a medical examination and contribute to the Council's Superannuation Scheme under the Local Government Superannuation Act, 1937.

Applications, stating age and giving full particulars of technical qualifications and experience, accompanied by not more than three testimonials, are to be received by the undersigned not later than first post on September 11th, 1945.

The Ministry of Labour and National Service, A9(D), have given permission under the Control of Engagement Order, 1945, for the advertisement of this vacancy.

F. A. ELLIS, M.I.E.E.,  
Borough Electrical Engineer.

Electricity Offices,  
Market Street, Huddersfield.

2636

### CITY OF BRADFORD ELECTRICITY DEPT.

#### Junior Mains Assistant

**A**PPPLICATIONS are invited by the City of Bradford Electricity Department for the appointment of a Junior Mains Assistant.

Candidates must have had a sound technical training and experience in the operation of high voltage and medium voltage A.C. and D.C. distribution systems.

The salary and conditions will be in accordance with the N.J.B. Schedule, the present salary being £295 per annum (Class H, Grade 10).

The selected candidate will be required to pass a medical examination and contribute to a Superannuation Scheme under the provisions of the Local Government Superannuation Act, 1937.

Applications, stating age and giving full particulars of training and experience, are to be endorsed "Junior Mains Assistant," and must reach the undersigned not later than Thursday, the 20th September, 1945.

This advertisement is published by permission of the Ministry of Labour and National Service (Technical and Scientific Register) under the Control of Engagement Order, 1945.

T. H. CARR, A.M.Inst.C.E., M.I.Mech.E., M.I.E.E.,  
Electrical Engineer and Manager.

Head Offices,  
27, Bolton Road, Bradford.  
August, 1945.

2673

### COUNTY COUNCIL OF THE COUNTY OF LANARK

#### Assistant County Lighting Engineer

**A**PPPLICATIONS are invited for the appointment of Assistant to the County Lighting Engineer. Applicants should have extensive knowledge of the design, erection and maintenance of Public Lighting Installations, both by gas and by electricity, and should have experience in the preparation of specifications and schedules of quantities, and should be neat draughtsmen.

The successful candidate will require to pass a medical examination and contribute to the County Council's Superannuation Fund.

Applications must be in writing and should state (1) Full name; (2) Date of birth; (3) Education, training and qualifications; (4) Details of past experience; (5) Present appointment; (6) Salary expected; (7) Position under the Control of Engagements Order, 1945. The applications should be accompanied by three recent testimonials, and should be posted to reach the County Clerk, Lanarkshire House, 191, Ingram Street, Glasgow, C.1, not later than Saturday, 3rd November, 1945.

Members of H.M. Forces are specially invited to apply. Permission has been received from the Ministry of Labour and National Service to advertise this vacancy.

Lanarkshire House,  
191, Ingram St., Glasgow.

2632

## COUNTY BOROUGH OF ST. HELENS

## Electricity Department

## Appointment of Senior Demonstrator

**A**PPPLICATIONS are invited for the above appointment at a salary in accordance with the Lancashire and Cheshire Provincial Council Scale P.T.A., Grade B (Female), £214 per annum, rising by annual increments of £11 to £236 per annum, plus war bonus, which is at present £48 2s. per annum.

Candidates must have had a good general education and hold a recognized Diploma in Domestic Science and Electrical Housecraft and possess a thorough knowledge of the use of electrical domestic appliances. They must be competent to conduct lecture demonstrations both in the showrooms and on consumers' premises and to advise consumers on the selection and use of electrical apparatus. Experience of large-scale industrial canteen work and school feeding will be an advantage.

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, accompanied by copies of not more than three testimonials, must be made on the form obtainable from the undersigned and be received by him not later than September 17th, 1945, in an envelope endorsed "Senior Demonstrator."

P. BREGAZZI.

Electricity Works, Borough Electrical Engineer.

Carlton St., St. Helens, Lancs.

24th August, 1945.

2669

## FIRST GARDEN CITY LIMITED

## Electricity Undertaking

**A**PPPLICATIONS are invited for the position of **SHIFT CHARGE ENGINEER** from men having received technical training in electrical and mechanical engineering and experienced in the operation of modern generating plant, including water tube boilers with automatic combustion control, steam turbines, centralised auxiliaries, remote controlled 11-kV switchgear, also A.C./D.C. rotary converting plant. Full salary in accordance with N.J.B. conditions, Grade 8, Class F, with early prospects of Class G.

