

ELECTRICAL REVIEW

FOUNDED
1872

Vol. CXXXVII. No. 3533

AUGUST 10, 1945

9d. WEEKLY

LOOK CLOSELY AT THIS PHOTOGRAPH



— it has not been retouched !

THE girls are working under Mazda Fluorescent Lamps, in open-top fittings.

Note the almost complete absence of shadows — even under the benches.

MAZDA

BIG TEK
POLITECHNIKI
SLASKIES

FLUORESCENT LAMPS
and MAZDALUX EQUIPMENT



Only fluorescent lighting can provide this amazing result.

Mazda Fluorescent Lamps are available in "Daylight" colour for most industrial lighting purposes, and also in the new "Warm White" colour for situations requiring a warmer light.

Managements of essential factories and businesses which can and should have better light NOW — as well as those who plan for the future — are invited to communicate with :—

The British Thomson-Houston Co., Ltd.

LIGHTING ADVISORY SERVICE : Bridle Path, Watford, Herts.

Telephone: Watford 5811



M4054



Britain still is free

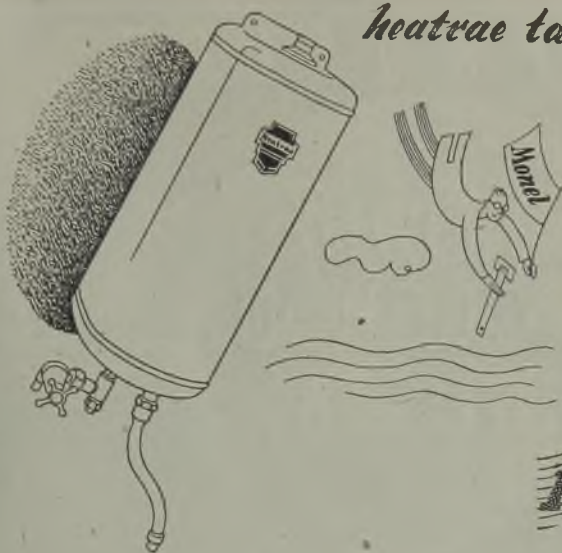
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GUILDFORD ENGLAND



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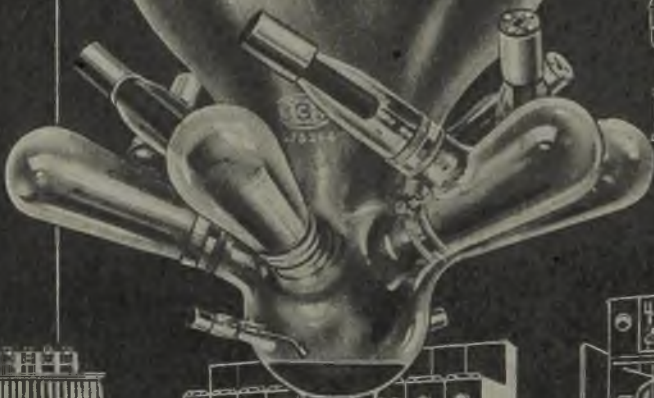
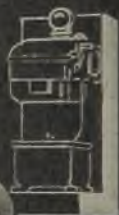
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& METAL-PLATE
RECTIFIERS

Construction
Co. Ltd.

Wolverhampton.

FROM SECRECY TO BROADCASTING



'The Ambush'

By G. D. Rowlandson

A PART from the fame of its salt springs, Droitwich ranks in history with those localities which provided secret asylum for survivors of lost causes. At Hindlip Hall in its vicinity, Gunpowder Plot conspirators defied search for eight days, and, later, Westwood Hall was the hide-out of many a Royalist during the Commonwealth.

To-day Droitwich has reversed its role — it has become informative; for there stands the great Regional Transmitter of the B.B.C. Altogether three Alton batteries have been installed at this station — two for transmitter purposes, the third as a stand-by against generator failure. A notable tribute to Alton reliability.

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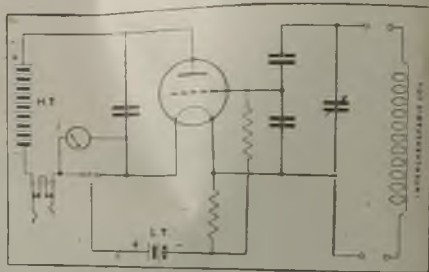


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EVERY ship and shore radio station must have, as an essential part of its equipment, a wavemeter that is absolutely reliable under all conditions.

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The 605A Wavemeter is normally used for frequency measurement of a transmitting station, and as a standard by which to tune a transmitter output. It can also be used to indicate the resonance of modulated carrier waves, and to indicate the



CIRCUIT OF THE REDIFFUSION
605A WAVEMETER

functioning of a very low-power radiating circuit.

The wavemeter unit is light and compact, weighing only $7\frac{1}{2}$ pounds, and is 5" x 8" x 8". The construction throughout has been designed to resist severe variations of climate in most parts of the world. The eight coils are carried in a case of similar size weighing 4 pounds. In use the coils are attached to two terminals placed on the side of the wavemeter.

This instrument is available now. Further details can be sent on request.

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A 3502



VISKRINGS CLOSE-UPS

N O . I F I X I N G



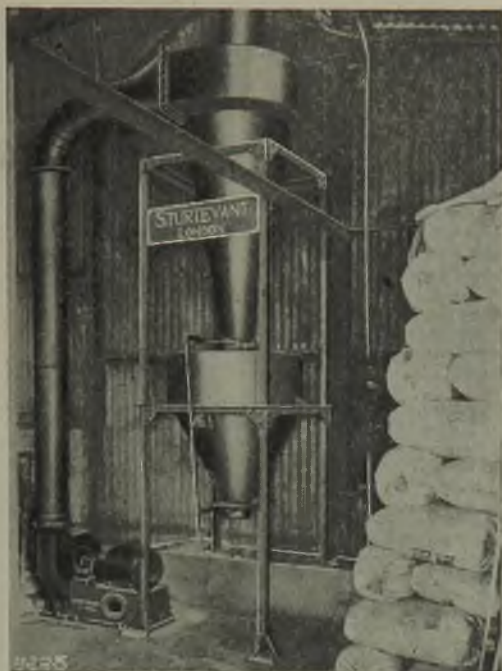
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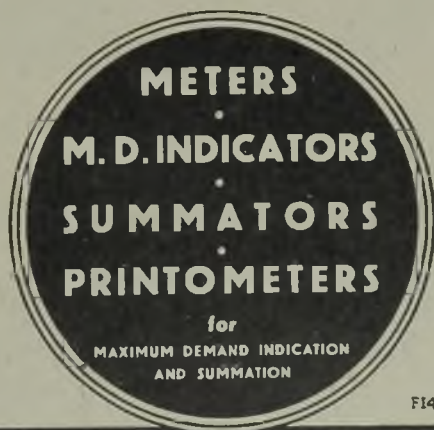
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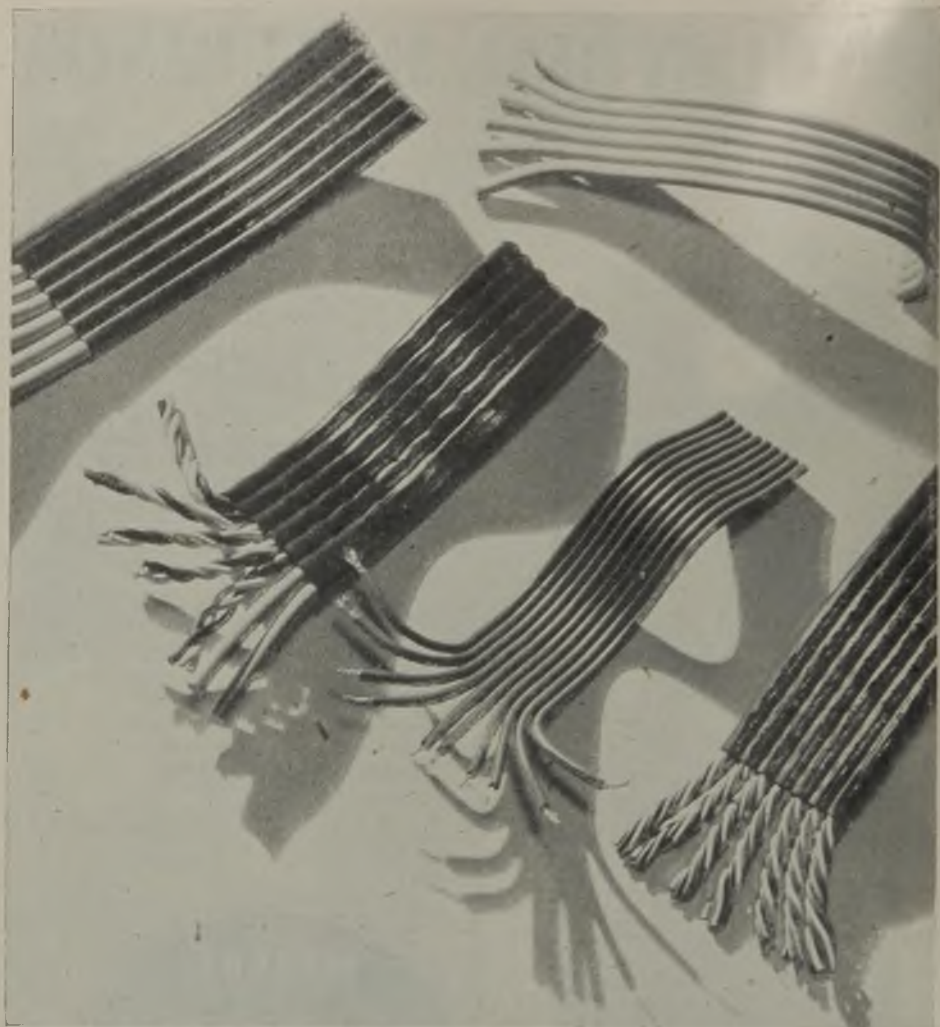


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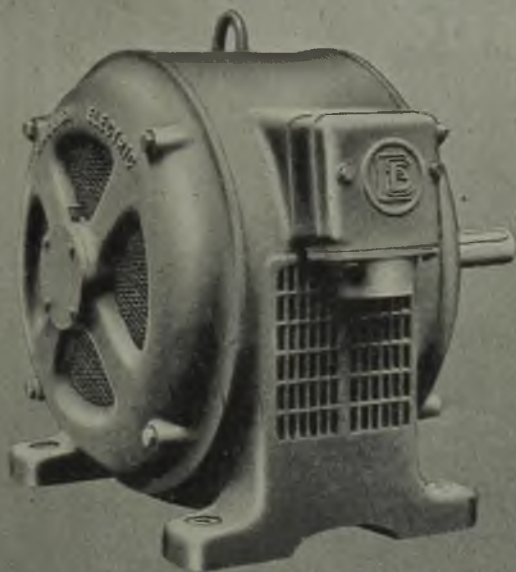
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P.W.16

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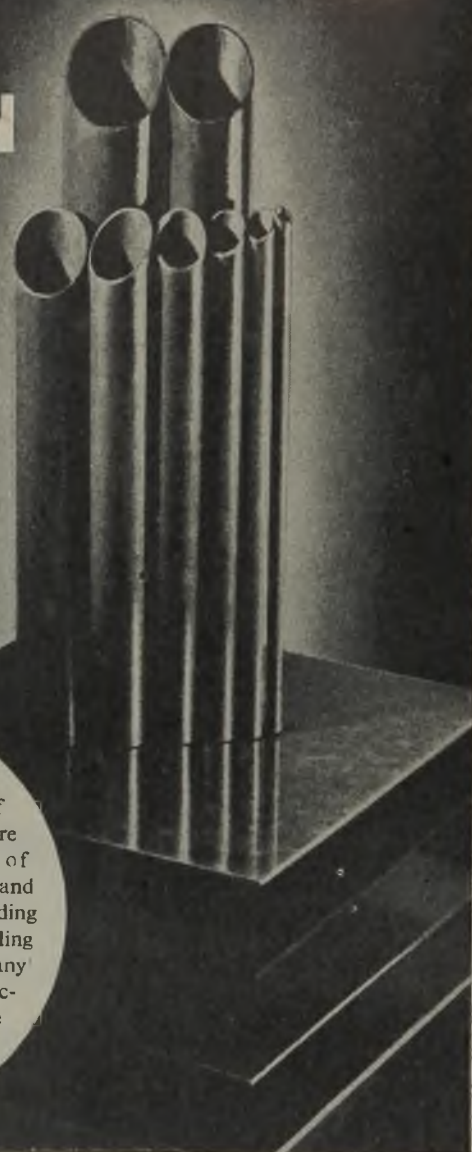
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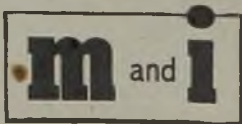


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How to make the best use possible of your water supply is told in these handy booklets:

FUEL ECONOMY BY WATER SAVING (Bulletin No. 31)

This is a survey of the economies (many of them substantial) that are possible in water supply for boiler feed, drinking and washing, process and cooling. It tells you, too, how to clean water mains and plant, and how to keep them clean.

WATER TREATMENT (Bulletin No. 39)

The correct treatment of water, whether for boiler feed, cooling or process is a matter for the specialist. This Bulletin surveys the whole field and describes briefly the methods available for overcoming your difficulties.

BLOW-DOWN (Bulletin No. 35)

Too often the blowing down of boilers is merely a matter of routine, bearing no relation to need. Excessive or insufficient blow-down are both serious fuel wasters. This Bulletin tells you why, when and how much to blow down.

THE UNORTHODOX USE OF ECONOMISERS (Bulletin No. 30)

This Bulletin shows how to obtain the maximum results from your feed-water economiser. Some of the suggestions may be new to you, e.g., the use of a condemned plant for process water heating or as an air heater.

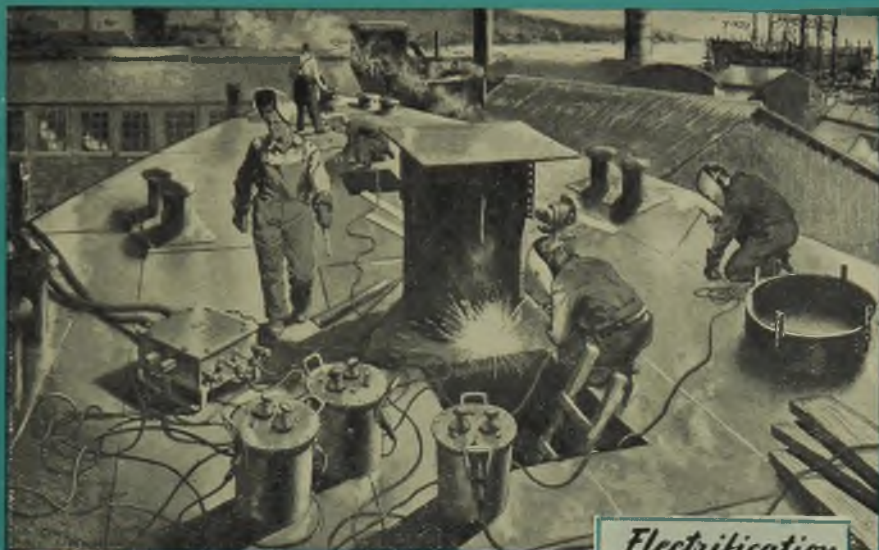
A SOUND ANSWER to practically every problem of fuel economy is quickly found in these Fuel Efficiency Bulletins. Keep a list of their titles handy; then you can turn up at once the particular Bulletin you need. The Bulletins are free from your Regional Office of the Ministry of Fuel and Power.



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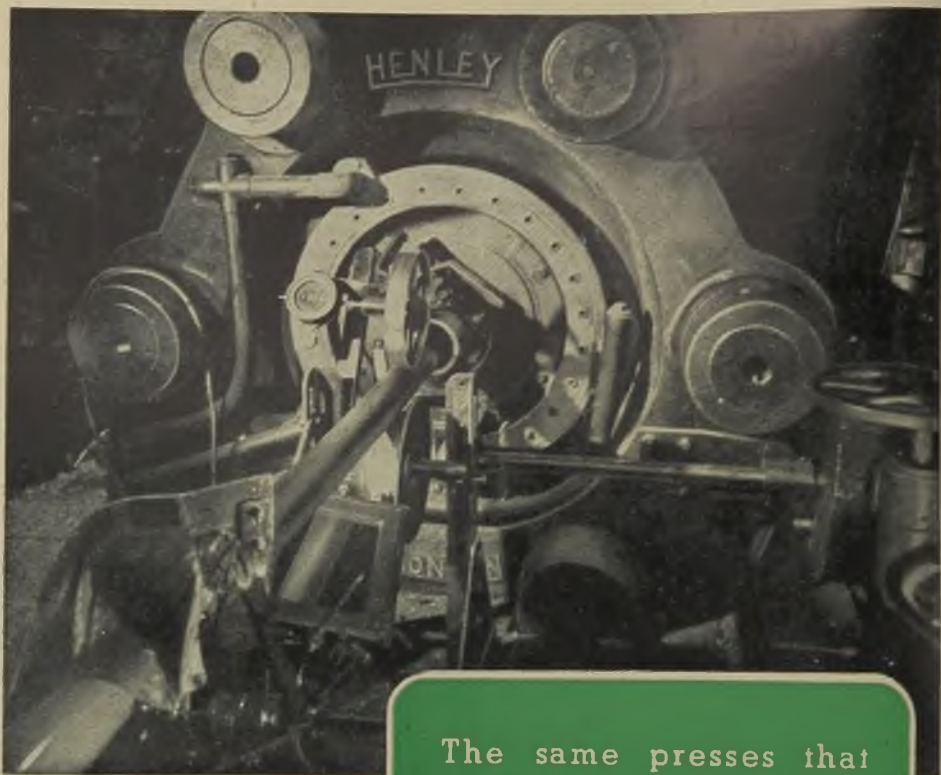
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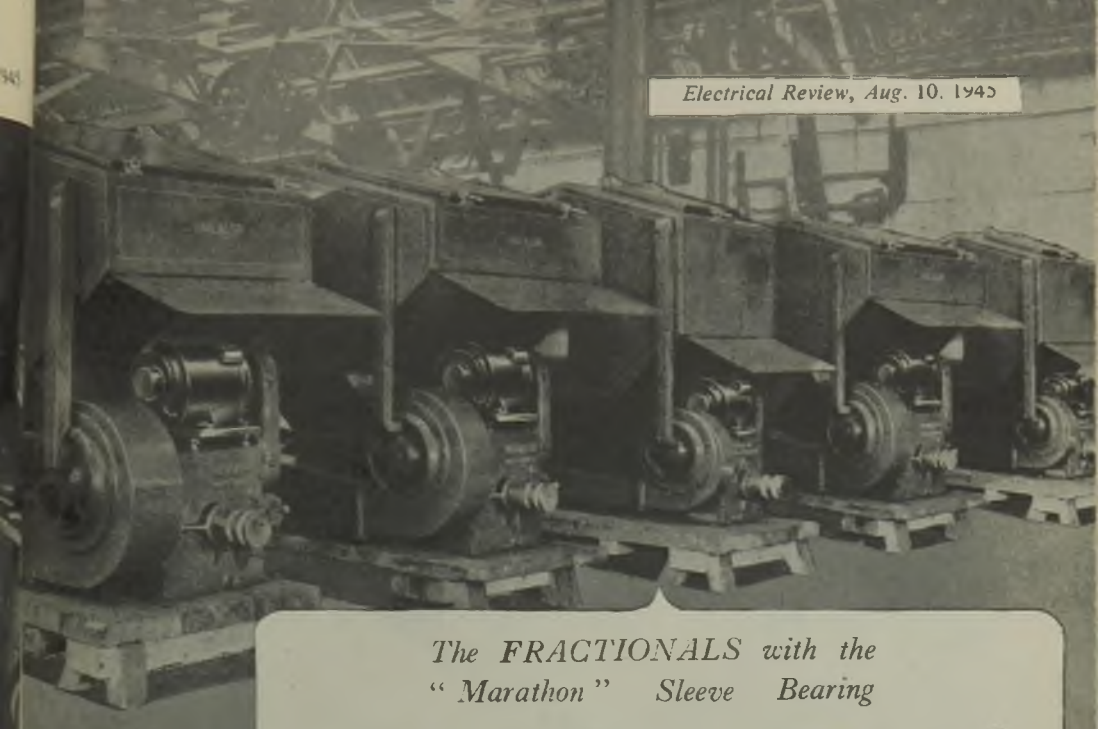
OPERATION

"PLUTO"

extrude flawless
sheathing for

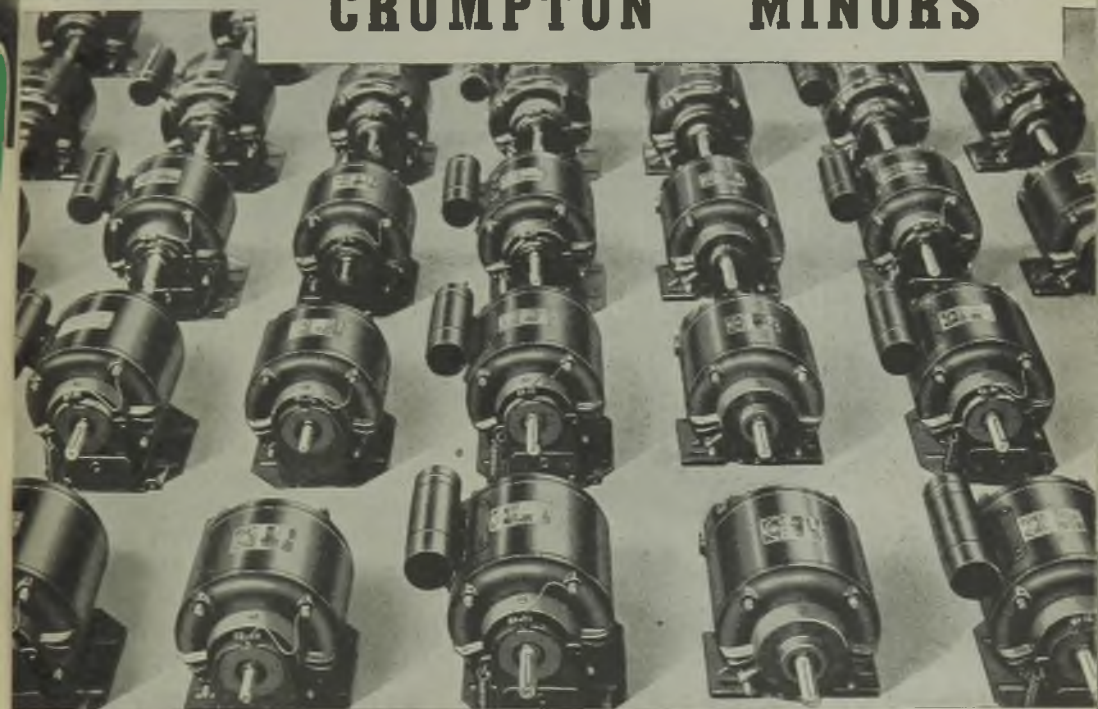
**HENLEY
CABLES**

1945
Electrical Review, Aug. 10, 1945



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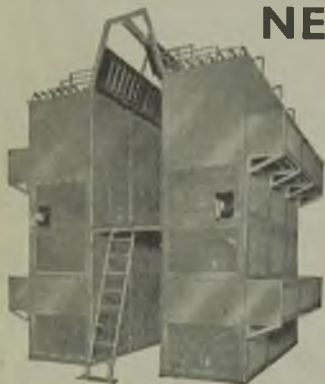
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can be tooled to produce an enormous variety of forms direct from the coil

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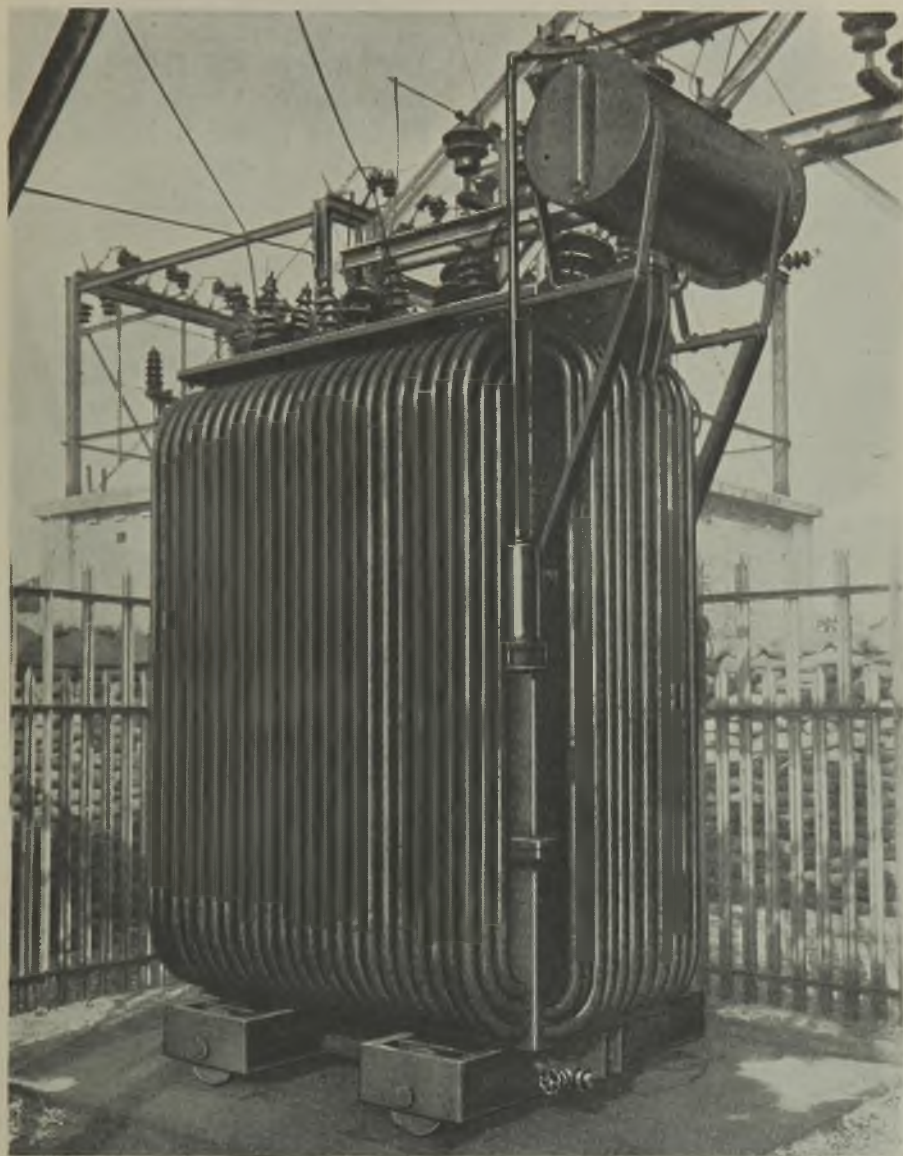
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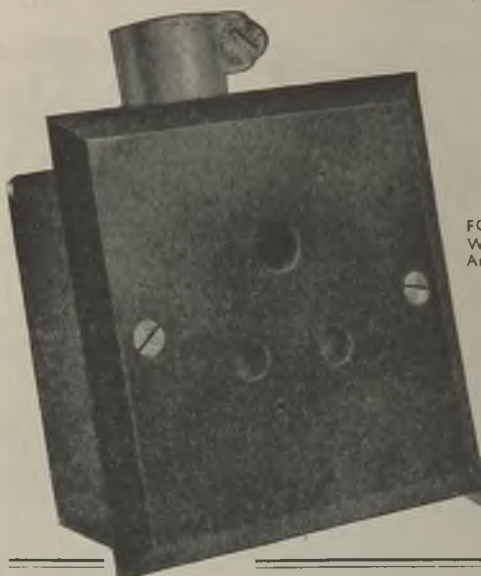
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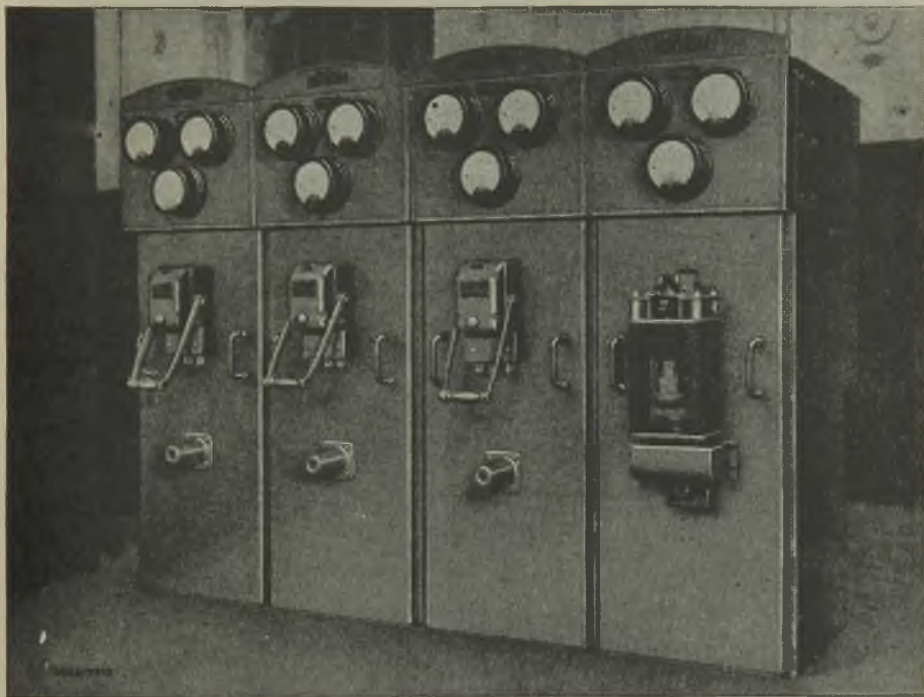
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AT 11 kV**

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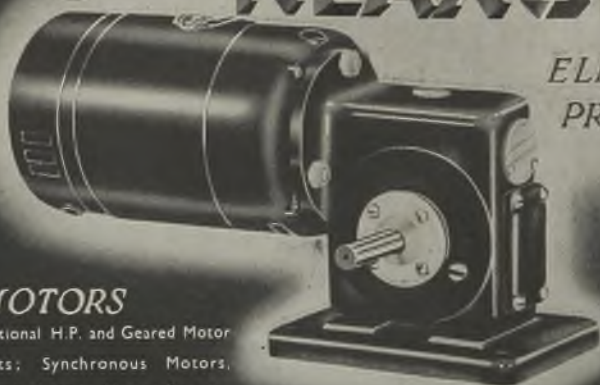
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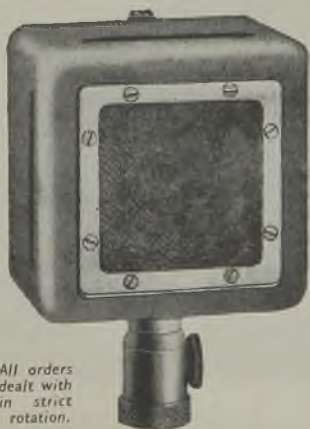
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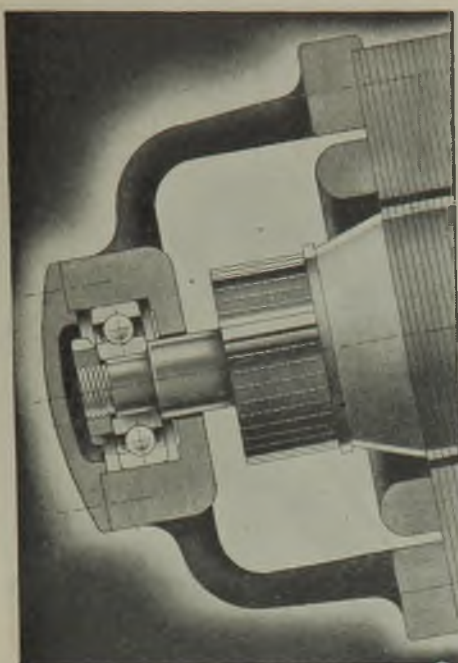
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20 ohms. Sensitivity 42 d.b. **PRICE £7.5**

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Unit Max. loading 10 watts. Impedance 15 ohms.
Horn, length 42 in., diam. 24 in.
Cut off, 170 C.P.S.

