ELECTRICAL REVIEW

FOUNDED 1872

Vol. CXXXVII. No. 3537 SEPTEMBER 7, 1945 9d. WEEKLY

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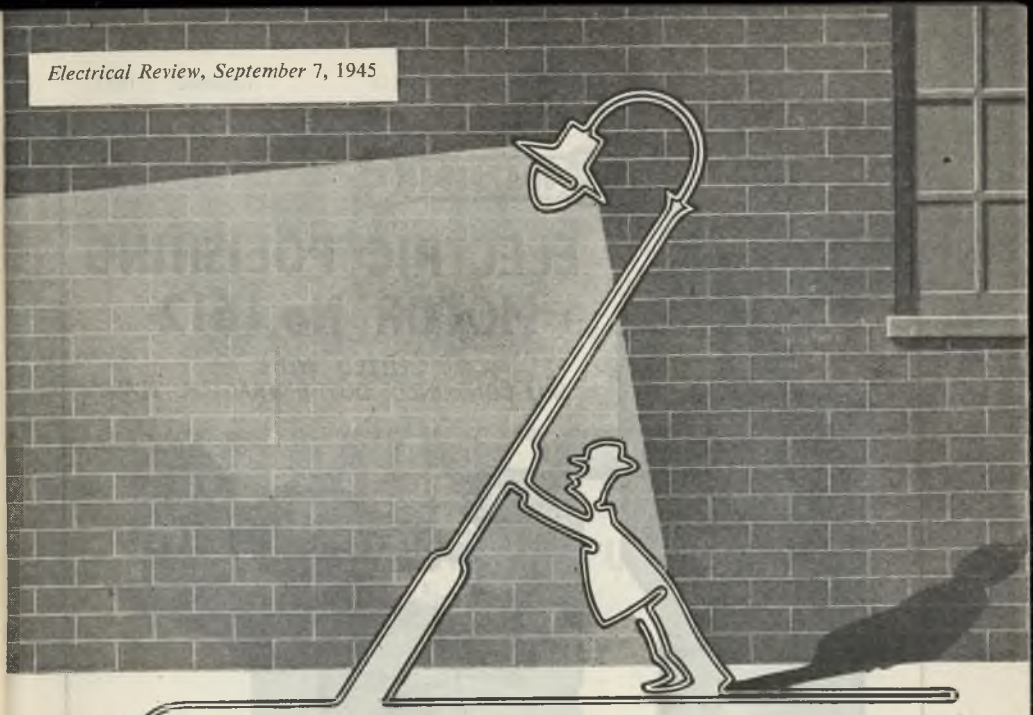

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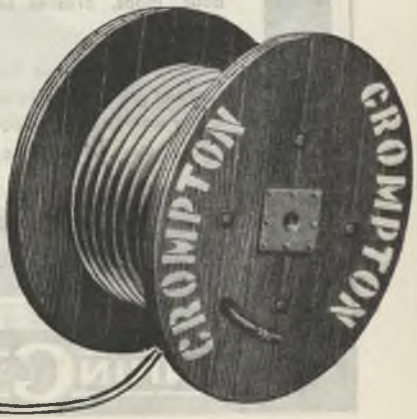

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ELECTRICAL REVIEW

September 7, 1945

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ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872

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Safe Utilisation

Competent Maintenance Staff Essential

HOW diversified may be the duties of those technically responsible for the use of electricity in factory processes is illustrated each year in the report of the Electrical Branch of the Factory Department entitled " Electrical Accidents," some particulars from which as regards 1944 are given elsewhere in this issue. Their activities extend from the operation and maintenance of high-voltage switchgear and transformers to portable lamps. In between come all the problems associated with motor drives, including the complexities of machine-tool control and the rough usage to which portable tools and their connectors are liable, and with industrial heating throughout its great range of specialised electrical features. Upon these men depend the safety of many times their number of non-technical persons and also the continuance of works output through reliable operation of apparatus in their charge.

Guarding Against Mishaps

From the analyses of accidents reported, it is clear that many probably would not have happened had the supervision been adequate or foreseeing or had the operative concerned been of the right type and suitably trained for his work. This applies more particularly to lower-voltage systems on which the great majority of accidents, including fatalities, have occurred. Often these are the result of ignorance of some of the more elementary risks and proven safeguards against them; in this category come the need for periodic testing (and recording) of earthing continuity and the relationship between earth leakage and over-current protection. Accidents at high voltages are most frequently due to inadvertence of highly skilled men or to some flaw in the permit-to-work system, indicating the desirability of conforming to B.S. 1086.

Selection and Statns

We are not unmindful of the extreme handicaps under which maintenance has been carried out during the war or of the feats of improvisation performed in most trying circumstances by the very few skilled electricians available for the work. Rather are we concerned with the selection and status of both supervising and operative grades in the future. An assessment of their proper status presents difficulties not found in electrical manufacturing works or in electricity supply undertakings.

The value of electricity may represent only 5 per cent. of that of the finished product and the non-electrical managements cannot be expected to appreciate the nature or magnitude of the problems encountered or the value of technically trained men with the requisite experience. Often the man who favours leaving plant alone so long as it works, but is quick to repair faults, is thought more of than one who is wise before as well as after the event and so is often able to prevent breakdowns.

The primary need, therefore, is for some authoritative indication of functional ability, more especially in the smaller factories, where the work would not call

for electrical engineers of professional standard with the readily recognisable distinction of membership of the Institution of Electrical Engineers. For supervising positions the Swan Diploma awarded by the Association of Supervising Electrical Engineers should be a most useful guide to industrialists, but to cover the whole field a nationally-organised system of training, coupled with the award of certificates of competence is required.

Power for Industry

PUBLIC references to electricity lately appear in too many instances to have been based on the assumption that its principal use is in residential premises. Yet the predominant national service it renders is the provision of power and heat in factories. Before the war this absorbed well over half the electrical output and more recently the proportion has approached two-thirds. Mere magnitude of consumption is not the important thing, however. Cheap power is vital to industry in a way that it is not for other purposes. It is an important factor in international competition, and, moreover, directly or indirectly makes it possible for the citizen to have the advantage of electricity in his home. This side of the picture should be kept well to the fore when considering the economics of the electricity supply industry.

Engineers and Managers

THE August *Electrical Power Engineer* again raises the age-old question of the managership of electricity supply undertakings, following upon the Bristol Corporation's decision to advertise for both a general manager and a chief electrical engineer, the latter to be subordinate to the former. Being what it is, our contemporary naturally presses the claim of the technical man to be both engineer and manager. This is certainly an arrangement which has generally worked well in the past and will no doubt continue. But it may legitimately be argued by some of the larger authorities that the business has now assumed such proportions and intensity that division of functions is desirable if not essential. An admirable compromise is often provided in such cases by a "commercially-minded" engineer backed by a good technical second in command.

Next Winter

SINCE the outbreak of the war the number of kWh generated per annum has increased by some two-fifths, whereas the number of those engaged in electricity supply has been reduced by one-quarter. Maintenance in the circumstances could not be adequate and a special correspondent of the *Sunday Times* expresses the fear that, since the position in this respect has not improved, more serious breakdowns will be experienced during the coming winter than in the last. On the other hand he considers that the factor in generating plant shortage represented by reduced steaming capacity of boilers due to unsuitable coal may be overcome by mid-winter. Much will depend upon the weather in determining the peaks caused by the use of electric fires between 8 and 10 a.m.

Load Mountains

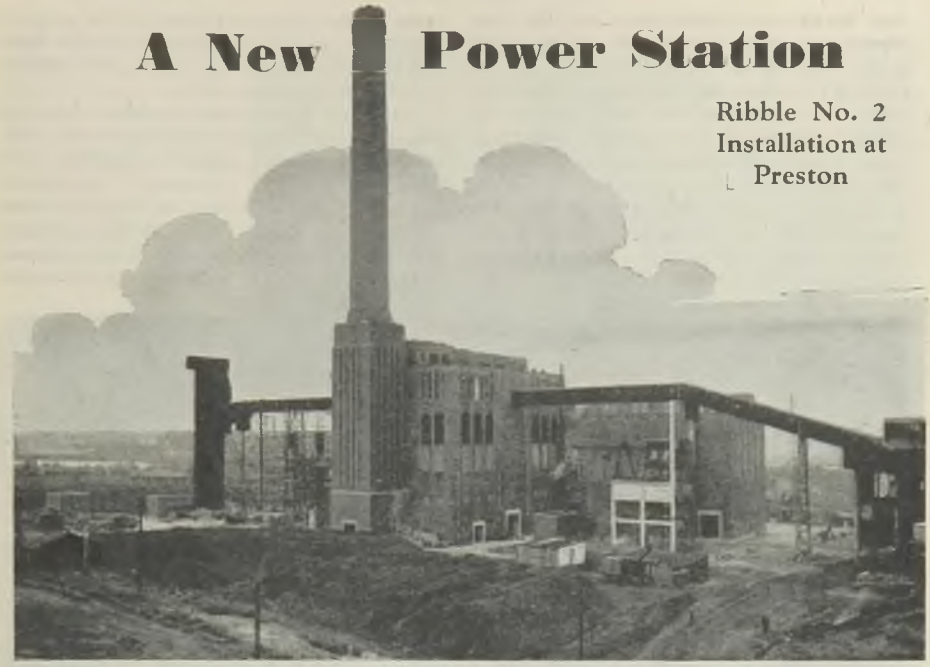
As a means of representing features of system loads, cut-out contour curves with their time bases side-by-side have been in use for some twenty years but are still not so widely employed as their usefulness appears to warrant. In Technical Report K/T.107 (P. Schiller) of the Electrical Research Association (9s. net) the method is applied to the analysis of load characteristics of various kinds. The Association has developed an improved arrangement, the materials for which will shortly be available in standard form. Load maps are also discussed, but these, while useful for dealing with seasonal cycles and long-term trends and capable of easy storage, do not make so ready a visual appeal and are not suitable for detailed load analysis.

Australian Cables

WAR conditions have naturally speeded up the trend towards self-sufficiency in the Dominions, particularly in Australia. One aspect of this is the erection of a works at Liverpool, N.S.W., by a group of British cable makers for the production of all kinds of rubber-insulated cables. From an article by the general manager of the works in a recent issue of *Erda* it seems that the prevalent rubber shortage has led to the extensive use of plastic substitutes, but apparently natural rubber is being obtained from Papua and production there is to be expanded.

A New Power Station

Ribble No. 2 Installation at Preston



ALTHOUGH the plant of the Ribble No. 2 generating station of the Preston Corporation Electricity Undertaking is referred to in the reports of the Central Electricity Board as "extensions," the station is completely independent of the Ribble No. 1 station alongside which it has been erected. Designed for an ultimate output capacity of 120,000 kW, its present capacity is half that figure, and it was first put into commission in 1942 with one 30,000-kW turbo-alternator and two boilers. While it was built during the war and is still without various finishes and refinements such as floor and wall tiling, merely as the result of war conditions, it has been built to take its place in the general scheme of things as a permanent installation, and our impression of it after a couple of days close scrutiny of its plant and operation is that it is a good straightforward station built for fairly wide and everyday working conditions. It is a riverside-operated, stoker-fired station designed for consuming Lancashire fine slack.

The station site is on the south bank of the River Ribble and about 400 yards south of the Albert Edward Dock; the station is partly dependent on the dock for its circulating water. The station is also about a mile south-west of both Preston Town and the main L.M.S. railway line, and it is served by sidings from a branch line from this main line to the Dock. The new station is to the west side of the adjacent, older, station, and at the west end of the new station is a storage ground for about 35,000 tons of coal.

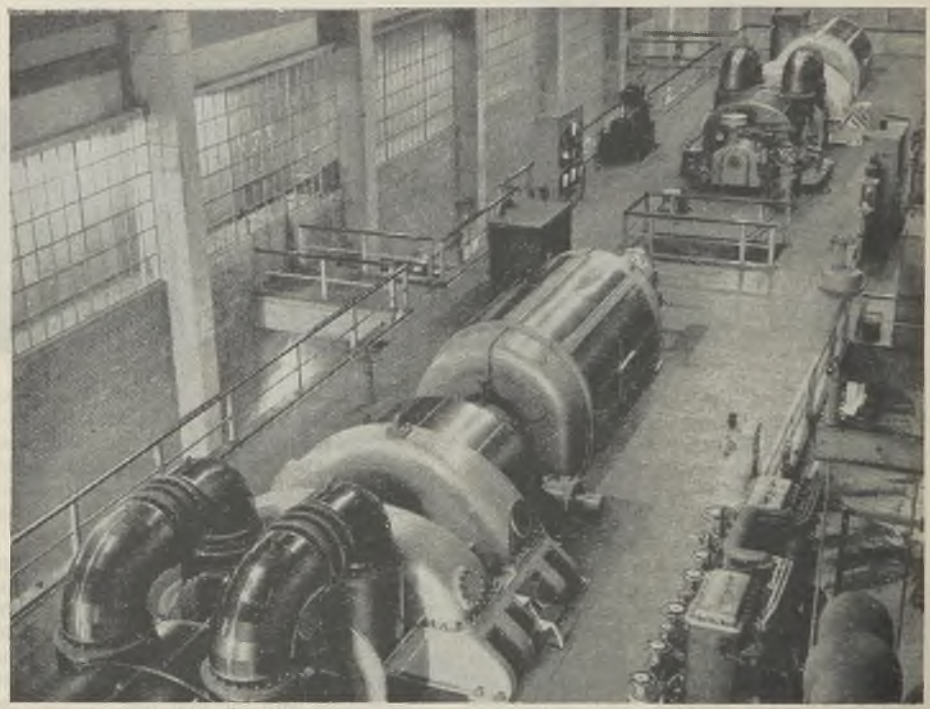
As it stands at present the main buildings are "L"-shaped, with the turbine house running east and west to the north and the adjoining boiler house to the south. The second half of the station, work on part of which has already been commenced, will be symmetrical with the first half, so that the completed main buildings will constitute a "T" formation, with the top of the "T" as the turbine house to the north and its leg as the boiler house to the south.

On the north/south centre line of the existing boiler house at the south end is the 300-ft. chimney which serves the whole of the first half of the boiler house. Running practically due east and west respectively, on the other centre line of the boiler house are coal conveyors running to the old power station and to the storage ground. In a bay on the south side of the turbine house, *i.e.*, between the turbine house proper and the boiler house, are the boiler feed pumps,

feed heaters and evaporators and the condenser extraction pumps, all at basement level, while in the same bay at a level of about 50 ft. above the basement are the surge tanks. In a bay on the north side of the turbine house are an auxiliary switchgear room at the turbine operating-floor level, the circulating water pumps at the basement level and a main cable passage vertically between the two chambers. Beneath this bay are culverts which receive water from and discharge it to the river and dock.

some of the important parts of the station: basement—28 ft., firing floor 44 ft., fan floor 105 ft., boiler-house roof 126 ft. and turbine-room operating floor 53 ft.

The plant foundations are taken down to the surface of the red sandstone about 30 ft. below ground level, while the buildings have been erected on "Franki" reinforced-concrete piles, a feature of which is their construction during the driving process. The buildings are of reinforced-concrete frame construction, with brick panel walls.



The two turbo-alternator sets are arranged in end-to-end alignment

In an annexe on the north side of this bay, *i.e.*, flanking the whole of the station on the north, are the station transformers which are housed individually in "open" cubicles. The turbine and boiler houses are, respectively, 208 ft. long and 83 ft. wide, and 96 ft. long and 114 ft. wide. At a point about 250 yards south-east of the station is a new 33-kV switch-house. Spanning the turbine room between the pump and auxiliary switchgear bays is a Babcock & Wilcox 75-ton electrically-operated overhead travelling crane. The following are the O.D. levels of

The chimney, which is 120 ft. square at the bottom, is of heavily reinforced concrete construction and brick-faced.

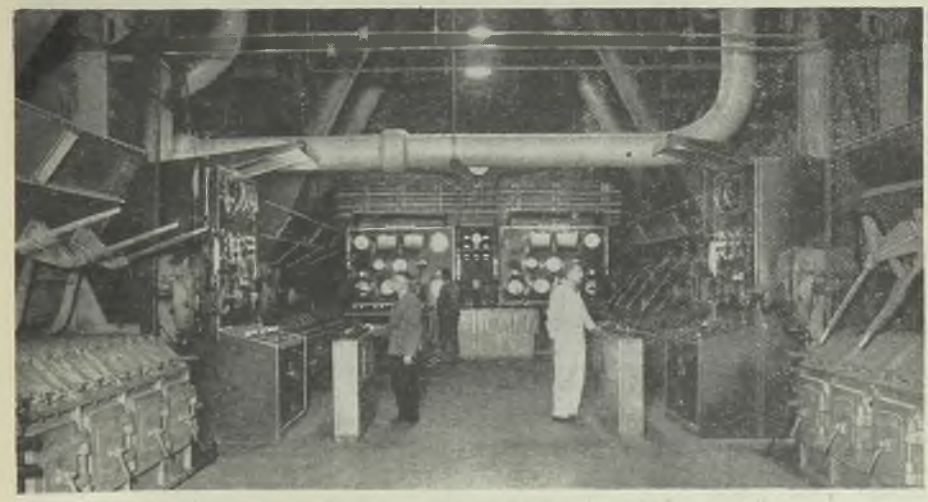
The two turbo-alternator sets are arranged in end-to-end alignment east to west, while the four boilers are installed in two lines, two in each line, separated by a wide firing aisle running east and west. The boilers, complete with stokers and air heaters, were supplied by International Combustion, Ltd.; each has an m.c.r. of 187,500 lb. per hour. They are of the "Lopulco" tri-drum type with solid forged drums, each being equipped

with a twin chain grate stoker 26 ft. wide and 22 ft. long, a convection-type superheater by the Superheater Co., Ltd., a Senior "Heenan" twin-type economiser, plate-type air heaters, and a combustion chamber with a volume of 8,100 cu. ft.

The Howden forced- and induced-draught fans are situated above the boilers and near the air heaters, while the secondary-air fans are installed at the basement level. The i.d. fans are driven by constant-speed motors with hydraulic couplings, while the f.d. fans are driven by two-speed motors. Ivor soot blowers, Hopkinsons mountings, and Copes feed-water regulators are among the remaining contributions to the boiler plant. Each of the boilers is remotely hand controlled from an individual central control desk, while there is also for each boiler an instrument panel with a comprehensive range of recording and indicating instruments and gauges by George Kent, Ltd. Spanning the firing aisle at one end is a panel containing mammoth load and pressure indicators which can be read from the far end of the boiler house.

On the west side of the station a conveyor links with a tower at the edge of the storage ground

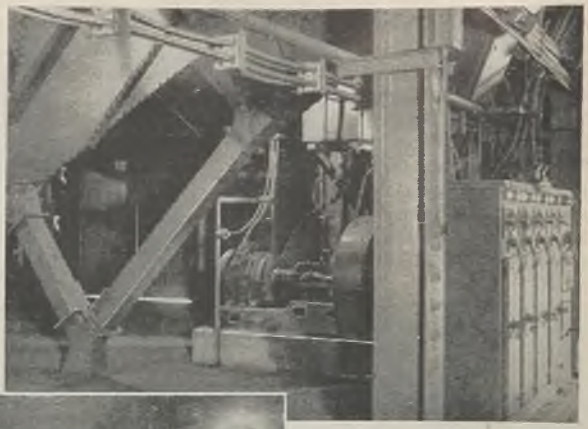
Coal is at present supplied to the station from two directions. On the east side a covered gantry conveyor is connected with the coal-handling plant in the old station, while on the west side a similar conveyor links with a tower at the edge of the storage ground. All the coal delivery on the west side of the station is at present by road. Coal delivered at the base of the existing tower is raised by a skip hoist to a hopper in the tower, from which the coal can be fed to the storage ground by a chute, or to the

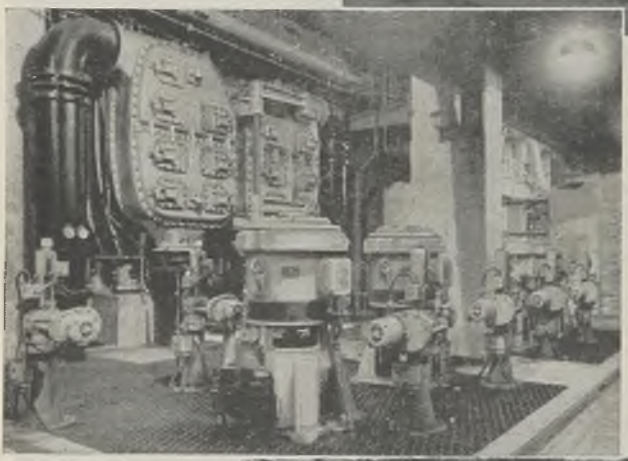


Four boilers arranged in two lines running north and south and separated by a wide firing aisle

conveyor to the new station which runs over the boiler bunkers situated centrally above the firing aisle. This conveyor has a capacity of 120 tons per hour, while that between the new and old stations has a capacity of 80 tons per hour.

Distribution over and reclamation from the storage ground is provided for by means of an International Beaumont drag scraper on the usual winch-drive and rope-haulage system. A future development of the





For each set there are two river-water and two dock-water circulating pumps; motors at condenser basement level

Ash from the hoppers is chute fed to a sluice system of handling; note secondary-air fan and stoker and fan-motor switchboard

tower at the edge of the storage ground. The north to south conveyors system will embrace suitable towers, and the one at the junction of the two conveyor lines will have a 60-ton hopper from which, by means of short interconnecting conveyors, any of the lines to the east and west can be fed.

coal-handling plant, work on which has already been commenced, will include two 150-tons-per-hour belt conveyors running north to south from the dock railway sidings to the power station, and crossing the river by a specially constructed bridge, and additional conveyors, one running east to the old power station, and one west through the new station to a second

Switchgear "A" is remotely operated from the control room in the old generating station

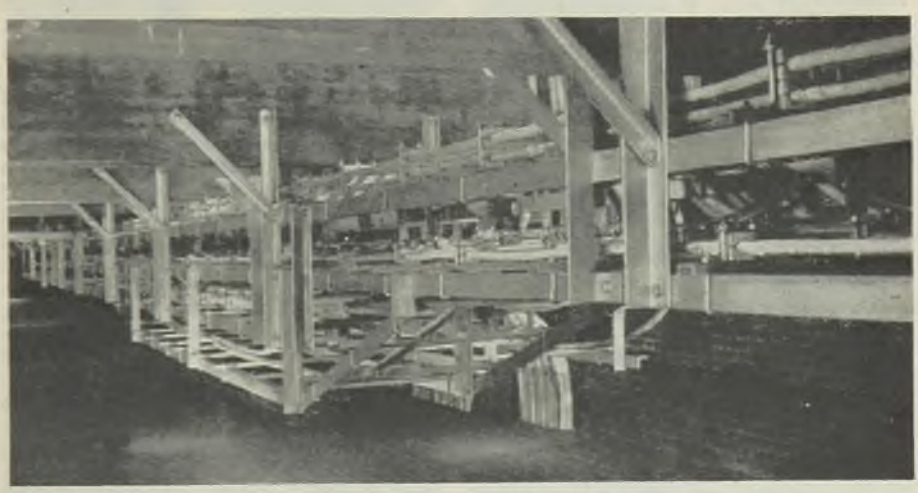
From the west end of the future conveyor to the storage ground a radial conveyor will discharge the coal from the main conveyor to the storage ground, as the level of this conveyor will be too low for chute delivery. The new tower, however, will also contain a hopper served by a skip hoist for delivery from west to east.

