

THE

P.60/45/L

ELECTRICIAN

Vol. CXXXIV. No. 3500.

Friday, June 29, 1945.

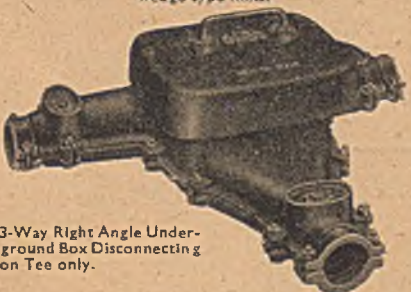
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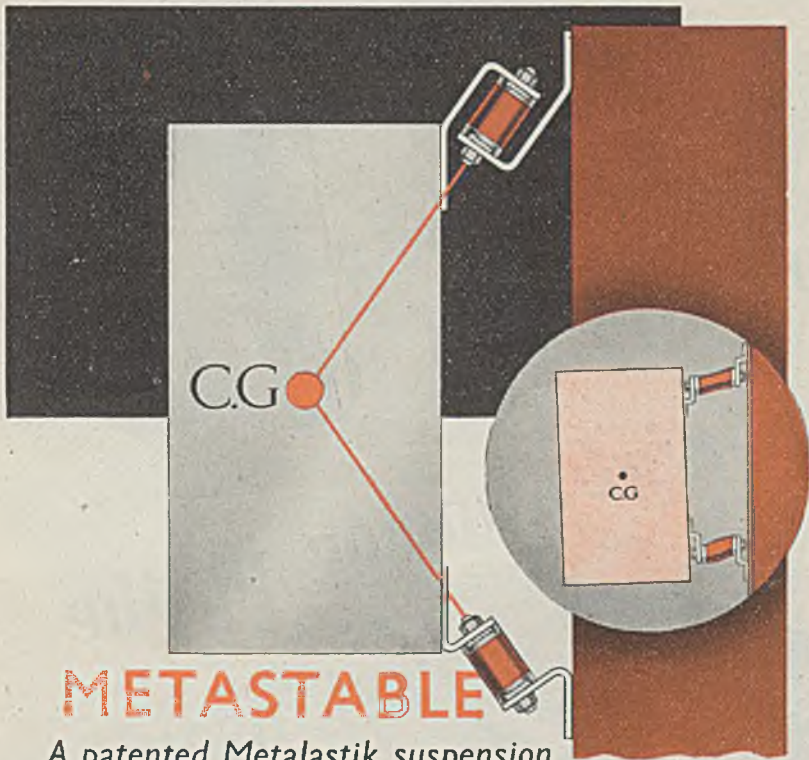
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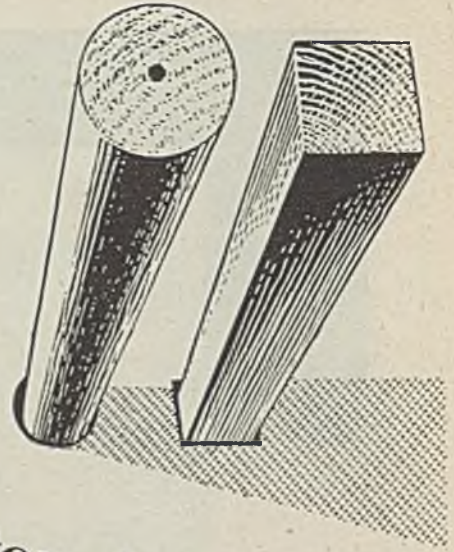
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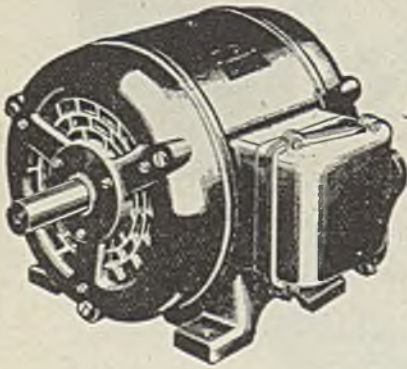