Applications in writing, with copies of two recent testimonials, to the undersigned as early as possible.

This advertisement is published by permission of the Ministry of Labour and National Service under the Control of Engagement Order, 1945.

CHARLES GOULD, M.I.E.E.,

Works Road, Letchworth, Hertfordshire. Engineer and Manager. 2547

## ELECTRICITY SUPPLY BOARD

## Vacancies for Engineers (Electrical and Mechanical)

**T**HE Electricity Supply Board invites applications for positions on its engineering staff carrying a salary scale £350 x £15 to £500 per annum. Candidates must have a University Degree in Electrical or Mechanical Engineering or hold Corporate Membership of either the Institution of Electrical Engineers or the Institution of Mechanical Engineers. The appointments will be on probation for a period of six months, and the starting salary in each case will depend on the qualifications and experience of the successful candidate.

Applications, stating age, qualifications and experience, should reach the undersigned not later than 10th September, 1945.

PATRICK J. DEMPSEY.

Electricity Supply Board, Secretary. 2653  
60-62, Upper Mount St., Dublin.

**C**HIEF Draughtsman to take charge of drawing office of electrical instrument and radio equipment manufacturers. Class A ex-Servicemen or men over 51 years of age. Write fully.—Box 2651, c/o The Electrical Review.

**C**HIEF Engineer required by important South London manufacturing firm to take charge of works laboratories. Candidate should have good academic qualifications in scientific and engineering field and have specific knowledge of R.F. and A.C. engineering. Previous first class administrative ability essential. The position carries considerable scope and good salary. Full details to—Box 2678, c/o The Electrical Review.

**C**HIEF Electrical Engineer required to take charge of design and manufacture of control gear and switchgear. Applicants must have experience of modern developments in lift control systems. Good permanent position available for suitable man. Please state age, experience and salary to—Pickering's Limited, Globe Elevator Works, Stockton-on-Tees. 2679

**C**LERICAL Assistant, Class A. Ex-Serviceman, for Stores Office. Must have thorough knowledge of all electrical material. Apply—London Electrical Company, 92, Blackfriars Road, S.E.1. 2324

**C**ONTRACTS and Office Manager required for estimating and technical correspondence by firm of Electrical Instrument Manufacturers, London district. Apply—Box 2585, c/o The Electrical Review.

**E**LECTRICAL and Mechanical Clerk and Storekeeper wanted by electrical contractors near Birmingham. Class A ex-Servicemen or over 51 (ex-Servicemen preferred).—Box 2660, c/o The Electrical Review.

**E**LECTRICIAN required immediately by Electrical Contractors, London, permanency to suitable man. Class "A" ex-Service man or man over 51. Apply, giving full particulars to—Box 2582, c/o The Electrical Review.

**E**LECTRICIAN-Wiremen wanted. Permanencies to suitable applicants, who should be Class A ex-service men or over 51, or otherwise exempt from Ministry of Labour control.—J. W. Russell Ltd., 18, Queens Road, Watford. 2550

**E**LECTRICIANS and Assistants, Class A ex-Servicemen only, especially old employees, please apply to Electrical Installations Ltd., 65, Vincent Square, Westminster, S.W.1. Vacancies are available in London area and Provinces. A number of permanent men wanted. 2616

**E**LECTRICIANS, Class A ex-Servicemen or over 51, required by electrical contractors, near City, permanency to right men. Best conditions.—Box 2638, c/o The Electrical Review.

**F**OREMAN for paper-insulated power cable shop in London area. Cable-making experience desirable, but anyone with good practical experience of similar work, such as power transformer making, would be considered. Fair education and a good understanding of the principles of modern foremanship essential. Salary depending on qualifications, but about £450 per annum, including cost of living allowance. Applications only from Class A ex-Servicemen, those over 51, and others exempt from the provisions of the Control of Engagement Order, 1945. Write.—Box 2661, c/o The Electrical Review.