The f.d. fans take in the air at the fan level and pass it through plate-type, cross-flow and main air heaters from which it passes by two paths to the combustion chamber from inlets under the chain-grate stoker. Each of these paths is tapped at two points near the stoker end, from which, *via* two auxiliary paths, a proportion of the preheated air is drawn off by the secondary-air fans and passed to the combustion chamber at entrances above the front arches.

The ashes pass from the rear end of the stoker to hoppers from which they are delivered to an "Usco" sluice-type ash-handling plant which, when finally extended to deal with the ashes from the eight boilers of the completed power station, will be capable of handling about 12 tons of ash per hour. The sluiced ashes are received in a sump outside the boiler house from which they are reclaimed by means of a telpher and grab and delivered into elevated storage bunkers for discharge into lorries.

The two turbo-alternators, supplied by the English Electric Co., Ltd., each have a m.c.r. of 31,500 kW and a speed of 3,000 RPM. The turbine stop-valve steam conditions are 600 lb. per sq. in. and 850 deg. F. The machines are two-cylinder units with nineteen h.p. impulse stages and 22 l.p. reaction stages, *i.e.*, eleven to each cylinder on the l.p. side. Steam is bled at four stages, two h.p. and two l.p., and the exhaust passes to a single-shell twin-section surface condenser which has a cooling area of 29,000 sq. ft. and will maintain a vacuum of 29 in. at the economical load when supplied with 18,500 gal. per minute of cooling water at 55 deg. F.

The condensate is drawn from each condenser by duplicate extraction pumps and passed on first to the steam-air ejectors and then the two l.p. feed-water heaters in series. Then it passes to the suction of the boiler-feed pumps, each of which has a capacity of 350,000 lb. per hour. There are two motor-driven feed pumps for normal use and a steam-turbine driven unit as a stand-by to each motor-driven one. The feed pump passes the condensate on to the two h.p. heaters in series, the final feed temperature to the economiser being 350 deg. F. at m.c.r. and 330 deg. F. at e.c.r.



Neat and accessible cable arrangements; upper cable passage

An evaporator with a capacity of 15,000 lb. per hour receives make-up water from the town supply and is served by steam taken from the first h.p. bleeding stage on light load or the first l.p. bleeding stage on heavy load. In the case of failure of the feed-water system the feed pumps can be supplied directly from the surge tanks.

The tidal river will not supply sufficient cooling water at all times, so arrangements

have been made to supplement this water from the dock, and two tunnels have been constructed to carry the water to and from the dock. These tunnels are of 6·5 ft. internal diameter, and one, about 1,050 ft. long, provides the inlet water to a dock culvert under the circulating pump bay, while the other, about 1,700 ft. long, returns the discharge water to a point in the dock about 500 yards west of the inlet point. The tunnels are lined with hydraulically prestressed concrete rings.

There is a separate river culvert in the same bay, but the outlet culvert is common to both the dock and river waters, and the return to the dock is controlled by a weir in the discharge tunnel line. Serving each condenser are two river circulating-water pumps and two dock circulating-water pumps, each for 631,200 gal. per hour.

Each alternator is cooled on the closed-circuit principle by means of a water-cooled air cooler in the foundation block and two motor-driven fans. It generates at 11 kV and is electrically "tied" to a 37,500-kVA English Electric main transformer which steps up the voltage to 33 kV.

High-Voltage Switchgear

The 33-kV switchgear is housed in a separate building; it is of the cellular double bus-bar air insulated type, with oil circuit-breakers of 1,500-MVA rupturing capacity after slight modification. This new 33-kV switchgear, which is housed in switch-house "A" is associated with metal-clad compound-filled 33-kV switchgear in the old station. The compound-filled switchgear will later be replaced by new cellular-type air-blast gear of 1,500-MVA rupturing capacity, which is to be housed in a new switch-house "B."

The switchgear in switch-house "A" is normally remotely operated from the control room in the old generating station, but for emergency use there is a local operation control room in switch-house "A." Arrangements are also provided for control of the circuit-breakers in the individual cells for use during maintenance work.

Supplied directly from the tie between each alternator and its main step-up transformer is a 2,000-kVA step-down unit transformer for supplying the set auxiliaries during normal running. In addition, there are two 2,500-kVA step-down auxiliary transformers for supplying essential station auxiliaries, one supplied from switch-house "A" and the other from the 33-kV switchgear in the old power station. There is a suitable interconnector between each unit transformer 400-V switchboard and the auxiliary transformer switchboard. Further, on each turbo-alternator block there is an isolator in the 11-kV connection to the unit transformer so that if the latter fails the auxiliaries can be supplied direct from the main system.

The three switchboards for the 400-V supplies from the unit and auxiliary transformers are arranged in one line with two 220-V DC switchboards for certain essential supplies, including emergency lighting. The whole of the switchgear was supplied by the English Electric Co., Ltd.

We were very impressed by the neat and accessible cable arrangements throughout the station which were carried out by British Insulated Cables, Ltd.

Capital and Operating Costs

"Loudaphones" are installed throughout the station, while there is an "Ordasign" signalling system for communication between the control rooms and the turbine house. Fire protection is provided by means of a "Mulsifyre" system.

The total cost installed for the first half of the station was about £28 per kW, including all costs attributable directly or indirectly to war conditions. During 1944, when two sets were in operation, the maximum demand was 60,600 kW and the kWh sent out amounted to 319·7 million. The running hours were 8,154. The gross calorific value of the coal was 11,604 BThU and 1·309 lb. of coal was consumed per kWh sent out; the thermal efficiency was 22·456 per cent. The works costs per kWh sent out for the year were: Coal 0·2717d., coal and ash-handling 0·0096d., and total works costs 0·3048d. Coal was 38s. 9d. per ton.

Mr. G. A. Robertson, M.Sc.(Tech.), M.I.E.E., A.M.I.Mech.E., the borough electrical engineer, who was responsible for the design and construction of the station, states that these performance figures would have been materially improved upon but for the enforced use of considerable quantities of unsuitable coal, combined with the fact that during the year in question trouble was experienced with the old river band screens necessitating long periods of operation on the dock circulating water system with a resultant high c.w. inlet temperature. We are indebted to Mr. Robertson for his assistance in compiling this article, and to Mr. J. Eatock, technical assistant.

I.E.E. Chairmen—I

Biographies of Local Centre Officials

THE next chairman of the South Midland Centre is **Mr. F. J. Elliott,** chief engineer and manager of the Wolverhampton Corporation Electricity Department. Mr. Elliott, who is fifty-five, was educated at the Merchant Venturers' Technical College and University College, Bristol, and became a pupil of the late Mr. H. Faraday Proctor in the Bristol Electricity Department. In 1910 he was appointed engineer-in-charge of rotary substations of that undertaking, later becoming engineer-in-charge of the generating station, assistant consumers' connection engineer and assistant mains engineer. Leaving Bristol in 1930, he was appointed chief engineering assistant at Wolverhampton and deputy chief engineer and manager in 1935. On Mr. T. A. G. Margary's retirement last year he became chief engineer and manager. Mr. Elliott is a member of the E.R.A. Sub-Committee C: Domestic Supply, and also of the E.D.A. Rural Electrification Advisory Committee.

Mr. D. B. Hoseason

Mr. F. J. Elliott

The new chairman of the East Midland Sub-Centre is **Mr. D. B. Hoseason,** assistant managing director of the Brush Electrical Engineering Co., Ltd. Mr. Hoseason, who is forty-six, is a native of Leek, Staffs. He was educated at the Borden Grammar School, Kent, and the Manchester College of Technology (he is an associate of the College) and then became a trade apprentice to the British Westinghouse Co., Ltd., Trafford Park. From 1920 to 1925 he acted as electrical machine designer to the Metropolitan-Vickers Electrical Co., Ltd., and was later appointed engineer-in-charge of motor development and chief engineer in the Motor Department. In 1940 he became electrical director and director of education and training to the Brush Company. Mr. Hoseason is a member of the Institution of Mechanical Engineers and the American Institute of Electrical Engineers. He was awarded the Hopkinson Premium by the I.E.E. in 1928 and the Willans Premium in 1930.

Mr. William Dixon, who is the new chairman of the North-Eastern Centre, has been with Merz & McLellan since 1911, having been made a partner in 1937. After a period in the firm's Newcastle office he transferred to London in 1924 and was intimately connected with the construction of the County of London Electric Supply Co.'s Barking power station and the company's cable system. He was also responsible for building the Littlebrook power station for the Kent Electric Power Co. and for many similar installations. From 1914 to 1918 he served in the Royal Engineers.

Mr. W. Dixon

Mr. G. H. Moir

Born at Whittingham, Northumberland, Mr. Dixon, who is fifty-six, was educated at the North-Eastern School, Barnard Castle, and the Armstrong and Rutherford Colleges, Newcastle-upon-Tyne. After serving his apprenticeship with C. A. Parsons & Co., he held a position on the company's testing staff until going to Merz & McLellan. He is a member of the Institution of Mechanical Engineers and of the Institute of Metals.

Mr. G. H. Moir, J.P., who was recently appointed general manager of the General Electric Co., Ltd., for Northern Ireland, is the new chairman of the Northern Ireland Centre. Born in Dundee in 1889, Mr. Moir was a student at the Belfast Model School and the Belfast College of Technology, serving his apprenticeship with Harland & Wolff, Ltd., and the late Mr. A. B. Wilson, consulting engineer. In 1911 he went to the Rose Deep Gold Mine in the Transvaal as an electrician and, after a short period as charge engineer at the Port Elizabeth Municipal power station, was in 1912 appointed town electrical engineer at Cradock, Cape Province. During the 1914-18 war he served in the Royal Marines, the R.N.A.S. and the R.A.F. From 1920 to 1927 he held appointments with the B.T.H. Co., in Rugby and Ireland, going to the G.E.C. in 1928 as assistant manager at Belfast. In 1941-42 he held a commission as flight-lieutenant (A.T.C.).

Wiring and Wiring Diagrams

Some Criticisms of Present Practice

By J. H. M. Sykes

ONE of the greatest aids to the relay engineer and the maintenance staff is a set of clear, simple and reliable wiring diagrams. Unfortunately, however, diagrams relating to any particular substation are seldom co-ordinated, so that connections between plant designed and installed by one manufacturer bear no relation whatever to those of another. Moreover, the way in which the diagrams themselves are produced frequently entails the loss of a great deal of valuable time in elucidating the details of even the simplest form of circuit.

Dealing first with the simple physical characteristics of the diagrams themselves, white prints are preferable to blue, and a very few standard sizes of drawing should be insisted on, no matter from what source. Suggested standards are 40 by 28 in., 28 by 20 in. and 20 by 14 in.

Some manufacturers issue drawings that do not even bear their own name and have no general title showing the part of the plant to which they belong. Among 100 drawings, one simple label, *e.g.*, "Diagram of alarm-relay connections," means little or nothing in a hasty search in time of trouble. Drawings should always be kept flat and, if an ample blank margin is arranged for on the left-hand side, they can be fixed in a plan clip and hung in a plan chest which may take the form of a simple and cheap asbestos cupboard in a convenient spot, with a flat table alongside for use in consulting. They may then be simply classified so that the minimum time is lost in finding the required diagram.

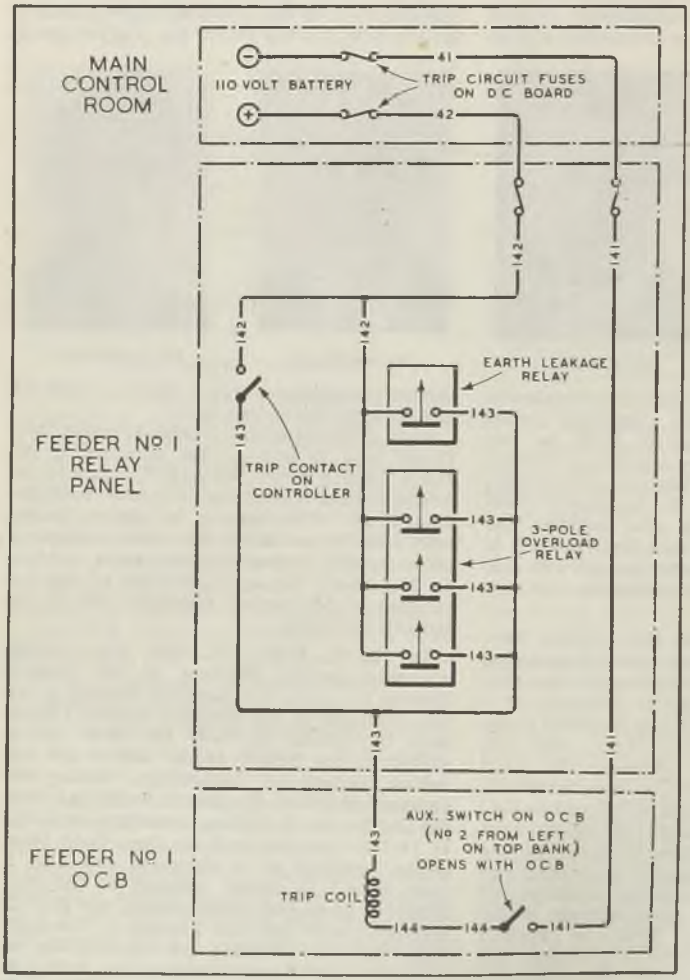


Fig. 1.—Schematic diagram of tripping circuits on "Flour Mill No. 1" circuit

Coming now to the electrical lay-out of wiring diagrams, we find an enormous divergence among the systems adopted by manu-

facturers. In some cases the whole of the secondary connections of, say, a large transformer unit or even of a complete substation are shown on one drawing, while one further drawing shows the complete lay-out of the remote control panels. Another manufacturer will take seven or eight drawings, each of an individual portion of the plant, such as the internal connections of the tap-changing gear, the bus-wiring of the relay panels and so on, to achieve the same object. Whichever method is adopted—

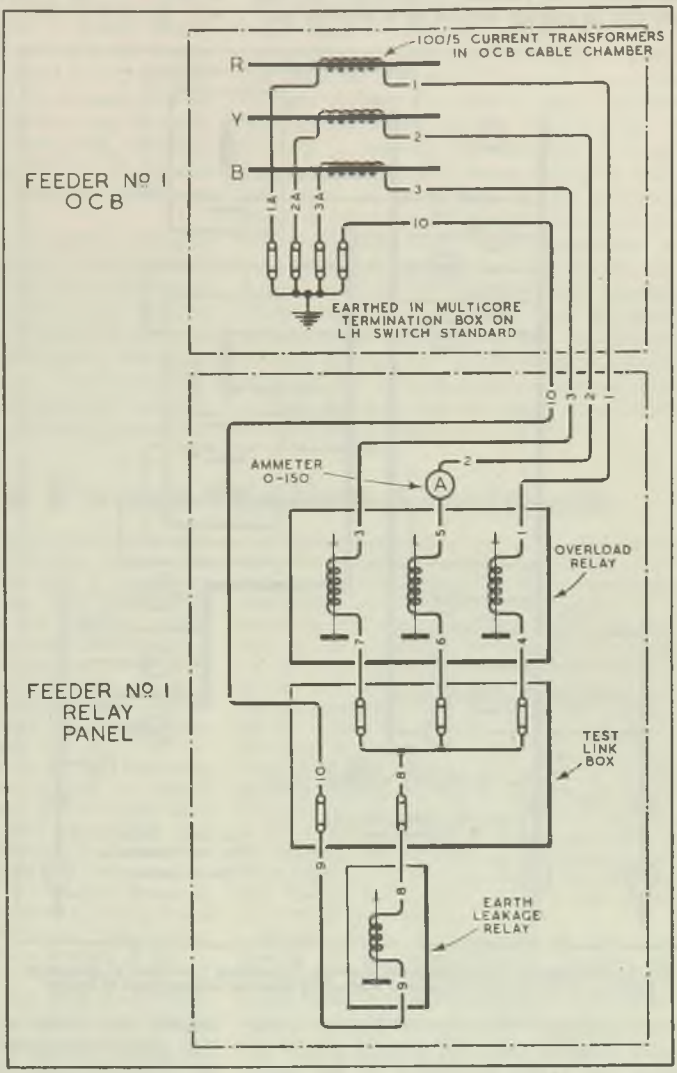


Fig. 2.—Schematic diagram of AC protection circuits on "Flour Mill No. 1" circuit

and wherever practicable without sacrifice of clarity, the first method is very much preferred; it should always be possible to ascertain the source of all secondary supplies, both auxiliary power feeds, alarm bus-wires, inter-tripping connections and the like. It should also be easily practicable to ascertain the physical location of the switches or fuses, or links isolating these supplies.

The most useful device in all wiring diagram work is the brief and simple schematic diagram which does not attempt to bear close relationship to the physical lay-out of the plant, but does give wiring numbers and fuse locations. Figs. 1 and 2 show typical schematic diagrams and the main wiring diagram could easily carry all the necessary schematics in one corner. For instance, on a circuit-breaker, the tripping circuit, the closing circuit, the essentials of the protection circuit, and the indicating and metering circuits, could all be very simply shown. In perhaps nine cases out of ten, reference to these schematics will be all that the maintenance engineer will find necessary, say, for the location of some trivial fault on an auxiliary contact.

Turning to the main wiring diagram, the multiplicity of wires, which is so often a confusing element militating against quick reference, can largely be avoided by the use of the "trunking" system of drawing shown in

Fig. 3. Allied to this, all multicore cables should have full details shown closely adjacent to their run, and should bear a simple letter or number at each end so that they can be quickly picked up at another part of the diagram. The physical lay-out of the wiring diagram need not attempt rigidly to follow the actual disposition of the items of plant. Slavish adherence to this principle leads to considerable waste of space in some manufacturers' diagram lay-outs. Each separate item should, however, bear a brief word as to its actual position, such as "Ammeter above label bracket on O.C.B."

Another important omission from many current wiring diagrams is an indication of the internal connections of relays and similar devices. It is not difficult to give a simple schematic set of connections inside the frame of the relay, showing, for instance, that the DC positive enters on terminal 1, goes through a contact which is normally open and emerges at terminal 2 once the contactor is closed. An unmistakable symbolic form of relay connection is shown in Fig. 3.

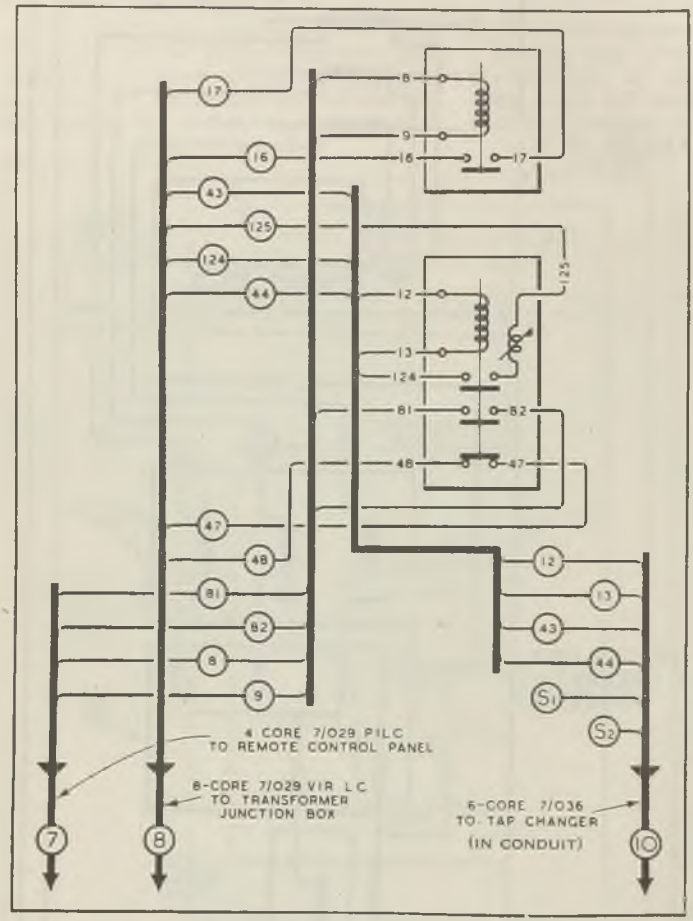


Fig. 3.—Portion of wiring diagram showing "trunking" method of grouping individual wires, and method of indicating internal connections of relays

The relay engineer frequently needs to test the insulation resistance of the secondary connections emanating from current and voltage transformers where the star point of the three-phase secondary is earthed. Not only is it desirable that this earthing should be actually carried out on the gear at a convenient and accessible point—and there are many lay-outs where the secondary earth point is in an almost inaccessible part of the switch lay-out—but it is equally important that the points of earthing shall be clearly indicated both on the schematic and on the main wiring diagram. Allied to this is the desirability of bringing the secondary current and voltage circuits through convenient test boxes with links so arranged that testing instruments can be inserted into the current-transformer circuits without causing an open circuit and consequent rise in voltage. These link boxes, if their location and terminal numbers are clearly marked on the schematic diagram, will be of the greatest possible assistance. On the gear itself, all multicore and auxiliary circuits should end in terminal blocks, and every wire should have a clear ferrule at its end corresponding

to the number on the terminal. This simple and obvious practice is of the greatest assistance in correlating the wiring diagram and the actual wire on the plant. The colouring of wires, so that of two connections on one terminal, that which rises from the outgoing multicore cable is easily distinguishable from the internal loop to the instrument or relay, will be found an advantage. All spare cores should be brought out to terminals, and given a number and properly made off, so that they can be quickly identified and used. This also applies to the wiring diagrams, where their location should be clearly shown.

Another link between the gear on site and the wiring diagram is the clear separation of tripping wires from the rest of the multicore lay-out—a precaution which may obviate inadvertent shut-downs. From the point of view of the safety regulations, terminals carrying voltages above "low-pressure" should be shrouded on the gear and can with advantage be indicated—perhaps by a double circle for the terminal number—on the wiring diagram.