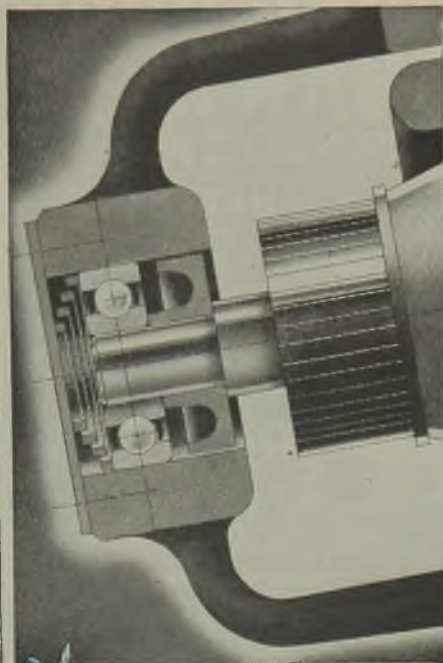
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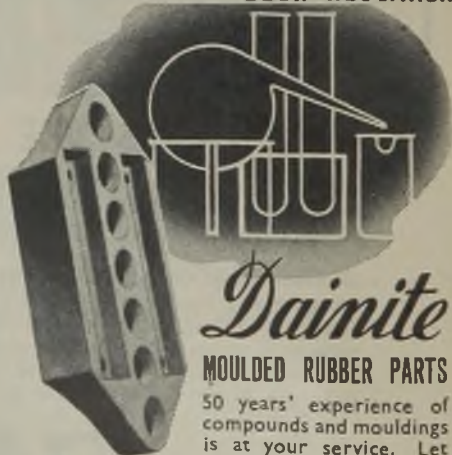
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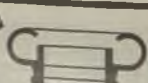
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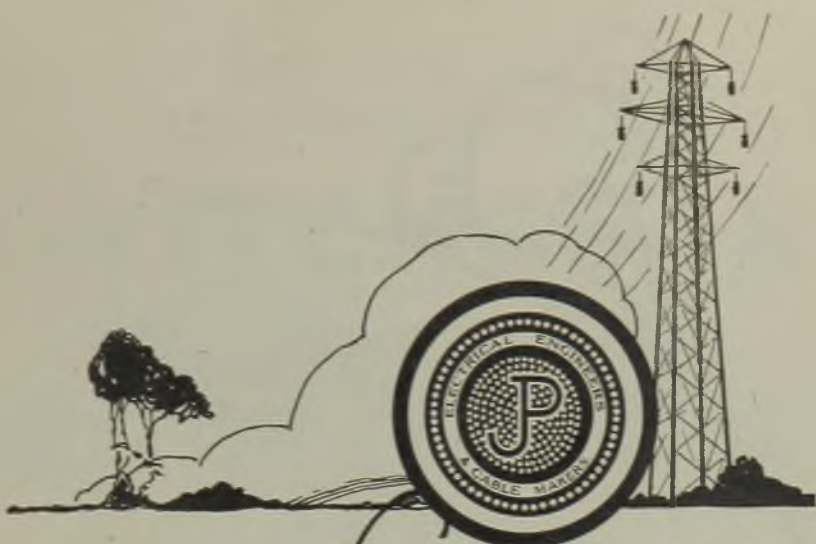


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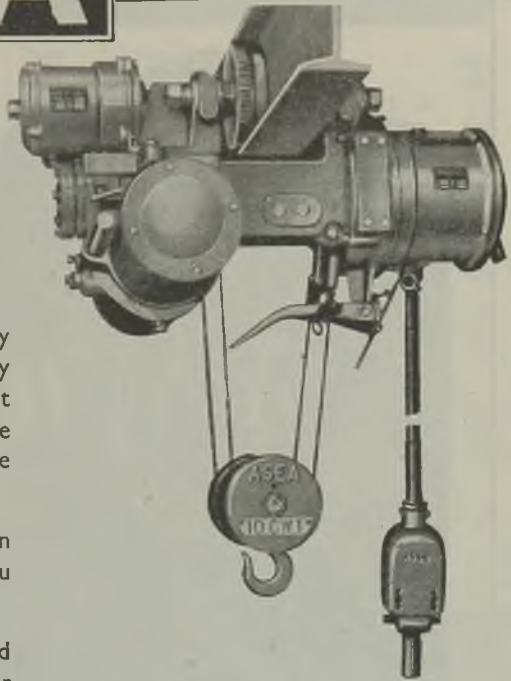
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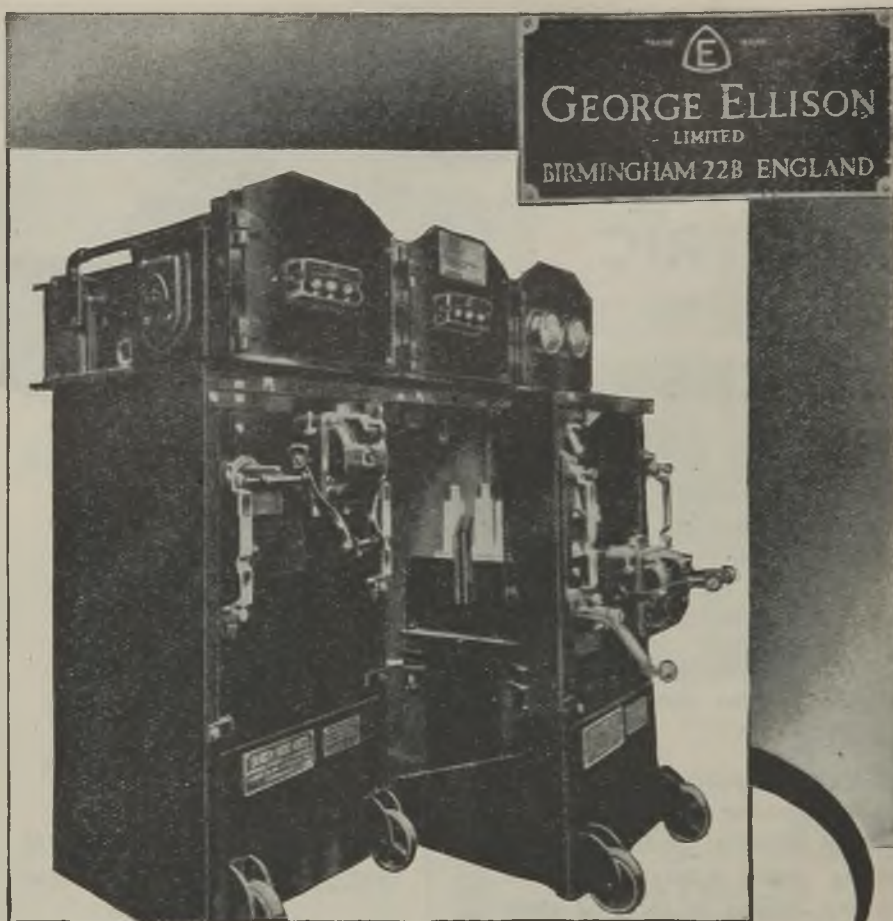
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ELECTRICAL REVIEW

August 10, 1945

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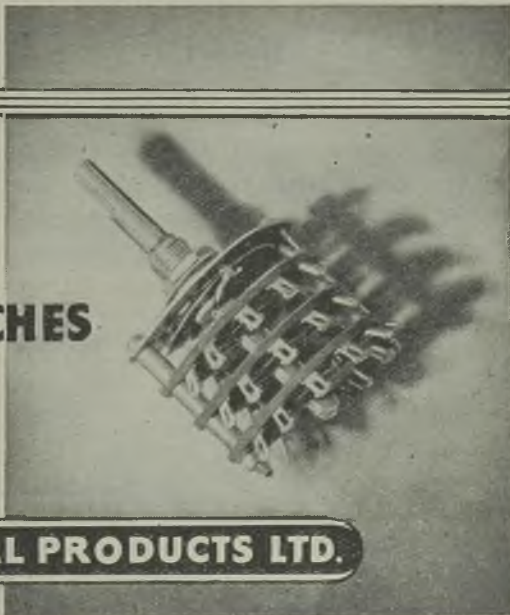
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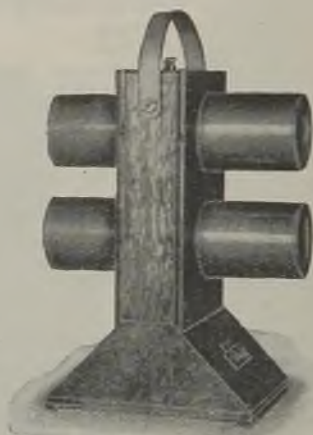


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ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872



Vol. CXXXVII. No. 3533.

AUGUST 10, 1945

9d. WEEKLY

Sales and Service

Ironmongers' Views on Contractors

RATHER bitter and not altogether justified strictures upon electrical contractors appear in the latest annual report of the Electrical Section of the National Federation of Ironmongers. The term "not altogether justified" is used deliberately because we are well aware of the shortcomings of many contractors, but criticism from such a source obviously (and appropriately) brings to mind the pot and the kettle.

According to the report, margins on electrical goods are inadequate, except in the case of supply authorities, which are able to finance their retail business out of revenue derived from the sale of energy; and in the case of electrical contractors "with whom retailing is a side line and who in many cases make little attempt to provide adequate display facilities for the public."

Prices of Appliances

With regard to the first of these exceptions it seems to have been overlooked that Section 48 of the 1926 Electricity (Supply) Act provides that the prices charged for appliances by a municipal supply authority must not be less than the retail prices (except in the case of sales to electrical contractors, when the usual trade price is charged); and separate accounts, ensuring that the full expenses are met, have to be kept.

This is by the way. The report returns to the condemnation of electrical contractors by saying that "a large proportion of them are not interested in retailing beyond enjoying the convenience of sending their

clients to a manufacturer's showroom. This results in unfortunate practices such as offering their clients discounts off fittings and appliances as an incentive to get their wiring order, or cutting their estimates for wiring knowing that they can recover easy profit on fittings, etc."

These seem to be strange words when it is recalled how often electrical contractors have complained about the way other parties to a contract have endeavoured to secure the discounts on fittings. It is the job of the electrical contractor to provide installations—not merely the wiring, and it is usually implied, if not specified, that his interest in the installation shall continue when the work is done.

The Contractor's Position

This, as we have said on previous occasions, is where the electrical contractor differs from the ironmonger. He may not always have showrooms, whereas ironmongers have and are thus able to display electrical appliances—among a hundred and one other things—but he does give service. Very few ironmongers have the desire, or the ability, to look after appliances once they have left their shops. This is understandable, for they deal in so many kinds of equipment. They should not, however, be resentful if the electrical contractor regards himself as a specialist with a prior claim to supply electrical equipment. In fact, if he had asserted that claim a little more in the past he would not have lost so much business. The fear of the ironmongers is that "unless a more progressive attitude is developed

by the contracting side of the electrical industry the day is not far off when the supply companies and local authorities will be almost the only suppliers of domestic appliances." Whichever way it goes the ironmonger, it seems, will be the loser. Either the contractor bucks up and takes the business or he doesn't and the supply authorities get it.

New Ministers Mr. ATTLEE has practically completed the formation of his Ministry and from the list of the

appointments of interest to the electrical industry given in our "Personal" section it will be seen that the new Ministers represent many aspects of national life. Probably the appointment which most closely concerns the electrical industry is that of Mr. E. Shinwell as Minister of Fuel and Power in succession to the first to occupy the post—Major G. Lloyd George. Mr. Shinwell has already had experience in the administration of the coal industry. His Parliamentary Secretary is Mr. William Foster and not, as had been anticipated, Mr. J. H. Wilson, who has been chief statistician in the Ministry. Mr. Wilson becomes Parliamentary Secretary to the Ministry of Works.

Fair Compensation In a broadcast to the United States last week Sir Stafford Cripps, the President of the Board of

Trade, referred to the "limited programme" which the new Government intended to carry out during the next five years, which he described as the orderly planning of the national resources. He gave an assurance that there was no thought of confiscation; anyone whose interests were taken over would be given fair compensation. He also promised that all necessary steps would be taken to guard against inflation.

Lincoln Cooling Water It looks as though a settlement will be made of the recent trouble at Lincoln over the proposed erection of cooling towers

as a part of the extension of the Corporation's power station. The Electricity Commissioners' suggestion that wooden cooling towers should be used instead of the concrete ones originally proposed might have got over the objectors' contention that 230-ft. structures would ruin the

distant view of the Cathedral but they would not have been a pretty sight; Mr. F. Newey, city electrical engineer, said that there would be twenty of them. Now the Central Board has accepted, subject to certain conditions, a later proposal that cooling water should be taken from the River Witham for the first half of the extension—40,000 kW. The matter was to come before the City Council at its meeting this week. It has been stated that the river scheme would save as much as £100,000.

Coal Clauses It is somewhat anomalous that while a great number of power consumers have to pay extra

for their electricity when the price of coal goes up, by virtue of a coal clause in their contracts, domestic consumers are not directly affected. But the continued rise in coal prices is bound to lead eventually to higher charges to domestic consumers and from the "psychological" aspect it might be better for such rises to be directly linked with coal. At least this is the view of the I.M.E.A. which has suggested to the Electricity Commissioners that a coal clause should be devised for the purpose. There was an ambiguous promise made to the Commissioners, that in the event of a substantial balance accruing from revision of prices a reduction would be made to the "most deserving consumers." This sounds like a reward for good behaviour.

Appliance Approval THE idea of an approval mark for electrical appliances, to be bestowed by a recognised testing

authority, has been canvassed here for many years. Some wartime productions have emphasised the need for something of the sort, and the need may become greater when all and sundry can lay hands on sufficient labour and material to produce electrical equipment. It is therefore interesting to note that the British Electrical Development Association is going ahead with the proposals made by a committee which it set up for the purpose some time ago. These proposals have been to the E.D.A. Area Committees and now Counsel's opinion upon the legal aspect of the matter is to be sought. There will, of course, be objections to the scheme from some quarters but reputable manufacturers will support it.

All-Electric Farming

Installations and Costs in Northumberland

HOW many farmers are properly aware of the multiplicity of duties that electricity can perform on their farms or of their actual cost? They have probably been told that for one kWh they can, for instance, milk twenty-two cows, hatch a dozen eggs, cut five cwt. of chaff, crush six bushels of corn or shear eighteen sheep; but how does this work out in practice? Figures for a group of four completely electrified farms in Northumberland go a long way to answering this query. The farms have not been specially selected except inasmuch as they are typical and cover the majority of the more



Pig food boiler designed by Nesco staff in use at Rock Farm



An 18,000-egg incubator and electric brooders at Rock Farm

common agricultural uses of electricity, as well as domestic applications. Various appliances installed in the farmworkers' cottages, such as cookers, wash-boilers, kettles and irons, are not taken into account in the figures of costs given.

The farms concerned

are four owned by Mr. C. I. C. Bosanquet at Rock, near Alnwick, and served by the North - Eastern Electric Supply Co., Ltd., which erected $3\frac{3}{4}$ miles of 20-kV overhead single - phase lines



and provided two 50-kVA and one 25-kVA pole-mounted transformers with some 1,320 yd. route length of three-wire 0.05 sq. in. overhead distribution lines, with all the necessary services, etc.

Every cottage in the small village of Rock has a supply and the organ in the church is fitted with an electric blower.

Threshing machine and combined grinder and crusher belt driven by the same 25-HP motor at Rock Moor

The farms themselves are of more or less equal size and cover about two thousand acres and between them handle practically all types of farming—arable, dairy and poultry and pig rearing.

At the first of them, Rock Farm, an 18-HP, 1,400-RPM motor has replaced an oil engine and is used to drive not only a thresher, but also a grinder and bruiser and a hammer mill.



This one-ton-an-hour grain dryer at Rock Moor is driven by a 5-HP motor

In addition there are a cake breaker (3-HP motor) and a turnip cutter ($\frac{1}{2}$ -HP). For potato grading a sorter and conveyor, both



driven by the same $\frac{1}{2}$ -HP motor, are provided. A boiler specially designed by the Nesco staff handles seven cwt. of pig food at a time. Its clamped-on elements (8.4 kW loading with three-heat switching) are balanced across phases.

The raising of chickens is a fairly recent enterprise. For this, three Robbins incubators are employed. One, holding 18,000 eggs at a time, incorporates six 500-W heating elements and a $\frac{1}{2}$ -HP motor for the fan. Each of the other two (900 eggs each) has two 250-W elements and a $\frac{1}{2}$ -HP fan motor. After hatching, the chicks (unless sold as day-olds), spend a fortnight successively in four brooders, all being disposed of after eight weeks. All three brooder houses have electrically-heated brooders representing in all $5\frac{1}{2}$ kW. The elements, which have three-heat switching giving 35, 70 and 140 W, are woven in asbestos cloth sandwiched between micanite and plywood and each heater board covers 100 day-old chicks.

To guard against delay in restoring supplies cut off on any one phase a three-wire line is taken to the incubator house and a change-over switch is provided. Wash-boilers (3 kW) are installed not only in the chicken meal house but also in the farm house, the equipment of which also includes a cooker ($2\frac{1}{2}$ kW), kettle (1 kW), radiators ($3\frac{1}{2}$ kW), iron (500 W) and coffee percolator (400 W). The fitting shop, already equipped with an electric drill, will soon have an

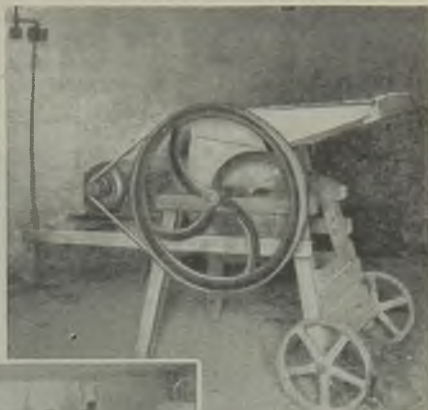
electric welder. Lighting totals just over 4 kW.

Consumption for Rock Farm for the last complete twelve months available (up to March, 1945) was approximately 42,000 kWh and the cost £146 or 0.835d. per kWh. The same tariff applies to each of the farms and comprises a fixed charge of £4 per quarter per farm plus a "unit" charge of 3½d. for the first 75 kWh per quarter in the summer quarters and the first 125 kWh in the winter quarters, 1½d. for the next 250 kWh and ¾d. for all over 325 kWh in the summer and 375 kWh in the winter quarters, less 5 per cent. discount.

At Rock Moor an oil engine has also been replaced by a 25-HP, 1,000-RPM motor for driving a rack saw mill, as well as a 4 ft. 6 in. thresher and a combined grinder and crusher; a special back-gearing arrangement employing V-belts has been provided

consumption here was 6,300 kWh costing £40 or 1.52d. per kWh.

The T.T. dairy herd is at Rock Midstead and at present the stock consists of about thirty-five Shorthorns in milk; it is proposed shortly to increase this number to fifty. In



A typical turnout cutter at Rock Moor



Dairy equipment at Rock Midstead includes a combine milker, steam raiser, steriliser and water heater

to avoid having to use lower - speed motors. Two turnout cutters (¾ HP each) are used and also a potato grinder (¾ HP). A one-ton-an-hour Mather & Platt grain dryer is operated by a single 5-HP motor which drives both hot- and cold-air fans and an elevator. There are radiators, kettles and irons in the farmhouse, the residence of the owner, and the lighting for the whole of the buildings amounts to just over 6 kW. Last year's

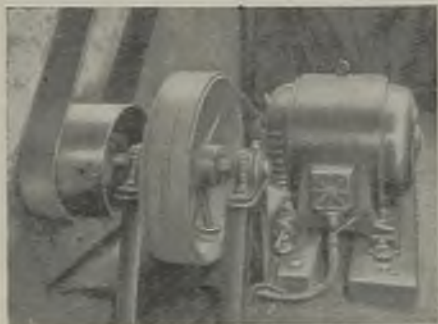
addition to a Gascoigne combine milker (1½ HP), the dairy plant includes a Martin's 15-kW steam raiser (15 lb. per sq. in.), a 5 ft. by 4 ft. by 3 ft. steriliser and a 20-gallon



Reyrolle water heater (2 kW). An 18-HP totally-enclosed surface-cooled motor, again replacing an oil engine, drives a 4 ft. 6 in. threshing machine and winnower, and an "Essex" mill (3 HP) has recently been installed to replace a larger machine. Besides

the ubiquitous turnip cutter ($\frac{3}{4}$ -HP) and potato grader ($\frac{3}{4}$ -HP) there are two radiators, a kettle, an iron and a boiling ring in use at the farmhouse and the lighting totals just over 3 kW. The account of £81 (excluding the farmhouse) represents a consumption of 15,000 kWh under the farm tariff and 7,800 kWh under a water-heating tariff of $\frac{1}{2}$ d. per kWh. The average price is 3·84d. per kWh.

A 25-HP, 1,500-RPM motor has replaced yet another oil engine at Rock South Farm, back-belted gear with V-belt drive again



This 25-HP motor with made-up back-belted gear replaced an oil engine at Rock South

being employed. This besides driving a thresher and crusher, operates grain elevators and shaker conveyors. Two potato graders and a turnip cutter, all with $\frac{3}{4}$ -HP motors, complete the farm equipment, but domestic appliances include a cooker (2 $\frac{1}{4}$ -kW), refrigerator ($\frac{3}{4}$ -HP), radiators (3 $\frac{3}{4}$ -kW), kettle (1-kW) and iron (550-W). There is a little more than 3 $\frac{1}{2}$ kW of lighting.

To minimise deterioration of the equipment all the tubing (screwed) is supported on spacing saddles well away from the walls and is painted. Watertight fittings are employed throughout and all the switch boxes have been drilled with a $\frac{3}{16}$ in. hole for ventilation.

The consumption at Rock South Farm last year (excluding the farmhouse) was only 3,000 kWh costing £26 or 2·08d. per kWh. For the whole of the four farms the total consumption was 74,300 kWh costing an average of 0·94d. per kWh. The total cost for the four farms, £293, is a good deal less than the wages of two farm workers.

We should like to thank Mr. Bosanquet for his permission to visit the farms and Mr. Macdonald, his agent, for showing us round; and also Mr. H. D. Phelps, of "Nesco" for assistance in preparing this article.

Broadcasting Plan

Re-allocation of Wavelengths

A FRESH radio-broadcasting plan, which advocates a new arrangement of wavelengths and transmitting powers to provide listeners in all countries of Europe with better quality of reception and greater freedom of choice of programmes, because of decreased interference, has been prepared by the British Radio Equipment Manufacturers' Association and issued on its behalf by the Public Relations Committee of the Radio Industry Council, 59, Russell Square, London, W.C.1, from which a limited number of copies of the report outlining the new plan are available on request, particularly to readers overseas.

A serious endeavour has been made to free the scheme from political influence by basing it solely on technical principles. The proposal is to remove the "local" services of all countries to the lower end of the medium waveband and slightly extend downward the present long waveband so to provide enough channels to give every country in Europe (and every large language group in the case of dual-language countries) two reliable national programmes. At the same time the plan would allow the present 9 kc/s separation between stations to be increased to 11 kc/s, thus reducing interference between stations and improving transmission and reception.

With the proposed re-allocation the larger the area of the country the longer would be the wavelengths chosen for it, and the power of its transmitting stations would be raised to a level which would give adequate coverage over the whole country. At the other end of the scale restriction of the "local" stations to such power as would give an adequate signal over their own areas would render it possible to plan more intelligently the use of "common" (shared) wavelengths among stations which are a great distance apart.

The former conception of "long" and "medium" wavebands would be replaced by a "national" waveband extending from 2,000 to 259 metres (150 to 1,157 kc/s) and a "regional" waveband from 259 to 192 metres (1,157 to 1,560 kc/s). Within those bands it is claimed that every nation in Europe can be given an adequate (and in most cases an improved) national broadcasting service, supported by greatly expanded regional services and much better opportunities than at present for receiving foreign programmes at high entertainment level.

The sponsors of the report make it clear that their proposed solution of the problem is by no means a hard and fast one and that it offers considerable elasticity in the wavelength allocation without harming the general scheme. They believe that the present phase in Europe holds a valuable opportunity and, in the view of British radio engineers, an obligation to correct past mistakes.

Power Station Operation

Possible Means of Improving Efficiency

AS it seems unlikely that the cost of mining and distributing coal will decrease, post-war power-station development will necessitate exercising economies hitherto neglected. Greater capital outlay may be involved, but the practical limits of expenditure are readily ascertained when comparison is made with the estimated saving in the heaviest station running charge, *i.e.* fuel.

Improvements in the steam cycle are governed by temperature and pressure considerations. Pressure presents few engineering difficulties, since conventional materials can be employed, provided their thickness is commensurate with imposed stresses. High temperature, however, changes the physical properties of metals, particularly tensile strength and elasticity; thus mild steel and the simple alloys are unusable. Temperature-resisting high-tensile steels are expensive and in most cases have heat transfer co-efficients inferior to those of mild steel.