**I**NSTUMENT Makers, experienced, used to high-class experimental work, able to use milling machine, lathe, and to screw cutting, able to work from blue prints and to fine limits and to use precision measuring instruments, required urgently for the Royal Aircraft Establishment, Farnborough, Hants. Starting rate 79s. 6d., plus 25s. 6d. per week bonus, for 47-hour week. Three hours overtime per week. Average earnings £5 13s. 8d. per week. Applications should be made in writing to the Exchange Manager, Ministry of Labour and National Service, High Street, Aldershot. 2628

**I**NVOICING and Costing Clerk required by large firm of electrical contractors in N.W. London area. Must be able to act on own initiative. Progressive and well-paid position to capable male applicant who is not restricted by Control of Engagement Order, 1945. Applications also considered from Class A members of forces. Apply, stating age, experience and salary required, to—Box 2630, c/o The Electrical Review.

**L**ABORATORY Chief wanted to take charge of experimental department of electrical instrument and radio equipment manufacturers. Class A ex-Servicemen or men over 51 years of age. Write fully.—Box 2652, c/o The Electrical Review.

**L**ADY Demonstrator required. Applicants must be experienced in the demonstration of electric cookers and other electric domestic appliances, and must possess the R.A.W. diploma or other similar qualification. Apply in own handwriting, stating age, experience and salary required, to—The Resident Engineer, The Wiltownshire Electricity Co. Ltd., 76, George Street, Stranraer, Wiltownshire. 2655

**L**AMP Sales Representatives required for Lancashire and South Wales area. Knowledge of lighting an advantage. Good salary, commission and expenses, car provided. Applications, giving full details of experience, age, etc., to—The Sales Manager, Lighting Division, E. K. Cole Ltd., Southend-on-Sea. 2662

**L**EADING manufacturing electrical engineers are considering appointment of several Engineer Salesmen in London and the Provinces. Sound technical training and ability to secure and maintain contact with senior officials are necessary. Applications, with details of age, experience and salary expected, to—Box 2654, c/o The Electrical Review.



**LIFTS.** Designing and Layout Draughtsman required by old-established London firm. Applications only from Class A ex-Servicemen or those over 51. Write, giving age and details of experience.—Box 2677, c/o The Electrical Review.

**MALE** Office Manager required to carry out cashier's duties and to control general office. Permanent position in progressive company manufacturing electrical equipment in Leeds. State age, experience, and salary desired to.—Box 2635, c/o The Electrical Review.

**MANAGER** required, with general experience in the manufacture of lead storage batteries. State experience and salary required.—Box 76, c/o The Electrical Review.

**MEN** released in Class A are invited to apply for position of Design Engineer for range of electrical instruments, meters and mechanisms of an electro-mechanical nature. Must be able to undertake original design and development work. Excellent prospects. Full particulars to Box No. 818, 191, Gresham House, E.C.2.

**METAL** Presswork. Representatives of good standing required in all districts of the British Isles, who are at present calling on or are in touch with engineers, to offer metal presswork capacity of high-class quality. Remuneration will be on a commission basis only to commence. This should appeal to men who already represent allied and associated products. Apply to—Box 7588, c/o The Electrical Review.

**OVERSEAS** Employment. Required for Gold Coast Colony, qualified Electricians with H.T. knowledge (A.C. and D.C.) armature winding and cable jointing. Experience of surface and underground mining installation and maintenance work, commencing salary, including cost of living allowance, £45 per month. Age limit 45 years. Continuous agreements, free quarters and medical services; 2nd class passage, tours of 15 months with 3 months' leave on full pay. Written applications (no interviews), giving following essential details: (1) Full name; (2) Date of birth; (3) National Service registration number and local office shown on registration card, N.S.2; (4) Medical grade, if known; (5) If discharged from the Forces, particulars of Service number, rank, unit and reasons for discharge; (6) Qualifications and experience; (7) Name and address of present employers; (8) Details of present work, should be sent to the Secretary, Overseas Manpower Committee (Ref. 4570), Ministry of Labour and National Service, York House, Kingsway, London, W.C.2. Applications cannot be acknowledged. 2668

**PROGRESSIVE** London Company developing and marketing electrical devices and instruments requires Sales Promotion Manager to co-ordinate direct selling activities, established relations with publicity media, senior executives of public utility undertakings and prospective customers. The position calls for administrative ability, initiative, drive and experience in promoting sales of speciality products. Write for full details of qualifications, experience, age, etc., to—Box 2594, c/o The Electrical Review.