It may be argued that it is difficult to ask a manufacturer who has for many years standardised his wiring diagram lay-out to alter it for one particular customer. Moreover, when a particular circuit, such as a circuit-breaker and transformer, comprises the plant of two manufacturers, it may be thought difficult for each to gain sufficient detailed knowledge of the other's plant to produce a properly co-ordinated diagram. But the co-ordination must obviously have been done at some stage in the contract, either by the consulting engineers or by the customer's own staff. The preparation of clear wiring diagrams can thus be accomplished, if not by the manufacturers' drawing offices, then by those who have complete knowledge of all details of the installation. For the preparation of the final completed drawing, the manufacturer's diagrams may perhaps be used only as a basis from which the completed picture is built up.

Glasgow Power Station Contracts

THE Corporation sub-committee dealing with the new Glasgow generating station has decided, subject to the approval of the Heavy Electrical Plant Committee, that negotiations shall be entered into with the following manufacturers for the supply and erection of plant:—Two 50,000-kW turbo-alternators.—C. A. Parsons & Co., Ltd. Four 300,000 lb. per hour boilers, with pulverised fuel equipment (900 lb. per sq. in. pressure at 900 deg. F. at turbine stop valve).—Babcock & Wilcox, Ltd.

The sub-committee agreed that the following six companies should be invited to submit tenders, after the necessary specifications have been prepared for the civil engineering and building contracts, and that the manager and the consulting engineers should be authorised to add to the list:—Bovis, Ltd., Charles Brand & Son, Ltd., Holloway Brothers (London), Ltd., Sir Robert McAlpine & Sons, Ltd., John Mowlem & Co., and George Wimpey & Co.

At a later meeting of the sub-committee the Town Clerk submitted a letter from the Ministry of Fuel and Power proposing a discussion with the Ministry before proceeding to negotiate the contract for the boilers and this was approved. A letter was also read from the Central Electricity Board asking if the Corporation would agree to meetings from time to time between Messrs. Merz & McLellan, consulting engineers, and representatives of the Board with a view to overcoming difficulties which may arise in the construction of the new station. The sub-committee agreed.

At the next meeting of the sub-committee the Town Clerk reported on a meeting with the chairman of the Heavy Electrical Plant Committee with regard to the contract for boilers. In a letter the chairman of the Committee indicated that as the Corporation's most recent orders for boilers had been placed with Yarrow & Co., Ltd., the Committee had expected that the Corporation would also place the contract for the boilers for the new station with them. The letter suggested that unless there were good reasons to the contrary it would be in the national interest, and also in the interests of the Corporation, to place the order with Yarrow & Co., Ltd. Not only would this contribute to the maintenance of balanced employment, but there appeared to be every reason for believing that Yarrow & Co. were relatively well placed from the delivery aspect.

Messrs. Merz & McLellan at the next meeting of the sub-committee reported on discussions with the two companies. Having regard to the technical adjustments which would require to be made in the scheme submitted by Yarrow & Co., involving considerable extra time, the sub-committee agreed to affirm its decision to negotiate for boiler plant with Babcock & Wilcox. This decision was subsequently approved by the Heavy Electrical Plant Committee. The committee also stated that there was nothing to prevent the Corporation from proceeding also with the placing of the contract for the turbo-alternators with C. A. Parsons & Co.

Views on the News

Reflections on Current Topics

CREDIT for the first full-scale post-war electrical conference (I call it electrical although gas has some share in it) goes to the Association of Public Lighting Engineers which is meeting in Glasgow next week. Through no fault of the Association's members the street lighting of this country as a whole cannot be considered satisfactory, but this deficiency is the Association's opportunity. The conference should do much to overcome the enforced parsimony of lighting authorities (who fear the ratepayer in the background) and help them to convince this ratepayer that he cannot at the same time clamour for good lighting and refuse to meet the cost.

* * *

Sir George Nelson, chairman of the English Electric Co., Ltd., shares the belief of others in a good position to judge that the electrical industry need not fear the future. In a *Sunday Chronicle* article, directed towards service men who are wondering what will happen to them in civil life, Sir George says:—" The electrical industries will eagerly welcome men on release from the Forces, provided that they have a natural aptitude for engineering and an appetite for hard work—for it is as well to emphasise that there are few ' soft jobs ' in engineering. We expect to find employment for them in very considerable numbers within the industry. This is no thoughtless optimism but is based on a sober estimate of prospects."

* * *

Practically all the credit for what was probably the most valuable invention of the war, radar, has, in official statements at any rate, hitherto been concentrated on scientists in the Service and Supply Departments, the Government Research Establishments and the Universities. I was, therefore, glad to hear Sir Stafford Cripps at the Radio Industry Council's lunch last Friday pay a strong tribute to the other half of the team which made its development possible, the scientists in the laboratories of the industrial firms. Without their stupendous efforts in making the " raw " laboratory product suitable for operational use the war might easily have been lost in 1940.

* * *

Quite unintentionally, I am sure, Mr. A. Gilbert Scott who, with his brother, Sir Giles Gilbert Scott, is responsible for the design of the new House of Commons, has revived a time-worn calumny of that assembly. Speaking at a luncheon last week, Mr. Scott said that the principal difficulty encountered in the ventilation of the new building was not the heating but the removal of hot air from the chamber. He described the elaborate air-conditioning system which would be installed, including an electrostatic filtering system, and said that each member would have a heating panel under his feet and a gently circulated current of air above his head. This seems to be an admirable arrangement for guarding against cold feet and hot heads. The new House will also have a system of 456 loud speakers to overcome acoustic defects.

* * *

My readers may have guessed by this time that I have an overpowering aversion to the application of the initials " T.V.A." to projects which bear little resemblance to the Tennessee Valley arrangements. It is a great relief to me to hear of a scheme to which the term can properly be applied; it is the proposed development of the Damodar River valley in Bihar and Bengal. This, similarly to the Tennessee Valley scheme, would combine flood control and irrigation with the generation of electric power to the extent of 350,000 kW ultimately. Control would be in the hands of an autonomous board charged with the duty of carrying out the work and administering it for the benefit and "rehabilitation" of the people of the area.

* * *

During this century we have seen the disappearance of many romantic aspects of human life. Now the hunter and trapper of so many stories of our boyhood days seems to be on the point of extinction. It is announced from the United States (above all places) that the American General Electric Co. has evolved a means of producing fur coats electrostatically. Fibres are charged in an electrostatic field and are " hurled " perpendicularly against an adhesive-coated backing fabric. A fur coat made in this way, it is said, would be more densely napped than that of a hide and more safely anchored, reducing the possibility of " moulting."

* * *

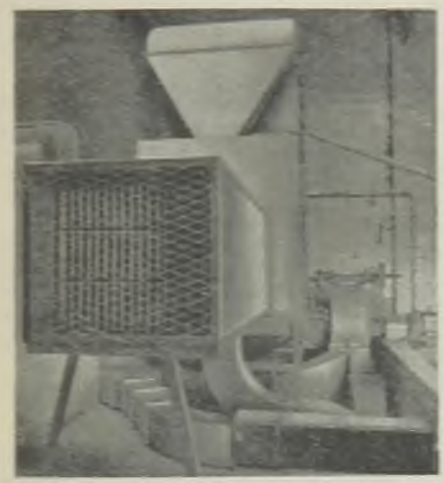
The versatility of electrical apparatus never ceases to surprise me. An inhabitant of Louisville, U.S.A., has just used the pump of his washing machine to remove flood water from the basement of his house. I do not, however, mention this as an argument in favour of the more general incorporation of pumps in washers.—

REFLECTOR.

Grain Drying

Conversion of Plant to Electric Heating

WITH the increasing popularity of the combine method of harvesting in this country there is undoubtedly scope for the design of an all-electric grain dryer. Pending its advent, however, conversion of solid-fuel plant to electric heating is making headway on account of the closer temperature control, safety, compactness, and labour-saving features inherent in electrical operation. The first conversion of a Kennedy & Kempe plant was fully described in the *Electrical Review* of November 5th, 1943, and since then other plants have been adapted on generally similar lines.



Electric grain drying plant at Pirton, Herts

A recent conversion by the Northmet Power Company (heating engineer, Mr. R. Grierson; district superintendent, Stevenage, Mr. J. C. Horrell), differing in a number of details, has been carried out to the instructions of Mr. L. T. Franklin who farms about 1,100 acres, mainly arable, at Walnut Tree Farm and High Down Farm, Pirton, Herts. Supply is taken by means of an 11-kV spur line, the voltage being stepped down for general use on the farm. The grain-drying heating load of 171 kW is supplied from a 150-kVA transformer which, although permanently installed, is put into commission only during the grain-drying season. The heating elements (Unity) are arranged in the air inlet in two banks of three, one bank having a total loading of 99 kW and the other 72 kW. Each bank is controlled by a three-stage Rheostatic thermostat.

The 20-HP fan motor and the 3-HP dresser motor are supplied, with the other farm requirements, cottages, etc., from a 50-kVA transformer which is in use throughout the year. From time to time, as required, the grain can be moved without bringing the heating and larger transformer into commission. This arrangement avoids the standing losses which would be incurred if a single but larger transformer were provided for the whole supply and left in commission throughout the year. The air-inlet trunking was foreshortened on account of the limited space available, thus reducing the size of the new building which had to be constructed; the materials thereby released were of value, being in short supply, for small trunking to carry the electrical installation. Instead of having the vee-belt drive, adopted in earlier conversions, the 20-HP fan motor is of the direct-coupled type. Crompton Parkinson motors are employed throughout the installation, with English Electric and Reyrolle switch and control gear.

The installation has attracted considerable interest and Mr. Franklin now has under construction a grain handling and storage plant, comprising concrete silos through which the grain after drying will be passed and stored by means of a 12-HP fan.

Export Inquiries

INQUIRIES 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 :—

India.—Agency for all kinds of electric wires, accessories, tools and ball bearings. (X.109.)

Belgium and Luxembourg.—Exclusive distribution rights for portable electric tools—hand drills, screwdrivers, flexible-shaft motors, high-speed bench drills, polishers, grinders, etc. (X.110.)

Heavy-Load Transport

B.E.A.M.A. Recommendations

FROM the British Electrical & Allied Manufacturers' Association, 36, Kingsway, W.C.2, we have received a copy of a memorandum on "The Transport of Heavy and Indivisible Loads" produced by the Association's Traffic Committee (Publication No. 121, 6d.). This refers to the tendency for electrical generating, transmission and distribution plant to be produced in very large units many of which must be transported complete. It gives as typical large pieces which will have to be moved in the post-war period transformers weighing 210 tons and measuring 33 ft. long, 15 ft. wide and nearly 19 ft. high; armatures of 90 tons, measuring about 23 ft. by 15·5 ft. by 15 ft.; and stators of 150 tons, measuring 24 ft. by 13 ft. by 13 ft. Drawings are reproduced in an appendix to the report showing the general contours of this plant.

The limitations of the British railways in this respect are mentioned, limitations, it is said, which are not suffered by American and Continental manufacturers. Although the restrictions upon road transport in this country are not so severe they still do not give electrical designers the scope required by projected developments and which is available to competitors in overseas markets.

Inadequate Roads

The industry views with much concern a statement that there is likely to be a limitation for road transport of 16·5 ft. for under-clearance of bridges in the post-war period; it is considered that a height of 20 ft. is the minimum which should be planned. Weak bridges should be strengthened rather than barred to heavy traffic.

It is appreciated that the wholesale reconstruction of roads to permit the movement of large indivisible loads is impracticable. As regards the transport of plant to sites in this country it is said that notice could be given to the Ministry of Transport at the time of the placing of the order, which would give at least twelve months' notice and early collaboration with the Electricity Commissioners might result in the siting of high-voltage substations along a selected road, perhaps some miles from their electrically-ideal position.

It is strongly recommended that any new arterial roads should be of sufficient strength and capacity to accommodate heavy indivisible loads —a matter which affects other heavy industries. As regards the movement of plant to points of shipment, it is thought that it might be practicable to confine the movement of large and heavy loads for the export market to selected main ports, several of which already possess facilities for handling loads of the magnitude stated and the provision of such facilities at north-east coast ports is considered desirable. The memorandum concludes with an appeal to the Ministry of Transport to give the industry guidance without delay regarding the future maximum overall dimensions and weight for road transport.

Correspondence

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

Re-Employment of Civilians

I AND many others who were not called into the fighting forces, but were required to stop at home to produce the "tools for finishing the job," are rather perturbed by the note inserted above the "situations vacant" advertisement column to the effect that:—"Applicants should be over 51, or Class A ex-Servicemen."

It seems that we who were just as much under orders as any Service men, and if working in London, and elsewhere frequently faced death, are to be penalised for not having been called on to wear Service uniforms, in the search for new situations.

I admire all the Service men and their sacrifices to win the war, but I do think that those who were ordered to remain in the workshops and factories should have some consideration and opportunities in the great change-over from war to peace production.

J.E.D. (*Works Electrician.*)

Concerning Trams

FROM the correspondence on this subject that has appeared within recent weeks one might gather the impression that the writers are all members of the "Light Railway Transport League," more often referred to as the "Tram Club." If this is so it would be interesting to have the views of some trolley-bus operators who have made the "natural" change, and their reasons why.

For the benefit of Messrs. Kirkland and Burrow I would point out that the 25 per cent. referred to maintenance costs, a point that they appear to have forgotten, and that at the present time the maintenance of electric railed vehicles is a constant source of anxiety to the maintenance man: in this I make especial reference to wheels.

Neither Mr. Kirkland, nor any other of your correspondents, has yet described a way in which the "modern" tram avoids noise, a point which is not purely illusory, and one which they would have noticed had they ever had the misfortune to live alongside a tramline.

Watford. A. R. GRIERSON.

PERSONAL and SOCIAL

News of Men and Women of the Industry

IT is reported by the *Electrical Power Engineer* that during the interval between the retirement of Mr. A. E. McKenzie from the position of borough electrical engineer of Wimbledon and the return of his successor, Col. N. R. Elliott from war service, **Mr. W. J. Oswald,** the chief assistant engineer, was offered the post of acting borough electrical engineer at a salary of £1,200 per annum—just over half of the figure to be paid for the new appointment. Mr. Oswald declined to accept the post but undertook, "under protest and in the interest of the maintenance of supply," the responsibility of the control of the undertaking. The Electrical Power Engineers' Association claimed on his behalf the appropriate salary under the A.M.E.E. scale and upon the Corporation's refusing this the matter was referred to the Ministry of Labour who remitted it to the District Joint Board for adjudication. At the same time the Ministry instituted negotiations with a view to settlement and as a result it was agreed that while Mr. Oswald was in control of the undertaking he should be remunerated in accordance with Clause 10 of the agreement of the National Joint Committee of Local Authorities and Chief Electrical Engineers. This clause gives an undertaking the option of paying a new chief engineer 85 per cent. of the scale salary for the first year and 92½ per cent. for the second, the full rate being payable thereafter.

Mr. E. R. Wilkinson, commercial manager of the Central Electricity Board, has accepted the invitation of the Executive Council of the Association of Supervising Electrical Engineers to continue in office as president of the Association for 1945-46. He will deliver his presidential address on October 16th at the Lighting Service Bureau, London. The *Electrical Supervisor* reports that Mr. Wilkinson was married recently at Cleveland, Ohio, to Miss Frances E. Lamblight, B.A., of that city.

Mr. H. Munday, has retired from the position of chief clerk in the Erith Electricity Department after forty years' service with the Corporation.

Mr. A. A. Kift, who has served for forty-three years with Marconi's Wireless Telegraph Co., Ltd., and during the last twenty years has been successively sales manager, assistant engineer-in-chief and contracts manager, retired from the company's service at the end of August. He actually reached retiring age in 1941, and at that time relinquished the position of contracts manager, but agreed to continue in the company's service until the end of the war, as did a number of other officials and employees who have reached retiring age since 1939.

Mr. Kift received his training as an electrical engineer at Finsbury Technical College. After a further specialised course at the Marconi Training College at Frinton, he was appointed to the erecting staff and was engaged in fitting some of the first half-dozen "White Star" liners which were equipped with wireless in and about the year 1902. After that his work ranged from the Labrador coast to Varna on the Black Sea, and included the erection of stations round the English coast. His colleagues have presented him with a cheque upon his retirement.

Mr. C. C. Hill, now assistant general manager of the Northmet Power Co., was at a recent meeting of the Sussex Electricity Undertakings Pool presented with a smoker's outfit in recognition of his services to the pool whilst with the Brighton undertaking. The presentation was made by Mr. A. J. Ryan, of Hastings, on behalf of the members.

Sir Robert Renwick has relinquished the post of Controller of Communications Equipment at the Ministry of Aircraft Production, which he has held since 1942, but is continuing as Controller of Communications at the Air Ministry.

Mr. Thomas Kirkham has resigned his position as managing director of Ericsson Telephones, Ltd., after fourteen years' service in that capacity, he will, however, remain on the board. **Air Commodore Hugh Leedham,** C.B., O.B.E., who for many years held important technical positions with the Air Ministry and Ministry of Aircraft Production, has been appointed to succeed Mr. Kirkham.

Mr. H. G. White, who has been at the Metropolitan-Vickers Traction Works, Sheffield, for the past twenty-five years, has joined the staff of Alfred Wiseman & Co., Ltd.

Mr. Arthur N. Duffett, A.M.I.E.E., resident constructional engineer to Rotherham undertaking, has been appointed, from thirty-one applicants, deputy electrical engineer at Blackburn at a salary of £852. He succeeds Mr. F. Barrell, who was recently appointed deputy electrical engineer at Leeds. Mr. Duffett was employed by International Combustion, Ltd., in erecting and setting to work boiler house extensions at Sheffield.

Mr. K. J. Fulton, manager of the London office of Santon, Ltd., has returned from the Army and is operating temporarily from "Inglecroft," Southwood Gardens, Hinchley Wood, Esher, Surrey (telephone: Emberbrook 1033).

Mr. W. E. Doran, M.A., A.M.I.E.E., is relinquishing the position of technical sales manager with the Cambridge Instrument Co., Ltd., to become managing director of the Doran Instrument Co., Ltd., Stroud, Gloucestershire. He received his early technical training at the West Ham Technical Institute and later,

after serving in the R.F.C. and the R.A.F. in the first world war, completed his education at Cambridge University taking a degree in mechanical sciences. In his new post he will be concerned with the development and manufacture of mechanical and electrical precision instruments.

Mr. Charles G. Gorton has arrived in India and has taken up his duties as works manager of the National Insulated Cable Co. of India, Ltd. He is assisted in his duties by his old colleague **Mr. S. F. Nicholls**, chief engineer and deputy works manager of the company.

Mr. R. G. Millard, senior electrical and mechanical officer of the R.A.F., Colchester area, was the guest of honour at a gathering of inspectors of works and station engineers at the George Hotel, Colchester, on August 30th. Mr. Millard's health was proposed by Mr. J. Hill, station engineer, and in his reply Mr. Millard recounted a number of experiences during the construction and maintenance of airfields in Essex and Suffolk.

Mr. J. A. Wimshurst has now returned from war service, and is resuming the management of the Portsmouth branch of Johnson & Phillips, Ltd., at 88, St. Thomas's Street.

Mr. P. Cawood has been appointed general manager of the Iron and Steel Department of the Bowthorpe Electric Co., Ltd. This new department has been opened to extend the range of overhead line material and to supply general metal work for the architectural and building industries.

At the end of September **Mr. D. W. Fletcher** will take up duties as Midlands manager for Birkbys, Ltd. His address is 837, Shirley Road, Hall Green, Birmingham, 28 (telephone: Birmingham (Shirley Green) 1797).

With reference to last week's note regarding the intention of **Dr. G. E. Haefely** to establish himself as a consultant on plastics, upon his leaving the Micanite & Insulators Co., Ltd., we are informed that Dr. Haefely's address is 7, Glengall Road, Woodford Green, Essex.

In this issue the Weymouth and Melcombe Regis Corporation is advertising for a successor to Mr. G. Nicolson, the borough electrical engineer, who is retiring in November. The salary offered is £900 per annum, rising by annual increments of £50 to £1,000, plus a cost of living bonus (at present £59 16s.) and a car allowance (at present £93 15s.). The Associated Municipal Electrical Engineers and the E.P.E.A. point out that, according to the latest available data, the commencing salary should be £964, rising to £1,134 in the third year.

Barry (Glam.) Corporation invites applications for the position of borough electrical engineer in succession to the late Mr. E. Goodman. The salary offered, in accordance with the scale of the National Joint Committee, is at present £583 per annum; in addition a cost of living bonus (at present £59 16s.) is payable.

Obituary

Mr. Arthur Ellis.—We learn with regret of the death at Llandaff, on September 1st, of Mr. Arthur Ellis the well-known consultant. Mr. Ellis, who was the third son of the late Sir Joseph Baxter Ellis of Newcastle-on-Tyne, was born in Newcastle in 1873. After his education at St. Bees, Cumberland, and the Rutherford College, Newcastle, he served an apprenticeship with C. A. Parsons & Co., Ltd. In 1892 he joined the Cambridge Electric Lighting Co. and in the following year was appointed borough electrical engineer of Southport. Three years later, in 1896, he went to Bolton as borough electrical engineer and tramways manager. In 1900 he became general manager and engineer of the Cardiff Corporation electricity and tramway undertakings and remained in this position until the end of 1919, when he resigned to establish a consulting practice. Mr. Ellis was a J.P. for Cardiff, and a member of the three leading engineering institutions and of the Association of Consulting Engineers. He was made an M.B.E. in 1943. He was a director of the West Gloucestershire Power Co. Mr. Ellis is survived by his widow, a son (Mr. F. A. Ellis, who is borough electrical engineer of Huddersfield) and two daughters.

Mr. J. A. Lloyd.—The death occurred on August 27th of Mr. John Ambrose Lloyd who was a member of the engineering staff of Marconi's Wireless Telegraph Co., Ltd., for nearly thirty years. During this period he assisted in the erection of wireless stations in various parts of the world, including Singapore, Africa and Portuguese Colonies. One of these was the broadcasting station at Durban which was the first in South Africa.

Mr. S. E. Hall.—We regret to announce the death at Bradford on August 20th, of Mr. S. E. Hall, A.M.I.E.E., aged sixty-eight years. Mr. Hall commenced business with the Sturtevant Engineering Co., Ltd., in 1900. In 1908 he joined the Adams Manufacturing Co., Ltd., at Bedford, and when it was formed into the Igranic Electric Co., Ltd., he continued his career with the new company. He left the Bedford works in 1919 to take over the Yorkshire branch office, from which he retired in March, 1943.

Mr. Edward Coote, manager of the Lamp Sales Department of the British Thomson-Houston Co., Ltd., died on August 27th at Richmond at the age of eighty-one. He had been with the company for forty-four years and previously was with the Edison Swan Electric Co., Ltd. During the war he was mainly engaged on work in connection with Government contracts.

Mr. J. H. Beckett.—We regret to report the death on August 24th of Mr. John Herbert Beckett, a director of the Walsall Electrical Co., Ltd. He was fifty-three.