Steam Pressure and Temperature

More advanced current practice involves steam temperatures up to about 1,000 deg. F., and pressures of 2,500 lb. per sq. in., giving Rankine cycle efficiencies up to 50 per cent. For a heat cycle using a final feed temperature of 300 deg. F. and a condenser vacuum of 29.0 in. Hg., an increase in steam pressure from 300 to 500 lb. per sq. in. gives an extra 2 to 2½ per cent. cycle efficiency. With the same general conditions, an increase in steam pressure from 1,300 to 1,500 lb. per sq. in. provides only ½ per cent. additional efficiency. It is clear that the curve relating steam pressure with cycle efficiency at constant temperature is non-linear, and the gain in efficiency diminishes as the pressure increases. The improvement obtained by increasing the steam temperature is nearly uniform throughout the range of workable temperatures and pressures; an increase from 500 to 700 deg. F. offers the same gain as an increase from 700 to 900 deg. F.—about 1½ per cent. extra cycle efficiency. The turbine exhaust moisture content is at present limited to about 15 per cent., above which erosion of the low-pressure blading will occur.

Exhaust moisture content depends upon steam pressure, temperature, vacuum and

By G. T. Shears,
Graduate I.E.E.

turbine efficiency, thus it is not possible to stipulate conditions without reviewing all these functions. The reheat cycle, wherein steam is expanded in a high-pressure turbine, reheated and exhausted to vacuum in a low-pressure machine, enables a high steam pressure to be used with a reasonable temperature, without excessive moisture in the low-pressure stages of the turbine. The high- and low-pressure machines may be on a common shaft or as individual turbo-alternators but in either case the plant is more complicated than a straight system.

The latitude of temperature variation permissible above the working figure is limited. A turbine expanding steam from an initial temperature of say 940 deg. F. requires very careful warming up and running. When the centrifugal stresses are added to those set up by temperature, it is obvious that turbine, and therefore steam cycle, advancement is dependent upon metallurgical development of high-tensile, heat-resisting steels.

Gas Turbines

Where gas or fuel oil is available the gas turbo-alternator will make rapid strides. Machines up to 4,000 kW have been built and thermal efficiencies of 20 to 23 per cent. are practicable. Experience and experimental data obtained from researches on jet-propelled aircraft and Velox boilers will undoubtedly assist development. These machines are associated with pressure-combustion furnaces in which the heat liberation rate is high and consequently the physical size of the furnace is small. Air, the working fluid, costs nothing but, owing to the small adiabatic heat drop per pound, large quantities must be passed through the turbine. As the direct-coupled compressor, which supplies air to the furnace, absorbs some three-quarters of the turbine's output the turbo-compressor unit is large. Nevertheless, a gas-turbine installation occupies less space per installed kW than a similar steam plant.

To have wide application in Britain these machines must be capable of burning coal. Experiments with pulverised-coal-burning compression-ignition engines and pressure-combustion furnaces may give some clue of how to deal with abrasive ash and flue-dust

carry-over. The development of a turbine to expand gases from a furnace fired with solid fuel will take time and cannot affect the immediate post-war electricity situation.

A new power station offers scope for efficient operation, but more often increased capacity becomes integral with older plant. This usually shows a saving in capital expenditure, but improved performance of the new plant is obtained at the expense of that existing. The installation of high-pressure boilers and turbines, which exhaust into existing low-pressure machines, or "topping," increases the steam cycle efficiency whilst retaining the old low-pressure turbines. Depending upon the low-pressure conditions, this system improves the thermal efficiency by from 15 to 30 per cent. The arrangement is applicable to installations where the boiler plant is obsolete and the turbines reasonably efficient. The capacity of the station is increased by the output of the topping unit, which is small owing to the limited heat drop allowable in it. Over-emphasis seems to be given to the base-load stations. In reality few plants operate under true base-load conditions; the majority suffer load fluctuations and peaking which are detrimental to their fuel consumption. Admittedly, the more efficient stations are singled out for base load operation and, under the control of the Central Electricity Board, load is allocated judiciously. This in no way detracts from the value of a policy of further saving.

Thermal Efficiency

Consider a station operating in parallel with the C.E.B. The electrical side offers little chance for improvement. The fuel consumption depends, therefore, upon how closely to the theoretical steam cycle the plant can be operated. A station having a Rankine cycle efficiency of 44 per cent. has to operate fairly well to produce an annual "sent-out" thermal efficiency of 28 per cent., the difference between these two figures being the boiler, turbine and small electrical losses plus the works power.

To control this vital heat mechanism three points are chosen, the boiler panel, the turbine panel and the main electrical control room. The closest harmony and co-operation are necessary to get even mediocre results. Physical barriers between these three departments are surmounted to some extent by the use of telephones and elaborate systems of telegraph, but each of the three operators understandably concentrates on his own

section in preference to taking a comprehensive view of the heat cycle.

In practice the shift superintendent has to co-ordinate the efforts of these three departments, but he is unable to cope with such transient conditions as changing fuel and load. Clearly, the solution lies in having a centralised control of boilers, turbines and load. Some stations have combined boiler and turbine controls on one panel as a first step. The duplication of flow-meters and certain gauges would afford information as to the state of other parts of the job. For instance, a boiler operator is usually informed of the load and perhaps reckons 10 lb. of steam for each kW. If condensers are dirty or circulating water warm, the poor vacuum will result in higher steam consumption. Vacuum gauges in the boiler house would enable the boiler staff to convert lb. of steam to kW with some accuracy.

Control Room Instruments

In a main control room, in addition to the usual alternator control panel fitted with controls for the oil circuit-breaker, governor, field rheostat, kW indicator, ammeter and power factor indicator, there should be a steam-range pressure gauge. If the control engineer desires to increase the generated load he has no guide, except his memory, as to which is the most efficient machine. Where there is no wide discrepancy in the age of the sets load will inevitably be allocated to suit the bus-bar loadings. Whilst the bus-bar loading must be studied it is not the essential efficiency aspect. A large amount of power may be transferred *via* a reactor before the losses in any way approach those produced by 0.1 in. Hg. increase in turbine back pressure; the inclusion of a condenser vacuum gauge in the control room would, therefore, effect a saving in steam. Gauges of the Kenotometer type are particularly suitable. The overload valves of a turbine should be shut whenever possible; the control room should have an overload-valve warning light and also a steam gauge reading P1 or the equivalent of the turbine.

An alternator temperature indicator and pilot lamps showing which cooling fans are running would enable the machine power factor to be corrected to reduce stator heating. Boiler flow indicators or recorders will permit an efficient load to be carried; a small variation in the electrical output is of little consequence and can be accommodated to the combustion conditions.

The foregoing are generally additions to existing plant. Emphasis is laid on existing plant, for a large amount of present generating equipment will have to be serviceable for some years to come.

The perpetual heat loss incurred by leakage of soft water is reducible by thorough plant maintenance rather than by the addition of apparatus. About 2 per cent. of the total water evaporated is lost, mainly through soot blowing. Whilst it is unwise to reduce this, it is advantageous to check the effect of each blower. The use of a blower that does not reduce the boiler draught loss could be discontinued. Modern evaporating plant attempts to recover the maximum amount of heat; even so, all water added to the heat cycle is initially cold and absorbs valuable heat. When joints and boiler tubes leak, the water lost is often at high temperature and thus involves a loss of sensible heat. Similarly, with steam leaks, sensible and latent heat plus the equivalent weight of soft water are lost.

Station availability and operating efficiency are influenced by the cleanliness of furnaces and boiler houses. If progress can be made in lancing and on-load cleaning, boiler steaming hours would be increased and a

source of frequent labour disputes removed.

A reduction in works power is often practicable, especially on constant-speed centrifugal pumps. Throttling pumps on the discharge valve, resulting in a reduction in motor amperes, gives the uninformed operator the impression of effecting economy, but the efficiency of the centrifugal pump is disproportionately lessened. This practice should be minimised and where pumps are run in parallel it should be necessary to regulate on one unit only. Miscellaneous small pumps that run singly must be regulated by throttling but the major issue rests with circulating-water and boiler-feed pumps, the joint consumption of which accounts for some 40 per cent. of a typical works power figure.

The selection and disposition of instruments receives insufficient attention from designers who sometimes, through lack of operating experience, overlook the importance of a system of well disposed indicators. The choice of instruments might well be decided by considering what information the plant engineers require in order to operate at maximum efficiency. Logical interpretation of a suitably placed measuring instrument can effect a saving that will repay with interest its purchase price.

Municipal Reports

Brighton

THE 1944-45 report of the engineer and manager at Brighton (Mr. H. Pryce-Jones) covers the fifty-third year of operation of the undertaking and also includes a general review of the war years. A printed Roll of Honour contains the names of twenty-four employees who have been killed or have died on active service, and the names are given of eight employees who have received decorations. Reference is also made to the bomb damage at the power station, which was described in the *Electrical Review* of January 26th last.

The quantity of electricity generated last year was 287.1 million kWh (against 324.7 million in 1943-44) and the power station load factor dropped from 34.56 to 30.33 per cent. The average cost of coal (or equivalent in fuel oil) rose from 46s. 5d. to 51s. 7½d., and the engineer points out that in 1938-39 the average cost was only 22s. 1½d.

A total of 125.7 million kWh was sold at an average price of 1.230d. as compared with 111.2 million at 1.239d. in 1943-44 and 125.0 million at 0.968d. in 1938-39; these figures include bulk supplies (last year 34.4 million kWh) but not export to the C.E.B. The number

of consumers increased by 1,647 during the year to 52,935, which was 290 more than the previous highest number (in 1939-40).

Total revenue increased from £612,900 in 1943-44 to £687,821 last year, expenditure on revenue account advancing from £480,046 to £553,428, and there was a net surplus on the past year's operation of £25,645 (against £20,141 in the preceding twelve months).

Leicester

The statement of accounts of the Leicester Electricity Department (general manager, Mr. John Mould) for the year ended March 31st last shows that gross revenue amounted to £997,796 against £960,329 in the previous year, and working expenses, including generation costs charged by the C.E.B., were £747,912 (£670,884), the net surplus being £112,144 (£120,263).

A total of 376.7 million kWh was generated (against 358.7 million) and 216.1 million (206.0 million) was sold. The average cost per kWh sold was 0.984d. (0.979d.) and receipts (electricity only) worked out at 1.057d. (1.073d.). At the end of the year 87,538 (87,300) premises were being supplied.

I.M.E.A. Activities

Recouping Coal Price Increases

RECENTLY the Incorporated Municipal Electrical Association approached the Electricity Commissioners to urge that a coal clause should be devised by which electricity supply undertakings would be able to recover from consumers the increased price of coal. It was suggested that such a clause should be based upon the price of coal at the beginning of the war. This method of raising prices, it was considered, was the best from a "psychological" point of view. In the event of a substantial balance accruing from a revision of prices a reduction would be made to the most deserving consumers. The *I.M.E.A. Journal* says that the Commissioners are considering the matter with a view to some general line being adopted.

At the interview at which this proposal was put forward the Commissioners mentioned the change of policy (already reported in the *Electrical Review*) by which it would no longer be a condition of price increase approvals that existing balances and reserve funds should first be drawn upon, unless those funds were substantial.

The question of flat-rate increases in the price of coal, as opposed to percentage increases, was also raised. The Commissioners said that they were fully alive to the situation and had made repeated representations on the subject to the Ministry of Fuel and Power. They were prepared to make further representations and if these were unsuccessful they would suggest that the Minister should meet representatives of the electricity supply industry. Regarding the alleged serious deterioration of the quality of coal, the Central Electricity Board had stated that while there had been some slight falling-off of calorific value there was no evidence of serious deterioration.

Earthing Problems.—The Electricity Commissioners, in a letter to the Council referring to the committee set up by the I.E.E. to consider certain earthing problems, drew attention to the possibility of dangerous voltages arising on consumers' premises if the neutral earth connection on live circuits was interrupted in cases of low-voltage supplies derived from medium-voltage systems. Attention was also drawn to the fact that different interpretations might be placed on No. 4 (iv) of the Electricity (Supply) Regulations, 1937. The Commissioners have informed the Institution of their concurrence in the view that it is desirable that the earthing connections of undertakings' systems should be opened while circuits are "alive." They therefore propose to revoke Regulation 4 (iv) and this will be taken account of in the revised eleventh edition of the I.E.E. Regulations. This would not debar the use of a switch or link in the earth connection but would mean that if it

was desired to insert an instrument temporarily in the earth connection for the purpose of testing or for locating a fault, it would be necessary to arrange that the earth connection was not broken while the circuit was alive. The proposal has been approved by the Joint Committee of Electricity Supply Organisations.

Allied Control Commission.—All the electricity supply associations were asked by the Deputy Director-General of the Control Commission for Germany, Public Utilities Sub-Branch, whether they were interested in the establishment of a consultative panel in order that views on matters affecting electricity supply in Germany might be made available to the industry. The matter was referred to the Joint Committee of Electricity Supply Organisations which has informed the Commission that the Joint Committee, together with representation from the Incorporated Association of Electric Power Companies, would be prepared to constitute itself a panel for the purpose in view. This has been accepted by the Commission and a meeting of the Panel was to be held at the end of July.

Domestic Appliance Supplies — Electricity supply associations and other bodies connected with the industry have drawn the attention of the appropriate Government Departments to the difficulties being experienced in obtaining domestic electrical equipment. It has been pointed out that it is a common complaint of local authorities, which are responsible for the erection of houses under the Government scheme, that appliances are either unobtainable or too dear. While certain equipment provided by a Government Department for temporary houses is purchaseable free of purchase tax, other authorities can only obtain it by paying the tax.

The *I.M.E.A. Journal* says that one Ministry in replying said that this was a matter for the Board of Trade, but the Board advised that representations should be made to the Treasury. The note concludes:—"It does appear that there is an entire lack of co-ordination between Government Departments."

Stokers' Manual

AN illustrated booklet, pocket size, of 87 pages entitled "The Stoker's Manual" has been prepared by the Ministry of Fuel and Power (Stationery Office, price 6d.). Its purpose is to assist employers to impart practical details of the best ways of firing industrial boilers (shell type as well as those used for sectional central heating) with explanations of why stoking should be done in certain ways. In addition to operational information and advice about tools and instruments, some account of what happens during the combustion of coal under various conditions is included.

PERSONAL and SOCIAL

News of Men and Women of the Industry

Ministerial Appointments.—The Prime Minister, Mr. Attlee, has now practically completed the forming of the new Government. Among the appointments likely to be of particular interest to the electrical industry are the following:—Lord President of the Council, Mr. Herbert Morrison. Chancellor of the Exchequer, Mr. Hugh Dalton. Home Secretary, Mr. J. Chuter Ede (Parliamentary Under-Secretary, Mr. G. H. Oliver). President of the Board of Trade, Sir Stafford Cripps (Parliamentary Secretary, Mr. Ellis Smith; Secretary, Department of Overseas Trade, Mr. H. A. Marquand.) Minister of Fuel and Power, Mr. E. Shinwell (Parliamentary Secretary, Mr. W. Foster.) Minister of Works, Mr. G. Tomlinson (Parliamentary Secretary, Mr. J. H. Wilson.) Minister of Supply and Aircraft Production, Mr. J. Wilmot (Parliamentary Secretaries, Messrs. W. Leonard and A. Woodburn.) Minister of Labour and National Service, Mr. G. A. Isaacs (Parliamentary Secretary, Mr. Ness Edwards). Postmaster-General, the Earl of Listowel. Minister of War Transport, Mr. A. Barnes (Parliamentary Secretary, Mr. G. R. Strauss.) Minister of Health, Mr. Aneurin Bevan (Parliamentary Secretary, Mr. C. W. Key.) Minister of Town and Country Planning, Mr. L. Silkin. Minister of National Insurance, Mr. J. Griffiths (Parliamentary Secretary, Mr. G. S. Lindgren.) Minister of Education, Miss Ellen Wilkinson (Parliamentary Secretary, Mr. A. Jenkins.)

Mr. E. Shinwell, who succeeds Major G. Lloyd George as Minister of Fuel and Power, was Parliamentary Secretary for Mines (Board of Trade) in the two previous Labour administrations. Mr. Chuter Ede, the new Home Secretary, is a former chairman of the London and Home Counties J.E.A. and was president of the British Electrical Development Association in 1937-38.

Mr. A. M. F. Palmer, who as was reported in our last issue has been elected Member of Parliament (Labour) for Wimbledon, is a technical assistant in the Electrical Engineer's Department of the London Power Co. and is concerned mainly with protective gear. He was educated at Acton Technical College and was a student with the Metropolitan Electric Supply Co. He has already had experience in public affairs as he was a member of the Brentford and Chiswick

Council for some years. As was mentioned in our previous note, Mr. Palmer is an associate member of the I.E.E. and author of the Fabian Society's pamphlet on "The Future of Electricity Supply" published in 1943. Mr. Palmer tells us that he has been offered and has accepted the position of editor of the *Electrical Power Engineer*, the journal of the E.P.E.A.

Alderman E. Porter, who was elected M.P. for Warrington, is leader of the employees' side of the Joint Industrial Council for the Cable Making Industry.

Mr. G. M. Campbell has relinquished the position of director of manufacture to the British Thomson-Houston Co., Ltd., but remains on the board as adviser to the managing director, Mr. H. Warren. Mr. W. W. Vinsen, assistant director of manufacture, has been appointed director of manufacture: and Mr.



Mr. W. W. Vinsen



Mr. E. H. Ball



Mr. L. G. Axe

H. J. Armstrong has been appointed manager of the Coventry Works, in succession to Mr. Vinsen. Mr. E. H. Ball, assistant sales director, has relinquished the managership of the transformer sales department, to which position Mr. L. G. Axe, B.Sc., A.M.I.E.E., has been appointed. Mr. Axe graduated in electrical engineering at Bristol University, and served his apprenticeship with the B.T.H. Co. During the war he has been superintendent of the B.T.H. transformer factory at Rugby.

The staff and employees of the Wallasey Corporation Electricity Department last week bade farewell to **Mr. B. T. Hawkins** on his retirement after twenty-four years' service as borough electrical engineer and manager. A presentation on behalf of the personnel was made by the deputy engineer and manager, Mr. E. Cook, and took the form of a "token" as the selected gift of an electric grandmother clock is not available yet. Several speakers representing the various branches of the Department referred to the harmony which had prevailed throughout the Department

during Mr. Hawkins' tenure of office, and spoke of the advance made by the undertaking. Practically all premises in Wallasey were now connected.

Liverpool Electric Power and Lighting Committee has appointed Mr. J. S. Jennings, turbine engineer, Clarence Dock power station, to be assistant shift engineer, Mr. N. P. L. Lloyd, assistant turbine engineer, being appointed temporarily as turbine engineer. Mr. E. A. Marshall, superintendent engineer, Mersey

that where an engineer's salary went up with output it became out of all proportion to the salaries of other chief officers.

Squadron-Leader E. Peacop, district manager of Walsall Conduits, Ltd., for the company's five southern branches at Reading, Oxford, Maidstone, Canterbury and Eastbourne, has since the formation of the Air Training Corps served as District Inspecting Officer and Officer Commanding the Reading Wing. As he is soon to move to London he was recently given a farewell dinner at Reading at which over a hundred guests attended, many of them connected with the electrical industry. Councillor



At the farewell dinner to Squadron-Leader E. Peacop. Left to right, front row: Group Capt. Courtney, Air Marshal Sir Philip Babington, Mrs. Peacop, Councillor W. E. C. McIlroy and the Mayor of Reading. Squadron-Leader E. Peacop is standing behind his wife

McIlroy presided, others present including Air Marshal Sir Philip Babington, Lt.-Col. Lord Dorchester, Group Cap-

Tunnel, has been appointed workshop superintendent in the Corporation Electricity Supply Department.

Mr. D. MacArthur, director of the Metropolitan-Vickers Electrical Co., Ltd., has been appointed general sales manager. Mr. W. A. Coates, while retaining his position of sales manager, Switchgear Department, is appointed assistant to general sales manager. Mr. G. W. G. Canter has been appointed manager, Marine and Special Contracts Department.

Mr. E. Stroud, director of the Brighton Lighting & Electrical Engineering Co., Ltd., who is president of the Illuminating Engineering Society for 1944-45, is also a vice-chairman of the Electric Light Fittings Association, and has recently been re-elected chairman of the E.L.F.A. Street Lighting Section for 1945.

Mr. G. Nicholson, borough electrical engineer of Weymouth, is to retire in November. It is proposed that a successor should be appointed at a salary of £900 rising to £1,000, plus cost-of-living bonus and car allowance. Sufficient time is to be allowed to enable Service men to apply for the position and if necessary Mr. Nicholson will be asked to stay on until his successor is able to take up his duties. At the meeting of the Council at which this was approved some members endeavoured to secure that the salary should be on the approved scale but this was successfully opposed by other members and the Town Clerk, who said

tain Courtney, and the Mayor and Mayoress of Reading. Squadron-Leader Peacop was presented with a silver cigarette case.

Mr. A. P. Quarrell, appointed a director of British Oil Engines (Export), Ltd., on its formation in March last, has now taken up his duties with this company, operating from its offices at 27, Gilbert Street, London, W.1. He has relinquished his appointment as the London manager of the Brush Electrical Engineering Co., Ltd.

Lt.-Col. Geoffrey F. Falk, T.D., M.I.E.F., has been released from the Army and will resume his duties with Falk, Stadelmann & Co., Ltd., on September 1st. Lt.-Col. Falk has served in the Royal Corps of Signals and immediately prior to demobilisation was on the staff of H.Q. Berlin District, B.L.A.

Mr. A. L. S. Cope, M.A., M.B.E., M.I.Ex., has been appointed export manager to Simms Motor Units, Ltd. He has had experience in all branches of the export trade, and has established many contacts in Europe and South America as well as other parts of the world. For many years Mr. Cope was manager of the Dunlop Rubber Co.'s organisation in Spain, after which he was European representative for Rootes, Ltd., and overseas manager for Tyresoles, Ltd.

Mr. A. G. Smith, chief assistant to the electrical engineer (Southern Area, L.N.E.R.), has been appointed electrical engineer (Southern Area)

in succession to Mr. D. James, who is being transferred to the chief electrical engineer's head office to undertake special duties.

Mr. C. E. Kingston is retiring from the position of commercial assistant in the Leeds Electricity Department after fifty-three years' service, six of them with the Yorkshire House-to-House Electricity Company which the Corporation took over forty-seven years ago. Mr. J. W. Blackburn, chief assistant accountant in the Department, is also retiring. He has forty-eight years' service to his credit.

Mr. R. E. Luff has been appointed a managing director of Cable & Wireless (Holding), Ltd., and Cable & Wireless, Ltd. The Hon. Jocelyn Denison-Pender has also been appointed a managing director of the former company.

Mr. F. T. Fletcher has ceased to be associated with De La Rue Plastics, Ltd. Mr. C. Milton Marshall has been appointed works manager of the company's London factories.

Mr. C. G. Hancock, mains assistant in the Hull Electricity Department, was recently appointed assistant secretary (North-Western Area) by the Electrical Power Engineers' Association.

Mr. Alex. W. Honeyman who has been appointed commercial manager to Carron Company, has been assistant commercial manager for the past seven years.

Mr. F. M. Hammond, of the Ayrshire Electricity Board, has been appointed constructional and development engineer, at a salary of £545 per annum, by the Poplar Borough Council Electricity Committee.

The Blackburn Electricity Committee has requested the General Purposes Committee to consider the question of applying the scale of salaries for chief electrical engineers to Mr. R. H. Harral, the borough electrical engineer.

Mr. J. S. Pickles, county electrical engineer, Dumfries, and vice-president of the I.M.E.A.,

is to give a broadcast talk on "Electricity on the Farm" in the B.B.C.'s agricultural programme in November.

Mr. A. Haddock, B.Sc. (Sheffield Electricity Department) is the new chairman of the Sheffield Sub-Centre of the I.E.E. The vice-chairmen are Messrs. W. T. Wardale (consultant) and J. A. Walker (Metro-Vick.)

Mr. L. H. Shelley, of Walsall, has been appointed assistant distribution engineer by the Torquay Electricity Committee.

Obituary

Dr. M. L. Kahn.—We hear with regret of the sudden death on July 25th of Dr. M. L. Kahn, chief engineer of the Witton Engineering Works of the General Electric Co., Ltd. Dr. Kahn was educated at Karlsruhe University and was awarded his doctorate in 1902 for original work upon the characteristics of the contact resistance of carbon brushes. As a result of this he was invited to collaborate with Prof. E. Arnold and J. L. La Cour in the preparation of a series of text books; the seven volumes covering the design and construction of electrical machinery are now generally considered as classics.

In 1904 he was appointed chief designer of the Brush Electrical Engineering Co. and proceeded thence to Witton as chief designer, becoming chief engineer in 1933. During his thirty-two years with the G.E.C. he was closely associated with many important developments, including rotary converters, the mercury arc rectifier, rolling mill motors, colliery winding motors, propulsion motors for ships, and traction motors. He was responsible for the design of some of the largest turbo-generators manufactured in this country.

He was an active member of the Institution of Electrical Engineers and took a prominent part in many discussions.

Will.—Mr. Robert W. Clark, A.M.I.E.E., late of Newcastle-on-Tyne, left estate of £12,322.

E.D.A. Activities

BEFORE the war one of the most active sections of the Electrical Development Association was the Rural and Agricultural Committee, but war conditions caused a suspension of its work in 1940. Now the Association has formed a new organisation—the Rural Electrification Advisory Committee. Among the members of this are representatives of the Ministry of Agriculture & Fisheries, the Royal Agricultural Society of England, the National Farmers' Union and other organisations of the farming industry, as well as a number of men in various branches of the electrical industry who are well known for their work in this direction.

The question of standard forms of tariffs raised by the South-East and East England (Greater London) Area Committee is being referred by the Council of E.D.A. to the Joint

Committee of Electricity Supply Organisations.

In January last the Testing House Committee recommended the establishment of an E.D.A. Testing House for judging the safety, reliability, performance and ease of maintenance of electrical apparatus, particularly domestic appliances. The report was sent to the Area Committees for their views, including their opinion on the desirability of an approval "mark." Comments having been received these have been referred to the Testing House Committee with authority to consult representatives of the Areas and to take Counsel's opinion on the legal aspect of adopting a suitable mark.

It is proposed to circulate an illustrated description of the standard service unit for single-meter domestic users to members and other interested parties.

Rural France

Progress in Electricity Supply

IN France one likely outcome of the war is extended use of electricity in rural areas. During the four years of occupation much attention was given to threshing by electricity, but it was discovered that in outlying districts power was insufficient to drive 10 HP motors, so an increase of voltage is envisaged from 115/200 V to 230/400 V at which a few rural districts are already supplied. It will mean the replacement of transformers and also of apparatus used by the consumers.

A vigorous propaganda campaign is to be undertaken among the peasantry, which has still much to learn about electricity and its advantages. The following figures give some idea of the headway made since 1919. France had 38,013 communes in those days, of which no more than 7,500 (or 20 per cent.) used electricity in one form or another. Most of the communes supplied with electricity were small towns of from 3,000 inhabitants upwards, and did not include villages. By 1931 a great change had taken place and only about 7,000 communes were then without electricity; by 1937 the figure had dropped to 1,500. Just before the outbreak of war 98 per cent. of the communes were using electricity, which placed France immediately after Switzerland and Denmark, while of the purely rural areas 80 per cent. were included in the network. During the occupation the Electrical Direction of the Ministry of Industrial Production was able to state, on January 1st, 1943, that only 965 communes remained to be "tied in" and that they comprised some 270,000 inhabitants.

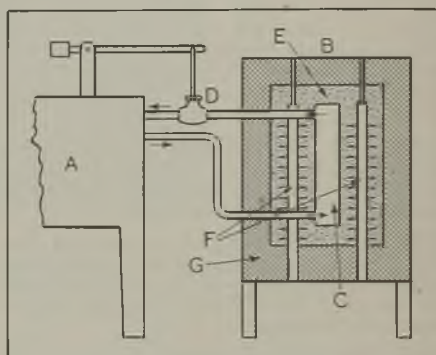
Consumption-of-energy statistics have not been available since 1942, but in that year some 822 million kWh was consumed by communes with fewer than 2,000 inhabitants. The increase in rural electricity consumption between 1937 and 1942 was 35 per cent. for domestic and 31 per cent. for non-domestic purposes. The number of electric motors being used on farms within this category in 1942 was 320,000.

The use of low-voltage power in the wheat producing areas has been very considerable, particularly since 1939, for driving threshing machines. It is not known yet how far this will further develop as normal conditions return and oil is once again obtainable. A

By Our Paris Correspondent

considerable extension of electric ploughing is expected, although domestic use of electricity will hold its lead and probably develop along much wider lines. The reason is not difficult to find. The severe coal shortage has caused the Government to intensify its hydro-electric construction and reconstruction work, and it is hoped that by the end of this year France will have an extra 1,400 million kWh from the Massif Central and the Pyrenees.