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**SALESMEN** wanted for non-ringing cables in Home Counties: one for counties North of London, one for Southern counties. Please send details of age, experience and connections to—Box 2674, c/o The Electrical Review.

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**FREEDOM** from Government Control, is desired by Keen Young Engineer (27), anticipating release from present post of Electrical Engineer Officer, R.A.F., very shortly. Civilian experience of estimating, maintenance, contracting. War-time experience, technical supervision and organisation of Electrical and Instrument sections of R.A.F. stations, administration of both sexes. City & Guide certificates in Electrical Engineering, Stud. I.E.E., A.M.Inst.B.E. Position required offering prospects for keenness, adaptability, and initiative. Location, home or abroad, immaterial.—Box 7464, c/o The Electrical Review.

**H.T.** Plumber Joiner wants settled permanent work, any part of country.—Parkin, 45, Wilson Street, Lincoln. 7534

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**MAINTENANCE** Engineer, returning from overseas post end of September, desires work. Experienced generation and distribution, switchgear, motors, etc., up to 11 kV, D.O. and supervision. Age 39.—Box 7547, c/o The Electrical Review.

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**PRACTICAL** all-round Electrical Mechanic, age 43, with unusually wide experience, covering small power stations, works maintenance, jigs, modern production methods, installations, aircraft equipment and petrol engines, desires position with British firm opening Colonial branch. Drawing office, sales and managerial experience. Australia preferred, but anywhere considered (licensed N.S.W.).—Box 7519, c/o The Electrical Review.

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JOHN DUNLOP.

Town Clerk.

City Hall, Belfast.

2665

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**3** h.p. Electric Motor 220/240 volts D.C. brand new Batwin—Chrisia Aircraft, Heston Airport, Hounslow 2345.

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**14** Exhaust Fans, Single-phase, 220/230v., air displacement 1900 cu. ft./min. Delivery ex stock. Price including carriage £12 2s. 6d. Deposit on returnable case £2 extra. Further details and sketch gladly sent. Southern Ignition Co. Ltd., 190 Thornton Road, Croydon, Phone THORnton Heath 4276-7-8. 75

**14** h.p. "Lister" 2 Cylind. 4-stroke Petrol/Paraffin Engine water cooled coupled to 5 kVA Alternator, 230/250 v. S/P.h. 50 c. complete with Water Tank, Fuel Tank, etc., with Voltage Regulator, Meter and Switches. Universal Electrical Co., 221, City Rd., London E.C.1. 2563

**40** h.p. Motor, 400/3/50, 850 revs., B.B., by Brittain; 22-h.p. by Laurence Scott, 580 revs.; 25 h.p. by Fuller, 1,400 revs.; 10-h.p. by Lanc. Dyn., 950 revs.; 7½-h.p. by Brooks, 1,000 revs.; 20-h.p. by Cromp. Park, 1,440 revs.; 13½-h.p. by Howells, 950 revs. All ball bearings and complete with starters, new condition, cheap to clear.—Box 2648, c/o The Electrical Review. 25

**92** h.p., 750 r.p.m. Synchronous Motor, 45 leading P.F., direct coupled to 100-130 volt, 550 amp. D.C. Set, complete with auto transformer starter; also 150-kVA, 400-volt, 3-phase, 428-r.p.m. Alternator, direct coupled to Belliss & Morcom Vertical Compound Engine.—Southalls (B'ham) Ltd., Charford Mills, Salfrey, B'ham, 8. 2620

**100** h.p. "Laurence Scott" Slipring Motor, 400/3/50, screen, protected, ball bearing, 930 r.p.m. Complete with "Allen West" oil immersed starter. Date 1941.—Stewart Thomson & Sons, Fort Road, Seaford, Liverpool, 21. 55

**140** kVA Belliss/Crompton Alternator, 400/3/50, 4-wire. Seen running.—Stewart Thomson & Sons, Fort Road, Seaford, Liverpool, 21. 47

**250** kVA Alternator, 400 volts, 3-phase, 50 cycles, 750 revs., with direct-coupled exciter; also two 250-kW Rotary Converters, with transformers and switchgear, input 6,600 volts, 3-phase, 50 cycles, output 420/210 volts D.C.—Midland Counties Electrical Engineering Co. Ltd., Grice Street, Spon Lane, West Bromwich. 36