Electrical Safeguards

Lessons Imparted by Industrial Accidents

DURING the earlier war years, under the stress of munitions production with inexperienced operatives, the number of accidents in connection with the use of electricity in factories increased appreciably. Last year, however, witnessed a decline in the total, which is given in "Electrical Accidents" (the annual report of Mr. H. W. Swan, Senior Electrical Inspector of Factories), as 1,072 reportable (*i.e.*, causing more than three days disablement) including 31 fatal, compared with 30 in 1938. Corresponding figures for 1943 were 1,255 and 58. There were, on the other hand more fatalities at premises not under the Factories Act, so that the total known to have been caused by electricity amounted to 157 as against 165 in 1943 and 181 (the peak) in 1942. There was some improvement in regard to domestic premises where the number was 37 compared with 44 in 1943 and 61 in 1942, but this figure was higher than in 1938, when there were 32 fatalities. Skilled workers were sufferers in 300 accidents (12 fatal).

Classes of Apparatus Involved

In the greatest number of cases (apart from 242 non-fatal eye injuries in welding) cables and flexibles were involved. Adding to these 174 (six fatal) accidents incurred with portable appliances brought the total for non-fixed apparatus to 355 (15 fatal). Switchgear below 650 V was associated with 156 accidents (three fatal) as compared with 29 (three fatal) at higher voltages, while fusegear was responsible for 57 non-fatal injuries. Crane trolleys caused 40 accidents (three fatal). More than half of the fatalities were at low voltage AC (250 or below) and more than three-quarters at less than 650 V.

The report describes a series of occurrences from which those which follow have been selected. As switches controlling arc-furnaces are operated with great frequency for tap changing the oil rapidly becomes carbonised. A method of continuous oil cleaning by means of a filter and circulating pump is claimed to keep the oil in good condition for several months. It might also be used for circuit-breakers on power supply systems which cannot be taken out of service immediately after they have cleared a fault or in connection with Buchholz relays, which cause the liberation of gas at each operation.

A stoppage of supply throughout a large industrial area was caused by the opening by means of the master-key of the wrong cubicle door on a 33-kV switchboard, although a safety-key-interlocking system had been provided. Master-keys should be strictly limited to emergency use, and important busbar systems should be equipped with quick-acting and discriminating devices for isolating a section in the event of an earth fault. The same accident demonstrated the need for consultations between fire-service and power-station and main sub-station staffs.

As a result of a misunderstanding that had fatal consequences, it is recommended that "permit to work" cards should state exactly what parts of a site or equipment are safe for work, delimiting the area within which a particular person or gang may operate, and also what work is to be carried out. Work not covered by the permit should be prohibited, no matter who gives the instructions; any extension of the original work should be the subject of a corrected or, preferably, a new permit. There should be a regular system of periodic spot checking and reporting to the management on the observance of safety rules.

High-resistance Earths

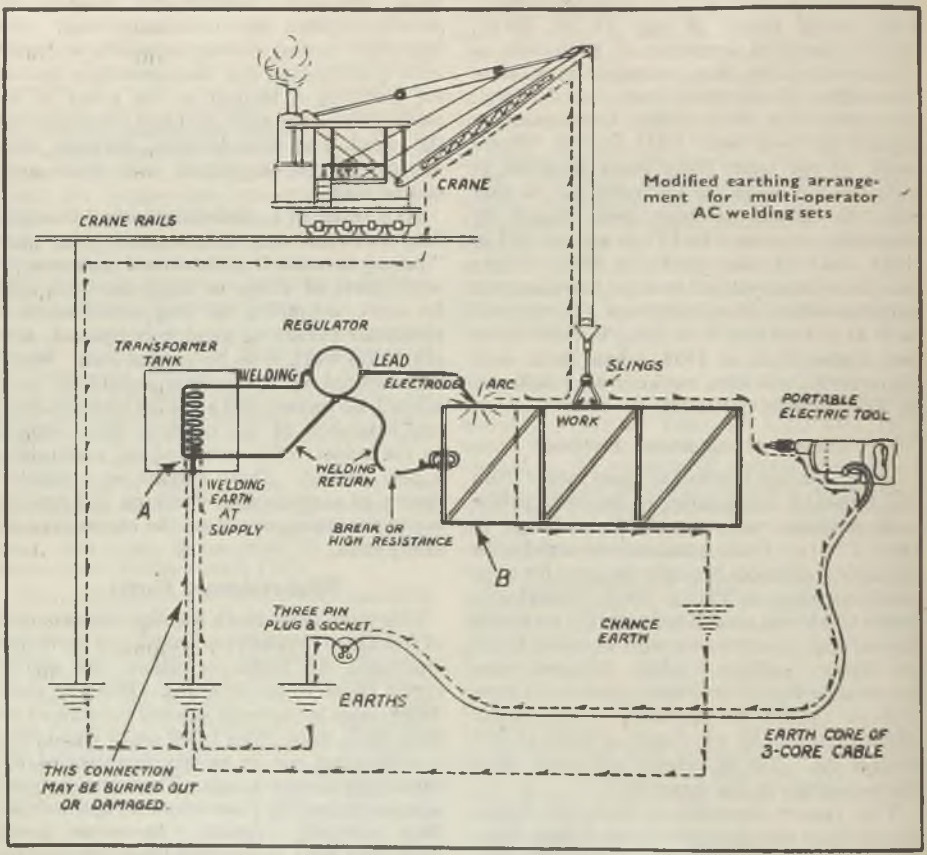
Fire risks from earth leakage currents due to resistance between electrodes and earth are illustrated by instances where the values varied from 10 to 50 ohms. Bonding continuity tests in factories showed resistances of from 20 to more than 1,000 ohms (the latter in nine cases out of twenty investigated by one supply undertaking). These installations were protected by fuses rated at upwards of 50-A carrying capacity. In some cases earth clips were loose or had been secured to water pipes from which the paint had not been cleaned.

The adoption of earth-leakage indication is often a desirable first step towards full protection, as it demonstrates the value of the latter to consumers. One method of providing indication as well as protection is to insert two mumetal-cored transformers over the neutral earthing conductor of the main transformer; one is saturated at a low value

of leakage for indication, recording and alarm, and the other is saturated at a higher value for sustained high leakage currents and operates a relay for tripping the main switch.

Reference is made to the possibility of inserting two-pin-and-earth plugs into three-phase sockets—a possibility that was discussed in the *Electrical Review* of May 11th. Warning notices are not enough; non-interchangeability must be secured through suitable dimensions. Many accidents still occur with portable tools because of neglect to test the continuity of earth conductors both in the flexible cable and on the fixed socket outlet.

Provisions made for training maintenance electricians are discussed in some detail. At one factory apprentices are put through a five-year theoretical and practical course and —in the absence of day classes—attend night classes for three years, sitting for an Ordinary National Certificate or City and Guilds Diploma. The chief electrical engineer also gives personal instruction covering 144 questions ; quarterly written tests are taken and an apprenticeship diploma is issued at the end. The syllabus includes the Electricity Regulations and their interpretation, AC and DC circuits, electrical laws and relationships, wiring diagrams, cables and loading, protection, earthing, transformers, fault testing and other practical electrical and mechanical points associated with maintenance.



A variation is proposed in the general practice of earthing the neutral of a welding generator or transformer at the frame or tank as at A in Fig. 1, which shows the possible path of stray return current or of the whole welding current if the return lead should break. In the arrangement proposed, which is more especially applicable to multi-

operator sets, earthing is carried out at the work, as indicated by B, so that the return current is restricted to the return lead.

The use of electrode holders with no insulating disc on the handle to prevent contact with the live part is too frequent. When such holders embody a plug and socket for disconnection while changing the electrode, a shrouded type of socket should be fitted to the cable, thus avoiding likelihood of exposure of live metal, either with the electrode plugged in or isolated.

Immersion Heaters in Salt Baths

A violent explosion in 1943 of a nitrate salt bath equipped with electric immersion heaters revealed that certain precautions are necessary. Baths for heat treatment of ferrous-alloys at temperatures below 500 deg. C should cause no trouble, so long as each resistance unit is provided with excess-current protection without too much margin over normal current and if heating is reduced during melting to prevent local hot spots. Immersion heaters should be readily removable for cleaning and kept clear from sludge deposition. Electrode heaters should also be quickly and automatically disconnected if current slightly exceeds normal value; guards, fitted to prevent short-circuiting of the electrodes, should not interfere with the insulation and even heating of the salt.

Aluminium alloys, on the other hand, especially those containing magnesium, where iron oxide forms part of the sludge, begin to react with the nitrate when 500 deg. C is greatly exceeded and this results in general or local overheating. Additional precautions should, therefore, be observed. An earth leakage indicator, scale 0-15 A, should be fitted for either internal or external heating elements. A test of the insulation and ohmic resistance of each element should be taken each month and recorded in order that a faulty element may be disconnected before failure. With DC immersion heaters voltage surges should be prevented by fitting any contactor coils with damping resistors having a much lower resistance at high than at normal voltages.

Where plating vats are in series, circulating currents may pass between them by way of the conductors bonding the metal casings of immersion heaters used for raising the temperature of the electrolyte. These circulating currents have sometimes fused the earthing conductor and are thus of a magnitude to make the heater casings into electrodes capable of vitiating the plating process. DC flow between vats may be checked by inserting in the earthing continuity bonds a rectifier calibrated to break down at a potential rise on the heater casing of about 20 V, thus giving double-wave direct earthing.

Danger of shock from radio-frequency heating circuits is not great in view of the high frequencies involved—3 to 50 megacycles for dielectric-heating and 0·3 to 3 megacycles for eddy-current work. Contact with conductors may, however, cause serious deep-seated burns. Generally all parts of the radio-frequency generating equipment should be equipped with interlocks to permit access only after the high-voltage supply has been cut off and all large condensers have been discharged and earthed. Conductors at medium voltage should be insulated or enclosed. Filament circuits of valves may then be left alive. Radio-frequency heating should be done in an enclosure (with non-access interlocks) designed as a screen to obviate radio interference or injury to workers. The heating circuit should be prevented from becoming alive at high voltage DC should some component (*e.g.*, condenser) of the oscillator circuit fail. This can be done by earthing the radio-frequency circuit either solidly or through a choke supplemented by overload protection of the DC supply to the oscillator, which will also take care of the valves.

The present edition of "Electrical Accidents," like its immediate predecessors, appears in a cyclostyled war-time guise for limited circulation. It is mainly a collection of comments and reports on well-established and new industrial processes prepared by electrical inspectors and the Factory Department, each of whom deals with the industries and problems encountered in his own area.

Tours of German Factories

A PARTY of engineering experts appointed by the Gauge and Tool Makers' Association is now touring Germany under the auspices of the Control Commission and is visiting selected factories whose methods of manufacturing gauges and measuring instruments, jigs and fixtures, precision tools, moulds and dies, might be of interest to Association members. A second party, nominated by the Diamond Tool and Gauge Manufacturers' Section of the Association, is also in Germany visiting selected factories engaged during the war in the production of diamond tools and gauges.

COMMERCE and INDUSTRY

Re-allocation of Labour. Copper Restrictions Relaxed.

Cancellation of War Contracts

ABOUT 45,000 firms engaged in munitions production have received a letter from the Admiralty, the Ministry of Supply and Aircraft Production, the Board of Trade and the Ministry of Labour and National Service dealing with the cancellation and reduction of war contracts. In this the importance of explaining the situation to the workers is emphasised and it is suggested that this can appropriately be done through joint production or works committees. Employers are asked to assist in the re-allocation of labour by informing local offices of the Ministry of Labour in advance of the actual release of workers. Where large numbers are involved the Ministry may arrange for a representative to attend at the works to explain to joint production committees the principles and methods of selection of workpeople for release and to indicate possible alternative employment.

The clearing of factories of materials and partly-manufactured goods and plant used in war contracts should be preceded by immediate preparation of inventories, and manufacturers are asked to get into touch with the Regional Controllers of the Ministry of Supply and Aircraft Production, who have the matter in hand. It is hoped that requisitioned factories which are required by their former occupants for peacetime purposes will be handed back as soon as possible. As regards development work for post-war trade manufacturers are asked to make the best possible use of their existing staff in view of the shortage of draughtsmen and other skilled workers. The Board of Trade asks to be informed of any important new developments in their early stages.

Tribute to Radar Manufacturers

Special commendation of the scientists in the laboratories of industrial firms for the outstanding contribution played in the development of radar was expressed by Sir Stafford Cripps, President of the Board of Trade and chairman of the Radio Board, at a luncheon of the Radio Industry Council at Claridge's Hotel, London, last Friday. By their ingenuity and resourcefulness, he said, they first turned the rough models, and even in some cases the ideas, of the Government scientists into devices which could be quickly and economically produced in the factories and which, in the exacting conditions of military service, were capable of giving good and continued performance.

Motor Application Research

As the result of a searching investigation of electric motor troubles experienced in service, Crompton Parkinson, Ltd., found that most of these had developed directly from incorrect initial application. For instance, it was not appreciated that excessive starting torque can be as detrimental as too little; or that if the horsepower is too large, there is incurred an excessive capital expenditure, and consequent loss in efficiency. Failures are too often attributed to a defective motor when the real reason is incorrect application—sometimes due to a lack of appreciation of the varying characteristics of the motors available.

To overcome these troubles Crompton Parkinson decided to form a Motor Application Research Department to co-operate with users. This department acts in conjunction with the Sales Department to give "service before sales" as distinct from "service after sales." Thus, in those cases where pre-installation investigation is essential, "Motor Application Research" ensures correct scientific application thus minimising the risk of failure in service. When application investigations are made a comprehensive report is submitted to interested parties. It is the company's intention to make available to motor users all the information essential to the successful application of each type of Parkinson motor.

Non-Ferrous Metal Control

The Minister of Supply has released the two Joint Controllers of Non-Ferrous Metals, Mr. W. Mure, C.B.E., and Mr. A. M. Baer, from their duties as from August 31st on which date the agreement of 1940 between the Ministry and the British Metal Corporation, Ltd., ended. The Control will be replaced by a Directorate of Non-Ferrous Metals under the Raw Materials Department. The Director will be Mr. R. D. Burn, at present Deputy-Controller of Non-Ferrous Metals, and the Directorate will operate from the same addresses as the Control :—Grand Hotel, Rugby (telephone: Rugby 2131) and Euston House, Eversholt Street, N.W.1 (telephone: Euston 1260).

Mr. G. F. A. Burgess and Mr. R. E. Talbot have also relinquished their positions as Deputy-Controllers of Non-Ferrous Metals, but Mr. Burgess is to continue for the time being to act as Controller of Mica.

Copper and Nickel Supplies

Copper and nickel are no longer subject to Combined Raw Materials Board allocation, and purchasing countries are free to obtain supplies from any source.

The Ministry of Supply announces that as from August 31st, applications to the Directorate of Non-Ferrous Metals for licences to acquire copper, nickel and zinc for the production of semi-manufactured or manufactured goods, whether for the home trade or for export, will be considered by the Directorate without restriction in respect of the type of article to be manufactured. Inquiries should be made to the Director, Directorate of Non-Ferrous Metals, Grand Hotel, Rugby.

Proposed Purchase Tax Reduction

The Treasury announces that it proposes to make an Order directing that from a date to be specified purchase tax on copper domestic hollow-ware shall be reduced from 33⅓ per cent. to 16⅔ per cent. Any representations which interested parties may wish to make with

regard to this proposal should be sent in writing to the Commissioners of Customs and Excise, City Gate House, Finsbury Square, London, E.C.2, not later than September 14th.

Private Trade with Denmark

Following the conclusion of a financial agreement and the removal of Trading with the Enemy restrictions on trade with Denmark, normal commercial relations between Denmark and the United Kingdom can now be resumed and trade can, in general, be handled through private channels. The Danish Government is prepared to consider the issue of import licences to private traders. United Kingdom exporters wishing to sell goods to traders in Denmark should apply to the Export Licensing Department of the Board of Trade in the normal way if the goods are subject to export licensing. Application for shipping space should be made in the usual way to the shipping agencies. The existing Export Credits Guarantee Department facilities are available. Import licences will be required for all goods imported into the United Kingdom from Denmark on private account which do not come under an open general licence.

Training for Export Trade

The Institute of Export, Royal Empire Society Building, Northumberland Avenue, London, W.C.2, has just produced a syllabus of education for export trade, to ensure to industry and the country the existence of a basic standard of proficiency in this increasingly important profession. The syllabus, which has been approved by representatives of the Federation of British Industries and of commercial and technical colleges covers commerce and export trade, use and interpretation of accounts, export practice, economic geography, economics, marine insurance, finance of exporting, methods of marketing and market research, sales promotion, elements of statistics and mercantile law. Courses based upon the syllabus will be available at commercial and technical colleges in London and all important provincial centres during the coming autumn and winter, and an approved correspondence course will be operated, primarily for Forces personnel unable to attend an educational centre.

Women and Electricity

Of nearly eight million women mobilised directly for the war effort, a great number of them worked directly on electrical apparatus or equipment. Over 31,000 women out of the 79,000 on Civil Defence were engaged as telephonists, while in the Postal Engineering Services there were 16,000 women teleprinter operators, and 4,600 women engineering assistants. The W.R.N.S. has employed 5,000 women directly on electrical equipment; and the Women's Land Army, at peak periods had 77,000 women using electrical equipment, counting all the dairy appliances as well as the heavier apparatus such as threshing machines, etc. The W.A.A.F. has used 79,000 women for handling electrical equipment, 95 per cent. of them replacing airmen in the skilled trades. Originally, there were only five of these grades open to them, but gradually women were drafted into seventy grades.

As a tribute to women's contribution to the war effort and to celebrate the coming-of-age of the Electrical Association for Women an exhibition, sponsored by the British Electrical Development Association, will open at the Dorland Hall, London, on October 11th. Under the title "Women and Electricity" scenes showing women in wartime action, particularly in the more skilled and technical occupations, are being depicted in vivid panels. Turning from the war scenes, the visitor will see constructive and labour-saving applications of electricity in post-war home planning. It is hoped to include some completely new designs of modern home appliances.

Trades Union Congress Proposals

Among the many resolutions on the agenda of next week's meeting of the Trades Union Congress at Blackpool next week is one from the Amalgamated Engineering Union calling for the ending of the direction of man-power, the maintenance of a guaranteed week in all industries and the substitution of a code of conditions governing the dismissal of workers for the provisions of the Essential Work Orders. The same union also proposes the continuance of the engagement of workers through employment exchanges, trade unions or other approved agencies.

Other matters which will be raised will be the 40-hour week; the establishment of a national development board composed of scientific and technical experts and representatives of trade unions; and equality of pay for both sexes. The Electrical Trades Union proposes the abolition of all indirect taxation which is regarded as inequitable.

E.W.F. in Northern Ireland

The Electrical Wholesalers' Federation has decided to extend its operations to Northern Ireland and already two Belfast concerns—Bell & Hull, Ltd., and Eirco Wholesale, Ltd.—have been elected members.

Electrical Ship Equipment

Electrical equipment, manufactured by the British Thomson-Houston Co., Ltd., will drive the complete cable laying and repairing machinery on what is claimed to be the world's largest cable ship, the *Monarch*, recently launched on the Tyne. It includes two 200-kW turbo-generators, two 100-kW generators driven by Diesel engines, switchboard, and motor and control gear for the whole of the cable laying machinery. The plant operates on the "constant current" system, which provides "steam engine" stalling and reversing characteristics on the motors, and enables the motors to develop appreciably constant torque at any speed down to standstill. This torque can also be maintained should the load reverse the motor, under which condition "dynamic braking" is obtained. Special generators are not necessary, "Amplidyne" exciters being used so that the same generating plant may be used either for constant current or constant voltage operation.

B.T.H. equipment will also be employed on the 17,600-ton oil tanker for the Anglo-Saxon Petroleum Co., Ltd., referred to last week (page 302). This is actually the third tanker of the same kind to have B.T.H. 13,000-SHP

turbo-electric propulsion equipment, and B.T.H. turbo-generators for the auxiliary services. These turbo-electric tankers are probably the highest powered tankers so far undertaken. The arrangement of the turbo-alternators and propeller motor retains the advantages of the twin-screw turbo-electric equipment in a single screw vessel by having two electrically independent "half motors" mounted together in the same frame and driving on to the same shaft. Each of the two sets of windings contributes half the total shaft horsepower under full load conditions, but economical operation can be obtained by using one turbo-alternator and one "half motor" unit at about three-quarters of the maximum ship speed. Control is effected by lever-operated contactor control equipment.

A large trawler, which Hall, Russell & Co., Ltd., Aberdeen, are to build for the Ministry of Public Works and Transport of the French Provisional Government for cod fishing will be fitted with electric windlass and capstan, refrigerating machinery and insulated cold chambers, radio equipment, echo-sounding gear and other special equipment.

Clock Manufacturers' Meeting

At the twelfth annual meeting of the British Clock Manufacturers' Association a report signed jointly by Mr. F. Mercer (Thomas Mercer, Ltd.), chairman of the Association, and Mr. D. W. Barrett (Smith's English Clocks, Ltd.), chairman of the Clock Manufacturers' Industrial and Export Group, was presented. This mentioned the return from service of the secretary, Wing Commander F. B. Cowen, M.C., T.D., and a rise in membership from 21 to 36. It was intended to reconstitute the Association to permit the formation of special sections. Referring to the overseas trade position, the report said that the Board of Trade had fixed 25 per cent. as the proportion of the industry's output to be exported. The officers and council were re-elected.

The meeting was preceded by a luncheon at which Sir Allan Gordon-Smith (S. Smith & Sons (England), Ltd.) president, occupied the chair.

Atlas Lamp Sales Conference

Preparations for increased demands for "Atlas" lamps and Ferguson radio receivers were made at a post-war sales conference of Thorn Electrical Industries, Ltd., held last week in London. Representatives from both Southern and Northern areas attended the three-day function, which was concluded with a dinner at the Holborn Restaurant. The company's plans for going ahead with even greater energy than before were referred to by Mr. Shea (London representative) in proposing the health of Mr. J. Thorn, chairman and managing director, and the board of directors. The visits paid to the company's factories, he said, revealed astonishing advances and the company could rightly claim to be one of the most progressive in the lamp industry. Seconding the toast, Mr. R. F. Read (Manchester) commented on the enthusiasm of Mr. Thorn in the company's activities and added that their radio factory was far in advance of many he had visited. In reply Mr. Thorn said that plans were in progress to improve the factories in several ways and new machinery was in course of production. The step taken in establishing a lamp cap factory had been justified by results, and obstacles that at the time had seemed insuperable had now been overcome. Mr. L. M. Glancy, managing director for the Northern area, said they proposed shortly to move to their new premises at Manchester. The part played in the war effort was referred to by Mr. Matthews (M.A.P.) who spoke of the company's landing and projection lamps. Mr. A. S. Shier, a director, presided at the dinner.