The risk of breakdown of electrically heated incubators has been reduced by the design of



French thermal-storage farm incubator

a heat accumulation incubator on the Baratte-Monteverdi system by the Etablissements Felmont. The incubator A is joined to the heating apparatus B, which is insulated by sand and heated by ribbed elements F sunk in sand E, water and finely ground marble. Any method for heating F can be used that will raise their temperature to 80 deg. C.

In the centre of the accumulator is some water C which circulates by means of a thermosyphon in the incubator and valve D, controlled by a thermostat, regulates the circulation of the water so as to keep the incubator at the desired temperature.

In the event of a breakdown the water continues to circulate and loses temperature very slowly, not reaching a dangerously low level for hatching for fifteen or twenty hours, by which time the breakdown will have been repaired. The same company has designed another model working on the same principle, but with hot air circulation.

Overhead-Line Charts—IV

Voltage Drop in 11- and 22-kV Lines

By J. S. Forrest, M.A., B.Sc., F.Inst.P.

IN a previous article published in the *Electrical Review* of July 20th, page 96, voltage-drop charts were given for 6.6-kV lines. Charts for 11-kV lines are shown in Figs. 10, 11 and 12. These can be used for both 11-kV and 22-kV lines as the following examples will show:—

Example 3

An 11-kV line is 10 miles long, and has 0.10 sq. in. conductors. What is the maximum load which can be supplied at a power factor of 0.9 lagging if the voltage drop in the line is not to exceed 10 per cent.?

The chart for 11-kV lines with 0.10 sq. in. conductors (Fig. 11) shows that 17 MW-miles at 0.9 power factor lagging gives a voltage drop of just under 10 per cent. As the line length is 10 miles, the required load is 1,700 kW.

Example 4

Compare the load carrying capacities, for a 12 per cent. voltage drop and a load power factor of 0.85 lagging, of a double-circuit

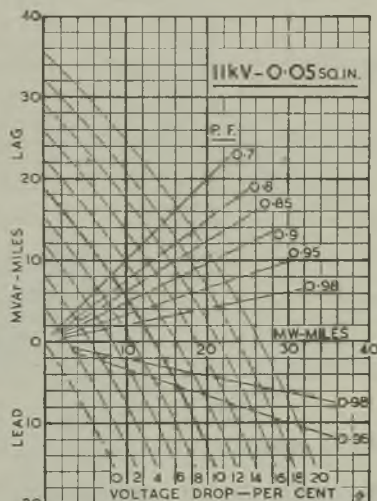


Fig. 10.—Voltage-drop chart for 11-kV line, 0.05 sq. in. copper conductors. (Use also for 22-kV)

11-kV line each circuit having 0.10 sq. in. conductors, and a single-circuit 22-kV line with 0.05 sq. in. conductors.

It is seen from Fig. 11 that a single 11-kV 0.10 sq. in. circuit will carry 19 MW-miles if the voltage drop in the line is 12 per cent. and the load power factor 0.85. The double-circuit 11-kV line will therefore carry 38 MW-miles. Reference to Fig. 10 shows that, for the same load power factor and line voltage drop, an 11-kV 0.05 sq. in. line will carry 11.5 MW-miles. Hence the 22-kV line will carry 46 MW-miles or about 20 per cent. more load than the double-circuit 11-kV line

Example 5

A double-circuit 22-kV line is 20 miles long and has 0.20 sq. in. conductors. What is the

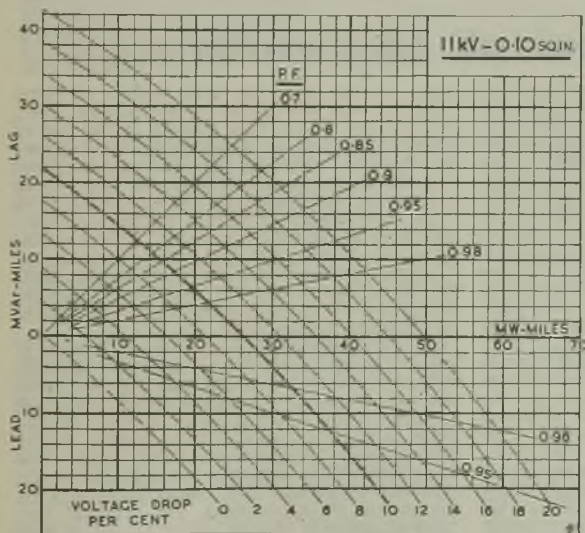


Fig. 11.—Voltage-drop chart for 11-kV line, 0.10 sq. in. copper conductors. (Use also for 22-kV)

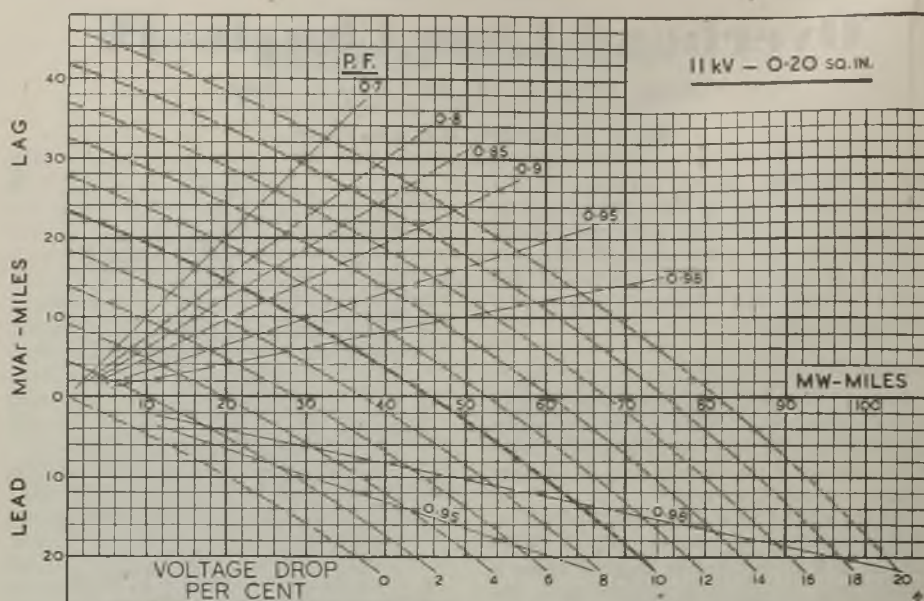


Fig. 12.—Voltage-drop chart for 11-kV line, 0.20 sq. in. copper conductors. (Use also for 22-kV)

voltage drop in the line when supplying a load of 16 MW at a power factor of 0.98 lagging?

A load of 16 MW at 22 kV is equivalent to 4 MW at 11 kV, that is, to 80 MW-miles

for two circuits or 40 MW-miles per circuit. Reference to Fig. 12 shows that 40 MW-miles at a p.f. of 0.98 lagging will give a voltage drop of 12 per cent, which is the required drop in the 22-kV double-circuit line.

Deferment of Apprentices

MR. L. C. Penwill, director and secretary of the Electrical Contractors' Association, has informed his members that the recently introduced procedure for the deferment of apprentices to the trade of "general electrician" has now been amended. Under this procedure, apprentices properly described as "apprentice general electricians" were eligible for deferment on account of their apprenticeship, whereas apprentices engaged on electrical wiring purely and simply were not so eligible. This position brought the former into line with apprentices in the engineering and shipbuilding industries, where similar deferments were granted to "apprentice maintenance electricians."

To enable the Government's plan for releases from the Forces in Class "A" to be brought into full operation and to compensate for the releases under Class "B" numbers of young men in the engineering and shipbuilding industries must now be called up to the Forces. Therefore the review of deferments mentioned below will apply also to apprentices to the trade of "general electrician" deferred in accordance with the N.S. 178 (or N.S. 178 revised) procedure.

All apprentices, except those in the building trade crafts, will have their deferments reviewed with a view to continuing deferment as appren-

tices in the following cases only:—1. Those who are over the age of 18 on July 1st, 1945, and (a) are within nine months of the end of apprenticeship or age 20, whichever is the earlier; or (b) have obtained the Ordinary National Certificate or its equivalent; or (c) will be taking the examination for the Certificate or its equivalent within 12 months of July 1st, 1945. 2. Those attaining the age of 18 on or after July 1st, 1945, and (a) have obtained the Ordinary National Certificate or its equivalent; or (b) will be taking the examination for the Certificate or its equivalent within 12 months of attaining the age of 18.

The arrangements under which deferment of call-up can be accorded on industrial grounds will continue, and it is expected that some who would not qualify under the above rules, will continue to be deferred under the normal rules (N.S. 300 procedure) if they cannot in any circumstances be spared from their work. The Association has strongly represented to the Ministry of Labour that unless deferments are granted to its apprentices, the electrical contracting industry will be totally unable to fulfil the very heavy demands which will be made upon it in connection with the Government's rebuilding programme.

Thrust Boring

Laying Cables and Pipes Without Excavation

THE capabilities of the latest type of mechanical thrust borer designed by Skylux, Ltd., Brunel Road, Acton, London, W.3, were recently demonstrated at Horley, Surrey, when hand-operated machines were watched in action forcing three separate bores under a concrete road.

The first was a thrust 25 ft. long under the road and was carried out from start to finish in 50 minutes. The prior work included the digging of the thrusting and receiving pits

was maintained throughout the whole length.

A lead pipe was subsequently attached to the pilot thrust tube in the receiving pit and (by reversing the ratchet knobs only on the machine) the pipe was drawn into the smooth hard bore, the machine being able to both pull or push in the one setting.

The third demonstration across the same roadway was the formation of a $7\frac{1}{2}$ -in. diameter bore and showed operation in a restricted area: in this case between two 4-in. diameter prior installations at 18-in. centres running parallel to the road. The soil around the hole proved to be quite hard and smooth owing to its displacement and compression. The initial bore is always of 2-in. diameter, subsequent enlargement being done by a die attached to the pilot thrust tube when it is withdrawn by reversal of the machine, at the same time drawing in the service cable, or pipe, to be permanently installed.

To enable the operators to check direction and level throughout the thrust a battery lamp

is incorporated in the pilot head which shines down the thrust tubes towards the machine so that if deflection of 2 in. or more takes place, the light will disappear.

The borer is worked without much effort by one or two ratchet levers (inserted at "A" on accompanying illustration) through a cleverly contrived gear box which permits automatic speed changing, the whole device not being too heavy to be lifted by two men.



Thrust borer in entry pit beside 25-ft. concrete roadway

and the setting of the machine into position. The method of sighting and levelling the machine is simple and straightforward.

The second demonstration had been designed to illustrate the ability of the machine to bore at any gradient and the use of gradient thrusting for avoiding existing installations. The crossing was under the same roadway and the machine was set for the pilot thrust to travel between the hard core of the road and a telephone cable installation 8 in. lower, to emerge in a receiving pit 25 ft. away. It was decided to commence the bore at a depth of 2 ft. 9 in. so a climbing gradient of 7 in 100 was necessary, which was obtained on the machine by a special curved spirit level, similar to those employed in railway surveying, which is also used for measuring any rise or fall of ground. The specified gradient

Bathroom Fatality

While sitting on the edge of the bathroom wash-basin to have her feet washed Ann Crossley Scargill, aged eight, of Oakworth, Keighley, caught hold of a tubular light fitting above the basin and received a fatal electric shock. At the inquest a verdict of "Death by misadventure" was recorded.

Views on the News

Reflections on Current Topics

RECENTLY I pointed out the absurdity of the arrangement by which local authorities had to pay purchase tax on electrical equipment for their new houses while the Ministry of Works was able to obtain appliances for its houses free of the tax. Apparently the electricity supply associations who have tackled the matter haven't got very far. They were told by one Ministry that it was a matter for the Board of Trade but the Board, in turn, suggested that the Treasury was the appropriate body to deal with the question. It is this "passing the buck" business which is one of the most dreaded features of Government control.

Chesterfield claims to be one of the first local authorities to have temporary bungalows erected and occupied. They are electrically equipped and the Corporation's electrical engineer, Mr. W. W. Grimes, has adopted a course which other undertakings might usefully follow. He is anxious that the tenants shall get the best out of their equipment but realises that some of them will be unfamiliar with it. And so he has had a hut erected on the estate in which a cooker and other appliances have been installed together with a demonstrator (Miss M. A. Applebee) who is in constant attendance to show the residents how things should be done.

A helpful suggestion for speeding up the building of houses is made by Mr. R. W. Steel, borough electrical engineer of Cheltenham. Following a recent demonstration of portable electric tools for use of the building trade, he proposed to the Corporation Electricity Committee that the use of these tools might be facilitated by providing an early electricity supply to building sites and making the tools available on reasonable hire terms. The Committee approved the scheme. The idea might appeal to other undertakings.

A satisfactory solution to the problem which has arisen in many areas in connection with the supply of electricity to temporary houses seems to have been reached by the Northmet Power Co. The company has informed the Enfield U.D.C. Housing Committee that it is unable to offer free extensions of mains owing to the short life of the houses and suggests that the Council should contribute to the cost on the following basis: Part electric sites (lighting, immersion heater and socket outlets), 50 per cent. of the estimated cost of h.v. and l.v. mains and substations. All-electric sites (lighting, immer-

sion heater, socket outlets, cooker and wash-boiler), 25 per cent. If buildings replace the temporary houses at the end of ten years and the lay-out of the estates enables the same distributor cables to be used without diversions or additions, 10 per cent. of the revenue from the permanent houses would be refunded until the whole of the contribution for the temporary houses (not including the service charges) has been returned. The Committee recommends the Council to agree to these terms.

One has, of course, often had to deal with members of the public who, using little or no electricity themselves, allege that it would cost more to do something by electricity than by other methods. Where there is an actual basis of comparison one may succeed in convincing the sceptical by means of factual data. Logical procedure is less easy when some such vague generalisation is enunciated as that "the price of electricity is too high," and no standard of reference is given—unless the criterion is intended to be zero. Sometimes it is asserted that electricity is cheaper "abroad"—rather a large place, but perhaps Ruritania is really meant. Disparagement of this sort seems to have been on the increase lately and one wonders why. It matters mainly because of its possible deterrent effect on the extension of electrification.

An example of this kind of thing is afforded by a letter from "Retired Teacher" in the *Edinburgh Evening News*. He (or she) having seen a local exhibition says that the cost of running an electric house should be stated. At the show it was suggested that it ought to be possible, with care and without using radiators, to run such a house for 3s. a week. The correspondent doubts this as in a London flat it cost him (or her) 12s. 6d. during a cold snap for running an electric radiator all day for three days. From this it is deduced that "few working men could stand the cost." And yet it is surprising how many working men are standing the cost already and how many more wish to "burden" themselves with electric homes.

I see that a recent stoppage of electricity supply in York was attributed to damage to a high-voltage cable by men who were excavating a road for the laying of gas mains. Is this a further indication that the wartime gas-electric truce is over?—REFLECTOR.

Export Market Advice

The Example of Canada

IN an article on "Export Market Control," which appeared in the *Electrical Review* of July 13th, "Sala" states that "control means that the manufacturer must plan his own advertising. . . ." He admits that "experiments" may be necessary and then asserts that the manufacturer should control his advertising "so as to satisfy *himself*. . . ." Such statements, as well as others in the same article, indicate that in spite of repeated cautions from many directions, we still have in our exporting circles men who persist in clinging to those obsolete theories which, in pre-war days, were doing so much to assist in diverting our trade into the hands of competing countries.

Having just returned after over four years spent in Canada, I propose to deal here more particularly with trade with that great country which should, and could, be England's best customer. As regards general policy, however, the same arguments apply equally to other countries. My duties brought me into close contact with many manufacturers and dealers, as well as buyers, both large and small. We often discussed the apparent scarcity of British products and I observed a remarkable unanimity in the opinions they expressed. It is now being realised there that if Canada is to maintain the export trade to Britain which she has built up in recent years, she must purchase more goods from Great Britain.

Willing Buyers

I can assure British manufacturers that Canadians are willing and even anxious to buy their goods, but they will not do so if we maintain the out-of-date methods advocated by "Sala" whilst other nations, particularly the United States, strain every effort to meet Canadian wishes and conditions. Take, for instance, the question of advertising. "Sala" says that the manufacturer must plan his own advertising. Nothing gives rise to more ridicule from Canadians than many of the English advertisements appearing in their journals. They do not understand our humour, where this is attempted, and our method of presentation is altogether foreign to them. It is absolutely necessary to employ a good local advertising

agent who "speaks the language" to plan one's advertising. I wonder how many English manufacturers realise that in Canada's largest city about 70 per cent. of the people are French-speaking, more, I believe, than in any other city in the world except Paris.

"Sala" says that the manufacturer should mould and adapt market development "to meet his own particular circumstances."

This policy produces what is probably the most emphatic and frequently-expressed objection of Canadian dealers to English methods. The truth, of course, is that the manufacturer must mould his methods to suit the particular circumstances of his customers. Canadians are quite sufficiently national-minded and business-like to know what they want and they are not going to be moulded or adapted by British or any other foreign manufacturer.

Unsuitable Agents

The unsuitability of many agents is the outstanding complaint against British firms, and I have personal knowledge of how true this is. Often the agent carries competitive lines and will push the one which pays him best. He has little technical knowledge of his wares, but this is the type of agent the manufacturer will obtain if he follows "Sala's" advice and tells the agent that sufficient justification for the price of his product is that "it is sold competitively in England." No self-respecting agent will tolerate such an argument, which ignores local conditions and competition as well as the addition of such costs as duties, freights, and so on.

Two vital points which have caused the downfall of many agencies before they have even become properly established are (1) the failure to maintain on the spot full and adequate supplies of spares, replacements and accessories, and (2) the parsimonious treatment of the agents. On the first of these points it is only necessary to remind readers of how much of Henry Ford's success as an exporter has been due to the availability of spares and replacements in almost every corner of the world. On the second point the following incident should

By E. Arthur Pinto,

A.M.I.E.E., M.E.I. Can.

prove convincing. One Monday I sent from Montreal an air-mail inquiry to some New York manufacturers for some specially-designed switchgear. They received the inquiry on Tuesday morning. Before lunch on Wednesday two engineers arrived in Montreal by air from New York, bringing with them written specifications and quotations, with alternatives, and three sets of detailed blue-prints for the required new designs. Later in the day I related this incident to the agent of a British manufacturer. He said: "Do you know that if I send a \$3 cable inquiry to my firm I have in each case to follow it with a written explanation as to why I cabled instead of sending an ordinary letter." Is it not under-

standable that so long as we in Great Britain adopt methods of this kind the best agents will work for the firms of competing countries?

If more of our manufacturers will ponder over some of the pointers I have endeavoured to give them and will avoid "Sala's" apparent theory that overseas customers are merely a lot of schoolboys waiting to have their markets "controlled" and "moulded" by us, they will get the trade. One final word of advice to would-be exporters. If they want to understand their overseas markets, they must visit them. Wherever possible, the head of the firm should go, but at least a very high officer should be sent, not once, but periodically.

Magnetic Crack Detector

DC Impulse Model

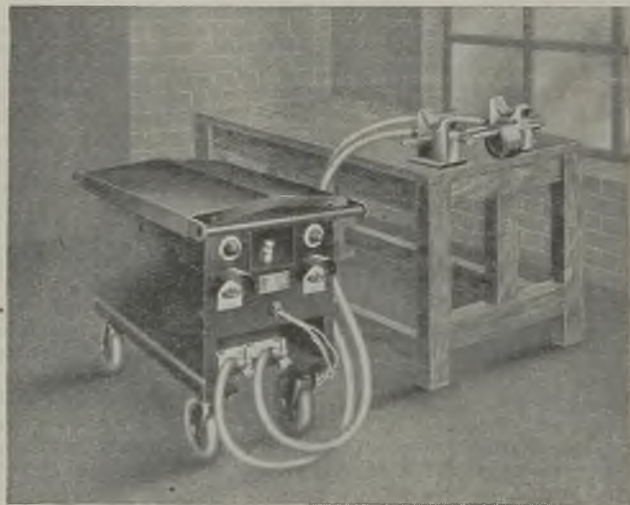
AS an alternative to AC magnetic crack detectors of the "Cirflux" series available from the EQUIPMENT & ENGINEERING CO., LTD., 2, Norfolk Street, Strand, London, W.C.2, there is now being offered a DC impulse model

especially where large loops in the connecting cables are unavoidable. For instance when impulse tests have to be applied to long metal bars it is generally necessary to increase the output voltage and, again, when testing parts by passing a magnetising AC cable round them it is quite easy to produce such a choking effect as will reduce the impulse current to a very small value.

The DC model, which incorporates selenium (metal) rectifiers, is contained in a steel cabinet mounted upon swivel rubber-tyred castors for easy transportation about a works and provides a direct-current impulse output up to 1,000 A at a low voltage.

It is fitted with a main three-phase input transformer operated from a regulating auto-transformer with adjustment by means of a four-way step switch between 346 to 440 V.

The impulse is controlled by means of a pneumatic timing relay which confines the period to approximately one



Mains-rectified DC magnetiser for crack detection

which, because it avoids the "skin effect," is preferable when sub-surface defects are sought and when the depth of cracks has to be gauged from the build-up of the magnetic particles in the detecting ink.

Another difficulty associated with AC impulse magnetisers is that of inductive effects which form a serious impedance to high amperage,

second duration and the duty cycle is rated at one impulse every thirty seconds. Two pilot lights are incorporated and a three-pole contactor to close the main circuit to the transformers by push-button on the front panel. Three main fuses are also fitted. The rectifiers are arranged in multiple banks and are easily accessible and well ventilated.

COMMERCE and INDUSTRY

Lamp Production Decontrolled. Staff Men's Salaries.

Coiled-coil Lamps Decontrolled

IN view of improvements in supplies the Board of Trade has made an Order (S.R. & O. 1945 No. 905) revoking the restrictions on the manufacture of certain electric incandescent lamps with coiled coil filaments. Inquiries about the manufacture of these lamps or the effects of decontrol should be addressed to the Ministry of Aircraft Production (D.O.L.P.) at 1, Clarendon Place, London, W.2.

Staff Foremen and Supervisors

An agreement has been reached between the National Federated Electrical Association and the Association of Supervising Electrical Engineers defining the positions of staff foremen and supervising electrical engineers in the contracting industry and stipulating minimum salaries. The proposed minimum rates are as follows:—Staff foremen: London District, £6 15s. 0d. per week (£351 per annum); other districts, £6 5s. 0d. per week (£325 per annum). Supervising electrical engineers: London District, £450 per annum; other districts, £400 per annum. The agreement also provides for holidays. It is stressed that the rates laid down in the agreement are minima and are exclusive of wartime adjustments to meet the increased cost of living.

Electrical Machinery Traders

The A.E.M.T., Ltd., was registered on July 26th, as a company limited by guarantee without share capital. Its objects are to foster and protect the trade, manufactures and interests of electrical machinery traders, etc. The membership fee on election is ten guineas with an annual subscription of ten guineas. The subscribers are: R. N. Ainsworth, 26, Worsley Road, Worsley, Manchester; L. Bowers, 31, Kingswood Drive, Roundhay, Leeds; M. G. Thomson, Waterloo, Liverpool; P. W. Kovach, Altrincham; W. E. Lawton, 78, Lyndhurst Gardens, N.3; H. W. Cole, Tadworth; E. H. Crook, Eastcote; R. C. Hull, Bush Hill Park, N.; E. J. Ferguson, Woking; F. R. Redington-Leech, 1, Westbourne Road, S.E.26; R. H. Gill, Leicester; G. R. Holding, 10, Glencairn Drive, Ealing; A. H. Blackman, Ilford; H. F. K. Dearlove, Bishops Stortford; P. G. Broom, Isleworth; and L. A. Snape, Birmingham. The registered office is at 11, Argyll Street, W.1.

Steel Production Film

Considerable technical difficulties had to be overcome in the production of "Steel," the first attempt made in this country to film the making of steel in Technicolor. Special asbestos-armoured screens and moist asbestos blankets had to be used to protect the cameras and the unit from the heat and flying drops of molten metal. Lasting just over half an hour, this documentary film traces the production of steel from the mining of the iron ore to the forging of the ingots. Spectacular shots are included of the use of the electric arc furnace, as well as the open hearth and Bessemer processes, the colour

and sound effects making the presentation very realistic. The film has been made for the British Council by Technique Film Productions in association with the Film Producers' Guild, Ltd., and will be shown in more than eighty countries, its commentary being given in over twenty languages.

L.E.P. Advertisements

The accompanying illustration shows one of a series of advertisements which the Lancashire Electric Power Co., is now running. The



One of the current L. E. P. advertisements

theme in each is the suggestion that the public should earmark its War Savings so as to be able to buy more electrical appliances when they become available.

Power Engineers' Salaries

The National Executive Council of the Electrical Power Engineers' Association discussed members' salaries at its June meeting and came to the conclusion that the present rates would have to be increased if the industry was to attract new entrants with the necessary knowledge and ability. One point made was that the operations of the Central Electricity Board had so narrowed the margin between plant capacity and maximum demand that the basis upon which salaries were originally assessed had been altered. It was also contended that there was a distinct difference between the cost-of-living increments and the actual rise in the cost of living. Manual workers' wages had risen in considerably greater proportion and moreover the industry was prosperous and well able to afford better salaries.

Three lines of approach were discussed:—
(a) A revision of the National Joint Board

agreement designed to enhance salaries generally; (b) Additions to existing salaries proportionally to wartime wage and salary increases granted to employees in industry generally; and (c) Lump sum additions of the same amount to all employees covered by the N.J.B. agreement.

It was stressed that conditions were very different from what they were in 1920 when the agreement was made; there had been a growing complexity demanding a higher level of competence and technical skill in all departments. The Council was in favour of a percentage addition to existing salaries as the simplest and most effective method of achieving the desired object.

Grading of Meter Staffs

In our issue of June 29th (p. 941) we published particulars of the grading of certain engineers on the meter staffs of electricity supply undertakings. Some doubt appears to exist as to the scope of this decision and so the *Electrical Power Engineer* points out in its July issue that it relates only to heads of meter or testing departments of undertakings. The question of the grading of other meter department engineers is still under consideration.

Cable Drum Makers' Wages

An award (No. 753) of the National Arbitration Tribunal has just been published regarding a dispute between British Insulated Callender's Cables, Ltd., and workers in their drum-making department. The workmen claimed payment as from April 1st last at the rate of 2s. 1d. per hour. Being unable to say with certainty under what rates the workers would be entitled under the agreement of the Joint Industrial Council for the Wood Box, Packing Case and Wooden Container Industry, the Tribunal awards that the company shall, within eight weeks from July 24th, and, if possible, in agreement with the Amalgamated Society of Wood-Cutting Machinists, establish a minimum rate or rates for the workers. Failing agreement the matter may be brought before the Tribunal again.

B.E.T.R.O. Members

We have received from the British Export Trade Research Organisation a list of companies which have been elected as ordinary members of the Organisation. Included in the list are the British Thomson-Houston Co., Ltd., Connollys (Blackley), Ltd., Crompton Parkinson, Ltd., Falk, Stadelmann & Co., Ltd., the Hackbridge Electric Construction Co., Ltd., the London Electric Wire Co. & Smiths, Ltd., Mather & Platt, Ltd., the Metropolitan-Vickers Electrical Export Co., Ltd., Herbert Morris Ltd., Murex, Ltd., A. Reyrolle & Co., Ltd., Sterling Industries, Ltd., and Ultra Electric, Ltd.

Fined for Leaving Job

A fine of £3 was imposed by Colchester magistrates on July 27th on William McNeil for leaving his employment with Colchester Corporation Electricity Supply Department without permission of the National Service Officer. Mr. F. Puxon, prosecuting for the Ministry of Labour, said this was scheduled employment. McNeil began work on April 4th

and left on April 25th. He was employed as a stoker and had not returned to work. Mr. J. Read, National Service Officer, said that defendant had made no application for permission to leave his work.

Lamp Price Reductions

In a letter to members of N.E.C.T.A. the director (Mr. L. C. Penwill) refers to losses sustained by members owing to the recent reductions in lamp prices. As regards purchase tax, he says that strictly speaking, the amount paid by the retailer is recoverable from the public, but in practice this recovery is impossible of achievement. Representations have been made by the Association to the Customs authorities. With regard to the price reduction itself, the E.L.M.A., upon presentation of the facts to it, realised the position in which a large number of members of the Association are placed, and has agreed to allow credits to their agreement holders based on the net value of stocks of reduced price lamps held by them on July 16th.

Electrical Supervisors' Meeting

The North-West London Branch of the Association of Supervising Electrical Engineers is holding a meeting on August 14th at the Brook Green Hotel, Hammersmith (7.30 p.m.), when a paper on "The Manufacture of Armour Piercing Shot by Electrically Heated Forging Machines" will be read by Mr. H. R. Whyte.