**500** Electric Motors, Dynamos, Transformers, Converters, etc., at low prices.—S. C. Bilby, A.M.I.E.E., A.M.I.E.E., Crosswells Road, Langley, near Birmingham. Phone, Broadwell 1359. 21

**2,700** Surplus Used Meters and Maximum Demand Indicators. Siemens-Schuckert—5, 10, 20, 50 amp., 200/250 volts, 50 cycles, W.S. Type, 1,800. Siemens Schuckert, Prepayment—5 amp., 200/250 volts, 50 cycles, V.W.5 and V.W.8 Type, 320. Siemens Bros.—10 amps., 200/230 volts, 50 cycles, 10H and 10K Type, 300. Reason Maximum Demand Indicators—7½, 10, 15, 25, 50 amps., 280. Good condition, ideal for temporary houses or departmental checking. Inspection invited. Any reasonable offer considered. Minimum quantity 12.—Electricity Offices, Market Street, Huddersfield. 2572

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**A**CCUMULATOR Plates (nd) and lead Peroxide; as actual smelters we pay top price. Also old storage batteries, transformers and whole installations purchased.—Elton, Levy & Co. Ltd., 18, St. Thomas Street, S.E.1. Hop 2825-6. 39

**D**C. Motors, 1 to 10 h.p., 200/500 volts, ball bearings, or would exchange with new 3-phase motors.—W. H. Sugden & Co. Ltd., Glenny Road, Barking, E. Phone. RTFlewlay 3302. 2645

**E**LECTRICAL Accessories and Electric Irons required for export to the Middle East. Full particulars to—Ascog Ltd., 44, Theobalds Road, London, W.C.1. 2636

**E**LECTRICAL Tachometer Equipment, complete with Generator and Instrument(s), preferably scaled 0-200 r.p.m. Particulars to—Commercial Structures Ltd., Staffa Road, Leyton, E.10. 2670

**E**NGINEERING Technical Books (new or second-hand) wanted in any quantity. Attractive cash offers. Call—Third floor, 356, Oxford Street, W.1, or "Stoneleigh," St. George's Avenue, Weybridge. 62



**MERCURY** (Quicksilver) wanted. Write for packing instructions. Gold, Silver and Platinum also purchased.—Collingridge & Co. Ltd., Riverside Works, Riverside Road, Watford (Tel. 5963).

**REQUIRED**, Automatic Coil Winding Machines for electrical coil winding.—Box 38, c/o The Electrical Review.

**WANTED** for South African market, Electric Kettles, etc. Quotations to—Box ZL 609, Deacons Advertising, 36, Leadenhall Street, E.C.3.

**WANTED**, Rotary Converters, any size.—Universal, 221, City Road, London, E.C.1.

**WTD**, 110-volt, 4-kW approx. Lighting Set with switchboard and batteries. Full particulars.—G. Ions, Searchlight House, Lower Penarth, Glam.

**10**—15-kW Coil-drying Oven, capacity 40-50 cu. ft.—Box No. 572, Mason-Peacock Ltd., 184, Strand, London, W.C.2.

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**SMALL** Armatures, etc., winding or re-winding, in quantity. High-class work, prompt delivery.—Southern Ignition Co. Ltd., 190, Thornton Road, Croydon.

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**MANUFACTURERS'** Agent with good connection throughout the West Country, desires sole representation for Cable Fittings and Appliances to complete his present range.—Box 7446, c/o The Electrical Review.

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**IT** is desired to secure the full commercial development in the United Kingdom of British Patent No. 524120, which relates to Winding Machines for winding together in a roll Ribbons of Metallic Foil separated by Ribbons of Insulating Material, either by way of the grant of licences or otherwise on terms acceptable to the patentee. Interested parties desiring copies of the patent specifications and further particulars should apply to Stevens, Langner, Parry & Rollinson, 5 to 9, Quality Court, Chancery Lane, London, W.C.2.

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## COMPANY MEETINGS

### NEWTON BROTHERS (DERBY) LIMITED

#### Striking War-time Achievements

**C**OLONEL P. C. Cooper-Parry, O.B.E., M.C., J.P., F.C.A., presiding at the 16th Annual General Meeting on August 22, at Derby, said:

"Dealing first with the Accounts: the net profit at £13,045 has remained fairly constant owing to the incidence of the Excess Profits Tax.