Australian Licensing Exemptions

The *Board of Trade Journal* (September 1st) publishes a list of goods which have been exempted by the Australian Commonwealth Government from the requirements of the Customs (Import Licensing) Regulations as from July 1st last. The list includes the following:—Storage batteries and electric trolley locomotives for mines; bicycle-lighting dynamos; main reduction gears for steam turbo-generators; hydro-extractors; motive power machinery and appliances, except i.c. engines and replacement parts for motor vehicles; steam or water turbines not exceeding 2,000 HP; parts of steam turbines exceeding 2,000 HP; water-tube boiler parts; enclosed type elements imported separately for stoves, ranges, ovens, cookers, grillers, etc.; circuit-breakers or switch units for use at voltages above 15,000, or at any voltage if the rupturing capacity is 250,000 kVA or higher; electrically-operated thrustors and time switches, except those controlled by master clocks; fuses for voltages less than 1,000 and having a rupturing capacity in excess of 5,000 kVA; and certain X-ray and electro-surgical equipment.

Fatalities

Shock from Drill.—At an inquest held at Skewen (Wales) recently into the death of David P. G. Thomas it was stated that Thomas, who was the son of the proprietor of the Skewen Main Colliery, received a fatal shock while using a portable drill on a fan casing. The engineer (Mr. E. L. Francis) said in his evidence that the drill had a defective switch and this had been by-passed to enable the drill to be controlled from a switch about 50 ft. from the job. The working place was very wet and there were steel plates lying around. While the deceased man was drilling the first hole the drill stuck and Thomas put it down and switched off. When he had released the drill Mr. Francis switched on and upon his return he found Thomas lying on the floor unconscious. Artificial respiration failed to revive him.

Mr. D. G. Gwyn, chief assistant electrical engineer to the Neath Council said that he had examined the drill. He found that the framework was not earthed and that a wire was visible through insulating tape wrapped round the point at which the switch had been by-passed. The conditions were conducive to electric shock. A verdict of "Accidental death" was recorded.

Death at Garage.—An inquest was held recently into the death of Herbert King, an agricultural worker, who received a fatal electric shock at Swineshead (Lincs). The evidence showed that King drove a lorry into a garage to have a tyre inflated. He was asked to do it himself and he used an electrically-

driven pump for the purpose. Having completed the task he was removing the pump, which had a bare metal handle, when he was heard to call out and was found lying in a puddle. A mechanic pulled the connecting plug out and the pump fell from King's hands. There had been some rain and the dead man's clothes were damp. The Coroner adjourned the inquiry *sine die* in order that the pump might be examined.

Shock from Radio Lead.—At an inquest at Sutton, Surrey, on a one-year-old boy it was stated that he had been killed through touching a wire attached to a radiogram. The father stated that he fixed a new lead to the set and left a wire bound with insulating tape which he thought was quite safe. The child apparently picked up the wire and removed the tape.

Clifton Display Stand

Clifton Aircraft, Ltd., has produced from scrap materials a most attractive exhibition stand, which made its first appearance at the Lytham annual show last week through the co-operation of Lytham St. Annes Corporation Electricity Department. The sixty components which make up the "Clifton" iron are shown in all stages of production from raw material to the finished article, and in addition the stand has a novel feature called a "Peep into the Future" which gives a telescopic view of the possibilities of a well-planned kitchen. Against a contrasting background illustrations of some of the entirely new and original designs of electric fires that will be available in the near future are shown. The display has been made in three sections to enable it to be used in electricity showrooms or display windows.

Clifton Aircraft domestic appliance stand

Factory Efficiency

Two books relating to work in factories have been received from the National Foremen's Institute, Inc., of the United States. The first, "Time Study and Motion Economy for Supervisors," by James D. Shevlin, formulate "Ten Commandments of Better Methods," which include "breaking down" the job, questioning the breakdown, pre-position, proper work area, etc. The other publication, which is in loose-leaf form, is the "Job Safety Training Manual," by K. L. Faist and S. M. Newkirk, comprising a brief intensive programme for supervisors composed of five two-hour sessions. Costing 10s. and 25s. respectively, the books are obtainable in this country from Mr. F. J. Burns Morton, Hillsborough, Clarendon Road, Hinckley, Leicestershire.

Steelwork Manufacture in Canada

Two well-produced volumes received from the Dominion Bridge Co., Ltd., Canada provide a pictorial review of the company's war activities and an indication of its peace-time work, which includes the manufacture of hydro-electric steelwork, handling equipment, boilers, etc.

Electrical Course for Dominion Forces

Organised by the British Council in co-operation with the Ministry of Supply, a course on electrical engineering was held last week for Dominion Forces at the University Overseas Club, Birmingham. The six-day programme included visits to the works of the B.T.H. Co., Rugby; the G.E.C., Witton; George Ellison & Co.; and English Electric Co., Stafford. "Electrical Engineering in Britain" was the title of an address by Mr. F. H. Clough (B.T.H.), while a "Brains Trust" under the chairmanship of Mr. D. P. Sayers, deputy chief electrical engineer, Birmingham Electric Supply Department, had as its members Mr. A. Cants (George Ellison & Co.), Mr. F. Caunce (English Electric), Mr. H. W. Malin (B.T.H.) and Mr. B. J. Privett (G.E.C.).

G.E.C. in Australia

It is reported that an agreement has been reached between the General Electric Co., Ltd., and Mort's Dock & Engineering Co., Sydney (N.S.W.) by which the latter company will make some of the mechanical equipment which the G.E.C. sells in Australia. The G.E.C. is given an option to purchase 10 per cent. of the company's capital.

Industrial Law for Executives

Particulars of the Industrial Welfare Society's correspondence course in industrial law can be obtained from the Society's secretary, 14, Hobart Place, London, S.W.1.

Trade Announcements

Benjamin Electric, Ltd., is to standardise the external colour of Benjamin industrial reflectors in slate grey. This change will bring the fittings into line with the lighter painting of interiors of factories and of the machinery.

The London sales office of Edison Swan Cables, Ltd., has returned to 155, Charing Cross Road, W.C.2.

Portuguese Imports

Expansion Halted in 1944

THE following table shows the value in 1944 of the principal electrical imports into Portugal, by countries of origin, with a note of increase or decrease compared with 1943. After two years of expansion in spite of war difficulties it will be seen that 1944 was one of decline, the only noteworthy exceptions being telephone installations, vacuum cleaners and the larger types of accumulators. Decreases in power plant, lamps, radio apparatus, and dry batteries were most marked. Among supplying countries Sweden and Switzerland were more prominent, while Germany, the United Kingdom and the United States all obtained smaller shares. (100 escudos = £1.)

Class of Goods	Escudos (000) 1944	Inc. or dec.
Accumulators and condensers weighing less than 8 kg. per cell	2,344	— 786
From Germany	495	— 489
„ United States	584	+ 383
„ Spain	774	— 672
„ Switzerland	194	+ 7
„ United Kingdom	152	— 94
Other electrical accumulators, condensers and parts	4,890	+ 2,280
From Germany	292	— 130
„ United States	1,126	+ 1,094
„ Sweden	2,708	+ 2,703
Batteries, dry	314	— 434
From United States	61	— 74
„ Germany	75	— 156
„ Sweden	101	+ 101
„ Spain	65	+ 61
Batteries, other	64	— 13
From United Kingdom	29	+ 2
Loudspeakers	249	+ 1
From United States	76	— 56
„ Germany	78	— 17
Radio apparatus	10,823	— 6,253
From Germany	2,376	— 9,584
„ United States	1,134	+ 717
„ Sweden	5,253	+ 3,083
„ Switzerland	1,604	+ 751
Telephone apparatus	2,308	— 32
From Germany	143	— 61
„ United Kingdom	242	— 758
„ Sweden	1,696	+ 659
Telegraph apparatus	245	— 89
From Germany	52	— 188
„ United States	80	+ 80
„ United Kingdom	78	+ 9
Generators, motors, transformers and parts weighing up to 100 kg.	7,744	— 1,986
From Germany	2,119	— 2,401
„ United States	416	+ 226
„ Switzerland	1,233	— 1,409
„ Sweden	3,231	+ 2,178
Ditto weighing 100 to 500 kg.	5,186	— 694
From Germany	1,066	— 512
„ Sweden	751	— 69
„ Switzerland	2,898	— 388
Complete installations for telephone exchanges (not including telephones, accumulators or dynamos)	3,776	+ 606
From Germany	1,747	+ 67
„ Sweden	1,952	+ 848
Vacuum cleaners	3,051	+ 871
From Sweden	2,952	+ 952
„ Germany	16	— 164
Insulating materials and porcelain insulators	3,180	— 1,120
From Germany	1,179	— 1,228
„ United States	597	+ 47
„ United Kingdom	226	— 28
„ Sweden	699	+ 39
„ Switzerland	310	— 60
Refrigerators (all from Sweden)	570	+ 63
Insulated wire or cable, textile-covered, weighing up to 120 gr. per metre	1,351	— 859
From United Kingdom	659	+ 225
„ United States	145	+ 108
„ Sweden	35	— 152
„ Spain	410	— 623
Ditto, weighing over 120 gr. per metre	438	— 24
From Germany	67	— 83
„ United Kingdom	352	+ 178
Ditto with other insulation and metal-protected	5,391	+ 371
From United Kingdom	1,781	— 1,113
„ United States	568	+ 509
„ Germany	1,129	+ 247
Ditto, with rubber	701	+ 641
From United States	34	+ 31
„ United Kingdom	654	+ 647
Lamps, for lighting and heating	4,842	— 2,644
From Germany	1,137	— 1,257
„ United States	2,692	*
Lamps, other electric	3,622	— 1,176
From Germany	926	— 836
„ United States	802	+ 419
„ United Kingdom	468	— 205
„ Hungary	1,268	— 182

* Comparative figures not available.

Portugal has an ambitious plan for the construction of hydro-electric generating stations during the next eight years. It is hoped to extend distribution to all parts of the country. Five years ago not much more than half the population had electricity available to them. The estimated cost of the plan (based on pre-war prices) is £8,000,000 for the water-power plant and £2,000,000 for high-voltage lines.

Mobile Telephone Service

AN application has recently been filed by the American Telephone and Telegraph Company for permission to install radio-telephone stations in a number of principal cities throughout the States to serve a proposed mobile telephone service. Under the company's plan, telephones in cars, lorries and boats would enable drivers to have the same two-way facilities as are now enjoyed by ordinary subscribers. The equipment would be connected with special radio-telephone exchanges which in turn would link the mobile subscribers to any ordinary telephone.—*Reuter.*

Newcastle Farm Week

Realistic Displays of Electrical Equipment

FROM August 25th to September 1st, a farm exhibition was held on the Town Moor in Newcastle-upon-Tyne, its object being, to use the engineering phrase coined by the organisers themselves, to "Weld Town to Country." The chairman of the Executive Committee was Mr. J. M. Craster, J.P., and the whole undertaking, which was opened by the Duchess of Northumberland, was sponsored by the Newcastle Corporation on behalf of that city, and the Counties of Northumberland, Durham, Cumberland and Westmorland.

View of byres and dairy showing milk cooler, sterilising chest, water heater and cold chamber (Photo by *Newcastle Chronicle*)

The exhibition went further than merely showing what is done on and about a farm, and endeavoured to illustrate facets of the whole of country life. Thus, in a district where there is so much dry stone walling, there was a demonstration of this ancient art, and everything from quilting and fur coat making, sugar and flour processing to bee-keeping and poultry was found its place. The area which was generously put at the disposal of the organisers by the Stewards of the Freemen of the City of Newcastle, covered about 25 acres. The central feature, facing all visitors as they entered the exhibition, was the farm steading which, so far as present restrictions allowed, was as like a normal farm as it was possible to make it. It had a fully working all-electric dairy with milking machine, steriliser, water heater and milk cooler, and a barn in which the various types of farm machinery were working. Behind the barn was a stackyard where stacking and threshing were carried out. A smithy had electric drilling machines and an electric blower worked by a smith, and the only thing that was absent was the farmhouse and cottages which, of course, it was impossible to erect. The steading was flanked on the one side by growing crops and cultivations, and on the other by grazing land on which sheep dog demonstrations were held from time to time.

Potato grader at work (Photo by *Newcastle Chronicle*)

An area of four acres was allocated to exhibits of agricultural machinery and implements and products of value, directly or indirectly to the agriculturist. In this section, for instance, apart from the ordinary farm machinery, there were exhibits by the Milk Marketing Board and the British Sugar Corporation designed to show the farmer how his crops are processed and the townsfolk (who probably accounted for 90 per cent. of the attendance) how the food they eat is derived from the crops the country can grow. The Rural Industries and the Women's Institute Sections were responsible for representing the many small rural industries.

There was a strong electrical atmosphere about the whole Exhibition, as from the day it was first suggested, the North-Eastern Electric Supply Co. appreciated its importance. The company offered to make electricity available, without charge, to the exhibition authorities and (except for any work in making final connections) to any exhibitors who wished to make use of it. This meant the establishment of a special substation, and the erection of a L.v. overhead network. A four-core cable was taken from the conductors on each pole to a multi-way fuse box near the foot of the pole, from which lengths of Pyrotenax cable were run to the point of use. This cable was ordered in standard lengths, and any that were too long were merely coiled in order to shorten them, and the whole buried a few inches below the ground. Thus a safe watertight job was made which could be put into commission extremely rapidly.

The only prime movers (other than cultivation machinery) in the whole exhibition which were not electric motors were in the stackyard where, in order to show the advantage of an electric motor for threshing, the threshing machine was driven in succession by a traction engine, a tractor and a 15-HP motor. Some care had to be taken not to show the townspeople farming under conditions which were too ideal, but realistic.

To circumvent the impossibility of erecting a farmhouse or cottages as far as possible, the N.E.S. Co. put up a large marquee and in this, apart from other things, was arranged a full-size all-electric kitchen which was built for a Newcastle housing exhibition last year, and which the company has since been lending to local authority electricity supply undertakings in the neighbourhood.

While this probably showed too many refinements for the normal farm kitchen or cottage (which is not easily adaptable for the purpose) it is thought that farmers' wives learnt much from discussing it with the company's staff who were in attendance, and it was of great value to the very large proportion of townsfolk who visited the exhibition.

Dominion Appliance Production

Position in New Zealand and Canada

THE New Zealand Factory Controller is quoted by *Commercial Intelligence* (Ottawa) as stating that arrangements had been made for the production of 16,550 electric stoves before the end of this year. Even if this total is not reached it is estimated that the quantities made will cover all requirements for new houses and should also be sufficient to meet the demand for replacements.

In a market survey of the Dominion by the Canadian Trade Commissioner at Auckland a list is given of the manufactures started since or shortly before the outbreak of war. It includes domestic refrigerators, lamps, electric fences, ranges, insulation tape and switchboards. Future prospects for these lines of manufacture, it is pointed out, depend in most instances on the extent to which the New Zealand Government will continue to protect such activity by tariffs.

With regard to the large potential market in New Zealand for imported goods, the Trade Commissioner considers it likely that Great Britain will again be predominant, although it is reasonably certain that Canada will at least retain her former market for certain electrical apparatus.

Canadian Reconversion

Reconversion to peace-time production of electrical appliances in Canada progressed further in July than in the whole of the previous two months and August was expected to bring an even greater acceleration. At least two electrical manufacturing companies predict that by the end of 1945 the production of electric ranges will have totalled half of any pre-war year. Such are the statements made by the *Financial Post* (Toronto) which proceeds to describe the position in respect of the various groups of domestic appliances.

For electric irons, toasters, kettles and heating pads demand far exceeds supply but a small flow is finding its way to dealers and production will be steadily stepped up until the end of the year.

Most manufacturers expect to take two months in cleaning up the " backlog " of orders for ranges, and at least one is thinking of working three eight-hour shifts. By October dealers expect to receive regular shipments of most makes. Most washing-machine makers have 1942 models in production and expect to be able to increase the volume steadily before the end of the current year, but until 1947 there will be no automatic " wash-rinse-dry " models turned out.

The first radio sets to be delivered (in the autumn) will be of the " midget " type popular just before the war. Larger models will come next, but console sets are not expected on the market until 1946. There is difficulty in obtaining components. With regard to refrigerators, the first deliveries (models made from 1942 dies) are not expected until November or December, and for six months there will be " only a trickle." Scarcity of the right kind of labour is the cause of delay. Contrary to wartime predictions that many newcomers planned to enter the electrical field, it now looks as if established appliance firms will continue to dominate the market.

ELECTRICITY SUPPLY

Big Sheffield Deficit. Australian Water-Power Scheme.

Aberdeen.—DEARER ELECTRICITY.—To meet increased coal charges and higher wages the prices of electricity are to be increased as follows:—Lighting flat rate 3½d. per kWh (as compared with 3 ⅛d.); prepayment meter lighting 3⅜d. (3½d.); heating and cooking 1⅛d. (1d.) for the first 750 kWh a quarter, ⅝d. (⅞d.) above. Motive power 2¼d. (2d.) for the first 125 kWh a quarter, 1⅜d. (1⅛d.) for the next 125 kWh, 1½d. (1⅜d.) for the next 1,250 kWh, 1¼d. (1⅛d.) for the next 3,500 kWh, and 0·8d. (0·7d.) for all over 5,000 kWh; alternative domestic tariff, fixed charge 7½ per cent. of the rateable value (instead of 6¼ per cent.) " unit " charge ½d. (0·45d.).

Accrington.—YEAR'S SURPLUS.—There was a profit of £8,157 on the past year's working of the Electricity Department.

Edinburgh.—STREET EXPLOSION.—About 120 yards of pavement were shattered and man-hole covers were blown into the air in Queen Street on August 24th, as a result, it is thought, of a fault in a main cable. Nobody was injured.

Fleetwood.—ELECTRICALLY EQUIPPED HOUSES.—The Council has decided that all appliances in prefabricated houses shall be electric.

Glasgow.—SUPPLY TO TEMPORARY HOUSES.—The Housing Committee has given permission to the Strathclyde Electricity Supply Co., Ltd. to provide supply to temporary houses in Mill Road, Gorget Avenue and Kelso Street.

Leominster.—CHEAPER ELECTRICITY.—Following the transfer of the Leominster Electricity Co.'s undertaking to the S. W. & S. Co. the latter's standard tariff has been introduced resulting in the following reductions in electricity charges:—Lighting flat rate, from 9d. to 6d.; heating and small power, from 4½d. to 1½d.; domestic tariff " unit " charge, from 1½d. to ¾d. In addition consumers will enjoy better facilities for obtaining service and for acquiring domestic apparatus when supplies become available.

Oldham.—FACTORY SUPPLY.—The Electricity Committee proposes to supply electricity to the Parkinson Stove Co.'s works in Union Street.

Scarborough.—SUBSTATIONS.—The Electricity Committee proposes to erect a new substation in the Valley Bridge area, and to extend the Filey substation.

Sheffield.—DEFICIT.—The 1944-45 accounts of the electricity undertaking show a deficit of £157,816, compared with a deficit of £60,000 for the previous year. For lighting and heating supplies the income rose by £51,000, but for power it fell by £78,000. The fall in consumption was 73,000,000 kWh.

Sittingbourne.—SUPPLY TO UFTON ROAD HOUSES.—The Urban District Council has approved a scheme submitted by the Kent Electric Power Co. for supplying electricity to the Ufton Road building site, with facilities for electric cooking if tenants desire.

Stockport. — SUBSTATION. — The Electricity Committee is to erect a transformer substation on the Bridge Hall Housing Estate.

GENERATING PLANT.—Sanction has been received to borrow £7,531 for the installation of steam generating plant at the electricity works.

Sunderland.—SUBSTATION SITES.—The North-Eastern Electric Supply Co., Ltd., is negotiating for two substation sites on the Springwell Farm estate.

Watford. — COLLECTION OF ACCOUNTS.—Arrangements are to be made for the collection of electricity accounts weekly, as an experiment, from the temporary houses to be erected. A weekly collection on account of 3s. 6d. per week in the case of all-electric houses and 2s. 6d. in other cases should approximately meet the usual quarterly account when any adjustment to the actual consumption will be made.

FRINGE ORDER. — No objection is to be raised by the Electricity Committee to the Northmet Power Co.'s application for a Fringe Order to supply the Elstree R.D.C.'s housing estate at Boreham Wood.

FEEDER EXTENSION.—Sanction has been received to borrow £2,750 for the extension of the feeder from Apsley substation to Marlowes substation.

ABOLITION OF DEPOSITS.—The wartime practice of requiring new domestic consumers to pay deposits is to be discontinued though the Electricity Committee is retaining the power to demand a deposit in any particular case.

PROFIT ON ELECTRICITY UNDERTAKING. — The electricity undertaking shows a profit of £17,152 for the past year.

West Sussex.—COOKING EQUIPMENT FOR INSTITUTION.—The County Council Health Committee is considering the provision of electric cooking equipment at Aldingbourne House institution at a cost of £333.

Overseas

Australia. — IMPORTANT HYDRO-ELECTRIC SCHEME.—A £30,000,000 hydro-electric and diversion scheme for the Snowy River in New South Wales and Victoria is being considered by the Australian Government. It provides for the construction of a power station generating 200,000 kW, the cost being shared by New South Wales, Victoria and South Australia and the Federal Government.—*Reuter*

TRANSPORT

Manchester.—TROLLEY-BUS OPERATING RESULTS.—According to the annual report of the Corporation Passenger Transport Department, working expenses of the trolley-buses averaged 19·731d. per mile (total expenses 23·178d.). The Corporation operates 153 trolley-buses of which 115 are four wheelers and 38 six wheelers. In the year to March 31st last receipts from trolley-buses amounted to £461,383, passengers carried numbered 62,236,959 and the mileage travelled was 4,098,921. The net surplus on revenue account was £59,388.

Oldham.—TROLLEY-BUSES.—The Passenger Transport Committee proposes to substitute trolley-buses for trams on the Hollinwood-Waterhead route.

A.P.L.E. Conference

THE first post-war annual conference of the Association of Public Lighting Engineers takes place at Glasgow next week. It commences on Tuesday with the annual general meeting in the morning and an address by the president, Mr. E. J. Stewart, M.A., B.Sc., inspector of lighting, Glasgow Corporation, in the afternoon, followed by the reading of the prize-winning paper. In the evening there will be a reception by the Lord Provost and members of the City Council at the City Chambers, George Square.

Wednesday's proceedings begin with a paper on " Glasgow's Street Lighting " by Mr. J. M. Ward and the conference luncheon will be held at the Grosvenor Restaurant at 12.15 p.m. In the afternoon Mr. F. F. Middleton is to read a paper on " Lighting of Bends, Junctions and Roundabouts " and afterwards Dr. J. W. T. Walsh will outline the work of the drafting subcommittee responsible for the British Standard Specification on street lighting to implement the 1937 Ministry of Transport report. The evening will be devoted to a reception at the Glasgow Corporation Lighting Department, a visit to the exhibition of street-lighting equipment which has been arranged at 20, Trongate, and demonstrations in the laboratories. It is hoped to arrange for the delegates a motor-coach tour of inspection of the city's street-lighting installations.