New Enfield Cables Factory

Enfield Cables, Ltd., are to establish in the Nantyglo-Brynmawr area of South Wales a new manufacturing plant, to which they will transfer from Brimsdown a portion of their growing business. The factory will employ not fewer than 600 people.

Inspection Instruments

An exhibition has been organised by the Sheffield Society of Technical Inspection, to be held in the Cutlers' Hall, Sheffield, from August 20th to 25th inclusive, with the object of indicating the wide range of equipment and instruments now available for inspection purposes. Wild-Barfield Electric Furnaces, Ltd., have arranged to display and demonstrate a photo-electric absorptiometer and a "Steelescope," both of the well-known Spekker types. Admission to the exhibition will be by programme guide, obtainable at the entrance, price 6d.

Electricity in Cotton Mills

In a report by the Nelson Juvenile Employment Committee on the recruitment and training of juveniles for the cotton industry, it is recorded that Mr. T. D. Martin, A.M.I.E.E., the Nelson borough electrical engineer, dealing with the question of the use of electricity in mills stated that the Nelson Electricity Committee had offered a new tariff for large industrial lighting users which, it was claimed, would be attractive to millowners for lighting only. This tariff was £4 per kilowatt of maximum demand per annum plus 0.25d. per kWh consumed, plus coal charges over 15s. per ton.

Concerning power drives for looms, it was

stated that it would cost about £25 per loom to equip each loom with an individual motor drive, which on the basis of a 20-year life for the motor, would with interest and sinking fund charges, amount to about £1 per annum. It was recommended that representatives of the Corporation should interview the manufacturers' association to discuss the possibility of applying, as an experiment, an individual motor to each loom in Nelson cotton mills.

Kirk Electrical Industries

The recently-formed Kirk Electrical Industries, Ltd., 16-24, Fulford Street, Bermondsey, is associated with Samuel Russell & Co., Ltd. (Iron Foundries) and Kirk & Co. (Tubes), Ltd. It will act as factor and wholesaler of "everything electrical." The chairman is Mr. A. K. Kirk and the managing director Mr. J. P. Ryan. The company will at first operate in London and the Home Counties, but branches will be set up in the provinces later.

Trade Announcements

The Birmingham branch of H. R. Cleave & Co. has moved to 96-97, Charlotte Street, Birmingham, 3. The telephone number is unchanged.

The head office of W. A. Sparrow & Co., Ltd., is now at 65, London Wall, London, E.C.2 (telephone: Monarch 7275), the office at 4, St. Mary Axe being out of use temporarily. The company's Birkenhead office has moved to 13, Union Court, Castle Street, Liverpool (telephone: Central 4220).

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:—

Belgium.—Supplies of pocket torches, cycle lamps and radio sets. (X.100.)

Ceylon.—Supplies of insulated gloves, meter seals, sealing wire and pliers, electricians' tools and Chatterton compound. (X.101.)

India.—Agency for bakelite electrical accessories and domestic electrical appliances. (X.102.)

India.—Agency for alternators, turbines, motors, convertors, transformers, control gear, domestic appliances, lamps, etc. (X.103.)

Iraq.—Agency for radio sets, refrigerators and other electrical goods. (X.104.)

Palestine.—Agency for "electrical and electro-technical goods." (X.105.)

West Indies.—Agency for domestic electric lighting fittings, lamps, toasters and other appliances. (X.106.)

TRADE MARKS

RECENT applications for trade marks include the following, objections against which may be entered within a month from the dates given below:—

July 25th

POLYANITE. No. 634,846, Class 9. Aerials for wireless telegraphy and television; electric flexibles, insulated wires for electrical purposes, cables for electric transmission systems, and electricity conductors.—Concordia Electric Wire & Cable Co., Ltd., Trent Mills, Derwent Street, Long Eaton, near Nottingham.

VERTILATERAL. No. 634,201, Class 11. Lighting installations, lighting fittings and parts (not included in other classes).—Holophane, Ltd., Holophane House, Elverton Street, Vincent Square, London, S.W.1.

August 1st

EUREKA. No. 628,772, Class 9. Electric flat irons.—Eureka Vacuum Cleaner Co., 6060, Hamilton Avenue, Detroit City, Michigan, U.S.A. Address for service: c/o Stevens, Langner, Parry & Rollinson, 5-9, Quality Court, London, W.C.2.

KRESTA (design). No. 631,904, Class 9. Electrical apparatus not included in other classes.—Kresta Electric, Ltd., Kresta Works, Parkes Street, Warwick.

BETA. No. 634,138, Class 9. Electrical apparatus and parts thereof and fittings therefor, none being included in other classes, but not including dry batteries.—Breton & Knight, Ltd., trading also as Beta Manufacturing Co., Poplar Works, Valley Road, Shipley, Yorks.

PREIL. No. 634,186, Class 9. Electrical apparatus and instruments not included in other classes; apparatus, instruments and devices for use in telegraphy, telephony, radio-telegraphy, radio-telephony, television, sound producing, reproducing, recording, receiving, transmitting and amplifying; and parts, not included in other classes, of all such goods.—Portogram Radio & Electrical Industries, Ltd., 10a, Sunnyhill Road, Streatham, London, S.W.16.

Design. No. 634,375, Class 9. Electrical instruments not included in other classes; scientific instruments; teaching instruments and apparatus.—Park Royal Scientific Instruments, Ltd., 52, Minerva Road, London, N.W.10.

TANNOY. No. 633,458, Class 17. Electric, acoustic, and heat insulators and insulating materials; sound deadening materials and preparations.—Guy R. Fountain, Ltd., Tannoy Works, Canterbury Grove, West Norwood, London, S.E.27.

INFORMATION DEPARTMENT

AN engineering firm has acquired a pre-war balancing machine, made by the Losen Hausen Co., Dusseldorf, marked 3099-1933, but does not know how to use it and the distributors cannot furnish any literature. Our Information Department will be pleased if anyone in the electrical industry knowing how this type of machine should be operated will communicate with them.

ELECTRICITY SUPPLY

Supply in N.E. Derbyshire. New Glasgow Station.

Barrow-in-Furness. — **BUSINESS TARIFF.** — The Electricity Committee has adopted an alternative two-part tariff for cinemas, shops and business premises for a trial period of 12 months. The new tariff has a fixed charge of £2 10s. per kW of m.d. per quarter plus $\frac{1}{4}$ d. per kWh in Barrow and $\frac{3}{4}$ d. outside the borough.

Blackpool. — **TRANSMISSION LINES.** — The Corporation is applying to the Ministry of Health for consent to borrow £154,269 for the provision of two transmission lines from Peel to the Bispham area.

Breconshire. — **HEATING INSTALLATION.** — The County Council has decided to have electric heating installed at the Public Assistance Institution at Brecon. The cost is estimated at £800.

Cheltenham. — **HOUSE INSTALLATIONS.** — The borough electrical engineer (Mr. R. W. Steel) reported to the Electricity Committee recently that the borough engineer had requested him to submit a price for wiring houses to be built on the Lynworth estate. Mr. Steel pointed out that the Council had no wiring department and the work would have to be done by local contractors. The Committee felt that as it had agreed to lay the first 50 ft. of service cable free of charge, it was for the Housing Committee to wire the houses. It agreed that the service charge of £6 should be allowed to cover the cost of additional outlets to those recommended in the Housing Manual and a further £1 6s. per circuit for a cooker and £1 for water heater outlets irrespective of whether these appliances were connected in the first instance. The electrical engineer would, if necessary, arrange for the tenders for wiring.

Clitheroe. — **PROPOSED PRICE INCREASE.** — The chairman of the Electricity Committee reports that the existing industrial tariff of 0.5d. per kWh (plus zone charge) operates at a loss in view of the increased cost of coal. Application is to be made to the Electricity Commissioners for consent to increase the charge to 0.65d. per kWh (plus zone charge).

Coventry. — **REDUCED SALES.** — In 1944-45, the Electricity Department sold 368 million kWh, a reduction of 11.7 per cent. compared with the previous year, due mainly to the falling off of work in connection with war requirements. There was a net profit on the year of £55,477. It is proposed to transfer £40,000 to the reserve fund.

Darlington. — **EXTENSIONS.** — The Town Council has received sanction to borrow £3,465 to supply electricity to Neasham Brickworks and £3,154 for distribution extensions.

Derbyshire and Notts. — **APPLICATIONS FOR SPECIAL ORDERS.** — The dispute of Chesterfield Corporation and adjoining local authorities with the Derbyshire and Notts Power Co. regarding its supply in an area of some 70 sq. miles in North-east Derbyshire was carried a stage further at a meeting of Chesterfield Town Council on July 31st, when, on the recommendation of the Electricity Committee, it was

unanimously decided to apply to the Electricity Commissioners for a Special Order to supply the western half of the area.

Alderman H. Varley, said that if the power company got its Order, Chesterfield would be completely surrounded, and any future expansion rendered impossible. The local authorities put up a strong case at the public inquiry, but he was not unmindful of the powerful position enjoyed by the company. If the company succeeded he did not think it would be the end of the story. The events of the previous week [the change of Government] proved that necessities of life were not to continue to be "the sport of vested interests." The public had decided that they should be controlled by the people. One of the first things the new Government was pressing was the nationalisation of electricity supply, and there was a great majority of the people in favour of it. In answer to Councillor T. J. Mitchell who asked if the Corporation could appeal to a higher authority in the event of the company's getting its Special Order, Alderman Varley replied that the Electricity Commissioners would decide the matter, but the Government was above them and might tell them what to do.

On the same day Mansfield Town Council decided to apply to the Electricity Commissioners for a Special Order to extend the Corporation's area of supply so as to include the parishes of Scarcliffe and Shirebrook in the Blackwell R.D.C. area, and the parishes of Carburton, Cuckney, Holbeck, Nether Langwith, Norton and Welbeck in the rural district of Worksop.

Droitwich. — **OVERHEAD LINES.** — The S.W. & S. Electric Power Co., proposes to erect overhead lines to Rylands Farm, Elmley Lovett, and Badge Court, Elmbridge.

Dumfries. — **PRICE INCREASE.** — The Town Council has decided that, subject to the Electricity Commissioners' approval, an interim increase of $\frac{1}{4}$ d. per kWh shall be applied to tariffs.

Eastbourne. — **IMPROVED FINANCES.** — Compared with a loss of £9,504 in 1943-44 the electricity accounts for the past year show a profit of £2,621.

Glasgow. — **THE BRAEHEAD STATION.** — The Corporation Electricity Committee has received a letter from the Central Electricity Board, referring to the arrangements to proceed with the construction of the first section of the Braehead generating station, comprising two turbo-alternators and four boiler units, at an estimated cost of £4,000,000. The Board envisages the possibility of area plant requirements calling for the installation of a further turbo-alternator unit and two additional boilers at Braehead to be in operation within the course of the next four or five years and feels that, as the work of the extension would commence before the completion of the first section, the Corporation's plans and estimates for the first section should include the whole of the foundations and civil engineering works for the com-

plete station. The Committee has accordingly decided to apply for consent to borrow £1,365,000 for buildings and civil engineering work; £2,883,000 for turbo-alternators, condensing plant, boilers and all ancillary plant; and £424,800 for engineering and contingencies.

Grimby.—ELECTRICITY CHARGES.—When the report and accounts of the Electricity Department were presented to the Town Council the chairman of the Electricity Committee (Alderman W. Thickett) said that Grimby was one of the few towns where three units could be obtained for a penny after the first 300 odd. The present charges were only 15 per cent. higher than before the war, but if the cost of coal were increased again electricity charges might well have to be raised substantially.

Hackney.—TRANSFORMERS AND MAINS.—The Borough Council Electricity Committee reports that twelve transformer units of 500 kVA each will be required soon, at least six of them within the next twelve months. It is therefore proposed to take six more transformers out of existing lightly-loaded substations, place them in new tanks and equip them with new h.v. and l.v. switching units and to purchase an additional six new transformers, with switching units. The total cost is estimated at £7,350. Mains extensions will cost £22,000.

Hastings.—RURAL SUPPLIES.—The Electricity Committee is to provide a supply to Wilting and Lower Wilting farms, Crowhurst, at a cost of £538; to Watts Place Cottage, Chitcomb (£360); and Shepherd's Farm, Peasmarsh (£80).

Herne Bay. — ELECTRICAL EQUIPMENT RECOMMENDED.—The surveyor recently reported to the Housing Committee that he had ascertained from the gas and electricity companies comparative annual costs to tenants of temporary houses for gas and electricity as follows:—Electricity, £9 ls. 1d. per annum (excluding water heating for which the company could not give a figure at the moment); gas, £10 14s. 5d. per annum. The Committee recommends the installation of electrical equipment.

Liverpool.—COAL WAGONS.—The Electric Power and Lighting Committee has appointed a deputation to wait on the Liverpool M.P.'s with a view to further representations being made to the Ministry of War Transport in regard to the charges made by the railway companies for the use of requisitioned hopper bottom coal wagons.

Maidstone.—ELECTRICITY PROFIT.—A report by the borough treasurer submitted to the Town Council at its last meeting showed that there was a profit of £9,761 on the past year's working of the electricity undertaking, against £9,087 for 1943-44. The chairman of the Electricity Committee (Councillor Watson) remarked that the total net profit from 1940 to 1945 was £36,000, of which £21,000 had gone to rate relief.

Montrose. — STREET LIGHTING CONVERSION.—It is proposed to convert public lighting at Ferryden, from gas to electricity at a cost of £500.

Preston.—DEVELOPMENT SCHEMES.—The Town Council has approved application for a loan of £171,000 for part of the extension to the Fylde coast transmission service with the acceptance

of a tender of English Electric Co. for switchgear and fuse-gear for Ribble generating station No. 2 for over £33,000. The simple hire scheme for domestic appliances is to be reintroduced and application is being made for a loan of £10,000 for this purpose.

Rochdale.—ELECTRICITY FOR ESTATES.—Sanction has been obtained to borrow £36,500 for providing electricity supplies to four new housing estates and temporary houses on other sites.

Rotherham.—SUPPLY TO MEXBOROUGH.—The Town Council has agreed to supply electricity to Mexborough urban district.

St. Marylebone.—CHANGE-OVER.—The Electricity Committee has obtained sanction to borrow £5,000 for apparatus in connection with the change of system and voltage.

Sedgley.—STREET LIGHTING TENDERS.—The U.D.C. Housing Committee is to obtain tenders for street lighting on new housing estates from the Midland Electric Corporation and the Gas Department.

South Shields. — SUPPLY TO TEMPORARY HOUSES.—The Town Council is to spend £6,210 supplying electricity to temporary housing sites.

Stoke Newington.—STREET LIGHTING.—The Borough Council Highways & Sewers Committee recommends an improved electric street lighting scheme costing £7,550 and the purchase of 140 time switches costing £450.

Worthing. — UNDERTAKING'S FINANCES. — There was a net profit of £2,963 on the operation of the electricity undertaking during 1944-45 (£2,614 after deducting a loss of £349 on the showrooms).

Wrightington. — SUPPLY TO FARMS. — The Lancashire Electric Power Co. proposes to extend overhead lines to Tunley Lane, Tunley Moss Farm and Moss House Farm.

RADIO and TELEPHONY

Hull.—TELEPHONE PROFIT.—The Corporation's telephones, the only municipal system in the country, made a profit last year of £32,918, an increase of £6,680 on the previous year.

Lewisham.—RELAY SERVICE.—With regard to a proposal by Telefusion, Ltd., to operate a broadcast wireless relay service in the district, the General Purposes Committee of Lewisham Borough Council expresses the opinion that no difficulty should be placed in the way of the provision of this public service, subject to the amenities of the borough being adequately safeguarded.

TRANSPORT

Manchester. — YEAR'S WORKING. — The Transport Committee reports that for the year ended March 31st last there was a deficit of £103,594 on the tramways, a surplus of £297,555 on the motor buses, and a surplus of £59,388 on the trolley vehicles.

Newcastle-on-Tyne. — TROLLEY-BUS DEVELOPMENTS.—The City Council is to spend £8,376 on further developments of the trolley-bus system.

South Shields. — TROLLEY-BUSES. — The Ministry of War Transport has sanctioned the borrowing of £18,000 by the Town Council for the purchase of six trolley-buses.

FINANCIAL SECTION

Company News. Stock Exchange Activities.

Reports and Dividends

The Chloride Electrical Storage Co., Ltd., held its fifty-fourth annual meeting on July 25th. The chairman, Mr. W. S. Naylor, in his speech said that throughout the war the company's factories and resources had been devoted to the maximum possible extent to the needs of the Services. Storage batteries played a very important part in modern warfare and to meet the demand a large increase in their output had to be made in the shortest possible time. In addition to new designs for novel applications of batteries the company had had to consider many problems due to the employment of batteries in unusual conditions, for instance, operation at temperatures below 0 deg. F. and up to 140 deg. F. Batteries made by them or associated companies had been used in Russian submarines, the midget submarines used against the *Tirpitz*, and on mine-sweepers in the combating of magnetic mines. Mr. Naylor also gave a list of other important war applications and then referred to the good work of "Exide" agents during the war; to the way in which industrial electric trucks had helped to counteract the man-power shortage; and to the advantages of the "Keepalite" emergency lighting system during the war.

He said that the company's training scheme for promising juniors was being extended and that all employees were being given an extra week's holiday with pay in recognition of their work in trying conditions.

The General Gas & Electricity Co., Ltd.—Mr. Arthur Collins, chairman, reported at the annual general meeting on July 30th that the bank overdraft had been reduced from £91,000 to £54,000 and that they had been able to build up the investment reserve. When the board took office the company had interests in twenty-seven different undertakings of which five were definitely bad. It had been their policy to dispose of their small undertakings to neighbouring large undertakings and this had been successfully carried out in a number of cases. They had used the proceeds of the sales to acquire a controlling interest in an old-established company manufacturing cords, flexes and other ancillary requirements for the electricity industry. A syndicate had undertaken to provide them with any necessary further capital required. The directors thought that the new venture would be satisfactory and would warrant the recommencement of ordinary dividends next year.

The Broadcast Relay Service, Ltd.—A comprehensive programme for peace-time production was outlined by Mr. Allan Miller, chairman and joint managing director, at the annual general meeting last week. A department for industrial heating apparatus used for wartime production was now available for peacetime uses. To keep in step with the policy of the B.B.C. they were planning to give subscribers a choice of three alternative programmes instead of two and they also intended to offer television

when programmes were made available. Mr. Miller did not see that the recent change in Government increased the risk of their business being nationalised. They were not a monopoly nor were they one of the nation's great or vital industries upon which the community might be dependent.

Hick, Hargreaves & Co., Ltd.—Mr. W. D'Arcy Madden, chairman, stated at the annual general meeting last week that in the change-over from war to peace-time production the company was fortunate in that its normal manufactures had to a considerable extent been required throughout the war. The financial position was a strong one and they had good liquid resources. They had a very large order book and there was a big demand for their specialised manufactures. They were now engaged in reconstructing and reorganising their machine shops and equipping them with the most modern plant.

The Palestine Electric Corporation, Ltd.—Viscount Samuel, the chairman, stated at the annual meeting last week that despite several direct hits on the corporation's works in air raids on Palestine, none of the property suffered any considerable damage. Every effort had been made to keep up the maintenance of the whole system at as high a standard as possible, but there was much deferred maintenance to make up; £P30,000 had been set aside for the purpose. There was reason to expect that the expansion of the undertaking would continue.

Thomas De La Rue & Co., Ltd.—Mr. B. C. Westall, chairman and managing director, in a statement circulated with the report, says that De La Rue Insulation, Ltd., the subsidiary of De La Rue Plastics manufacturing laminated material, appears to be getting into its full stride in a shorter period than its parent company. A new factory is being built on a site acquired at Tynemouth and they hope to be in production there by the end of the current year.

A. C. Cossor, Ltd., are to pay a final dividend of 7 per cent., tax free, together with a cash bonus of 2½ per cent., tax free, making 12½ per cent. (10 per cent., tax free). The net profit for the year ended March 31st was £134,430 (£102,606). In addition a dividend of £45,000, tax free, has been received from a subsidiary company in respect of the three years ended March 31st.

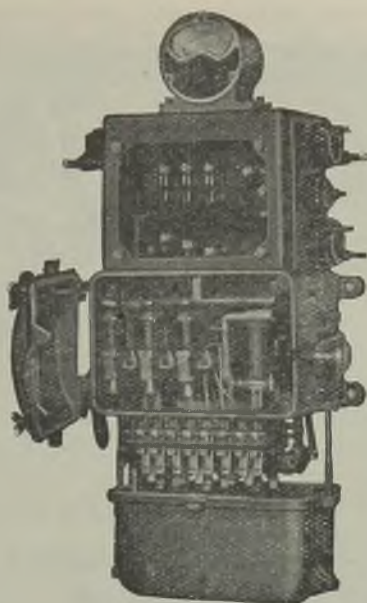
The London Electric Supply Corporation, Ltd., is to pay an interim dividend of 3 per cent. on the 6 per cent. non-cumulative preference shares in respect of the year ending December 31st, 1945. Consideration of payment on the ordinary shares is deferred until the end of the year.

The City of London Electric Lighting Co., Ltd., for the first time since 1942, has declared an interim ordinary dividend—2½ per cent. The dividend for 1944 was 6 per cent.

The Kalgoorlie Electric Tramways, Ltd.—The local authorities have granted a further twelve months' extension of the concession under which the undertaking is operating and which

Control for squirrel-cage motors

by



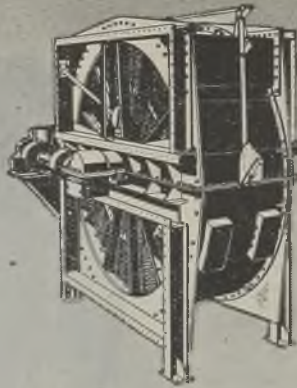
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smallest industrial installation.*

HOWDEN

James Howden & Company (Land) Ltd.
195, Scotland Street, Glasgow, C.5, and
101-103, Baker Street, London, W.1.

is due to expire on December 5th next. A sum of £8,000 has been paid to the trustees to enable them to distribute 8 per cent. on account of capital on the "B" debenture stock.

The Telegraph Construction & Maintenance Co., Ltd., is issuing a further 227,221 £1 shares at 50s. a share to existing shareholders in the proportion of one new share for each two shares held.

Richardsons Westgarth & Co., Ltd., are maintaining their dividend at 8 per cent. The net profit for the year ending March 31st was £62,880 (£63,396).

Newton Bros. (Derby), Ltd., announce a dividend of $17\frac{1}{2}$ per cent. (same) for the year to March 31st last. After providing for taxation, the net profit was £13,645 (£13,431).

Metal Industries, Ltd., have declared a final dividend of 6 per cent. (same) on the "A" and "B" ordinary shares, making 9 per cent. (against $8\frac{1}{2}$ per cent.) for the year.

The Victoria Falls & Transvaal Power Co., Ltd., shows a profit for 1944 of £575,921, £20,342 more than for the previous year. The dividend is maintained at 15 per cent. and £150,000 (same) is placed to reserve, £342,240 (£327,153) being carried forward.

Falk, Stadelmann & Co., Ltd., are raising their dividend from $7\frac{1}{2}$ to 10 per cent. for the past year.

New Companies

Midland Electric Co. (Leicester), Ltd.—Private company. Registered July 23rd. Capital, £1,000. Objects: To carry on the business of manufacturers and repairers of, and dealers in, dynamos, motors, magnetos, batteries, electrical apparatus and supplies, wireless and television goods, etc. F. H. Farmer, 55, Humberstone Gate, Leicester is the first director. Registered office: 55, Humberstone Gate, Leicester.

Henry Lewis (Mayfair), Ltd.—Private company. Registered July 21st. Capital, £3,000. Objects: To carry on the business of electrical engineers and contractors, manufacturers of, and dealers in electric lamps, reflectors, bells, fires, cookers, fans, motors, armatures, dynamos, etc. Directors: C. M. Lynes, 2, Leinster Mansions, Finchley Road, N.W. and H. Lewis, 1, Englewood Road, Balham, S.W. Registered office: 120a, Mount Street, W.1.

S. Jackson & Co. (Electrical Appliances), Ltd.—Private company. Registered July 20th. Capital, £1,000. Objects: To carry on the business of manufacturers of, and dealers in, electrical appliances and goods, wireless and television sets and accessories, etc. Directors: S. Jackson and Fanny Jackson (formerly surname Jacobson in both cases), both of 43, Cambridge Street, Bletchley, Bucks. Registered office: 43, Cambridge Street, Bletchley, Bucks.

Lincass Electric, Ltd.—Private company. Registered July 23rd. Capital, £100. Objects: To carry on the business of manufacturers, exporters, importers, installers, maintainers, and distributors of and dealers in electrical equipment and accessories, wireless goods, etc. First directors: C. Bone, St. Michaels,

Nags Head Lane, Great Missenden; and G. M. Keates, 19, Fernbrook Drive, North Harrow. Registered office: 31, Pinner Road, Harrow.

Epheta Manufacturing Co. (Elements), Ltd.—Private company. Registered July 25th. Capital, £1,000. Objects: To carry on the business of manufacturers of electrical replacement elements and spirals, etc. First directors: S. List, 17, South Grove, Highgate; and W. J. Chaney, "Chaney's," South View Road, Marlow. Registered office: 64, Newman Street, W.1.

A. C. Simpson (Transformers), Ltd.—Private company. Registered July 26th. Capital, £1,000. Objects: To carry on the business of manufacturers of, and dealers in, electrical appliances and supplies, etc. Directors: A. C. Simpson and Sarah E. Simpson, both of 24, Eldon Avenue, Boreham Wood. Registered office: 124, Shenley Road, Boreham Wood, Herts.

Selectrics, Ltd.—Private company. Registered July 27th. Capital, £1,000. Objects: To carry on the business of manufacturers of, and dealers in, dynamos, motors, armatures, batteries, electro-medical apparatus, etc. Mrs. I. Pollachek, 88, Green Hill Court, Prince Albert Road, N.W.3, is the first director. Office: 58, Pentonville Road, N.1.

Companies' Returns Statements of Capital

Electrical Agencies (London), Ltd.—Capital, £1,000 in £1 shares. Return dated December 31st (filed March 8th). All shares taken up. £1,000 paid. Mortgages and charges: Nil.

Grierson, Ltd.—Capital, £10,000 in 6,000 ordinary and 4,000 preference shares of £1. Return dated March 5th. 4,001 ordinary shares taken up. £4,001 paid. Mortgages and charges: Nil.

Midland Electric Wire Co. (1939), Ltd.—Capital, £2 in £1 shares. Return dated February 28th. All shares taken up. £2 paid. Mortgages and charges: Nil.

Increase of Capital

British Insulated Callender's Cables, Ltd.—The nominal capital has been increased by the addition of £12,499,900 beyond the registered capital of £100. The additional capital is divided into 933,324 6 per cent. first cumulative preference, 1,045,445 $5\frac{1}{2}$ per cent. second cumulative preference and 10,521,131 ordinary shares of £1 each. The first and second preference shares carry no voting rights except in special circumstances.

Bankruptcies

W. B. Ralphs, electrical contractor, lately carrying on business at 2, Mulgrave Road, Middlesbrough.—Proofs for dividend by August 18th to Mr. C. L. Townsend, 80, High Street, Stockton-on-Tees.

R. A. Young, electrical and mechanical engineer, Gullet Passage, Shrewsbury.—Proofs for dividend by August 14th to Mr. P. M. Milward, 12, Lonsdale Street, Stoke-on-Trent, Official Receiver.

STOCKS AND SHARES

TUESDAY EVENING.

STOCK Exchange markets and public confidence in stocks and shares have undergone acute depression since the General Election figures were declared. Gilt-edged stocks, the dollar groups and certain sections of the mining market, were able to escape the malaise. Apart from these, the markets have been distinctly flat.

Comparison with last week's prices shows a melancholy list of falls, extensive and, in some cases, considerable. As might be supposed, British Electric Traction deferred has experienced the most spectacular fall, being 250 lower on the week. Southern Railway preferred is 12½ points below last week's price. Electricity supply ordinary shares are down in nearly every case. The greater part of this year's decline has taken place during the past ten days.

Seven Months' Prices

Occasion is usually taken in August to look back, and to compare current prices with those of the previous January. The last seven months have brought events of far-reaching consequence. Peace in Europe and Labour success in a General Election are two outstanding occurrences of historic importance. The Budget last spring was noteworthy for its hint of possible relief, at some early date, of tax burdens. The Treasury and the Stock Exchange have partially relaxed the previous rigidity of their control over new issues of stocks and shares.