The Trading profit for the year decreased from £174,045 in 1944 to £100,367. This does not reflect slackened activities. During 1944/45 production reached a peak level and the reduction in the trading profit is due entirely to reduced profit margins.

Including a near estimate for the year the total of Excess Profits Tax payable for all periods to 31st March, 1945 will be over £950,000, of which £759,000 has already been paid. Net dividends total £37,768.

Whilst the Company's normal products would alone have played an important part in the technical achievements of the war, we are particularly proud of a new development—the "Newton-Derby" carbon pile automatic voltage regulator invented by Mr. Frederick Newton, which in October, 1939, after exhaustive Government tests, was accepted and went into production in large quantities. It had real advantages over existing equipment, a much wider field of application, less bulk and weight, less working parts, and was capable of being produced in very large quantities at low cost.

It was obvious that that supplies for the wide field of use could not be met by any one manufacturer and at the request of the Ministry of Aircraft Production our Directors placed designs, working drawings and technical advice at the disposal of various British manufacturers operating under the M.A.P. "parent" and "daughter" procedure, and later of the Supply Departments of the U.S.A., Canada and Australia.

Under the protection of the British-U.S.A. Patents Exchange Agreement correspondingly large quantities of "Newton-Derby" design Voltage Regulators have been manufactured by American firms.

This piece of equipment has been an integral and essential part of almost every aeroplane, warship, radar and gunsight installation, and in respect of which the turnover from all manufacturing sources must have run into many millions of pounds sterling.

The magnitude of the application of this one patent affords striking tribute to the brilliant skill of Mr. Frederick Newton.

The changeover to peace requirements will be fraught with many problems. It is reasonable to assume that service requirements will continue, albeit on a considerably reduced scale, and it is reasonable, too, to assume that curtailment of requirements for our "patented" products will fall first on those firms who have been manufacturing under Government licence.

I now move the adoption of the Report and Accounts and ask Mr. F. Newton to second the motion and Mr. F. V. Pipe to support it.

Mr. Frederick Newton, A.M.I.E.E., M.I.Mech.E., seconded the motion, said:—

Light weight, small bulk and fewness of parts concomitant with the highest technical performance have been the keynote of our developments used so extensively during the war, and that a wide commercial field is open for the Company's products.

Mr. F. V. Pipe, A.M.I.E.E., Managing Director, supporting the motion, said:—

From 1939 to July, 1945 we have produced: 108,216 Engine-driven Generators, Rotary Transformers, etc., for aircraft, a large proportion of these being our original designs. In addition, eight other firms brought in by the M.A.P. made 231,220 machines to our designs and drawings, while large quantities were made for M.O.S.

135,432 "Newton-Derby" Automatic Voltage Regulators; and some ten other works were brought in to assist, who produced between them 674,584 regulators.

For Admiralty requirements we designed and produced 9,220 Motor Alternators, Motor Generators, special Motors, etc., and a number of firms selected by the Admiralty manufactured further large quantities. We manufactured 24,800 special "Newton-Derby" Regulators for naval use.

The Report and Accounts were unanimously approved. Mr. Robert Mitchell, M.I.Mech.E., was re-elected a Director, and Messrs. Watson, Sowter & Co. were re-appointed Auditors. The proceedings closed with a cordial vote of thanks to the Chairman, Directors, Staff and Employees.

2676



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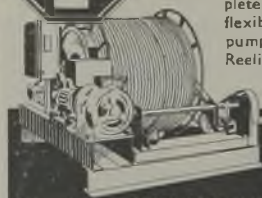
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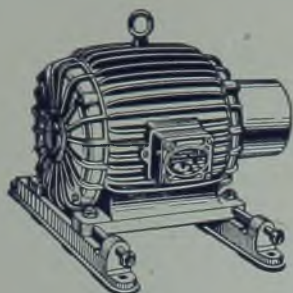
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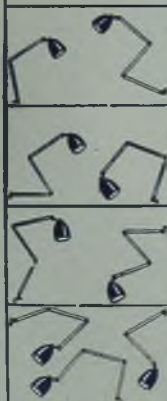
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