On Thursday morning a paper on " Engineering Principles in Street Lantern Design " will be presented by Messrs. J. S. Smyth, B.Sc.(Eng.) and J. G. Christopher and at the concluding session in the afternoon Mr. E. S. Harris will read a paper on " The Commercial Aspect of Public Lighting."

The conference sessions will take place at the Royal Technical College.

Restarting Television

THE Television Development Committee of the Radio Industry Council, at a meeting last week decided to apply to the Government for the immediate introduction of a television " still " pattern picture transmission from Alexandra Palace. The Committee states that it is the intention of the industry to rehabilitate a large number of Servicemen who have been on radar and communication work, and this will be possible only if facilities are available for training. There is considerable uneasiness among television set owners who have been unable to get their sets overhauled because of the lack of a transmission. The Committee mentioned that the B.B.C. had already begun to send out test signals on the television sound channel.

The chairman (Mr. C. O. Stanley) said that the change in the international position had encouraged the industry to feel that television programmes should start at an early date and it was imperative that this great spearhead for British export trade should be got under way immediately. America would have television sets on the market in mass production quantity early in 1946, and if British industry did not move at once it would be another case of " too little and too late."

Important Indian Project

THE Delhi correspondent of *The Times* says that the plan for the economic development of the Damodar River valley, in Bihar and Bengal, to which we briefly referred last week, was presented by the Central Technical Power Board to a conference of Government representatives which decided to proceed with the necessary investigations and surveys.

The scheme involves the construction of eight dams and a barrage on the Damodar and its tributaries, combining flood control with irrigation and the generation of electricity. It is estimated that the development would cost 55 crores of rupees (about £41,000,000) and would take ten years to complete.

An interconnected system of hydro-electric and thermal stations would have a total capacity of 350,000 kW. The Board envisages a single autonomous administration for the scheme to secure the necessary technical co-ordination and the rehabilitation of the population. In ths connection it suggests that a detailed examination of the Tennessee Valley Authority Act would be useful.

Forthcoming Events

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.

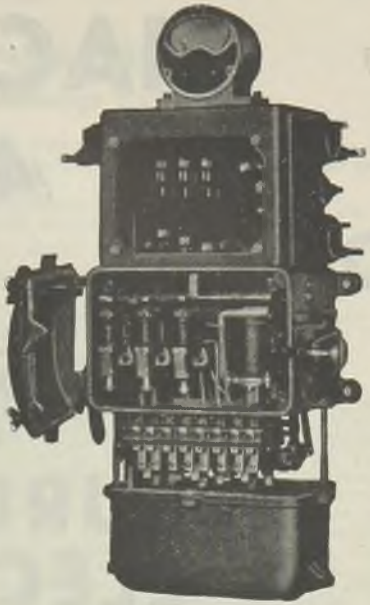
Saturday, September 15th.—*Manchester.*—Engineers' Club, 3 p.m. Association of Supervising Electrical Engineers (Manchester Branch). " Motor Control Gear," by Mr. Mathieson.

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.

Control for squirrel-cage motors

by



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FINANCIAL SECTION

Company News. Stock Exchange Activities.

Reports and Dividends

Bakelite, Ltd.—Sir James Swinburne, Bt., F.R.S. (chairman) presided at the recent annual meeting. A statement presented by the managing director, Mr. H. V. Potter, B.Sc., showed that the company's production had been almost doubled during the war. On the Government's recommendation, the company's productive facilities were widely dispersed and factories were established in Lancashire, North Wales, Derbyshire and Hertfordshire. The financing of the additional plant required had been effected almost entirely from the company's own resources.

The administration of the company had recently been reorganised and a number of units established, and it was the company's intention to enter new fields of plastics. For example, the manufacture of vinyl plastics to replace rubber as cable covering and tubing would be continued and expanded. Vinyl plastics had a very versatile range of applications. The manufacture of these materials would be concentrated in a new factory on a new site.

Associated British Engineering, Ltd.—As we reported last week, this company proposes to make an issue of shares. It was stated in the report that the directors considered the amount too small to offer to the present shareholders, but at last week's annual meeting the chairman announced that in response to requests from shareholders they had decided to reduce the issue of ordinary shares to 15,500, of which 15,250 would be offered to existing shareholders in the proportion of one new share at 40s. for each £10 of ordinary stock now held.

Thorn Electrical Industries, Ltd.—The report for the year ended March 31st last states that the combined profit of the company and its subsidiaries, after charging working expenses and depreciation, but before meeting taxation, was £80,063 (against £84,850 for 1943-44). The net balance after deducting taxation was £26,978 (£24,645) to which is added £10,235 (£9,090) brought in. General reserve receives £15,000 (against £12,000), the ordinary dividend is maintained at 20 per cent., and £10,713 is carried forward.

Calcutta Tramways Co., Ltd.—This company (which the Bengal Government proposes to take over at the beginning of next year) reports a rise in receipts of £330,565, to £1,248,724, during the past year. After providing £80,000 for reserve and renewals (same) but nothing (against £25,000) for contingencies, the net revenue is £493,127 (against £223,312) to which is added £5,108, sundry credits and interest. The ordinary dividend is maintained at 7½ per cent. and the balance carried forward is increased from £31,168 to £35,876.

Aron Electricity Meter, Ltd., announces that its net profit for the past year was £19,266 against £19,064 for 1943-44. The dividend is maintained at 15 per cent.

Walsall Conduits, Ltd., are maintaining their interim dividend at 20 per cent.

The Lancashire Electric Light & Power Co., has declared an interim dividend of 2½ per cent., as last year.

The British Oxygen Co., Ltd., is to pay an interim dividend of 8 per cent. (same).

The British Power & Light Corporation, Ltd., is again paying an interim dividend of 2½ per cent.

Brown Bros., Ltd., announce the payment of an interim dividend of 2½ per cent., as last year.

New Companies

Eastgate Electrical Supplies Ltd.—Private company. Registered August 21st. Capital £2,000. Objects: To acquire the business carried on by W. A. Thackston at 24, Three Colt Street, E.14, and to carry on the business of wholesale distributors and stockists of electrical equipment for industrial and household purposes, etc. Directors are: W. A. Thackston, 15, Roche House, E.14; F. C. Biggs, 9, Cranborne Road, Hatfield; and C. G. Cross, Lulworth, Fairview Road, Basildon, Essex. Secretary: C. E. Clarke. Registered office: 24, Three Colt Street, E.14.

Doanco, Ltd.—Private company. Registered August 21st. Capital, £1,000. Objects: To acquire the stock, fixtures, fittings and effects of the business of Fred A. Doe, electrical contractor of 45, Regent Road, Liverpool. First directors: F. A. Doe and Mrs. Doris E. Doe, both of 39, Moor Drive South, Great Crosby, Liverpool, 23. Registered office: 45, Regent Road, Liverpool.

Beeston Domestic Appliances, Ltd.—Private company. Registered August 21st. Capital, £500. Objects: To carry on the business of manufacturers of, wholesale and retail dealers in, and agents for, household and general electrical and other equipment and appliances, etc. Subscribers: T. D. C. Taft, C. A., and Eric Winstanley, both of 13, St. Peters Gate, Nottingham, which is the registered office.

Hardon Electrical Co., Ltd.—Private company. Registered August 23rd. Capital, £1,000. Objects: To carry on the business of electrical, mechanical, and wireless engineers and contractors, etc. The subscribers are: H. R. Bettinson, solicitor, and S. C. Butts, solicitor's clerk, both of 243, Bristol Road, Birmingham, 5. Registered office: 31, Stafford Street, Birmingham, 4.

J. & F. Lewis Lighting & Radio, Ltd.—Private company. Registered August 17th. Capital, £100. Objects: To carry on the business of manufacturers of, and wholesale and retail dealers in and exporters and importers of, wireless, television and telephonic apparatus and components, electrical goods, etc. First directors: P. V. Rose and H. Rose, both of 166, Egerton Road, Whalley Range, Manchester, 16, the address of the registered office.

B. M. Ryder, Ltd.—Private company. Registered August 20th. Capital, £1,000. Objects: To carry on the business of electrical, radio, lighting, telephone and mechanical

engineers, etc. Subscribers: R. E. Ryder, 75, Carlton Road, Nottingham; and C. G. Taylor, C.A., 38, Clarendon Street, Nottingham. Secretary: T. H. Whiten, 79, Rothesay Avenue, Nottingham. Registered office: 75, Carlton Road, Nottingham.

Robins & McSorley, Ltd.—Private company. Registered August 20th. Capital, £400. Objects: To carry on the business of manufacturers and repairers of and dealers in electrical accumulators, batteries, acids, containers, dynamos and general electrical goods, etc. Directors: J. T. Robbins, 19, Park Avenue West, Ewell; and D. J. McSorley, 6, Home Farm Estate, Sipson, Middlesex. Registered office: 19, Park Avenue West, Ewell, Surrey.

Companies Struck off the Register

The following companies were struck off the Register on August 21st: — Ismay Refrigerating Co., Ltd.; Kensal Radio Manufacturing Co.; and Zeros (Sales), Ltd.

Companies' Returns

Statements of Capital

Power Securities Corporation, Ltd.—Capital, £2,000,000 in £1 shares (1,000,000 7 per cent. cum. participating preference and 1,000,000 ordinary). Return dated February 28th. 500,000 preference and 800,000 ordinary shares taken up. £1,300,000 paid. Mortgages and charges: Nil.

Westminster Engineering Co., Ltd.—Capital, £25,500 in £1 shares (13,000 ordinary and 12,500 preference). Return dated March 12th. 9,071 ordinary and 9,279 preference shares taken up. £14,550 paid. £3,800 considered as paid. Mortgages and charges: Nil.

J. W. Ray & Co. (Liverpool), Ltd.—Capital, £3,000 in £1 shares. Return dated May 29th. 2,753 shares taken up. £2,753 paid. Mortgages and charges: Nil.

Marconi International Marine Communication Co., Ltd.—Capital, £1,500,000 in £1 shares. Return dated June 11th. 1,192,726 shares taken up. £1,087,726 paid. £105,000 considered as paid. Share warrants to bearer outstanding, £4,730; surrendered, £120. Mortgages and charges: Nil.

National Accumulator Co., Ltd.—Capital, £350,000 in 175,000 preferred ordinary and 175,000 deferred ordinary shares of £1. Return dated July 2nd. All shares taken up. £292,616 paid. £57,384 considered as paid. Mortgages and charges: Nil.

Increases of Capital

Electrotest, Ltd.—The nominal capital has been increased by the addition of £9,000 in £1 ordinary shares beyond the registered capital of £1,000.

Rothermel Corporation, Ltd.—The nominal capital has been increased by the addition of £90,000 in 1,800,000 ordinary shares of 1s. each beyond the registered capital of £50,000.

Cinema-Television, Ltd.—The nominal capital has been increased by the addition of £830,000, beyond the registered capital of £368,250. The additional capital is divided into 530,000 5 per cent. cumulative preference shares of £1 and 12,000,000 "A" ordinary shares of 6d. The capital is now £1,198,250 in 550,000 5 per cent. cumulative preference, 12,000,000 "A" ordinary shares of 6d., £348,127 "B" ordinary stock and 4,920 "B" ordinary shares of 6d. Part of the above increase is for the purpose of acquiring not less than 90 per cent. of the issued share capital of Bush Radio, Ltd.

Mortgages and Charges

British Columbia Electric Railway Co., Ltd.—Particulars filed of general mortgage bonds for 50,000,000 dollars authorised July 18th and covered by trust deed dated July 1st, but actually executed July 25th, charged on real and immovable and leasehold properties and rights, shares in various other companies, and the company's undertaking and other property, present and future (subject to trust deed dated February 23rd, 1907). The amount of the present issue is $5,000,000 (designated 4 per cent. general mortgage bonds 1945 series). Trustees: Montreal Trust Co., 466, Howe Street, Vancouver, B.C.

R. F. Winder, Ltd.—Satisfaction in full on July 12th of mortgage or charge dated March 22nd, 1934, and registered March 28th, 1934, securing all moneys due or to become due from the company to Midland Bank, Ltd.

Pioneer Private Telephone Co., Ltd.—Satisfaction in full on June 24th of legal charge dated October 26th, 1942, and registered October 27th, 1942, securing £2,700.

Receiver Released

A. E. Rising, Ltd.—C. Hayter, St. Fillans, Hendon Road, Finchley, N.3, ceased to act as receiver and/or manager on August 4th, 1945.

Liquidations

Whitehead Switchgear & Inventions, Ltd.—First and final dividend of 4d. in the £ payable September 21st at 35, Windsor Place, Cardiff.

Bankruptcies

L. H. Lawrence (described in the petition and receiving order as Henry Frederick Lawrence), 43, Canterbury Road, Margate, electrical engineer.—Application for discharge to be heard on October 16th at the Guildhall, Canterbury.

A. C. W. Wilson, electrical engineer, Wepre, Higher West Cross Lane, Swansea, and lately residing at 7, Glanmor Road, Sketty, Swansea.—Last day for receiving proofs for dividend September 14th. Trustee: Mr. R. Betts, Official Receiver, Government Buildings, 10, St. Mary's Square, Swansea.

W. B. Ralphs, 30, Ayresome Street, Middlesbrough, and lately residing and carrying on business at 2, Mulgrave Road, Middlesbrough, as electrical contractor.—Supplemental dividend of 9s. 2½d. in the £ payable September 17th at 80, High Street, Stockton-on-Tees.

R. J. M. Holmes (deceased), electrical engineer, 17, Buston Terrace, Newcastle-upon-Tyne.—First and final dividend of 4s. 5d. in the £ payable September 12th at the Official Receiver's Office, Gibb Chambers, Westgate Road, Newcastle-upon-Tyne.

STOCKS AND SHARES

TUESDAY EVENING.

THE change-over from war to peace conditions is making its influence felt as one of the principal factors now operating in Stock Exchange markets. An outstanding feature of the last week or so has been a violent rise in the price of Consols, due to the expectation, previously mentioned here, that the Government may issue a substantial undated loan bearing 2½ per cent. interest at the price of 100. Industrial stocks and shares were unfavourably affected by the announcement that Lease-Lend was coming to an abrupt end. Upon this being slightly modified, a recovery occurred in the shares of the companies principally concerned.

Equipment and Manufacturing

Aron Electricity Meter is repeating the dividend of 15 per cent. to which it was advanced last year from the previous 10 per cent.; the price has responded with a rise of 64s. 3d. A little demand for British Vacuum Cleaner shares served to raise the price by 1s. 9d. to 35s. Electric Constructions, with a rise of 2s. 6d., regained 60s. and English Electrics are similarly higher at 55s. 6d. Other ordinary shares to improve by 2s. 6d. are Lancashire Dynamo, 5⅛, Crabtrees, 43s. 9d., and Murex, £5. A florin gain lifted General Electrics to 96s. Siemens at 37s. 6d., and Ward & Goldstone at 32s., are 1s. 6d. better. Telegraph Constructions hardened to 55s.; the new shares are a few pence lower than the old. Ransome & Marles, 87s. 6d., have risen 1/16. A 3s. spurt carried Associated Electricals to 57s., bringing the price level with that of Babcock & Wilcox. Enfield Cable at 63s. 6d., and Falk, Stadelmann at 36s. have hardened.

Market Movements

Buying from India is said to be the reason why Calcutta Electrics rose 4s. to 66s. 6d. The Tramways shares are equally better at 83s. Overseas issues are mostly good. International "Tel. & Tel." show a gain of 2 at 31. Palestine Electrics at 39s. and Brazilian Tractions at 29½ have both improved. Cable & Wireless preference rose to 112½, and the ordinary receded to 90½; Globe Telegraph ordinary are 1s. 6d. harder at two guineas. At 69, Southern Railway preferred has lost 7½ points in three weeks. London Passenger Transport "C" holds its recent rally to 63. Radio shares have been erratic. Cossor came down from 42s. to 40s. before recovering to 41s. Philco are better at 14s. E.M.I. and E. K. Cole are a trifle easier at 33s. 6d. and 36s. 3d. respectively.

The price of Tokyo Electric 6 per cent. sterling bonds has again been fluctuating sharply. Early this year, as observed last week, the price of these bonds stood at 25. To-day it is 58½. No interest has been paid since June, 1941. Interest on the bonds being cumulative, the price includes a nominal 24 points, say £12 net.

Metal Industries

Metal Industries has raised its dividend of 8½ per cent. to 9 per cent. and the chairman, Sir Donald Pollock, at the recent meeting stated that the maintenance of the favourable level of profits is the direct result of the directors' policy of continued expansion and consolidation during the past few years. Metal Industries holds all the ordinary stock in Electrical Switchgear & Associated Manufacturers, as well as all the issued share capital of the Igranic Electric Co., besides £925,000 ordinary stock of the British Oxygen Co. At 47s. 6d. the price has recovered 1s. 3d. of the recent heavy fall.

Preference Shares' Stability

As one consequence of the policy of the Government, investment is looking a little askance at stocks and shares the prices of which stand at substantial premiums over their par value. This attitude of caution is shown more particularly in relation to Home Railway stocks, and to the prior-charge issues of utility companies in which the electricity group is, of course, included. Nevertheless, so strongly held are preference shares in this section that, even to-day, a 6 per cent. first-class preference stands at a price which pays little more than 4 per cent. on the money, and sometimes rather less.

Whatever element of caution may attach to preference shares, the prices of which stand well over their par value, the fact remains that demand keeps very constant. Investment is ready to consider the purchase of shares that come on offer, whether at a premium or not, provided the security is good. It may be of service, therefore, to mention that 2,000 North-Eastern Electric 5 per cent. non-cumulative preference shares are on offer at 23s. 6d., the yield on which at this price, is £4 7s. per cent. The shares carry participating rights after the ordinary have received 8 per cent. The dividend on the ordinary for the past few years has been 7 per cent. per annum. These preference shares require £80,482 for their annual dividend service, and the amount available on the last published profits was £1,806,000. In front of them is an issue of 7 per cent. cumulative preference. The price of the latter is 33s. 6d. offering £4 3s. 6d. per cent. on the money.

Four per Cent. Yield

Yorkshire Electric Power 6 per cent. preference are on offer at 29s. to return £4 2s. 9d., but Northmet Power sixes at 30s., give a round 4 per cent. and Clyde Valley Sixes at 30s. 6d. pay £3 18s. 6d. Four per cent. preference shares standing near to par are in demand, as, for instance, South Metropolitan Electric 4 per cent. This is a third preference, but shares can hardly be bought under 22s., ex the dividend due this month, the yield here being £3 12s. 9d. per cent. London Associated Electric 4½ per cent. preference at 23s. afford £3 18s. 3d. per cent. on the money.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specifications (1s. each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

AIR Control Installations, Ltd., and G. E. Clifford.—" Apparatus for use in testing and constructing radio apparatus and other devices and various materials to withstand meteorological extremes." 16234. October 4th, 1943. (571,294.)

British Thomson-Houston Co., Ltd.—" Electric motor control systems." 16365/42. November 27th, 1941. (571,244).

British Thomson-Houston Co., Ltd., and J. H. Walker.—Dynamo-electric machines." 19548. November 23rd, 1943. (571,313.)

A. A. Brooks and W. G. Walter.—" Direct-recording oscillographs." 20639. December 9th, 1943. (571,321.)

Chance Bros., Ltd., and J. G. Holmes.—" Light signalling apparatus." 14726. September 8th, 1943. (571,290.)

Edison Swan Electric Co., Ltd., and J. Winfield.—" Electrolytes for electric batteries or accumulators." 18093. November 2nd, 1943. (571,305.)

English Electric Co., Ltd., and J. H. Barnard.—" Fuse links for electric cut-outs." 20043. December 1st, 1943. (571,298.)

English Electric Co., Ltd., H. S. Carnegie and W. E. M. Ayres.—" Electromagnetic torque transmitters such as slip couplings and brakes." Cognate applications 20922/43 and 24537/44. December 14th, 1943. (571,323.)

Frigidaire, Ltd., and C. E. Williams.—" Refrigerators." 16300. October 5th, 1943. (571,295.)

W. K. Lewis.—" Underground link and fuse boxes employed in electrical distribution systems." 15712. September 24th, 1943. (571,262.)

Meters, Ltd., H. V. Barnes and H. H. Mitchell—" Prepayment mechanism." 17362. October 21st, 1943. (571,302.)

Pathé-Cinema, Anciens Etablissements Pathé Frères.—" Incandescent electric projection lamp with reflector." 4015/42. May 10th, 1941. (571,242.)

Philco Radio & Television Corporation.—" Frequency modulation detector and convertor." 19574/43. November 24th, 1942. (571,314.)

Philips Lamps, Ltd., and A. F. Jeans.—" Apparatus for controlling the load on an X-ray tube." 8099. June 13th, 1942. (571,243.)

T. Ryle.—" Fuses for electrical circuits." 14652. September 7th, 1943. (Convention date not granted). (571,289.)

Soc. Industrielle des Procèdes Loth.—" Radio transmitting devices for navigation purposes." 10635/40. June 23rd, 1939. (571,239).

Standard Telephones & Cables, Ltd.—" Electrical calculating apparatus." 12233/43. July 27th, 1942. (571,253). " Electrical calculating apparatus." 15048/44. July 27th, 1943. (Divided out of 571,253). (571,270.)

Stupakoff Ceramic & Mfg. Co.—" Activation of electrical conductors which are non-conductors when cold." 7110/43. March 19th, 1942. (571,279.)

Westinghouse Brake & Signal Co., Ltd.—" Railway signalling systems." 3341/42. March 27th, 1941. (571,241). " Railway traffic controlling apparatus." 15000/40. January 19th, 1940. (571,272.)

Australian Cable Industry

Rapid Wartime Development

SINCE Cable Makers (Australia) Pty., Ltd., was formed by a number of leading British cable makers and metal manufacturers in 1940 over six hundred different types and sizes of rubber-insulated cables have been produced in the company's works at Liverpool, New South Wales. Some particulars of the concern's activities were contributed to the May issue of *Erda* (Sydney) by the general manager, Mr. A. L. Blake.

Mr. Blake says that the company acquired a 35-acre site and erected what is considered to be the most modern type of plant of its kind in the world. The buildings, of brick construction, are spacious and well-lighted and ventilated, and the machinery was, in the main, manufactured overseas to the latest designs developed by British cable manufacturers. Some plant was made in Australia to the British companies' designs. Wire-drawing plant at the works reduces heavy-gauge copper wire purchased from Metal Manufactures, Port Kembla, to the smallest size of conductor required, and there are complete facilities for mixing rubber and carrying out all the final processes of manufacture.

Crude rubber supplies have been greatly reduced and this has resulted in a remarkable development of plastic insulation. Designs of machinery for the production of these cables developed by the British cable makers have also been given to the Australian company.