Up to about a month ago, prices were rapidly recovering from a temporary depression produced by the announcement of a forthcoming General Election. This recovery suffered a sharp setback as a result of the national poll. The following table, representative of electrical and manufacturing shares, compares present with last January's prices:—

Ordinary Shares	Jan. 2nd	Now	Rise or Fall
	s. d.	s. d.	s. d.
Automatic Tel. & El.	67 6	69 6	+ 2 0
Cossor, A. C. (5s.)	32 6	37 6	+ 5 0
Crabtree (10s.)	44 0	42 0	- 2 0
De la Rue Elec. & Musical (10s.)	35 6	31 0	- 4 6
Elec. Constrn...	61 3	60 0	- 1 3
Enfield Cable	64 0	65 6	+ 1 6
Eriasson Tel.(5s.)	53 9	50 0	- 3 9
Lancs. Dynamo	100 0	102 6	+ 2 6
Mather & Platt	55 0	51 3	- 3 7
Reyrolle	72 6	72 0	- 6
Siemens	36 0	37 6	+ 1 6
WestinghouseBr.	75 0	74 0	- 1 0

British Insulated Cables & Callender's Cable Company have joined forces, and the £1 shares of the merger company are quoted at 41s. 6d. How the prices of various other members of

the group have fared, can be observed from the following table:—

Ordinary Shares	Jan. 2nd	Now	Fall
	s. d.	s. d.	s. d.
Assoc. Elec. Ind. Crompton Parkinson (5s.)	61 0	55 0	6 0
English Electric	33 6	28 0	5 6
Ever Ready (5s.)	55 6	53 0	2 6
General Electric	42 0	39 6	2 6
Henley's (5s.)	98 0	90 0	8 0
J. & P. . . .	27 6	25 6	2 0
	79 0	73 6	5 6

Electricity Supply

After standing up stoutly to minor shocks, the market for Home electricity supply shares was badly shaken by the result of the General Election. The announced intention of the Labour Party to nationalise utility enterprises served to create anxiety amongst holders of shares in the electricity supply market. The list as a whole gave way, the London group proving especially vulnerable. Here are six examples of the ordinary shares in this section:—

Ordinary Shares	Jan. 2nd	Now	Fall
	s. d.	s. d.	s. d.
City of London	30 0	29 6	6
County of London	43 0	38 0	5 0
London Assoc.	26 0	24 6	1 6
Metropolitan	43 0	39 0	4 0
Northmet Power	41 0	37 0	4 0
South London	30 0	29 6	6

The Scottish and the provincial groups have come under the same political malinfluence. Being completely in the dark as to the possible implications of socialisation, holders of the shares have been realising on a fairly extensive scale, with this result:—

Ordinary Shares	Jan. 2nd	Now	Fall
	s. d.	s. d.	s. d.
Bournemouth & Poole	62 6	59 0	3 6
Clyde Valley	42 0	39 0	3 0
Edmundsons	31 0	28 9	2 3
Elec. Dis. Yorks Lancs. Light & Power	45 6	44 6	1 0
Mid. Counties	37 0	35 0	2 0
Mid. Elec. Power	41 6	39 0	2 6
North Eastern	44 0	42 6	1 6
Northampton	34 6	31 0	3 6
Scottish Power	50 0	48 9	1 3
Yorkshire Elec.	40 6	36 0	4 6
	43 0	38 6	4 6

Falls and Rises

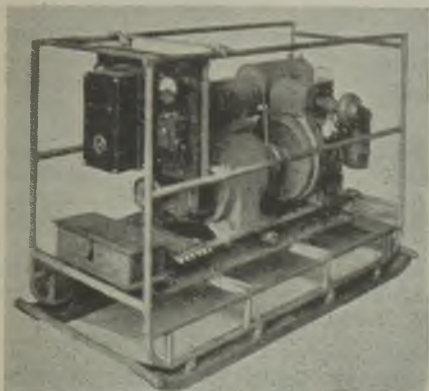
The Home Railway interim dividend declarations were received with indifference. Transport "C" started the year at 69, and is now 62½. Southern preferred, from 78 has gone back to 64. Amongst other traction issues, British Electric Traction deferred is 235 points lower at 965, Thomas Tillings are 14s. 6d. down at 47s. 6d. Calcutta Trams have pursued a hectic course. At 79s. the net gain on the year is 10s. 6d. Indian electricity shares have good rises to their credit, Calcutta at 63s. 9d. being 18s. 3d. higher, and Cawnpore similarly better at 59s. 6d.

Manufacturers' War Work—X

Meeting Special Requirements of the Services

Higgs Motors, Ltd.

WHILST many manufacturers have been obliged to diverge from their normal peacetime products and adapt their plant to necessities of war, Higgs Motors, Ltd., have been heavily engaged in meeting the huge wartime demands for their own particular



1.25-kVA Higgs petrol alternator set with Petter engine (mounted on skids)

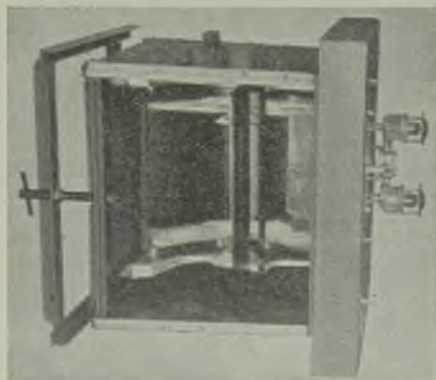
products, namely, electric motors and dynamos up to 500 HP. In addition, however, to the many thousands of standard machines supplied for various war needs, a considerable quantity of special equipment has been produced for the British and Allied Forces. This includes several thousand petrol engine driven generating sets, with outputs from 1 to 12 kW both AC and DC, for supplying electricity for various duties such as lighting and heating of field H.Q.s, lighting decoy aerodromes, power and lighting for mobile workshops, laundries, etc., and battery charging in the field.

A special type of sine-wave alternator with an Austin 8 engine was developed for radio-telegraphy work, also demonstration sets for Admiralty instructional purposes. Over ten thousand special 50-V AC motors were made for installation on radiolocation apparatus and almost as many again built to Government specification for use on Bofors guns. In spite of labour and other current difficulties production has been maintained at a high level.

Simplex Electric Co., Ltd.

It is significant to note how closely the war production of this company has followed the phases of military activity. First equipment, then defensive weapons, then offensive devices. In the early days there were tremendous demands for the company's normal industrial products for the equipment of ordnance factories, shipyards, etc., and at the same time special work for the equipment of the Forces was also in hand, an early contribution being the manufacture of portable food containers for use in the field. Thousands of stationery boxes, ammunition containers, etc., were also made during this period.

Following this "equipment" phase, production was started on a wide variety of defensive weapons, including anti-tank mines, bombards, shrapnel mines and mortars to a total of well over 2,000,000. The company also had a hand in defensive apparatus to combat the magnetic sea mine. The expansion of the R.A.F. resulted in heavy demands for aircraft components and various products for aerodrome use. The latter included mobile floodlights, obstruction lights, landing lights and a special device known as an "angle of approach" indicator which enabled aircraft to land safely when difficult

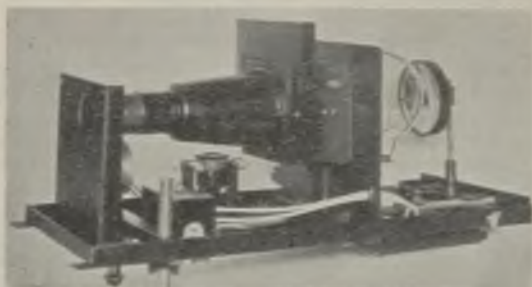


Simplex mobile floodlight (cover removed) for aerodrome use

conditions prevailed. During this time there was still a continuous demand for conduit

and fittings, lighting fittings, switchgear and other products, all for war purposes.

After El Alamein the nature of the com-



Simplex angle-of-approach indicator (cover removed) for guidance of landing aircraft

pany's war effort became more directed to the offensive. First was a call for the well-known "Jerry can" to aid the North African campaign and in a short time thousands were being produced each week. The conveyor system was used, starting at the presses and ending at the infra-red drying plant. Other sections of the Simplex factories were equally busy on the production of more lethal weapons, such as rockets, Bangalore torpedoes, incendiary bombs, demolition charge containers, etc., the output of these reaching a total of 2,000,000.

Early in 1942 an urgent request was received from the War Office for an initial supply of a weapon, production of which at that time had barely started. By a great effort lasting 24 hours a day the job was completed in time. A few days later it was made known that these weapons had been used with great success in the landing at St. Nazaire. With the offensive spirit now uppermost the Simplex factories continued to pour out an assortment of war materials including flash bombs for photographic reconnaissance, mortar bombs, petrol drums, map lights, and more normal products such as heavy-duty cooking equipment for use afloat and ashore, floodlighting for airfields, conduit and fittings for Bren carriers and rotary junction boxes for armoured fighting vehicles.

The approach of "D Day" brought demands for some specialised equipment amongst which were some thousands of smoke floats to be dropped by aircraft during landing operations. In connection with the "Mulberry" scheme large numbers of switchgear panels for the control of portable

welding apparatus were produced. Almost on the eve of "D Day" a last-minute demand came for directional signs required for the guidance of troops on the Normandy beaches. Throughout the war the vitreous enamelling plant of the company was engaged upon war production. Amongst the many jobs handled were some millions of enamelled mugs for the troops.

C. H. Blackburn & Co., Ltd.

C. H. Blackburn & Co., Ltd., have made instrument sterilisers of various sizes for use in the sick bays of warships and at R.A.F. stations, and other products include bowl sterilisers, high

pressure sterilisers, autoclaves, hot and cold water sterilisers, electrically heated food conveyors, wax dipping baths and heat sealing apparatus for tropical packing. The company will be gradually switching over its activities from wartime production and intends to developing the manufacture of electrical domestic appliances.

Davey Paxman & Co., Ltd.

Over two million HP Paxman oil engines have been built since 1939 as propelling units for more than half the British submarines constructed, all the British Diesel-engined tank landing craft, all the British Diesel motor gun boats and the "Gay Viking" class of blockade runners; and as auxiliary engines for over 1,000 naval vessels and a large number of merchant ships. Hundreds of 30, 40, 50 and 60-kW generator sets have been made for destroyers, corvettes, transport ferries, gunboats, etc., as well as more powerful generators up to 300-kW output for battleships and cruisers, depot ships, and aircraft carriers. Power units were also supplied for all the heavy anti-aircraft guns used against the flying-bomb attacks.

Paxman boilers have been installed in hundreds for heating aircraft and munition factories, etc., and for shipboard use. Refrigeration machinery has been supplied for emergency food stores and for War Office barges. Filter plants for collieries and machinery for the manufacture of explosives are other products. Paxmans also claim to have become the biggest makers of tank sprockets in the country, and they have made large quantities of mines, paravanes, smoke producing apparatus, etc.

NEW PATENTS

Electrical Specifications Recently Published

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

AKT.-GES. Brown, Boveri & Cie. — "Arrangement for fixing an arc guiding sleeve suspended from the anode bushing of a rectifier." 3205/43. (January 20th, 1942.) (570655.)

J. J. V. Armstrong (P. E. Brunberg). — "Electric transformers and welding machines." 15344. September 18th, 1943. (570753.)

F. Aughtie. — "Electrical strain gauges." 11443. July 14th, 1943. (570751.)

F. W. Bauer and B. F. Jellinek. — "Apparatus for the heating of rooms by circulating hot water." 14554. September 6th, 1943. (570674.)

British Thomson-Houston Co., Ltd., and A. Bowen. — "Projection screens." 16302. October 5th, 1943. (570691.)

British Thomson-Houston Co., Ltd., and W. H. Lund. — "Incandescent electric lamps." 17097. October 18th, 1943. (570760.)

British Thomson-Houston Co., Ltd., A. Bowen and A. P. Castellain. — "Reversible ratchet mechanisms." 8877. June 2nd, 1943. (570664.)

W. E. Burnand and T. Firth & J. Brown, Ltd. — "Apparatus for inducing motion electrically in a conducting fluid." 19170. November 17th, 1943. (570706.)

E. L. W. Byrne (Titeflex Metal Hose Co.). — "Ignition distributor radio shield." 21592. December 24th, 1943. (570773.)

Ferodo, Ltd., and R. C. Parker. — "Electrical means for indicating the difference in the speeds of two rotating members." 867. January 17th, 1944. (570725.)

G. D. Freeman. — "Steam generators." 18680. November 10th, 1943. (570701.)

G. A. Harvey (London), Ltd., and H. B. Fergusson. — "Apparatus for holding and manipulating heavy work for effecting welding and like operations." 1131. January 20th, 1944. (570731.)

S. R. Horrabin and F. A. J. Griffiths. — "Electric light fittings." 1482. January 26th, 1944. (570736.)

G. Liebmann and Cathodeon, Ltd. — "Cathode-ray tubes." 13506. August 19th, 1943. (570672.)

F. S. Loebl, R. Loebl and Loblite, Ltd. — "Electrical connectors and like fittings." 16215. October 4th, 1943. (570714.)

Mullard Radio Valve Co., Ltd., and C. L. Richards. — "Radio receiving circuits." 12406. July 30th, 1943. (570772.)

J. F. O'Brien. — "Polarised outlet section for electric wiring system." 6473/43. (April 27th, 1942.) (570658.)

Pressed Steel Co., Ltd., and E. G. Rowledge. — "Method of lubricating refrigerator compressors and the like." 2142. February 5th, 1944. (570780.)

G. R. Shepherd (Westinghouse Electric International Co.). — "Magnetic structures for electrical apparatus." 1115. January 20th, 1944. (570730.)

Standard Telephone & Cables, Ltd. — "Liquid cooling arrangements for electron discharge devices." 14866/43. (October 5th, 1942.) (570679.)

Standard Telephones & Cables, Ltd., and G. Gilliver. — "Method of and apparatus for electrically welding metals." 15279. September 17th, 1943. (570681.)

Standard Telephones & Cables, Ltd., and E. A. Richards. — "Metal rectifiers of the selenium type." 801. January 15th, 1944. (Addition to 526482.) (570722.)

A. H. Stevens (Electronic Laboratories, Inc.). — "Electric discharge lamps." 8497. June 20th, 1942. (570743.) "Lamp structures." 3284. February 22nd, 1944. (570791.)

Stratton & Co., Ltd. and H. N. Cox. — "Tools for the manipulation of connections or instruments of sensitive electrical apparatus and in the manufacture thereof." 15381. September 20th, 1943. (570682.)

Amended Specification

550191. British Thomson-Houston Co., Ltd. — "Magnetic cores."

Progress in Brazil

Water-Power Development

IN spite of increased difficulties resulting from the war, the Brazilian Traction, Light & Power Co., Ltd., which, through its affiliated concerns, controls electricity supply in the cities of Rio de Janeiro, São Paulo and Santos, states in its report for 1944 that the service was well maintained although under some restrictions. The extremely dry period experienced in the Rio region coupled with the great growth of load under war conditions necessitated the rationing of power supply in that area and it is expected that this will continue for at least the rest of 1945. Sales of electricity in the three areas amounted to 2,395,847,529 kWh, as compared with 2,148,027,358 kWh in the preceding year, the number of consumers increasing from 654,375 to 662,734.

To relieve the difficult situation in the Rio area while the capacity of the hydro-electric plants is being increased—a 230,000 V transmission line, 205 miles in length, is being constructed from the Serra do Cubatão plant of the São Paulo system to the Ribeirão das Lages plant. At the Serra do Cubatão plant, the connection of the existing units to the new tunnel and surge tank is nearly completed and will provide additional capacity to the extent of 55,000 kW. The provision of another 67,000-kW unit will not be completed before August, 1946. The Brazilian authorities have authorised still another 67,000-kW set for this plant and every effort is being made to expedite its manufacture in the United States.

At the Ribeirão das Lages plant, the raising of the dam, driving and lining of the large tunnels and erection of the third of the new units of nominally 35,000 kW each are proceeding but progress has been slow.

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.—August 31st. Timaru Borough Council. 11-kV oil circuit-breakers.

September 6th. Sydney County Council. Boiler feed pumps for Pyrmont "B." Spec. 758.

September 10th. N.S.W. Public Works Department. System protection for 66-kV and 132-kV lines, Southern Electricity Supply.

Birmingham.—August 29th. Electric Supply Department. Distribution transformers. (See this issue.)

Bradford.—August 29th. Corporation. Static transformers. (August 3rd.)

Brighouse.—August 31st. Town Council. Transformers and switchgear. (August 3rd.)

Chichester.—August 17th. City Council. About 20 miles of 11-kV and control cables and accessories. (July 13th.)

Glasgow.—August 31st. Corporation Lighting Department. 500 lanterns for electric lamps. Specs. etc., from the Lighting Department, 20, Trongate.

Scotland.—October 15th. North of Scotland Hydro-Electric Board. 132-kV transmission lines. (See this issue.)

Sheffield.—August 27th. Electricity Department. Three 1,000-kVA 11,200/3,300-V transformers. (August 3rd.)

West Hartlepool.—August 27th. Town Council. Paper-insulated cables. (See this issue.)

West Riding.—September 1st. Standing Joint Committee. Electrical work in connection with adaptations at the West Riding Constabulary Headquarters, Wakefield. Specifications and forms of tender from the West Riding architect, County Hall, Wakefield.

Wilton.—August 25th. Borough Council. Supply and erection of a public lighting installation in the borough. Borough surveyor, Municipal Offices, Fugglestone House, Wilton.

Orders Placed

Friern Barnet.—Highways Committee. Accepted. Twenty-four concrete lamp columns (£180).—Concrete Utilities.

Hastings.—Electricity Committee. Accepted. Pole-mounted transformers. Three 15-kVA units (£178) and two 20-kVA units (£131) each.—Bonar Long & Co.

Salford.—Light, Heat & Power Committee. Recommended. Private telephone exchanges at Gas Department premises.—Reliance Telephone Co.

Health Committee. Recommended. Mobile X-ray apparatus (£526).—A. E. Dean & Co. 20-cwt. battery truck (£247).—Crompton Parkinson.

Walsall.—Electricity Committee. Recommended. 350 two-part tariff prepayment meters (£2,017).—Sangamo Weston.

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.

Birmingham.—Permanent houses (200); city engineer.

Bournemouth.—Completion of Linford sanatorium; borough engineer.

Bradford.—Schools, St. Anne's and St. Joseph's; R.C. managers.

Sun-ray treatment section, central baths; city architect.

Brighton.—Houses (1,030), churches and school, Withdean estate; borough engineer.

Bromsgrove.—New schools and instruction centre, Lickey Grange; secretary, Birmingham Royal Institution for the Blind.

Chester.—Factory extension, Jesmond Road; Fletcher & Co., Ltd.

Coniston (Lancs.).—Residential college for adult education; Oxford University.

Coventry.—Extensions, Gulson Road Hospital (£7,500); city engineer.

Eastry (Kent).—Sewage works (£21,000); R.D.C. surveyor.

Farnborough.—Hospital extensions (£10,000); Hampshire county architect, Winchester.

Hull.—Works reconstruction, Marfleet Avenue; J. H. Fenner & Co., Ltd.

Ilford.—New buildings, Huson Works, New North Road; S. A. S. Yeo, architect.

Keighley.—Extensions, Spindle Fly Works, Sunderland Street; Heaton & Flint, Greengate, Keighley.

Kent.—Temporary county offices, Springfield, Maidstone (£7,500), horticultural institute Swanley (£14,000), County Hospital, Dartford (£21,700), girls' technical school, Margate, and extensions to Technical College, Erith (£10,000); county architect, Maidstone.

Liverpool.—Alterations and extensions to the Maghull Home for Epileptics (£750,000); C. E. Grisewood, secretary.

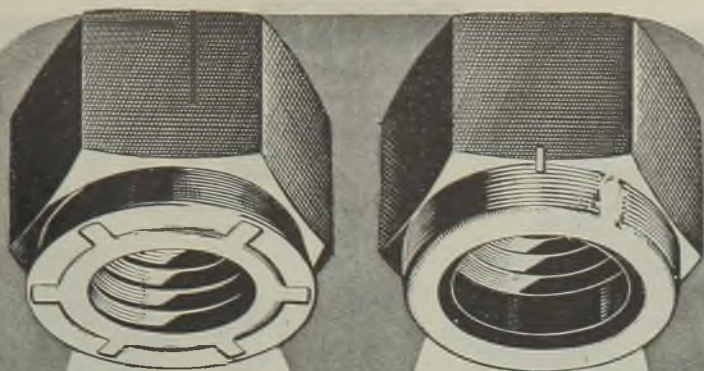
Manchester.—In the reference in our June 29th issue to the extensions at Urmston Hospital, the architect should have been given as Clifford Wild, 72, Bridge Street.

Flats (199), Medlock Street site, Hulme; J. Higgs, housing director, Town Hall, Manchester.

Oxfordshire.—Maternity block at Henley Institution; G. R. Hutton, county architect, 3, Becket Street, Oxford.

Stourbridge.—Extensions to tuberculosis block, Hayley Green Hospital, for North Worcestershire Joint Hospital Board; H. E. Folkes, architect, 34, Hagley Road.

Woolwich.—Permanent dwellings (67), Woodlands estate, Plumstead; borough engineer, Woolwich Town Hall.



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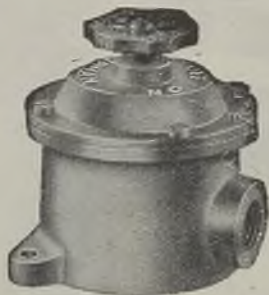


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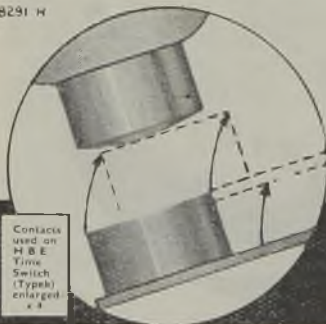


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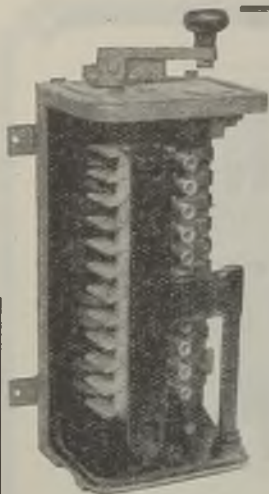
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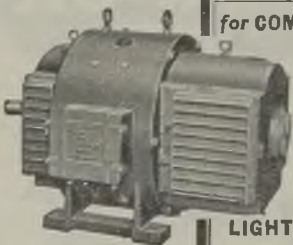
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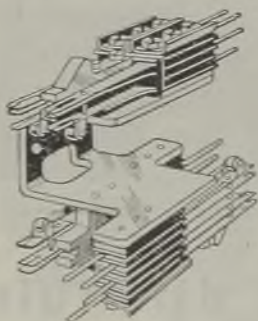
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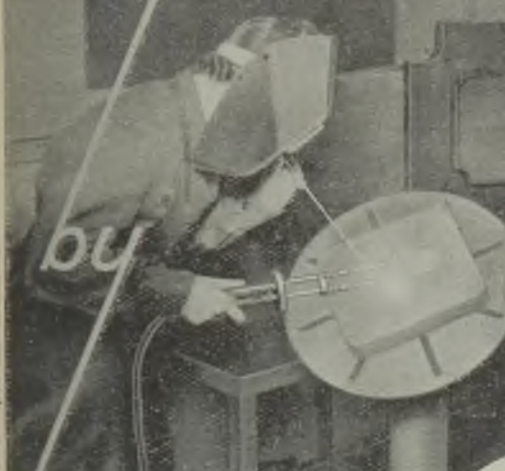
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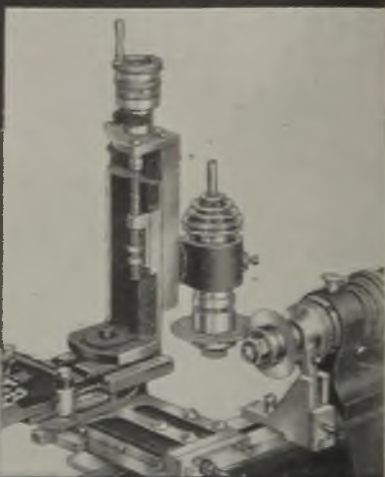
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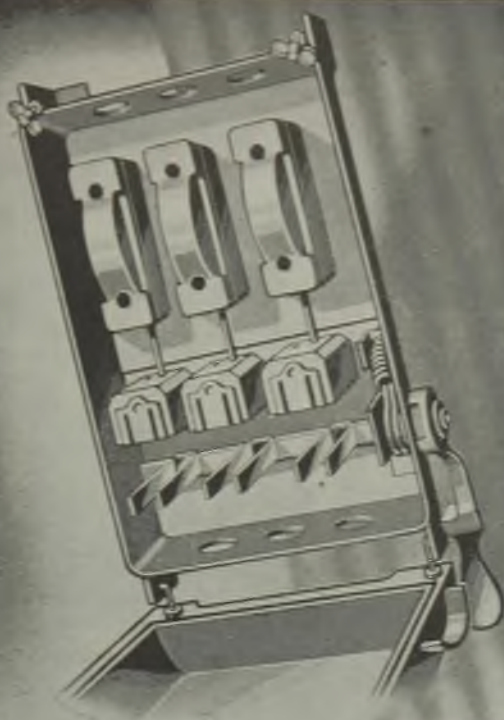
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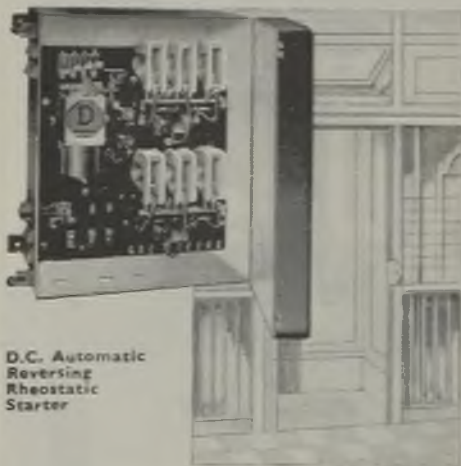


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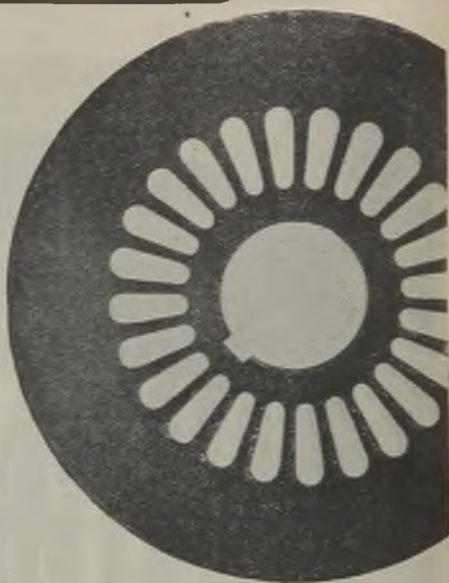
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SILK VARNISH GLASS
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MADE BY —

F. D. SIMS LTD.

HAZELHURST WORKS, RAMSBOTTOM, LANCs.

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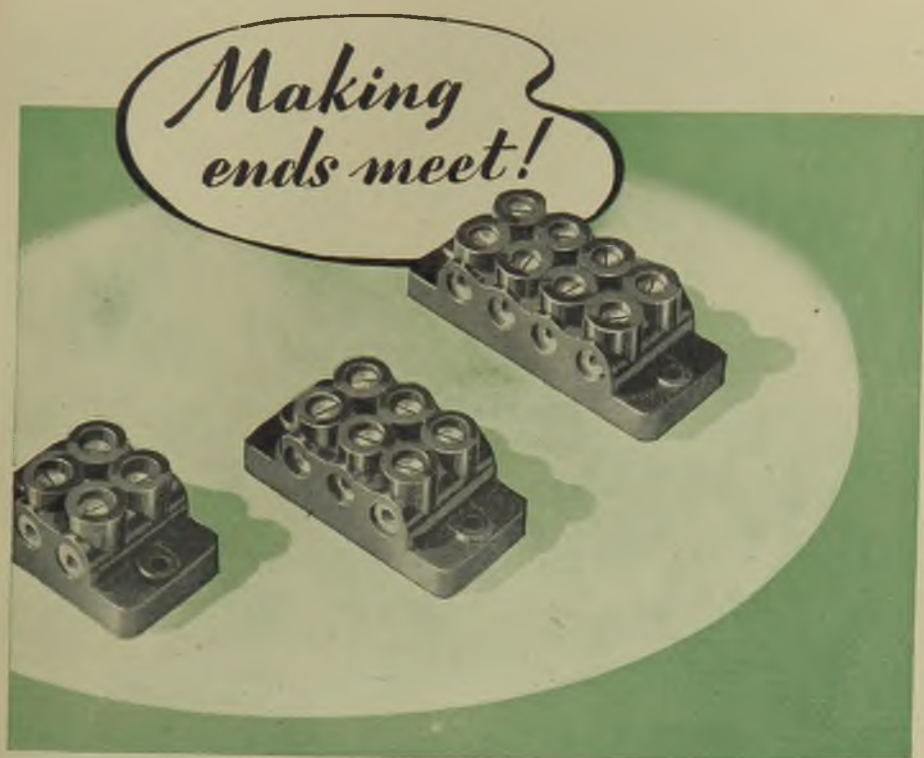
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SUPPLIES ARE AVAILABLE
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We have a wide range of Standard 2, 3, and 4 Way Terminal Blocks to meet the requirements of manufacturers of electrical equipment. We have designed and produced many mouldings for the Electrical Trade, and these are some of the few which we can still manufacture for present-day needs. However, we look forward to the time when we shall be solving your post-war problems, assisted by the extensive knowledge we are gaining in manufacturing to exacting war-time specifications.

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This is an S.P. stand-off insulator extensively used in radio transmitting equipment. We make many types of insulator for all purposes. It may be worth your while to consult us before you finalise your design.

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Telephone: Stourport 111.

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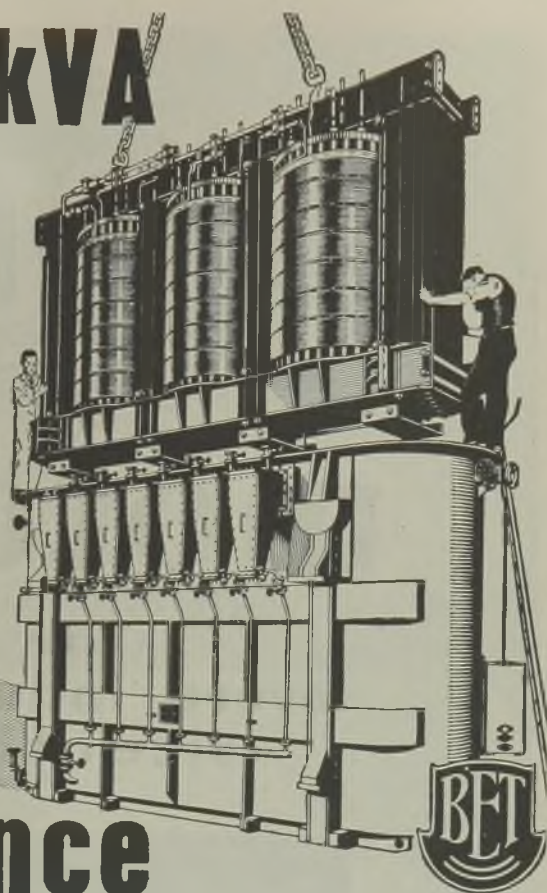
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62,500 kVA

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B.E.T.

Experience



This B.E.T. 62,500 kVA Transformer is going into its tank to give years of service. Its duty will be a responsible one but it goes out with the confidence of its makers. B.E.T. have specialised

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The
British Electric Transformer
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In association with CROMPTON PARKINSON LIMITED

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motors

**for
every industrial
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L.D.C. Weather-proof Motors, operating in the open, driving Sludge Pumps.

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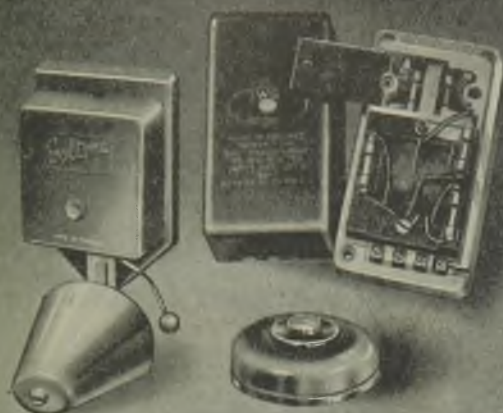
WILLESDEN, LONDON, N.W. 10

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Foster Transformers & Switchgear Ltd.

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Made to a Standard



This illustration shows a W. & G. Electric Bell, Push and Transformer, one of many types usually available.

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

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ESTABLISHED OVER HALF A CENTURY

**Vacuum
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Process
a cause
of worry?**

*then let us give you the
benefit of our practical
experience*

Consult -

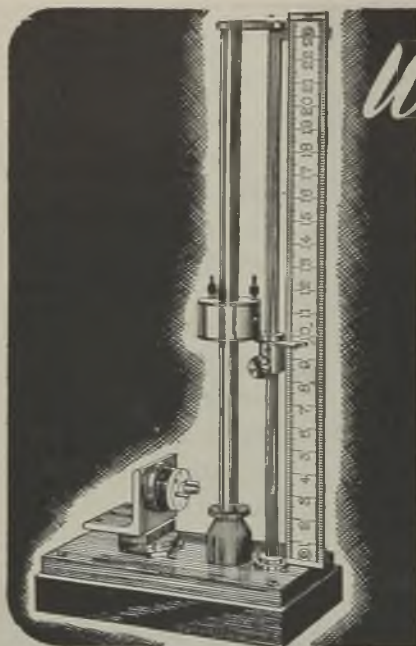
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*First in the field of British Insulating
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Wylex Testing

MOULDING TEST—Wylex mould their own mouldings and prove for themselves the strength of every one. Here is shown the Impact Test Machine, designed and made at Wylex Works. Wylex mouldings must satisfy the exacting demands of this machine.

"Wylex must be good"

GEORGE H. SCHOLDS & CO. LTD.
WYLEX WORKS, WYTHENSHAW,
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*Tens of Thousands
in daily use*

GRIPPER

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**LEAVES
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HANDS FREE**

**11¹/₂ + 40%
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**BRITISH CENTRAL
ELECTRICAL CO. LTD.**
6-8 Rosebery Ave. London, E.C.1
Telephone 2525

*"An
absolute
necessity
if ever there
was one!"*

SLIDING RESISTANCES

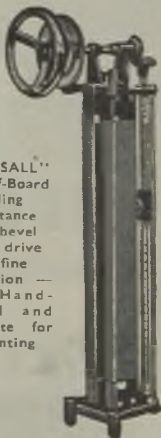
FOR ALL PURPOSES

"Cressall" Sliding Resistances are manufactured in an immense variety of types and sizes to meet every known requirement.

Every "Cressall" Resistance is of sound design and incorporates the best possible workmanship—yet

PRICES ARE COMPETITIVE

"CRESSALL"
Back-of-Board
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wheel drive
for fine
regulation —
with Hand-
wheel and
Dialplate for
mounting

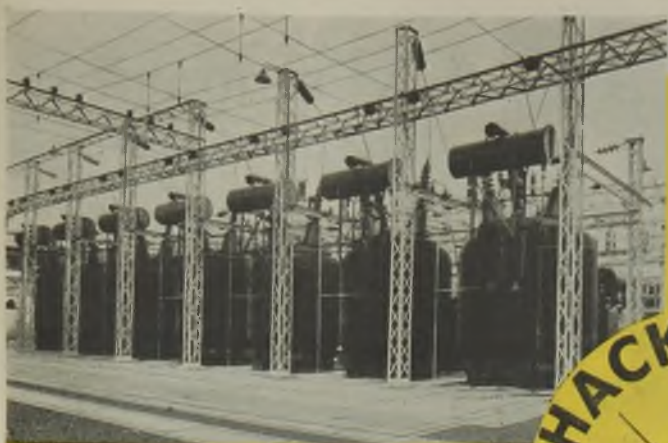


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Phone: Aston Cross 3463/4
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Please send us your enquiries—and ask for descriptive literature



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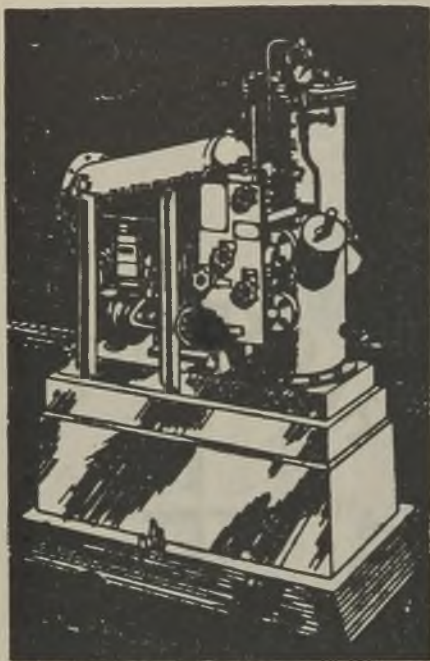
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Hackbridge Transformers are backed by nearly a quarter century of experience in constructing millions of kVA of transformers including very large units of over 90,000 kVA capacity, for service all over the world. The illustrations show for example installations in Tasmania, South America, Canada and East Africa.

HACKBRIDGE ELECTRIC CONSTRUCTION CO. LTD., WALTON-ON-THAMES, SURREY
Telephone : Walton-on-Thames 760 (8 lines) Telegrams : "Electric, Walton-on-Thames"



A Monument to Efficiency

In a single passage through the Metafilter, transformer and heavily carbonized switch oils can be completely freed from all suspended impurities; and all traces of sludge and moisture removed—a monumental tribute to the efficiency of the Metafilter.

The Metafilter is economical and easy to operate; and can be used on switches and transformers while under load.

Metafiltration

THE METAFILTRATION COMPANY LTD
BELGRAVE ROAD · HOUNSLOW · MIDDLESEX

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Telegrams : - - Metafilter, Hounslow



THE
**Sump
Mopump**

SUMP Mopump for
sunwatering shallow
small wells or sumps.
Strongly constructed
unit prepared for
continuous service.

Can be provided
with float controlled
automatic starting
and stopping switch



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WIRE
GRIDS
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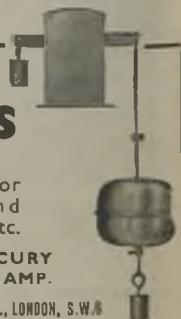
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FLOAT SWITCHES

for
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MECHANICAL OR MERCURY
CONTACT TYPES 5-10 AMP.

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RESISTANCES

Although present circumstances render it difficult for us to give our pre-war service to all customers we are still working in their interests.

New materials and manufacturing processes which we are now using to increase output also contribute in large measure to improved performance and reliability of our products. Thus, when normal times return, all users of Berco Resistances will benefit by our work to-day.

THE BRITISH ELECTRIC RESISTANCE CO. LTD.
QUEENSWAY, PONDERS END, MIDDLESEX

Telephone: HOWARD 1492.

Telegrams: "VITROHM, ENFIELD."

R.1

BERCO Wire-wound Potentiometer

From War — with equally loyal service — to Peace



DURATUBE & WIRE LTD.

Faggs Road, Feltham, Middx.

Telephone: FELtham 3332 & 3803



DURAWIRES & DURACABLES ARE NOT A WAR EMERGENCY SUBSTITUTE
 They are not a substitute at all in the sense in which this irritating word is generally used. DURAWIRES AND DURACABLES have their own OUTSTANDING PROPERTIES and will play their part in building the New World as they have helped to win the war.

~~Emergency~~

~~Substitute~~

HALSEY'S

ELECTRIC CO. LTD.

WHOLESALE ELECTRICAL DISTRIBUTORS

will be pleased to advise on any problem connected with

FLUORESCENT (DAYLIGHT OR WARM-WHITE) LIGHTING

— Your enquiries will receive prompt attention —

Comprehensive stocks of E.L.M.A. Lamps, Switchgear of every description, Cables, Conduits, Fittings, Accessories, etc. Delivery in Greater London by our own transport.

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WITH
"PRANA"
WOVEN WIRE ARMOURING
FLEXIBLE · DURABLE · ECONOMICAL
Write for booklet to Dept. 52
SPARKLETS LIMITED
LONDON, N.18

GREY & MARTEN LTD.

Manufacturers For

For all Electrical Work. To British Standard or any other specifications.

With a reputation for purity of constituents and excellence of appearance.

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Phone : HOP 0414

Grams : Amalgam, B'ham

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**LAND & MARINE
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**YARROW & CO. LTD.
SCOTSTOUN
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The MOTORLITE TRANSFORMER UNIT

This low-voltage unit of maximum efficiency and safety incorporates a double-wound transformer (to B.S.S. 794) and double-pole switch with 4 fuses (2HT and 2LT) all mounted on a readily removable Gas Oven type door, the opening of which breaks both circuits. The HT Terminals have safety shields. Two spare fuses for each circuit are mounted in the case.



Two or three arm lamp brackets can be supplied at an extra cost.

Standard rating—60,
80 and 120 V/A max.
Volts 440, min.
Volts 12

Made by
THE CONCORDIA
TRANSFORMER CO.
a subsidiary of
THE CONCORDIA
ELECTRIC SAFETY,
LAMP CO. LTD.

Telephone :
ABBey 4266

SOLE SALES AGENTS :

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ELCORDIA LIMITED, 2 CAXTON ST., WESTMINSTER, LONDON, S.W.1



Resistance

Bath night! Ugh—immediate Resistance, though not quite our type. We have studied the subject for years and pride ourselves that Cromaloy wires are by far the best proposition in their own field of Resistance.

Cromaloy

ELECTRICAL RESISTANCE WIRES

A. C. SCOTT & Co. Ltd., CROMALOY HOUSE, CITY RD., MANCHESTER.

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SAXONIA  **PRODUCT**
ESTAB. 1895

HEAT RESISTING
INSU-GLASS

REGISTERED No. 820,081

INSULATED - INSTRUMENT WIRES
PLAIN & ENAMELLED H.C. COPPER STRANDS

NON-FERROUS SAND CASTINGS

In all
non-ferrous
metals

TRIONITE

TRIONITE LTD.

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Dear Sirs,

BEVERLEY WORKS,
ALMA STREET,
BIRMINGHAM, 6.

ALSO HOT STAMPINGS SPRINGS AND PRESSWORK.

Yours faithfully
REDFERN STEVENS LTD.

(Regd.)

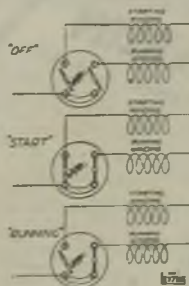
"TWINOB" A.C. SINGLE-PHASE MOTOR-STARTING SWITCH

Split-Phase Control

5 & 10 amps. at 250 volts



STANDARD



ALL-INSULATED

LEAFLETS EI. 41, 52 & 60

Established
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The reputation acquired in nearly half a century's diligent labour is no small asset. We prize it too highly to produce any appliance which is not a credit to our name. In fact, the upholding of your esteem is the foundation of our future.

DOWSING COMPANY (ELECTRICAL MANUFACTURERS) LTD.
Kangley Bridge Road, Lower Sydenham, S.E.26



JUST TO REMIND YOU—
"HYPERLOY"
 TRANSFORMERS & CHOKES

- WEIGH ONLY TWO OUNCES
- MEET THE MOST RIGID TROPICAL SPECIFICATION
- CAN EASILY BE MOUNTED IN ANY POSITION
- VARIED WINDINGS MEET MANY DIVERSE APPLICATIONS
- FULFIL THE MOST EXACTING REQUIREMENTS OF MODERN ELECTRONIC AND COMMUNICATIONS EQUIPMENT 1023

WRIGHT & WEAIRE LTD
 HIGH ROAD • TOTTENHAM • LONDON • N17 Tel.: TOTtenham 3847/9
 VIBRATORS • TRANSFORMERS • SWITCHES • COILS

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PUSH BAR HOLDERS

Bakelite moulded—fitted with a porcelain interior in which is housed the quick break switch mechanism, terminals and plungers. They can be supplied as a cord-grip type or with screwed cap to suit either 1/2 gas, 1/2 and 1/2 brass or 1/2 and 1/2 conduit threads.

**ASHLEY
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MULTI-PLUG ADAPTORS

ELEVEN TYPES

Fully illustrated descriptive folder on application

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



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TENAPLAX

Co-axial Cable

SOME TENAPLAX CABLES HAVE
60% AIR INSULATION
 Patented method of construction
 reduces losses to a minimum

for
 HIGH
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 FREQUENCIES

- Plastic Cover • _____
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Write for full particulars to:
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CAN BE
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 FOR ANY
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Hints on machining TUFNOL

THE ENGINEERS MATERIAL. NON-METALLIC. LIGHTWEIGHT



Fuller details of speeds and
 cuts are given in our "Manual
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GRINDING. A centreless grinder or sand-paper machine is recommended for grinding circular sections of Tufnol. Run centreless grinders dry, prevent clogging and true up periodically. Use open-grained garnet or flint grinding bands for sand-papering machines, close grained bands may clog and "burn" the Tufnol. Strip Tufnol can be ground to accurate limits on vertical spindle machines fitted with grinding wheels. Finish by light application on a dry mop and apply "Tufnol Finishing Oil".

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CONDENSERS



We regret that this particular type of condenser is not on our stock list. If, however, you require a high voltage condenser of 10—10,000 mmf. capacity, it is more than probable that a **Mycalex** Condenser can be found that will exactly suit the operating conditions.

A fully illustrated brochure, giving characteristic curves, details of ratings, sizes, etc., will gladly be sent on request

MYCALEX COMPANY LIMITED - CIRENCESTER - GLOS.

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AS SURE AS THE SUNRISE

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KNIGHTON LANE, BUCKHURST HILL, ESSEX.

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TO YOUR SERVICE

Write to:-

The DALYTE ELECTRICAL
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about

CABLE REELING DRUMS

The Dallyte Electrical Co., Ltd., West Row, London, W.10

The new PYROBIT UNIVERSAL NEON TESTER

in a moulded plastic case
is now available

Ask for
Leaflet



for the
vest
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ACRU ELECTRIC TOOL MFG. CO. LTD.
123 HYDE ROAD, ARDWICK, MANCHESTER

Dependability



INSTRUMENT WIRES
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TELEPHONE & RADIO CORDS
CABLES & FLEXIBLES

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ADJUSTABLE LIGHTING



FOR INDUSTRIAL USES

'Direct-O-lite'

C.M.CHURCHOUSE LTD..

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Telephone: PARK 8617-B

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**FOR TRAM & TROLLEY WORK
FOR CABLE CONSTRUCTION & REPAIR
FOR USE IN CHEMICAL FACTORIES**



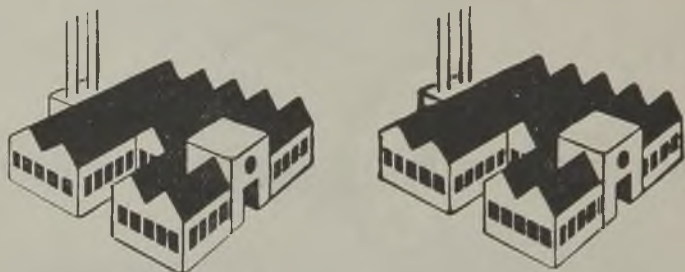
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INSULATING
TAPE

P & B Insulating Tape retains its adhesiveness and offers permanent resistance to mechanical damage. It is proof against water and the fumes of acids and alkalis. Supplied in rolls from 1/4" width upwards. As our industry is controlled our ability to execute orders is subject to the regulations imposed by the Ministry of Works

THE RUBEROID CO. LTD.

92 Commonwealth House, New Oxford Street, W.C.1



one of these factories is out-of-date

ITS PLANT IS first-class, its workers skilled and willing, its management capable—but its lighting is wrong. All the good work, the new machinery, the careful executive control, operate in extremes of light and shadow, trying to the eyes and nerves, slowing up output . . . In the other factory, OSRAM Fluorescent Lamps provide a cool, shadowless light that is the next best thing to daylight itself—restful, diffused, evenly distributed. And economical, too! The 80-watt OSRAM Fluorescent Lamp gives three times as much light as a tungsten lamp for the same amount of current. No wonder records are broken in Factory No. 2 while it is always a struggle to keep abreast in Factory No. 1.

Stocks available at all G.E.C. Branches

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FLUORESCENT

LAMPS

DAYLIGHT and WARM WHITE



CLASSIFIED ADVERTISEMENTS

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

THE CHARGE for advertisements in this section is 2/- per line (approx. 8 words) per insertion, minimum 2 lines 4/-, or for display advertisements 30/- per inch, with a minimum of one inch. Where the advertisement includes a Box Number there is an additional charge of 6d. for postage of replies.

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

Original testimonials should not be sent with applications for employment.

OFFICIAL NOTICES, TENDERS, ETC.

CITY OF BIRMINGHAM ELECTRIC SUPPLY DEPT.
Distribution Transformers to Specification No. D.E.123

THE ELECTRIC SUPPLY COMMITTEE invites tenders for the supply and delivery during the period ending 31st August, 1946, of

10,750/410-volt, three-phase **DISTRIBUTION TRANSFORMERS** of the Indoor, Outdoor and Pole Mounting Types, and of various ratings from 50 kVA to 1,000 kVA.

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 refunded 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 Wednesday, 29th August, 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, F. W. LAWTON,
Birmingham, 4. Chief Engineer and Manager. 2528
1st August, 1945.

COUNTY BOROUGH OF WEST HARTLEPOOL

Paper Insulated Cables

TENDERS are invited for twelve months' **SUPPLY AND DELIVERY OF PAPER INSULATED CABLES** in accordance with specification and tender form which may be obtained on application to the undersigned.

Tenders, addressed to the Chairman of the Electricity Committee, must be delivered at the Town Clerk's Office, Municipal Buildings, West Hartlepool, not later than Noon on 27th August, 1945.

No tender will be received unless it is enclosed in a sealed envelope, which must bear the words: "Tender for Cables," but shall not bear any mark indicating the sender.

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

Electra House, S. TILLOTSON, A.M.I.E.E.,
Church St., West Hartlepool. Borough Electrical Engineer. 2529
31st July, 1945.

NORTH OF SCOTLAND HYDRO-ELECTRIC BOARD

THE North of Scotland Hydro-Electric Board invite tenders for the supply, delivery and erection of 132,000-volt Transmission Lines.

Copies of the Form of Tender, Conditions of Contract, Specification and Schedules may be obtained from the undersigned on deposit of £5 5s., which will be returned on receipt of a bona fide tender.

Tenders on the form supplied must be lodged with the undersigned not later than 15th October, 1945.

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

16, Rothesay Terrace, T. LAWRIE,
Edinburgh, 3. Secretary. 2538
31st July, 1945.

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.

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.

SHEFFIELD CORPORATION

Electricity Department

Appointment of Deputy General Manager and Engineer

A PPLICATIONS are invited for the position of Deputy to the General Manager and Engineer at a commencing salary of £1,100 per annum, rising to £1,400 per annum by three annual increments of £100.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and candidates must have previous Local Authority Service carrying a transfer value within the meaning of the Act, or otherwise be not more than 40 years of age. The selected candidate will be required to pass a medical examination.

Candidates should be Corporate Members of the Institution of Electrical Engineers, and should have had a sound training in mechanical and electrical engineering. They should be experienced in the construction, operation and control of a large Electricity Supply Undertaking, and have a sound technical knowledge of both modern steam practice and the latest developments of electrical practice.

Applications, which must be made on the application form, copies of which may be obtained (with particulars of the duties, terms and conditions of appointment) from the undersigned, must be received by the undersigned by the first post on Tuesday, the 28th August, 1945.

Canvassing or any communication with members of the City Council, either directly or indirectly, is prohibited and will be a disqualification.

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

JOHN HEYS,

Town Clerk.

Town Hall,
Sheffield, 1.
27th July, 1945.

2493

LONDON POWER COMPANY LTD

A SSISTANT Maintenance Engineer required at Battersea Generating Station.

Applicants should be capable of organising and directing a large staff in all classes of work associated with repairs and maintenance of large H.P. and E.H.P. water tube boiler plant and auxiliary equipment, and should have had previous experience in this category.

Applicants should also have a sound technical training, preferably with Drawing Office experience, and a general knowledge of power station operation.

Salary in accordance with N.J.B. Schedule, Class M, Grade 8B (first year), £529 per annum.

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

Applications, in writing, to the Station Superintendent, Battersea Generating Station, Kirtling Street, S.W.8.

2515

COUNTY BOROUGH OF BLACKBURN**Electricity Undertaking****Appointment of Technical Superintendent**

APPPLICATIONS are invited for the above position from Engineers who have had considerable experience in the construction, operation and maintenance of modern electricity supply undertakings.

Applicants must also have had experience in the design, layout and operation of modern power stations, and be corporate members of the Institution of Electrical Engineers and/or the Institution of Mechanical Engineers.

The conditions of employment will be in accordance with the National Joint Board Schedule, and the salary will be Class H, Grade 3, at present £664 per annum.

The appointment will be subject to the provision of the Local Government Act, 1937, and the person appointed will require to pass a medical examination.

Applications, stating age and giving full particulars as above, technical training and qualifications, accompanied by copies of not more than three recent testimonials, must be forwarded to:

R. H. Harral, M.I.E.E.,
Engineer and Manager,
Electricity Offices,
Jubilee Street,
Blackburn.

appropriately endorsed and delivered not later than Saturday, August 18th, 1945.

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

CHAS. S. ROBINSON,

Town Hall, Blackburn. Town Clerk. 2496

BOROUGH OF ALDERSHOT**Electricity Department****Meter Tester**

APPPLICATIONS are invited by the Borough of Aldershot Electricity Department for a fully qualified Meter Tester in a Class "A" Non-Polyphase Testing Station. Salary will be in accordance with the National Joint Board Schedule of Salaries for a Class D Grade 8A Station. Applicants must have had experience in the use of a potentiometer, and in the calibrating of sub-standard instruments, also in the repairs, testing and calibrating of A.C. single phase and D.C. meters, and prepayment fixed charge collectors. They must also be fully conversant with the Electricity Commissioners' requirements and instruments connected with a Class "A" Station under the Electricity Supply (Meters) Act, 1936. The post will be subject to the provisions of the Local Government and Other Officers' Superannuation Act, 1937, and the successful candidate will be required to pass the necessary medical examination.

Applications, giving full particulars of age, training and experience, together with copies of three recent testimonials, should be sent to:

Mr. L. W. GEORGE, A.M.I.E.E.,
Borough Electrical Engineer,
87, Victoria Road, Aldershot, Hants.

and endorsed "METER TESTER," not later than the first post on the 24th August, 1945.

By permission of the Ministry of Labour and National Service under the Control of Engagement Order, 1945.

2522

JOHNSON & PHILLIPS LTD.

invite applications for
the position of

Manager of their Publicity Department

Applications, which will be treated in strict confidence, should state age, qualifications, experience and salary required, and should be addressed to the General Manager, Victoria Works, Charlton, S.E.7.

2506

**APPOINTMENT OF FOUR RESIDENT ENGINEERS
AND FOUR ASSISTANT RESIDENT
ENGINEERS FOR INDIA**

APPPLICATIONS are invited for the above posts in the Electricity Supply Department of Messrs. Martin & Co., Calcutta, to fill vacancies in their Electricity Supply Undertakings in the United Provinces and Central Provinces of India.

Grade B. Applicants for the posts of RESIDENT ENGINEER should be fully qualified Electrical Engineers between the ages of 35 and 40 years, and should have had at least four years' executive and commercial experience in the control and management of an Electricity Supply Undertaking.

Grade A. Preference will be given to those with additional qualifications, e.g., Chartered Electrical Engineers, Chartered Mechanical Engineers and those with at least four years' experience in the efficient maintenance, operation and control of a modern thermal power station.

Grade B. Applicants for the posts of ASSISTANT RESIDENT ENGINEER, preferably unmarried, should be between the ages of 25 and 30 years, with sound technical training and practical experience in Electrical Engineering.

Grade A. Preference will be given to those with additional qualifications, e.g., Bachelors of Science, Student, Graduate or Corporate Members of the Institutions of Electrical Engineers, and those with at least four years' practical experience in the generation and/or distribution of electricity.

SALARY SCALE (1 rupee equals 1s. 6d. approx.). Grades according to qualifications.

RESIDENT ENGINEER: Grade A, Rs. 1,250/-, rising by annual increments of Rs. 100/- to Rs. 1,750/- per month. Grade B, Rs. 1,000/-, rising by annual increments of Rs. 50/- to Rs. 1,200/- per month.

ASSISTANT RESIDENT ENGINEER: Grade A, Rs. 750/-, rising by annual increments of Rs. 50/- to Rs. 950/- per month. Grade B, Rs. 625/-, rising by annual increments of Rs. 25/- to Rs. 725/- per month.

All posts carry a 5 years' agreement, with free passages, a liberal house and car allowance, free medical attention and liberal home leave on renewal of contract.

Successful applicants will be required to pass a medical examination and contribute to the Company's Provident (Superannuation) Fund.

Applications, stating post applied for, age, whether married, qualifications, particulars of education, training and experience, and accompanied by copies of not more than three testimonials or references, should be addressed to "F. D." c/o Charles Barker & Sons Ltd., 31, Budge Row, London, E.C.4. 2532

**THE CHESHAM ELECTRIC LIGHT & POWER
COMPANY LTD.****Assistant District Distribution Engineer**

APPPLICATIONS are invited for the above appointment from qualified engineers experienced in the installation, testing, maintenance and operation of H.V. and L.V. overhead and underground mains, and in the erection and operation of distribution sub-stations. The salary will be not less than £330 per annum, plus a war allowance at present £65 per annum, and car allowance.