Mr. Blake says that to provide the necessary copper for cables the Australian mines will have to increase their production by 10 per cent. and the cotton-spinning industries, and those producing silk and rayon threads, will have to be expanded. " Practically all of the raw materials used in the cable industry can be found in Australia and we have every reason to believe that all raw materials for the manufacture of electric cable will be found here shortly after hostilities cease." The Liverpool factory employs about 600 people directly and it is expected to have an annual turnover (at pre-war values) of £1,000,000.

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. Pumpless 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.)

October 4th. Electric Supply Department. 132-kV overhead lines. (See this issue.)

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. (August 31st.)

Burnley.—September 20th. Electricity Department. E.h.v. cables. (See this issue.)

Burton-upon-Trent. — September 19th. Electricity Department. Cables. (August 31st.)

Edinburgh.—September 14th. Corporation Electricity Department. Installation of electric lighting in West Pilton Housing Area. (106 houses.) Specifications, etc., from Engineer's Office, Dewar Place; tenders to Town Clerk.

Eire.—December 14th. Electricity Supply Board. Civil construction work in connection with the hydro-electric development of the Erne, including dam, power station, etc., at Cathaleen'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. (August 31st.)

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.)

Twickenham.—September 13th. Borough Council. Electrically driven air compressor plant and equipment at Bell Hill, Hampton. A. S. Knolles, borough engineer, Municipal Offices, Twickenham. (Deposit, £2 2s.).

Woolwich.—October 9th. Electricity Department. One 750-kW Diesel alternator and four 30-MVA outdoor reactors. (August 31st.)

Wrexham.—September 11th. Rural District Council. Wiring 18 houses (to be erected), at Cefn for electric lighting and power. D. E. Edwards, engineer, Imperial Buildings, Wrexham. (Deposit, £2 2s.).

Orders Placed

Glasgow.—Corporation Housing Committee. —Accepted. 2,000 wash boilers (£7,083).—W. H. Dean & Son, Ltd., Burnley.

Transport Committee.—Accepted. Installation of individual motors and control gear at Coplawhill Car Works. (£2,091).—B.T.H. Co.

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.

Belfast.—Factory, Harbour Estate; Harry Ferguson (Motors), Ltd., tractor manufacturers.

Blackley.—Works canteen, Blackley New Road; architects' department. Bradford Dyers' Association, Ltd., 39, Well Street, Bradford.

Chesterfield.—Houses, Wingerworth Estate (£22,500); J. Adlington, Ltd., builders, Halcyon, Station New Road, Tupton.

Arkwright No. 2 Colliery for Staveley Coal & Iron Co.; G. F. Kirk, Ltd., builders, 172, Chatsworth Road.

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

Criccieth.—Houses (42), Tynrhos site for U.D.C.; J. E. Griffith, architect, "Isallt," Criccieth.

Darlington.—Clothing factory, Faverdale for Alexandre, Ltd., Leeds.

Dartford.—Five blocks of flats, Wyvern estate, Miskin Road; R. Baker Smith.

Milk bottling depot, Watling Street; Co-operative Wholesale Society, Ltd.

Didsbury.—Houses (12), Spring Gardens; T. W. Evans (Didsbury), Ltd., builders, 3, Spring Gardens.

Durham.—Additions, Bishop Auckland Junior Technical School; county architect, 34, Old Elvet, Durham.

Glasgow.—Shops, Balornock estate (£12,374); housing director.

Glendale.—Houses (70), Wooler, Lowick and Branxton; R.D.C. surveyor.

Ilford.—Houses (326), Oaks Lane estate; borough engineer.

Jarrow-on-Tyne.—Houses (50); borough engineer.

Leigh.—Houses (26), Thompson Street; and passenger lift, Town Hall; borough surveyor, Town Hall.

Manchester.—Laboratory and classroom, York Place, for Manchester University; J. W. Beaumont & Sons, architects, 53, Spring Gardens.

Morayshire.—Nursery school, Aberlour orphanage (£5,000); Canon Wolff, warden.

Newcastle (Staffs).—School kitchen and dining room, Ellison Street; schools architect, Municipal Buildings.

Oldbury.—Maternity home, for Health Committee; Harvey & Wicks, architects, 5, Bennett's Hill, Birmingham, 2.

Penistone (Yorks).—Houses, Park Avenue; U.D.C. surveyor.

Peppard.—Two ward blocks and handicraft unit at Sanatorium for Berks and Bucks Joint Sanatorium Committee (£24,428); Kent and Sussex Contractors, Ltd., Carlton Road, Erith.

Peterhead.—Improvement scheme (£30,000), for Thomas Smith & Co., woollen manufacturers, Kirkburn Mills; manager.

Rotherham. — Houses (100) for the Town Council; Rotherham Master Builders' Federation.

Saddleworth.—Houses (50), Springhead, for U.D.C.; G. G. Baines, architect, 12, Guildford Street, Preston.

Scarborough.—Reconstruction of war-damaged houses for T.C. (£5,300); Mollekin Bros., builders, Maltby.

Sedgefield.—Houses (60), Ferryhill and West Cornforth; W. Hopps, architect, Council Offices.

Stockport.—Clothing factory, Union Street; Humphreys Bros., Ltd., Water Lane, Wilmslow.

Houses, Coniston Road and Gorsey Bank Road (£6,116); J. Foulkes & Son, builders, Wicken Street.

Nurses' home and training block, Stepping Hill Hospital, for Health Committee; H. S. Fairhurst & Son, architects, 55, Brown Street, Manchester, 2.

Stretford.—Public baths, Old Trafford, for T.C.; borough surveyor, Town Hall.

Sunderland.—School, Commercial Road, Grindon and Tunstall Hills; education architect, John Street.

Additions, the Crown Works, Pallion; Steels, Ltd.

Swinton.—Hall and community centre; borough surveyor, Town Hall.

Urmston.—School kitchen and dining room at Grammar School for Lancashire Education Committee; county architect, County Offices, Preston.

Wallsend.—Grammar school; borough engineer.

Warrington.—Nurses' residential block at Sanatorium; borough surveyor, Town Hall.

Watford.—Research station, Munden estate; Ministry of Works.

Weardale (Co. Durham).—Brick and pipe factory, Fir Tree; Crossley Building Products, Ltd.

Trade Publications

Quasi-Arc Co., Ltd., Bilston, Staffs.—Technical Circular No. 594 containing details of "Vortic" mild-steel electrodes for vertical and overhead welding of mild steel and high-tensile structural steels to B.S. 968.

Glenfield & Kennedy, Ltd., Kilmarnock.—An illustrated publication describing the company's wave-making machinery for swimming baths.

F. H. Wheeler & Co., Ltd., 39, Victoria Street, London, S.W.1. A list of representative electrical installations carried out by the company—industrial, commercial, for public authorities, and domestic. A separate folder gives a list of the twelve or so branches of the company from Bournemouth to Aberdeen.

Elliott Bros. (London), Ltd., Century Works, Lewisham, S.E.13.—List No. 815 (second reprint) dealing with the company's latest developments of automatic regulators for heat control in power stations, gasworks, steelworks and for a variety of industrial processes. Fully illustrated.

Arthur Scrivener, Ltd., Tyburn Road, Birmingham.—A 103-page book on "Centreless Grinding" describes, with numerous illustrations and diagrams, the objects and applications of this method of grinding, several electrical examples being included.

Clifton Aircraft, Ltd., Lytham, Lancs.—Leaflets relating to the "Clifton" electric iron and breakfast cooker.

Applications for copies of these publications should be made on firms' business notepaper.

Rural Exhibitions

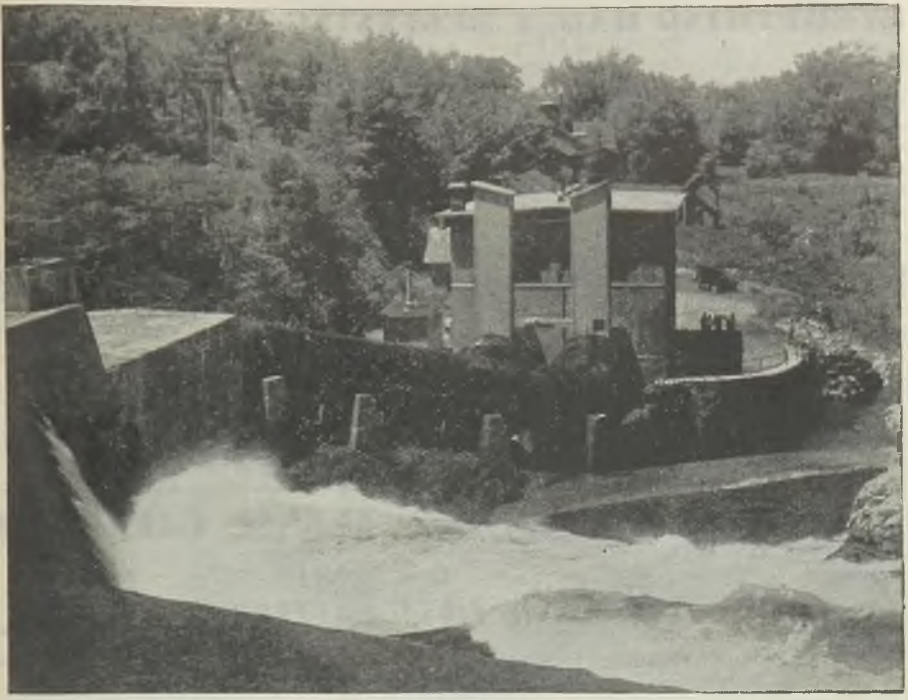
A SERIES of fourteen exhibitions featuring farm and household electrical appliances now being conducted by the East Anglian, Beds., Cambs. and Hunts., and Newmarket Electric Light Companies may be regarded as a foretaste of the electricity supply industry's post-war plans for widespread development in the rural areas.

The display of equipment includes a combined "Essex" mill and "Hemel" friction hoist powered by one 3-HP motor and easily operated by one man; electrically operated pumps; a food mixing machine; a root grater; a stainless steel tipping tank; a pneumatic grain elevator; an electric 2-way hoist; sheep-shearers; tyre pump; paint sprayer; an assortment of electrically operated hand tools; and portable electric welders. Soil-warming cable is shown in operation, while arable farmers will be able to inspect a model grain dryer and moisture-content gauge. In the Dairy Section practical demonstrations are given of hygienic mechanical milking and milk-recording, milk-pumping, cooling, sterilising of utensils, bottle washing, filling, capping and cold storage and water-heating apparatus.

On the domestic side a fully-furnished all-electric kitchen gives practical effect to many suggestions offered by individual housewives, members of women's institutes and a number of public organisations. Its unit-type construction renders it equally suitable for both present and future homes.

Institute of Metals

THE thirty-seventh annual autumn meeting of the Institute of Metals is to be held at the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W.1, on September 12th with sessions commencing at 10 a.m. and 2.15 p.m. The papers to be presented and discussed include one on "An Electron-diffraction Study of the Atmospheric Oxidation of Aluminium, Magnesium and Aluminium-Magnesium Alloys," by L. de Brouckère.



FAMOUS HYDRO-ELECTRIC STATIONS.

This photograph shows the headgates, falls and penstocks of the Vergennes Power Station in Vermont, U.S.A. Statistical data are not at present available.

REGISTERED ASSOCIATION MARK

The Members of the

Association of Steel Conduit Manufacturers

have pleasure in announcing that

AS FROM

1st MAY, 1945

THE TRADING SCHEME IN RESPECT OF

A.S.C.M. STEEL CONDUIT

HAS BEEN ENTIRELY REMODELLED.

ALL TRADE BUYERS OF STEEL CONDUIT ARE ENTITLED TO A GRADED DISCOUNT UPON THE BASIS OF THEIR ANNUAL PURCHASES, AND SUCH GRADED DISCOUNT WILL BE ALLOWED OFF INVOICE AT THE TIME OF PURCHASE.

CUSTOMERS WILL NOT BE ASKED TO SIGN AS EXCLUSIVE BUYERS.

EXCLUSIVE BUYING BONUS AND DEFERRED REBATES ARE TO BE DISCONTINUED.

Full details of the Scheme may be obtained from any Member, Authorised Wholesale Factor or :

The Secretary,
Association of Steel Conduit Manufacturers,
25 Bennett's Hill,
Birmingham 2.

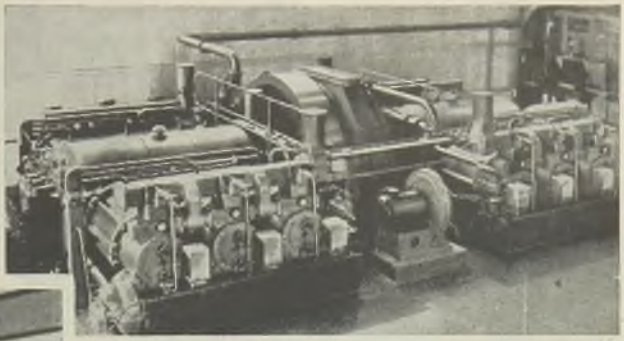
The Members of the Association are :—

ALMA & CRANMORE TUBE CO. LTD.
BARLOW, H. J., & CO. LTD.
ELECTRICAL CONDUITS LTD.
GENERAL ELECTRIC CO. LTD.
GRIFFITHS, ISAAC, & SONS
HILDICK & HILDICK
McDOUGALL, JAMES, LTD.
SIMPLEX ELECTRIC CO. LTD.
Comprising :
Credenda Conduits Co. Ltd.
Perfecta Tube Co. Ltd.
Simplex Conduits Ltd.
Stella Conduit Co. Ltd.
METALLIC SEAMLESS TUBE CO. LTD.
STEEL TUBE & CONDUIT CO. (Middlesbrough) LTD.
TALBOT-STEAD TUBE CO. LTD.
TIPPER BROTHERS (BILSTON) LTD.
WALSALL CONDUITS LTD.

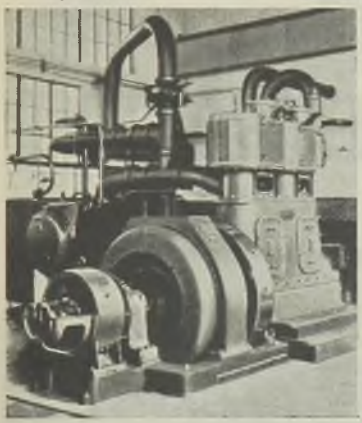
Advertisement of the Association of Steel Conduit Manufacturers, 25 Bennett's Hill, Birmingham 2

"Engine Type Generators"

The illustrations on this page show a few installations of Metrovick Engine Type Generators.



1,000kW Metrovick Engine Type Alternator with closed circuit ventilation. Installed in the West Indies and driven by a Crossley Premier Vis-a-Vis 212 r.p.m. Gas Engine.



375 B.Hp. 375 r.p.m. Browett Lindley Steam Engine driving a Metrovick 250 kW 4,000 Volt Alternator at a Chinese Coal Mine.

450 kW Metrovick Alternators driven by Belliss & Morcom Diesel Engines in a British Power Station.

1 of 2 Metrovick 120 kW 500 r.p.m. Alternators driven by a Belliss & Morcom Steam Engine at a Laundry.

For all types of Engine Driven Generators send your enquiries to:

METROPOLITAN Vickers ELECTRICAL CO. LTD.
TRAFFORD PARK · MANCHESTER 17

C/A101

INCREASE PRODUCTION BY *Consulting* METROVICK'S ILLUMINATING ENGINEERS

MORE LIGHT ON THINGS SOON TO COME . . .

The fruits of research

DURING the past five years every branch of industry has been carefully re-studied by Crompton lighting engineers to improve visual efficiency and working morale. New lamps and new lighting techniques are accomplished facts. You will not have to wait long for their introduction.

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for the LATEST in lighting

CROMPTON PARKINSON LIMITED, ELECTRA HOUSE, VICTORIA EMBANKMENT, LONDON, W.C.2

Telephone: TEMple Bar 5911 *Telegrams: Crompark, Estrand, London*

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.

REPLIES TO advertisements published under a Box Number if not to be delivered to any particular firm or individual should be accompanied by instructions to this effect, addressed to the Manager of the ELECTRICAL REVIEW. Letters of applicants in such cases cannot be returned to them. The name of an advertiser using a Box Number will not be disclosed. All replies to Box Numbers should be addressed to the Box Number in the advertisement, c/o ELECTRICAL REVIEW, Dorset House, Stamford Street, London, S.E.1. Cheques and Postal Orders should be made payable to ELECTRICAL REVIEW LTD. and crossed.

Original testimonials should not be sent with applications for employment.

APPOINTMENTS FILLED

Dissatisfaction having been so often expressed that unsuccessful applicants are left in ignorance of the fact that the position applied for has been filled, may we suggest that Advertisers notify us to that effect when they have arrived at a decision? We will then insert a notice free of charge under this heading.

DERBY County Borough, Assistant Distribution Engineer; Sussex Electricity Supply Co. Ltd., Superintendent; Box 2141, Technical Assistant.

OFFICIAL NOTICES, TENDERS, ETC.

CITY OF BIRMINGHAM

Electric Supply Department

132-kV Overhead Lines to Specification No. D.E.125

THE Electric Supply Committee invites tenders for the supply, delivery and erection of 132-KILOVOLT DOUBLE-CIRCUIT STEEL TOWER OVERHEAD TRANSMISSION LINES HAVING A TOTAL ROUTE LENGTH OF APPROXIMATELY 19 MILES.

The General Conditions of Contract (which include the Corporation's usual Fair Wages and Conditions of Labour Clause), Specification and Forms of Tender may be obtained on application to the undersigned, accompanied by a deposit of TWO POUNDS, which will be returned on receipt, by the appointed time, of a bona fide tender not subsequently withdrawn. Cheques must be made payable to the City of Birmingham Electric Supply Department.

SEALED TENDERS, enclosed in the official envelope provided and endorsed for the purpose, must be delivered to the undersigned NOT LATER THAN 10 a.m. on Thursday, 4th October, 1945, when they will be opened. Tenders not complying with the foregoing will be rejected.

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

14, Dale End, Birmingham, 4. 24th August, 1945.

F. W. LAWTON, Chief Engineer and Manager. 2697

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

H

COUNTY BOROUGH OF BURNLEY

Electricity Department

TENDERS are invited for the supply and delivery of E.H.T. Cables. Copies of the specification, conditions and form of tender may be obtained from the Borough Electrical Engineer, 43, Grimshaw St., Burnley.

Tenders, in plain sealed envelopes endorsed "E.H.T. Cables," to be delivered to the undersigned not later than the first post on Thursday, 20th September, 1945.

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

ARCHIBALD GLEN, Town Clerk.

Town Hall, Burnley. 31st August, 1945. 2732

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.*

BOROUGH OF WEYMOUTH AND MELCOMBE REGIS

Appointment of Electrical Engineer

APPLICATIONS are invited for the above appointment. Salary £900 per annum, rising by annual increments of £50 to £1,000 per annum, plus cost of living bonus, at present £59 16s. per annum, and a car allowance, at present £93 15s. per annum.

The appointment will be subject to the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination. The appointment will be terminable by 3 months' notice on either side.

Applications, endorsed "Electrical Engineer," stating full particulars of age, qualifications, past and present appointments and experience, and giving the names and addresses of two persons to whom reference can be made, to be forwarded to the undersigned so as to be received not later than the 1st October, 1945.

Testimonials are not required.

Members of H.M. Forces who have the necessary qualifications are invited to apply for the above appointment, and the date for the receipt of applications has been extended with this object in view.

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

PERCY SMALLMAN, Town Clerk.

Municipal Buildings, Weymouth. 27th August, 1945. 2683

SALES MANAGER FOR BATTERY ELECTRICAL VEHICLE DEPARTMENT

BRUSH Electrical Engineering Co. Limited, where a progressive policy has been instituted, is inviting applications for the post of Sales Manager for their Battery Electrical Vehicle Department. Applicants must have sound technical qualifications and experience, and knowledge of sales administration. Good prospects and salary for the right man. Write, giving full particulars, to—Industrial Relations Services (A.E.E.) Limited, 27, Gilbert Street, London, W.1. 2724

BOROUGH OF LUTON

Electricity Undertaking

APPLICATIONS are invited for the following appointments:—

1. SWITCHBOARD ATTENDANT. Applicants must have had sound experience in the control of high and low pressure switchboard and the operation and maintenance of rotary converting plant.

Conditions of service and rate of pay will be in accordance with the National Joint Board Schedule, Class G, Grade 9a (present salary £307 per annum).

2. HOME SERVICE DEMONSTRATOR. Candidates must have had good training in Domestic Science and should hold a recognised diploma in that subject and Electrical Housecraft. They should be not less than 25 years of age and have had sufficient previous experience to make them competent to conduct lecture demonstrations either at the showrooms, in consumers' homes or in public rooms; to advise consumers in the choice and use of all domestic appliances; and to conduct housewifery courses for girls in the A.T.S., W.A.A.F. and factories.

Salary £230 per annum, rising by 3 annual increments (£15, £10 and £10) to £265 per annum, plus war bonus, at present £48 2s. per annum.

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

Applications, giving age, details of training and experience, present position held, and accompanied by testimonials, must be delivered not later than Wednesday, 19th September, 1945, to C. T. Melling, M.Sc.(Tech.), M.I.E.E., A.M.I.Mech.E., Borough Electrical Engineer, Electricity Offices, St. Mary's Road, Luton.

This advertisement is published by permission of the Ministry of Labour and National Service under the Control of Engagement Order, 1945. Canvassing, either directly or indirectly, will be a disqualification.

W. H. ROBINSON,
Town Clerk.

Town Hall, Luton.
1st September, 1945. 2725

WINWICK HOSPITAL, WARRINGTON

APPLICATIONS 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

WEST HAMPSHIRE ELECTRICITY CO. LTD.

APPLICATIONS are invited (preferably from ex-Servicemen) for the following posts:—

JUNIOR MAINS ASSISTANT. Salary in accordance with N.J.B. Grade E9 (commencing £301 p.a.). Applicants should be qualified to assist generally with the construction, maintenance and operation of rural supply systems, including the keeping of mains records and office work.

SALES REPRESENTATIVE. Salary up to £300 p.a. according to qualifications. Applicants must be familiar with rural supply work, including installations, apparatus, supply tariffs and farming applications. Car driver essential.

Full particulars of education, training and experience to Engineer and Manager, Electricity House, Lyndhurst.

The Ministry of Labour and National Service have given permission under the Control of Engagement Order, 1945, for the advertisement of these vacancies. 2714

BOROUGH OF BARRY

Appointment of Borough Electrical Engineer

APPLICATIONS for the above appointment are invited from qualified Engineers who are experienced in the management and administration of an electricity undertaking distributing electricity purchased in bulk. Applicants must be under 45 years of age, unless they are already contributors to a Superannuation Scheme under the provisions of the Local Government Superannuation Act, 1937. The salary will be in accordance with the agreement made by the National Joint Committee of Local Authorities and Chief Electrical Engineers, dated 9th July, 1941. The present salary, according to the scale, is £583 per annum, and this salary will be paid from the date of taking up duties. In addition, a cost of living bonus is payable, amounting at present to £59 16s. per annum.