Applications, stating age, training and appointments held, should be addressed to the Secretary, at 66 The Broadway, Chesham, Bucks, and endorsed "Assistant Engineer."

The Ministry of Labour and National Service Technical and Scientific Register have given permission under the Control of Engagement Order, 1945, for the advertisement of this vacancy. 2520

FIRST GARDEN CITY LIMITED**Electricity Undertaking**

CONTROL ENGINEER required to operate modern E.H.T. and D.C. switchboard at generating station, N.J.I.C. schedule (No. 9 area) rate, 2s. 4½d. per hour; state experience, age, married or single, as there is an acute housing shortage in the area.

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

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

Works Road, Letchworth, Hertfordshire. Engineer and Manager. 2496

STALYBRIDGE, HYDE, MOSSLEY & DUKINFIELD TRANSPORT & ELECTRICITY BOARD

Electricity Department

Applications are invited for the following positions:

ASSISTANT Maintenance Engineer. Applicants must preferably have had experience in the operation and maintenance of H.P. Turbines and Boilers (650 lbs. sq. in.) in a Selected Generating Station, and should have had a sound mechanical training, and be capable of supervising all repairs on Turbines, Boilers, Coal, Ash and Auxiliary Plants. Commencing Salary £485 per annum, in accordance with N.J.B. Schedule, Class "H", Grade 7. Switchboard Attendant for the Control Room in a Selected Generating Station. Experience with E.H.T. and L.T. Switchboard and large Generators essential. Wages and Conditions of Employment in accordance with N.J.I.C. Schedule (Area No. 3). Present wages 29.75d. per hour, average hours 48 per week.

Applicants for the above positions should apply by letter only in the first instance, enclosing copies of recent testimonials. Successful candidates will be required to pass a medical examination, and contribute to the Board's Superannuation Scheme.

Applications should reach the undersigned not later than 24th August, 1945.

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

J. HARWOOD LUMSDEN, M.I.Mech.E., A.M.I.E.E.,
Chief Engineer.

Electricity Offices & Showrooms,

Tame Valley,

Stalybridge, Cheshire.
2510

COUNTY BOROUGH OF HALIFAX

Appointment of Chief Inspector, Public Lighting Department

APPLICATIONS are invited for the appointment of CHIEF INSPECTOR in the PUBLIC LIGHTING DEPARTMENT.

Salary £250 per annum, rising by four annual increments of £12 10s. to £300 per annum, plus current War Bonus (at present £59 16s. per annum.).

Applicants should have experience in the maintenance of public lamps, gas and electricity supply systems, the control of men and in administrative and clerical matters.

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

Applications giving particulars of age, experience and position as regards National Service, accompanied by copies of two testimonials, and endorsed "Chief Inspector, Public Lighting Department," must be delivered to the undersigned not later than 18th August, 1945.

W. USHER,

Town Clerk.

Town Hall,

Halifax.

24th July, 1945.

2472

AN opportunity occurs for a Maintenance Electrician to assume full charge of the work of an industrial group. An adequate salary will be paid and the candidate will be expected to supervise and develop the industrial maintenance and domestic installation business as determined by the Directors. Only candidates suitably qualified and possessing enterprise, initiative and drive and preferably commercial experience will be considered. Applications only from those over 51 or from Class A ex-servicemen with references to—Box 2523, c/o The Electrical Review.

APPLICATIONS are invited for the position of Combustion Engineer. Applicants should have had experience of the operation of large boiler units, preferably working at high pressure. Some electrical knowledge is also desirable. Salary Grade 43, Class II, N.J.B. Schedule. Apply Power Station Superintendent, Northmet Power Company. This advertisement is issued with the consent of the Ministry of Labour and National Service.

2503

THE MERSEY POWER COMPANY LTD.

Applications are invited for the following positions:

TECHNICAL Assistant. To supervise Records Office and carry out technical investigations. Degree, or equivalent technical qualification. Previous works experience not essential. Salary Class J, Grade 10A (at present £300 per annum).

Assistant Switchboard Attendant: Technical qualifications and previous experience with power plant switchgear required. Salary, Class J, Grade 10A (at present £300 per annum).

Conditions of appointments in accordance with N.J.B. Agreement.

Applications, stating present position, age, details of training and experience, together with copies of testimonials, to be addressed as below, and received not later than Wednesday, August 28th, 1945.

Envelopes should be endorsed with the vacancy applied for.

Permission has been received from the Ministry of Labour and National Service to advertise these vacancies.

General Manager and Engineer,
The Mersey Power Co. Ltd.,
Roche House,

Runcorn,
Cheshire.

2509

APPLICATIONS invited for appointments, after present restrictions are removed, for Transformer Sales Engineers for various areas in the British Isles. Immediate vacancies open to Class "A" ex-Service men.—Box 7416, c/o The Electrical Review.

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

DRAUGHTSMAN required for Electrical Machines. North Kent district. State experience and salary required. Applicants should be over 51 years of age. Class A ex-service men, or otherwise exempt from M.O.L. control.—Box 2353, c/o The Electrical Review.

ELECTRICIAN required immediately by Electrical Contractors, London, permanency to suitable man. Class "A" ex-Service man or man over 51. Apply, giving full particulars to—Box 2422, c/o The Electrical Review.

ELECTRICIANS required. Apply in writing, giving full details of experience, to Giles (Electrical Engineers) Ltd., 11 Victoria Colonnade, Southampton Row, W.C.1. Class A ex-servicemen only, or over 51. 2505

ELECTRICIANS wanted by Central London Contractors. Class "A" ex-Service men only, or over 51.—Box 7383, c/o The Electrical Review.

ELECTRICIANS wanted by Electrical Contractors in Warrington, Lancashire. Permanency to good men. Class "A" ex-Service men or over 51.—Box No. 2494, c/o The Electrical Review.

ENGINEER required with up-to-date knowledge of design of electrical automatic controls; hydraulic and general engineering experience also essential; applications only from those over 51 or Class A ex-servicemen. 2508

EXPANDING London Company engaged in development of new electrical instruments requires immediately executive to co-ordinate research and development work and small-run production prior to sub-contracting for large-scale manufacture. The position is one of considerable scope, requiring knowledge of scheduling, time-planning, purchasing, and calls for ability to co-ordinate the activities of technical personnel, but does not necessitate technical qualifications. Write full details of qualifications, etc. to—Box 2499, c/o The Electrical Review.

FOREMAN required for Electrical Instrument department, sound knowledge and practical experience with moving coil instrument production, scaling, calibrating, training female labour. Permanent post with good prospects. Over 51 or Class A ex-service man only.—Box 2398, c/o The Electrical Review.

INVOICE Clerk (Female) required for electrical wholesalers, Hammersmith district, good at figures and preferably with knowledge of E.L.M.A. discounts, etc. Permanent and progressive position to suitable applicant. State full particulars of experience, age and wages required in confidence to—Box 2454, c/o The Electrical Review.

LARGE Company in North West Area has vacancies for Senior Electrical Designers, immediately the present restriction on employment is removed. Applications are now required, and applicants should have experience in design of A.C. and D.C. Dynamo-Electric Machines of all types and sizes. State age, experience, and salary required.—Box 2495, c/o The Electrical Review.

LADY Secretary-Typist. London (Westminster) office of Manchester engineers. Interesting, permanent post. Full particulars—Box 2533, c/o The Electrical Review.

LIFT Engineers. Old-established firm requires experienced man as General Manager. Salary and participation in profits. Applications accompanied by details of experience will be considered in confidence.—Box 2456, c/o The Electrical Review.

MAN experienced in high vacuum technique, required to take charge of Department manufacturing Mercury Switches. Knowledge of Glasswork an advantage.—Box 2525, 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 2424, 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.

OVERSEAS Employment. Accountant (Temporary Staff). Required by the Nigerian Government Public Works Department for one tour of 12 to 24 months. Fixed salary between £600 and £720 a year according to qualifications and experience. On salary of £600 separation allowance for married men is between £72 and £192 a year according to number of children. Candidates must hold a recognised accountancy qualification, and should preferably be members of the Institute of Cost and Works Accountants. They should have had experience in the Store and Accounts section of a large electricity undertaking, and be capable of supervising the issue of electrical stores for construction works, and keeping all necessary costing records. Applications, which must be in writing, stating date of birth, full details of qualifications and experience including present employment, also identity and National Service or other registration particulars, and quoting Ref. No. O.S. 749, should be addressed to—The Ministry of Labour and National Service, Appointments Department, Sardinia Street, Kingsway, London, W.C.2. 2530

REQUIRED immediately for India expert Production Engineer for new dry battery factory. Candidates must have long manufacturing experience, ability to erect, operate and maintain production machinery. Knowledge of formulae essential. Apply in writing with particulars of experience and salary required to Bowden Bros. Ltd., Grand Buildings, Trafalgar Square, London, W.C.2. 2517

SALESMAN wanted for non-rig cables in S.E. Counties and South Coast areas. Details of age, experience and connections to Box 2511, c/o The Electrical Review.

SALESWOMAN required for Electrical Contractors Showroom. (Only applicants having held similar position need apply). Write giving full particulars, wages required, etc. W. T. Clarke & Co. Ltd., Sicilian Avenue, Southampton Row, W.C.1. 2421

SWITCHBOARD Attendant, experienced in operating E.H.T. Switchgear, synchronising and control of turbine alternators, for Iron and Steel Works, North-East Coast. Salary £350 per annum. T.U. Permanent position. The Ministry of Labour and National Service have given permission under the Control of Engagements order, 1945, for this advertisement.—Apply Box 2487, c/o The Electrical Review.

THE Indian Iron & Steel Co. Ltd. require an Assistant Electrical Engineer, who must be well experienced in electrical maintenance in Iron and Steel Works. Modern power house experience an advantage. Technical knowledge essential, and preference to candidate with engineering degree or equivalent. Age about 30-35. Starting salary Rs.1,000/- per month (= £75 at 1/6d. exchange). Provident Fund, free unfurnished quarters, free medical attention, passage paid both ways, local leave allowed in India, and Home leave on renewal of Agreement, four years Agreement. Write with details of experience, stating age and whether married, and position applied for to—Z. W., c/o Charles Barker & Sons Ltd., 31, Budge Row, London, E.C.4. 2531

TRANSFORMER Assembler 10-200 kVA. Must be capable of complete assembly from drawings. Good progress for efficient man in new department. Applications only from those over 51 or Class A ex-servicemen.—Reply Box 2474, c/o The Electrical Review.

WANTED. Storekeeper. Good prospects for efficient and responsible man. Must be over 51 or Class "A" ex-Serviceman.—Box 2500, c/o The Electrical Review.

WELL-known Firm in the Manchester District will require Engineers immediately after removal of present restriction of employment, for handling of enquiries or orders for Electric Motors, Generators and Allied Equipment. State age, experience and salary required.—Box 2488, c/o The Electrical Review.

WIREMAN wanted, London, over 51 or otherwise free to take position. Best conditions. Reply—Box 2344, c/o The Electrical Review.

WORKS Manager required by leading cable manufacturers, London area; sound managerial qualifications essential, together with experience of manufacture of rubber and thermoplastic insulated cables; experience of wire-drawing and other operations an advantage, age 35/45; first-class opportunity for the right man. Write in confidence, stating experience and salary required, to—Box 2458, c/o The Electrical Review.

WORKS Manager required for Dominion Lamp Works. Extensive production and technical experience of General Service Lamps essential. Must possess resourcefulness to develop and expand existing production on own initiative. Full details to Box 2521, c/o The Electrical Review.

WORKS Manager required for small Control Gear and Switchgear Works in the North-West of England. Applicants should have had experience in similar manufacture and must give full particulars of age, experience and salary required. Address to—Box 2462, c/o The Electrical Review.

APPOINTMENTS FILLED

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

BUCKROSE Light & Power Co.—Assistant Area Engineer.

SITUATIONS WANTED

ADVERTISER (50), experienced in all branches sales office organisation, many years administrative position, methodical and efficient controller, seeks change.—Box 7382, c/o The Electrical Review.

A.M.I.E.E. seeks responsible senior position. Wide experience electrical contracting and wholesale. Knowledge of American methods. Full experience both technical and commercial in management and administrative work.—Box 7438, c/o The Electrical Review.

A.M.I.E.E. (38). Specialised H.T./L.T. Switchgear. 8 years B.E.A.M.A., experience export contracts, now free, requires similar position with large undertaking. Offers to—Box 7421, c/o The Electrical Review.

BUYER. A.M.P.O.A. Age 35. Ten years with leading firm Domestic Electrical Appliance Manufacturers; still so employed. Desires change to Company engaged on similar light engineering activities, London area or South.—Box 7355, c/o The Electrical Review.

ELECTRICAL and Mechanical Engineer, fully qualified seeks appointment where organising ability and keenness are essential. Experienced in the management and administration of an electrical undertaking with extensive practical experience construction, maintenance and operation work.—Box 7434, c/o The Electrical Review.

ELECTRICAL and Mechanical Engineer Mem. Am.I.E.E. It.-col. Polish Army Engineers 30 years' managerial experience in electrical trade and contracting business, seeks technical or administrative post knowledge of languages. Ready for eventual service on Continent or Overseas.—Box 7435, c/o The Electrical Review.

ELECTRICAL Engineer, Assoc.I.E.E. representing large manufacturing firm. All types motors and control gear. Good connection London and surrounding counties. Considerable experience estimating, planning, tendering and office management. Desires change, with responsible position.—Box 7422, c/o The Electrical Review.

ELECTRICAL Engineer, I.E.E., age 44, desires works maintenance.—H. H. Devonshire House, Woodstock, Oxon. 7385

EXPORT. Electrical Engineer with sound mechanical, field, office, construction and maintenance experience in Great Britain, Switzerland, Chile, Brazil, British West Africa, British West Indies on Electric Traction, Public Utility, Open and Underground Mining, Oil Field and Refinery, War Office and Air Ministry, offers his services to manufacturers of repute who are desirous of opening up their export markets. Age 43. Public School, A.I.E.E. languages spoken, French, Spanish, Portuguese, with slight knowledge German. Italian.—Box 2481, c/o The Electrical Review.

JUNIOR Electrical Engineer (22). Apprenticeship. Higher National Cert. Stud I.E.E. draughting and plant installation experience, requires progressive position.—Box 7419, c/o The Electrical Review.

DIESEL GENERATING PLANT

K EEN young man (27), at present serving H.M. forces, seeks progressive post. Qualifications include City and Guilds and Higher National certificates. Student M.I.E.E. 6 yrs. experience electrical contracting plus 6 yrs. as electrician R.A.F. Release group number 25.—Box 7886, c/o The Electrical Review.

P LUMBER-joiner, married, requires situation, North-West Coast preferred, c/o The Electrical Review.

P RDUCTION Engineer, fully conversant manufacturing high standards, electrical instruments and mechanisms, experimental, prototypes. Present position assistant chief engineer and responsible for development eminent electrical equipment manufacturers. Release granted one month's notice, age 41. Within 20 miles London only, residing S.W. area.—Box 7389, c/o The Electrical Review.

P ROFESSIONAL Electrical Engineer, at present free, seeks position. Salary £800.—Box 7371, c/o The Electrical Review.

S ALES Engineer, exempt, with connection amongst Wholesalers, Contractors and Works in Midlands, 35 years' experience desires position as Wholesale Manager or Representative. South or South West areas not objected to. First-class Testimonials.—Box 7433, c/o The Electrical Review.

S ENIOR Executive Appointment reqd. by Administrative Engineer (34), experienced Factory organisation, modern production methods, Trade Union negotiations, planning, rating, progress, layout, stores, sub-contracts, etc. At present engaged in executive capacity by world famous company employing 16,000 operatives. Box 7436, 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.

GEORGE COHEN, SONS & CO. LTD.

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GUARANTEED ELECTRICAL

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MOTORS. GENERATORS.

SWITCHGEAR.

etc.

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Established 1834.

ELECTRIC MOTORS AND DYNAMOS

W E hold one of the largest stocks of New and Second-hand Motors. Secondhand machines are thoroughly overhauled. Inspection and tests can be made at our Works.

For Sale or Hire. Send your enquiries to:—

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Reconditioned A.C. and D.C. Motors and Starters Equal to New.

STONHOUSE STREET, CLAPHAM, S.W.4.

Day and night service.

MACaulay 4555.

300 h.p. RUSTON HORIZONTAL SIX-CYLINDER COLD STARTING DIESEL, new 1927, 300 r.p.m., direct coupled to 275-kVA. 440-volts, 3-phase, 50-cycles METRO-VICK. Alternator.

240 h.p. PETER VERTICAL 4-CYLINDER COLD STARTING 'ATOMIC' DIESEL, new 1934, 300 r.p.m., direct coupled to 200-kW METRO-VICK. 400-volts, 3 phase, 50-cycles Alternator.

240 h.p. RUSTON HORNSBY VERTICAL FOUR-CYLINDER COLD STARTING DIESEL, new 1929, direct coupled to 130-kW L.D.C. 400-volts, 3-phase, 50 cycles Alternator.

168 h.p. PETER VERTICAL 3-CYLINDER COLD STARTING ATOMIC DIESEL, new 1932, 400 r.p.m., direct coupled to 100-kW, 220-volt D.C. Generator.

120 h.p. RUSTON VERTICAL TWIN-CYLINDER COLD STARTING DIESEL, new 1930, 333 r.p.m., direct coupled to 85-kW, 400-volts, 3-phase, 50-cycles Alternator.

60 h.p. RUSTON VERTICAL 3-CYLINDER COLD START DIESEL, new 1936, 500 r.p.m., direct coupled to 50-kW CROMPTON 250-volt D.C. Generator.

60 h.p. BLACKSTONE HORIZONTAL SINGLE-CYLINDER COLD START DIESEL, new 1934, 240 r.p.m., direct coupled to 35-kW E.C.C. 220/230-volt D.C. Generator.

60 h.p. FIELDING & PLATT HORIZONTAL SINGLE-CYLINDER COLD START DIESEL, new 1931, direct coupled to 35-kW E.C.C. 230-volt D.C. Generator.

48 h.p. CROSSLEY HORIZONTAL SINGLE-CYLINDER COLD START DIESEL, 240 r.p.m., new 1932, belt driving 25-kW, 400-volts, 3-phase, 50 cycles Alternator, 750 r.p.m.

37½/42 h.p. CROSSLEY VERTICAL SINGLE-CYLINDER COLD START DIESEL, new 1935, 500 r.p.m., direct coupled to 20-kW, 400-volts, 3 phase, 50-cycles Alternator.

30 h.p. RUSTON VERTICAL 3-CYLINDER ELECTRIC START DIESEL, new 1939, 1,000 r.p.m., direct coupled to 20-kW BULL 430/215-volt D.C. Generator (2 available).

22 h.p. BLACKSTONE HORIZONTAL SINGLE-CYLINDER HAND STARTING DIESEL, new 1942, 600 r.p.m., belt driving 17.5-kW NEWTON 220-volt D.C. Generator, 540 r.p.m.

17 h.p. NATIONAL HORIZONTAL SINGLE-CYLINDER HAND STARTING DIESEL, new 1934, belt driving 10-kW CROMPTON 280-volt D.C. Generator.

9 h.p. LISTER VERTICAL SINGLE-CYLINDER HAND STARTING DIESEL, new 1937, 1,000 r.p.m., direct coupled to 4.5-kW, 110-volt D.C. Generator.

All the above offered in first-class condition complete with all accessories.

NEWMAN INDUSTRIES LIMITED, YATE, BRISTOL 2492

REBUILT MOTORS AND GENERATORS

L ONG deliveries can often be avoided by purchasing rebuilt secondhand plant. We can redesign or replace surplus plant of any size.

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NEW AND SECONDHAND MOTORS.
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MISCELLANEOUS SWITCHGEAR.

FAGGS ROAD, FELTHAM, MIDD.

Tel. Feltham 3471/3.

BOROUGH OF HORNSEY

Electricity Undertaking

THE Council have for sale the following (Generating Plant):—

3 Brush Ljungstrom Turbo Alternators, complete with 500/560-volts D.C. motor-driven auxiliaries. Steam pressure 185 lbs. sq. in. Temp. 550°F. Generators 6,600 v., 50 cycle, 3-phase, 3,000 r.p.m.

No. 1, 1,500 kW, steam consumption 13.6 lbs. per kW hr.

No. 2, 1,500 kW, do. 13.3 lbs. do.

No. 3, 3,000 kW, do. 13.0 lbs. do.

2 Babcock & Wilcox Marine Type Water Tube Boilers, complete with super-heaters, chain grate stokers, pipe-work, valves, etc. Capacity of each 10,000 lbs. per hour. Working pressure 185 lbs. sq. in.

2 ditto, but with Greene Economisers of 160 tubes each. Capacity 15,000 lbs. per hour each.

2 ditto, but with Greene Economisers of 224 tubes each and balanced draught fans and double grates. Capacity 22,000 lbs. per hour each.

2 Laurence Scott "Sirocco" Induced Draught Fans, complete with D.C. motors and control gear: 44 h.p. and 58 h.p. respectively.

1 Greene Economiser of 96 tubes complete.

3 Weir Steam-driven Boiler Feed Pumps—2 of 10,000 lbs. per hour capacity each and 1 of 90,000 lbs. per hour.

1 Rees Rotobur Eight-stage Boiler Feed Pump driven by 20 h.p. D.C. motor with Brookhirst control gear.

1 Steel Chimney Shaft, 80 ft. high by 7 ft. diameter.

All the above plant is in good working order and can be inspected by appointment. Purchaser to dismantle and remove plant.

Offers, in writing, to be submitted to Mr. F. C. Orchard, M.I.E.E., A.M.I.Mech.E., Chief Electrical Engineer and Manager, Electricity Offices, Crouch End Broadway, N.8.

H. BEDALE,

Town Hall, Town Clerk.
Crouch End Broadway, N.8. 2539

WATER TUBE BOILERS IN STOCK

Two 25,000 lbs. evaporation,	230 lbs. W.P.
Two 25,000 lbs. "	175 lbs. "
Three 20,000 lbs. "	175 lbs. "
One 12,000 lbs. "	200 lbs. "
One 12,000 lbs. "	160 lbs. "
One 9/10,000 lbs. "	200 lbs. "

We install complete, including brickwork. Economisers, Pumps, Piping Valves, Generating Sets and Motors in stock. Please send us your enquiries; we can give immediate delivery.

BURFORD, TAYLOR & CO. LTD.

Boiler Specialists, Middlesbrough.

Telephone: Middlesbrough 2622.

32

A large stock of Searchlights (sale or hire), also Winches of our self-sustaining type. Hundreds of thousands supplied during the last 40 years to Government departments, corporations and innumerable traders. Mirrors, Lenses, A.I.D. Turnbuckles, etc., also surplus Carbon Rods, Ebonite and Fibre.—London Electric Firm, Croydon.

A C. and D.C. House Service Meters, all sizes, quarterly and prepayment, reconditioned, guaranteed one year. Repairs and recalibrations.—The Victoria Electrical Co., 47 Battersea High Street, S.W.11. Tel. Battersea 0780.

A C. and D.C. Motors, all sizes, large stocks, fully guaranteed.—Milo Engineering Works, Milo Road, East Dulwich, S.E.22 (Forest Hill 4422).

A C. and D.C. Motors always in stock.—Dawson, Caledonia, Oakengates.

A C. Motors, 1/50th h.p. to 10 h.p., from stock. Also D.C.—The Johnson Engineering Co., 86, Great Portland Street, London, W.1. Tel.: Museum 6373.

AERIAL Cables, all sizes quoted for, good deliveries against Government contract numbers.—Edwards Bros., 20, Blackfriars Road, London, S.E.1.

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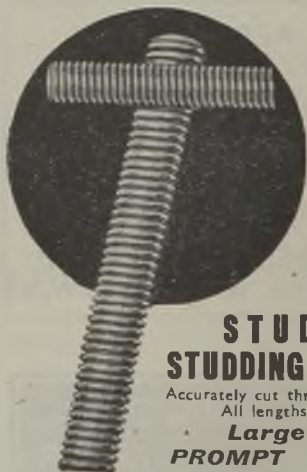
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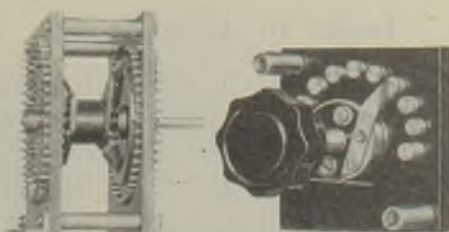




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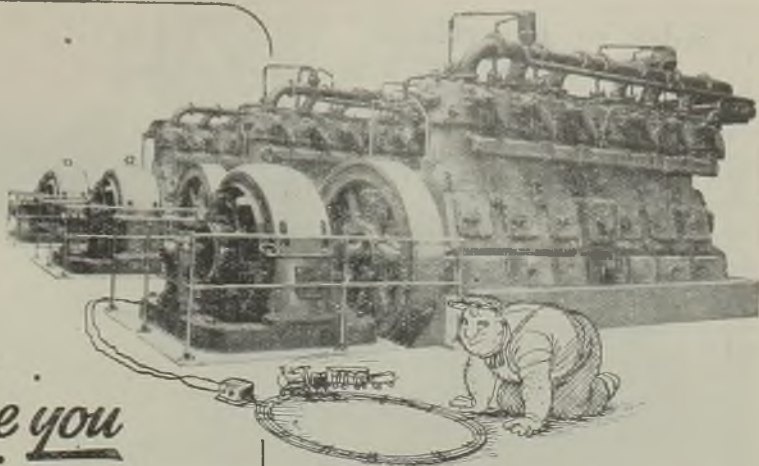
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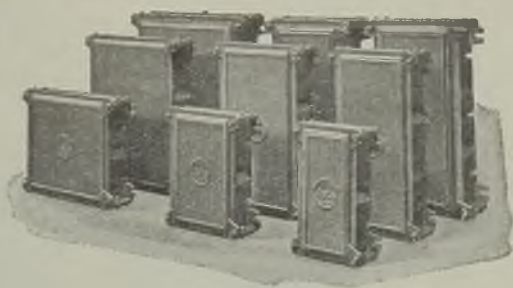
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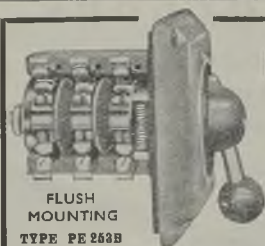
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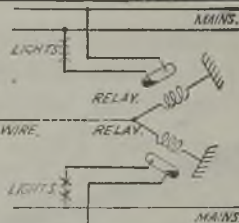
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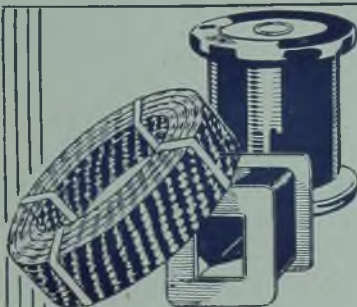


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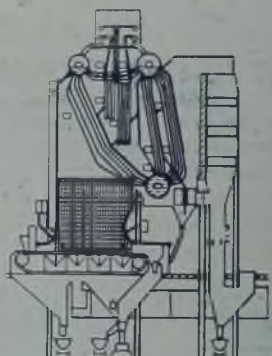
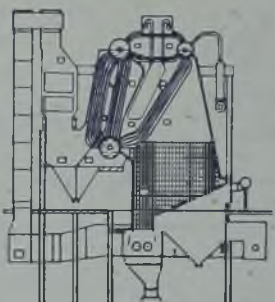
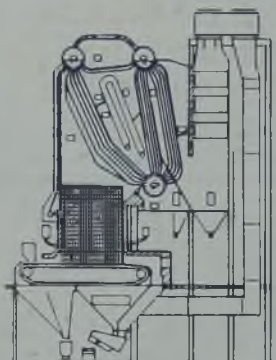
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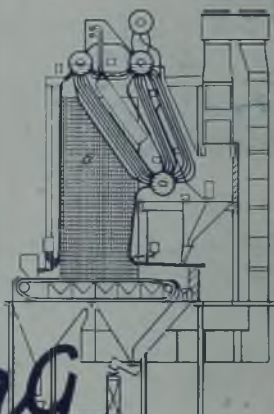
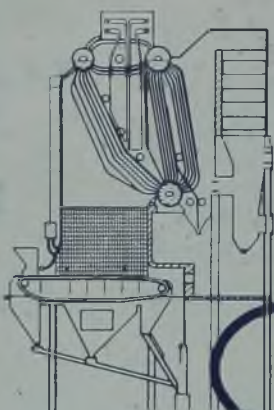
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