The person appointed will be required to devote the whole of his time to the duties of the office and to live in the borough. The appointment will be subject to termination by three months' notice on either side; to the provisions of the Local Government Superannuation Act, 1937, and to the successful applicant passing satisfactorily a medical examination by the Council's Medical Officer. Application forms may be obtained from the undermentioned and must be returned not later than Friday, the 21st September, 1945.

T. D. HOWELLS,
Town Clerk.

Town Hall,
Barry, Glam.
6th September, 1945. 2719

GENERAL SALES MANAGER

JOHNSON & PHILLIPS LTD. are prepared to receive applications for the position of General Sales Manager (Home).

Apply by letter only, giving particulars of age, education, qualifications, training, experience and salary required, to General Manager, Charlton, London, S.E.7.

2701

SALES MANAGER

EXCEPTIONAL opportunity for right man. Must be a good organiser and have creative ability and knowledge of marketing and sales promotion. Must be experienced in successful control of representatives. When applying state if any experience of Building, Hardware, Electrical or Engineering Trades. Excellent references will be required. Unqualified please do not apply. Apply by letter only, stating experience, age, salary required and when available, to Managing Director.

THE RAWLPLUG CO. LTD.,
Rawlplug House, Cromwell Rd., London, S.W.7.
2681

ARMATURE Winder for S.W. London, all classes A.C. and D.C. jobs. Good conditions of employment and permanency for experienced man. Vacancy open to Class A ex-Servicemen only. Immediate appointment preferred, but we are prepared to wait. Write—Box 7564, c/o The Electrical Review.

ARMATURE Winders required for Midlands, used to all classes repairs, large and small. Class A ex-Servicemen or over 51.—Box 2709, c/o The Electrical Review.

ASSISTANT Production Controller required by engineering establishment in South-East London. Previous experience with factory manufacturing electro-mechanical devices and radio preferred. Should be capable of undertaking all production control functions. Write, giving full details of experience, qualifications and salary reqd., to—Box 7651, A.K. Advg., 212a, Shaftesbury Av., W.C.2. 2693

CHIEF 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.

ASSOCIATED MUNICIPAL ELECTRICAL ENGINEERS (Great Britain and Ireland) and the ELECTRICAL POWER ENGINEERS' ASSOCIATION

NOTICE

WEYMOUTH CORPORATION

Appointment of Borough Electrical Engineer

THE Standing Joint Committee of the above Associations desire to point out that all applicants for the above advertised post should stipulate a salary in accordance with Clause 10 of the Agreement made by the National Joint Committee of Local Authorities and Chief Electrical Engineers for the Electricity Supply Industry, under which clause the latest available data indicates a commencing salary of £964 for the first year, rising to £1,134 per annum, the third year and thereafter subject to adjustment above or below in accordance with the National Agreement.

ALL ENGINEERS, WHETHER ENGAGED IN THE ELECTRICITY SUPPLY INDUSTRY OR NOT, ARE URGENTLY REQUESTED TO INCLUDE THE ABOVE CONDITION IN ANY APPLICATION MADE FOR THE APPOINTMENT REFERRED TO.

W. ARTHUR JONES, A.M.I.E.E., Secretary,
Standing Joint Committee,
A.M.E.E.—E.P.E.A. 2684

CHIEF 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.

CHIEF 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—Pickerings Limited, Globe Elevator Works, Stockton-on-Tees. 2679

CLERICAL 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

DESIGNER Draughtsman required, with experience on Electrical Accessories. Knowledge of Plastics and Moulding technique would be an advantage. Applicants should be Class "A" ex-Servicemen or over 51. Full particulars, age, experience, and salary required.—Box 2734, c/o The Electrical Review.

ELECTRICAL and Mechanical Engineers (Temporary Staff) for P.W.D., Nigerian Government. (A) Electrical and Mechanical Engineer in charge of construction. Salary £1,200 p.a. Candidates should possess corporate membership of one of the recognised Institutions or have equivalent qualifications, and not less than 10 years' experience in similar work to the duties of this appointment, which are those of a Resident Engineer, in the extension of existing power stations. These are driven by steam or internal combustion engines, with water tube boilers and ancillary plant in units up to 10,000 kW. Requirements also include the ability to lay out, estimate for and supervise construction of complete electrical systems in rural areas, with generating units up to 300 kW and high and low tension distribution. Some knowledge of hydro-electric plant will be an advantage. (B) Electrical and Mechanical Engineers. Age 30/50 years. Salary £600 to £1,000 p.a. according to qualifications and experience. Candidates should possess qualifications as for (A) and have had experience of power station and distribution works, and will be required personally to carry out the erection of internal combustion engined generating sets up to 100-kW capacity, gas producer plant and all switchgear and ancillaries usually associated with power stations of the sizes indicated, also carry out the erection of overhead e.h.t. and l.t. distribution mains, etc., indoor and outdoor substations, switchgear and plant, and to supervise laying and jointing of cables. All appointments will be for one tour of 12 to 24 months in the first instance. Free passages and quarters and outfit allowance of £60. Applicants should indicate plainly whether their application relates to A or B. Write, quoting D.1420A, to Ministry of Labour and National Service, Appointments Dept. (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. 2699

DRAUGHTSMEN required (London area) with good experience in Machine design and Plant installation. A knowledge of Bakelite Moulds an advantage. Reply stating age, experience and salary required to—Box 2728, c/o The Electrical Review.

ELECTRICAL Plant Engineer with good technical training, preferably a member of the Institution of Electrical Engineers, and with experience of manufacture and repair of motors and switchgear as well as of general maintenance. The plant to be controlled includes substation with three 1,000-kVA. 11,000/440-volt transformers, nearly 1,000 motors, 20 electric auto-controlled furnaces, electric cranes and trucks, and special manufacturing facilities such as arc and spot welding plant, crack detectors, demagnetisers, rectifiers, and sundry auxiliary machines. Candidates must have intimate knowledge of efficient lighting practice, factory power distribution and power factor correction, and be familiar with the Factories Act as it affects electric plant. State salary required. The Ministry of Labour and National Service, Division A.9D, have given permission under the Control of Engagement Order, 1945, for the advertisement of this vacancy. Address Works Manager, Albion Motors Ltd., Scotstoun, Glasgow, W.4. 2700

ELECTRICIAN required for General Industrial installation work. North London district. Applicant should be over 51 years of age. Class A, ex-Serviceman, or otherwise exempt M.O.L. Control would suit.—Box 2720, c/o The Electrical Review.

ELECTRICIANS 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

ELECTRICIANS for general installation work, also Electricians for plant maintenance. Permanencies for suitable applicants. Class A ex-Servicemen or otherwise exempt from Ministry of Labour control.—Dicks Ltd., 149, High Street, Winchester. 2689

ENGINEER required by well-known radio company to take charge of their drawing office and mechanical design. Must have academic qualifications and previous experience. Write, giving full details of experience, qualifications and salary required, to—Box 7658, A.K. Advg., 212a, Shaftesbury Avenue, W.C.2. 2690

ENGINEER with experience of works and production organisation, and control of personnel, required by important company in the electrical industry in the London area, in the capacity of Assistant Works Manager. Good prospects, salary and pension for man with the required qualifications.—Box 2708, c/o The Electrical Review

JUNIOR Engineer with experience of light electrical production and knowledge of electronic circuits required by firm North of London. Applications invited from men over 51 and from Class A ex-Servicemen only.—Box 2707, c/o The Electrical Review.

LABORATORY 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.

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.

LIVE Sales Representatives wanted for speciality distributed through electrical wholesalers. Easily worked with other lines. Large commission. Training given. Write, giving particulars of area covered, to—Box 2698, c/o The Electrical Review.

MANAGER required to take charge of technical development in the design and production of small Electric Motors. Please send full details of experience and salary required.—Box 2716, 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.

MOUNT Vernon Hospital and the Radium Institute, Northwood, Middlesex. Electrician wanted, to be responsible for the maintenance of domestic installation motors, lifts, etc., and to carry out new installation as required to I.E.E. standards. Class A men on demobilisation leave are eligible or men over 51 years of age. Wages £5 per week. Applications, stating age and experience, with copies of testimonials, to be forwarded to the Secretary as soon as possible. 2706

NEON Benders and Pumpers, also Erectors, required after the present restrictions of employment are removed. Good wages. Applicants should apply to—Box 2718, c/o The Electrical Review.

OVERSEAS Employment: Armature Winder required for service in the Middle East. Good education including technical training leading up to Ordinary National Certificate standard or its equivalent; must be fully trained with good experience in winding large and small high-speed motors (A.C. and D.C.) and small and medium size transformers. Must have served a full apprenticeship with a firm of repute and have subsequent experience with rewinding work entailed by maintenance of motor transformers, etc., in a large works. Age not over 35. Salary (in sterling), plus allowances in local currency, not less than £600 p.a. Free furnished bachelor accommodation, passages out and home, and kit allowance. Written applications (no interviews), giving the following essential details (1) Full name; (2) Date of birth; (3) Whether married; (4) National Service registration number and local office shown on registration card N.S.2; (5) Medical grade, if known; (6) If discharged from the Forces, particulars of Service number, rank, unit and reasons for discharge; (7) Industrial training and experience; (8) Name and address of present employers; (9) Details of present work, should be sent to the Secretary, Overseas Manpower Committee (Ref. 480/46), Ministry of Labour and National Service, York House, Kingsway, London, W.C.2. Applications cannot be acknowledged. 2686

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, stating qualifications, experience, age, etc., to—Box 2594, c/o The Electrical Review.

RADIO and Electro Mechanical Engineers have a number of vacancies for junior and senior technical personnel and invite applications from Loudspeaker Engineers, Radio Component Designers, Mechanical and Electrical Research Engineers and Designers. Class "A" ex-Servicemen or those over 51 only. Please submit full details of experience and technical qualifications together with age and present salary to—Box 2733, c/o The Electrical Review.

REPRESENTATIVE Wanted to travel overseas to establish agencies in various countries. Preference will be given to applicants who are well acquainted with the Telephone Industry and various Electric Clock Systems. A knowledge of French and Spanish is desirable. Apply, giving details of experience, qualifications, age and salary required to—Box 7595, c/o The Electrical Review.

REPRESENTATIVES required in Midlands by makers of electric wires and cables. Must have live connection. Apply, with full particulars of experience, etc., to—Box 2703, c/o The Electrical Review.

TECHNICAL Assistant. Young man required for work of a technical nature in an electric lamp factory. Applicants should have received a fair technical training and some industrial experience is desirable. Knowledge of electric lamp manufacture not necessary. Applicants should be Class A ex-Servicemen or otherwise exempt from Ministry of Labour control. Apply—Cryselco Limited, Kempston Works, Bedford. 2650

TELEPHONE Industry. A vacancy exists for an Assistant Sales Manager. Preference will be given to applicants possessing technical knowledge and a general experience of the Telephone Industry. Applications only from Class "A" ex-Servicemen or those over 51. Apply, giving details of experience, qualifications, age and salary required to—Box 7596, c/o The Electrical Review.

WANTED, Works Manager for electrical engineering company. Must be good administrator and capable of controlling labour. Knowledge of switchgear an advantage but not essential. Write for particulars to—Box 2702, c/o The Electrical Review.

WELL-known company marketing necessary insulating materials has vacancy for technically qualified Representative to contact principal users for sales research and development. Must be conversant with design, manufacture and operation transformers, switchgear, condensers and cables. Permanent and progressive post for energetic man. Salary, expenses and car. Full particulars career and salary required to—Box 2682, c/o The Electrical Review.

WINDER, well experienced in rewinding small armatures and A.C. motors. Good opportunity and prospects for right man with initiative. S.W. London. Applications only from those over 51 or Class A ex-Servicemen.—Box 7529, c/o The Electrical Review.

X-Ray Service Engineers, also X-Ray Couch Fitters (over 51 or Class "A" ex-Servicemen only) wanted by—General Radiological Ltd., 15-18, Clipstone Street, W.1. 7518

WORKING Manager required by small company employing 60-70 hands in electrical department. Must have first-class knowledge of small induction coil winding and test gear, also light assembly work. Good salary and percentage of profits. N.W. London.—Box 2704, c/o The Electrical Review.

SITUATIONS WANTED

ABOUT DOMESTIC ELECTRICAL APPLIANCES

MANUFACTURERS who have not yet prepared their sales organisation are invited to communicate with the advertiser, who is desirous of negotiating with firms of repute for an appointment as **SALES MANAGER.**

Experience offered includes a wide electrical engineering training, modern methods of selling, education and control of salesmen, promoting of exhibitions, cookery demonstrations, etc.

For further particulars please apply in first instance—Box 7551, c/o The Electrical Review.

AS GENERAL MANAGER OR GENERAL WORKS MANAGER

MANAGER (44), B.Sc.(Eng.), M.I.Mech.E., A.M.I.E.E., A.M.I.Chem.E., seeks appointment carrying complete responsibility. Chemicals, textiles, Ministries, canning, etc. Experienced negotiator.

Box 7541, c/o The Electrical Review.

ADVERTISER having upwards of 30 years' commercial experience in the electrical engineering industry and a sound technical background desires a change for wife's health reasons, preferably to West Lancashire or South-East England areas. Administrative post in selling organisation of a sound manufacturing concern, internal or external, would suit. Congenial employment more desirable than income. Able to take up new post early 1946.—Box 7570, c/o The Electrical Review.

A.M.I.E.E. (34), Sales Engineer, major R.E., available October, requires progressive post.—Box 7524, c/o The Electrical Review.

A.M.I.E.E., A.M.I.Mech.E., Major R.E.M.E., age 37, released end Sept., desires executive post with consulting or manufacturing engineers. Experience design and manufacture railway signalling equipment, machinery and electrical instruments.—Box 7568, c/o The Electrical Review.

ARMATURE Winding Shop Foreman, thorough experience in all types of repairs and rewinds, from fractional to 500-h.p. A.C. and D.C. machines. Desires permanent and progressive position.—Box 7509, c/o The Electrical Review.

CHIEF Buyer desires change, 30 years' experience, purchasing for large Electrical, Radio and General Engineering firms, excellent references.—Box 7514, c/o The Electrical Review.

CHIEF Draughtsman, 7 years with present company, seeks change. Wide practical and theoretical knowledge (mechanical and electrical), able to supervise planning and estimating.—Box 7567, c/o The Electrical Review.

CONTRACT Engineer, Assoc.Brit.I.R.E., Patentee (27), seeks appointment, Radio or Electrical, preferably export trade. Good workshop, D.O., sales and export experience.—Box 7581, c/o The Electrical Review.

DRAUGHTSMAN-Engineer, B.Sc. standard, electrical and mechanical, experienced power station and industrial switchgear and control gear design and layouts, sound organising, standardising and controlling abilities, 20 years present firm, over 51, desires change in executive capacity.—Box 7565, c/o The Electrical Review.

ELECTRICAL and Mechanical Engineer, B.Sc. (Hons.), A.M.I.Mech.E., G.I.E.E. (27), workshops, drawing office and design experience, desires post as designer, preferably on rotating electrical machinery.—Box 7578, c/o The Electrical Review.

ELECTRICAL and Mechanical Engineer (42), keen, with initiative, requires responsible post Southern Counties, 25 years' extensive experience installation, maintenance works plant, manufacture press tools, control light assembling, estimating, buying, stores organisation; present remuneration £575 p.a.—Box 7508, c/o The Electrical Review.

ELECTRICAL Engineer, honours degree, seven years' experience, technical, production, administrative, in light electrical manufacture, seeks post.—Box 7548, c/o The Electrical Review.

ELECTRICAL Engineer, now demobbed after 6 years' service, lost own contracting business in 1940, not starting again, requires position with established firm where previous experience of all branches of contracting can be used to mutual advantage. Investment considered in sound business.—Box 7581, c/o The Electrical Review.

ELECTRICAL Engineer (25), highest technical training, wide practical experience, requires position firm engaged agricultural electrical installations, Oxon., Bucks., Berks., Glos. area. Details—Box 7572, c/o The Electrical Review.

ELECTRICAL Engineer (31), requires post in Birmingham area. Experience in planning, estimating and supervision of internal wiring and outdoor distribution schemes.—Box 7581, c/o The Electrical Review.

ELECTRICAL Engineer (32), Higher National Certificate, Electrical and National Certificate (Mechanical), recently returned from abroad, seeks appointment with Electricity Supply Undertaking. Extensive experience in mains development, construction, installation and operation.—Box 7582, c/o The Electrical Review.

ELECTRICAL Sales Engineer (52), with good connections London and Southern Counties, wishes to represent or act as agent for manufacturer of heating appliances, resistances, transformers or general. Experienced estimating and schemes. Own car. Available September.—Box 7549, c/o The Electrical Review.

ELECTRICIAN/Engineer, 43, married, seeks permanent Supervisory Appointment Home or Abroad. Formerly G.T.C. instructor, Air Ministry station engineer. Good theoretical knowledge and excellent experience. A.C./D.C. Power, H.T. and M.V. Paper Cables, U.G./O.H. Lines, Domestic apparatus. Write—Box 7489, c/o The Electrical Review.

ELECTRICIAN, 30 years' wide and varied experience of electrical and mechanical installation, erecting and maintenance of industrial plant, all-round man, conscientious and reliable.—Box 7584, c/o The Electrical Review.

ENGINEER seeks sit. as Works Manager. Fully qualified tool maker, instrument maker, drawing, 26 yrs.' exp., age 40. Good organiser. London area.—Box 7539, c/o The Electrical Review.

ENGINEER (22), Grad.I.E.E., Higher National Elec. and Ordinary National Mech., 5 years' B.T.H. apprenticeship, with considerable experience in their testing sections, seeks post in N. London or S. Midlands areas, preferably with supply corporation.—Box 7574, c/o The Electrical Review.

ENGINEER, aged 31, desires executive position in a factory organisation: 9 years' practical experience electrical manufacture, 3 years' production planning, estimating and rate fixing, 2 years investigator for M.A.P., Adm., M.O.S., etc., into methods and costs of production. Vicinity London preferred.—Box 7577, c/o The Electrical Review.

ENGINEER (38), Grad. I.E.E., twenty years' experience in light engineering including design and development of specialised small machines and buying seeks permanent executive position in large firm or municipal undertaking asst. engineer or buying preferred. London or Home Counties. £500 p.a.—Box 7517, c/o The Electrical Review.

EX-F/O., R.A.F., Elect. Eng. Officer, aged 37, recently released Class "A," with experience of instrument and electrical work, organisation and production. Civil experience, 9 years with large southern electricity undertaking as representative. School Certificate. Residing at present at Cambridge, seeks appointment as technical or sales representative.—Box 7585, c/o The Electrical Review.

FOREMAN-Supervisor, practical and technical experience construction and maintenance, shortly free.—Box 7560, c/o The Electrical Review.

FRACTIONAL Horse-power Manufacture. Competent Manager, age 38, with a lifetime experience in the manufacture of fractional horse-power motors, seeks responsible post with reputable firm where expert knowledge can be utilised to its fullest advantage. The advertiser, at present in London area, is willing to move to any part of the British Isles if suitable proposition presents itself. He is in possession of first-class references which can be substantiated by previous employers with every confidence. Will be pleased to give fullest account of experience on request, and treat replies with fullest confidence. Apply—Box 7544, c/o The Electrical Review.

GRADUATE I.E.E. (30) requires position as Assistant to Works, Sales or General Manager of electrical manufacturers. Experience with production of batteries, cables, wires. Familiar with technical correspondence; administrative and executive experience.—Box 7573, c/o The Electrical Review.

PLANT Engineer (44), London, earning £600, desires change and seeks invitation to submit particulars of experience and qualifications.—Box 7516, c/o The Electrical Review.

LT.-Colonel, Electrical Engineer (34), B.Sc., A.M.I.E.E., exp. industrial and domestic applications, development elec. supply, now holding senior appointment Services dealing German industrial survey, free Oct., desires responsible position with prospects or partnership. Salary £800. Full particulars from—Box 7525, c/o The Electrical Review.

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.

R.E.M.E. Officer, now serving in Far East, age 27, release group 26, Grad.I.E.E., Diploma in Electrical Engineering, 2 years' workshop company commander, keen and willing to learn, desires to contact progressive firm in U.K. able to offer position with prospects of advancement.—Box 7576, c/o The Electrical Review.

SALES and Estimating Engineer, excellent connection with consumers paper cables and possessing comprehensive knowledge of trade, seeks executive position.—Box 7571, c/o The Electrical Review.

SERVICE Engineer, just returned from abroad, termination of contract, ten years' experience all types industrial instruments, pleased to hear from interested concerns.—Box 7537, c/o The Electrical Review.

YOUNG Engineer (21), B.Sc. (Electrical and Telecommunications), seeks progressive position.—Box 7526, c/o The Electrical Review.

FOR SALE

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

SPECIAL PURCHASE

Diesel-driven Alternator Sets for Sale

ONE 60-kVA Ruston & Hornsby 'L.D.M. fully automatic battery starting Diesel-driven GENERATING SET, 410 volts, 3-phase, 50 cycles, complete with exciter.

ONE 150-kW Diesel Engine-driven GENERATING SET by Ruston & Hornsby/Laurence Scott, type 5VXER, 500 r.p.m.; coupled to Alternator, 410 volts/235 volts, 3-phase, 50 cycles, with exciter.

ONE 225-kW Diesel-driven GENERATING SET by Ruston & Hornsby/Laurence Scott, engine type 5VEZ, running at 333 r.p.m.; coupled to Alternator, 400/230 volts, 3-phase, 50 cycles, with exciter.

ONE 225-kW Diesel-driven GENERATING SET by Ruston & Hornsby/Laurence Scott, type 6VE, running at 333 r.p.m.; coupled to Alternator, 400/230 volts, 3-phase, 50 cycles, with direct coupled exciter.

ONE 375-kVA Diesel-driven ALTERNATOR SET by Ruston & Hornsby/Laurence Scott, comprising 8VER engine, running at 428 r.p.m.; coupled to Alternator, 400 volts, 3-phase, 50 cycles, with direct coupled exciter.

The above plant is available for inspection immediately under working conditions. All the machines are very modern and in excellent order.

GEORGE COHEN, SONS & CO. LTD.
Wood Lane, London, W.12, and Stanningley, nr. Leeds.
2696

COX & DANKS LTD.
for
NEW AND SECONDHAND MOTORS.
A.C. and D.C.—Fractional to 100 h.p.

M.G. SETS. DISTRIBUTION BOXES.

MISCELLANEOUS SWITCHGEAR.

FAGGS ROAD, FELTHAM, MIDDX.
Tel. Feltham 3471/3. 72

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