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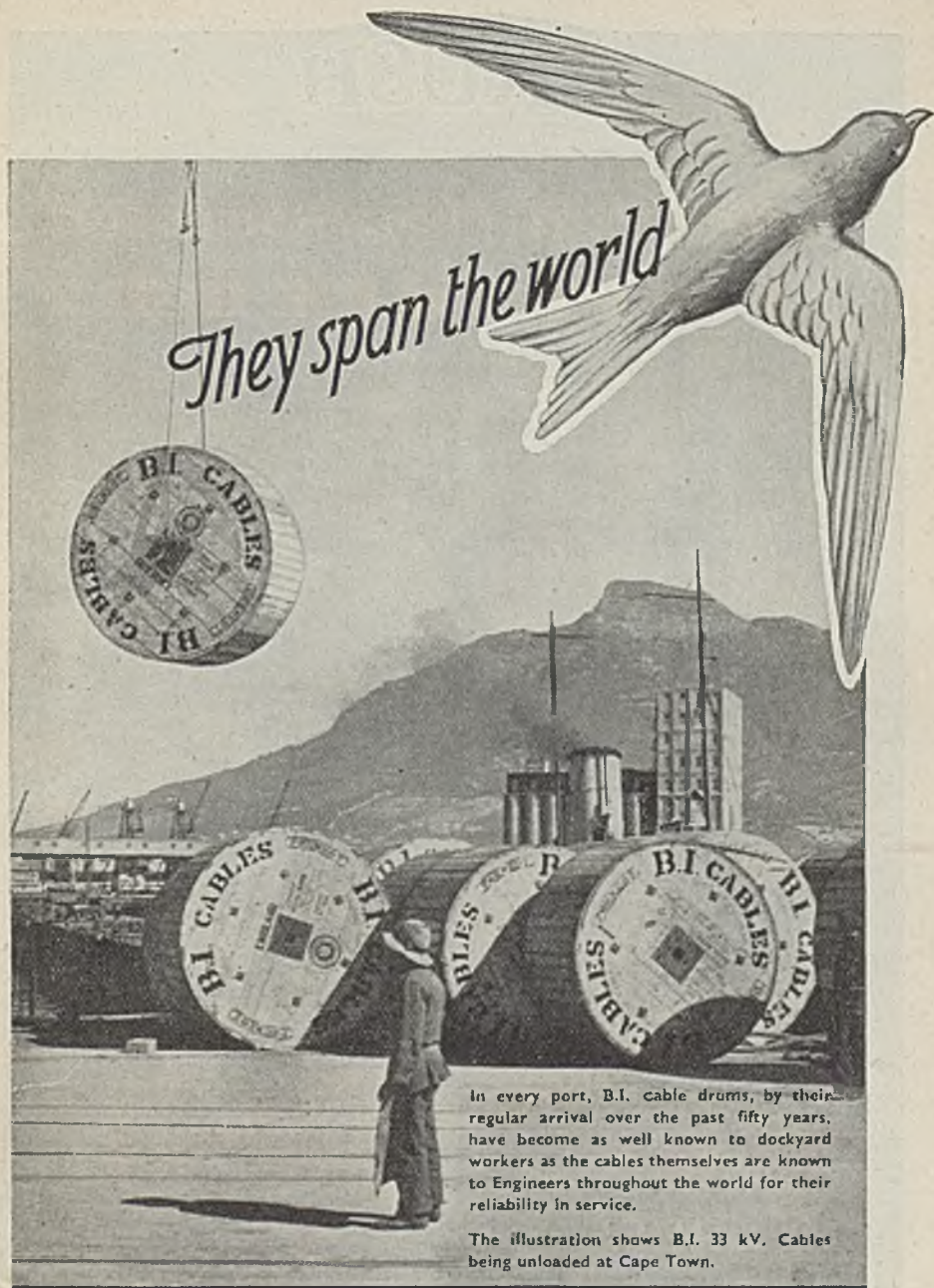
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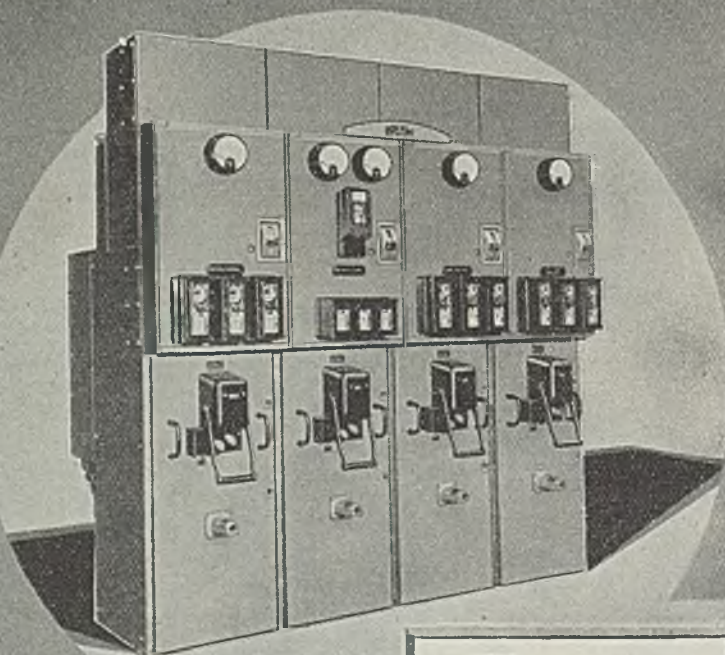
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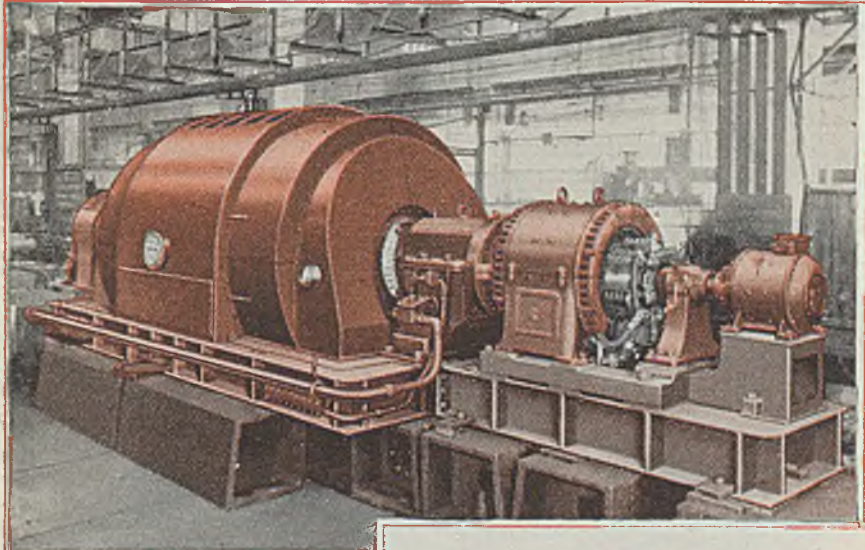
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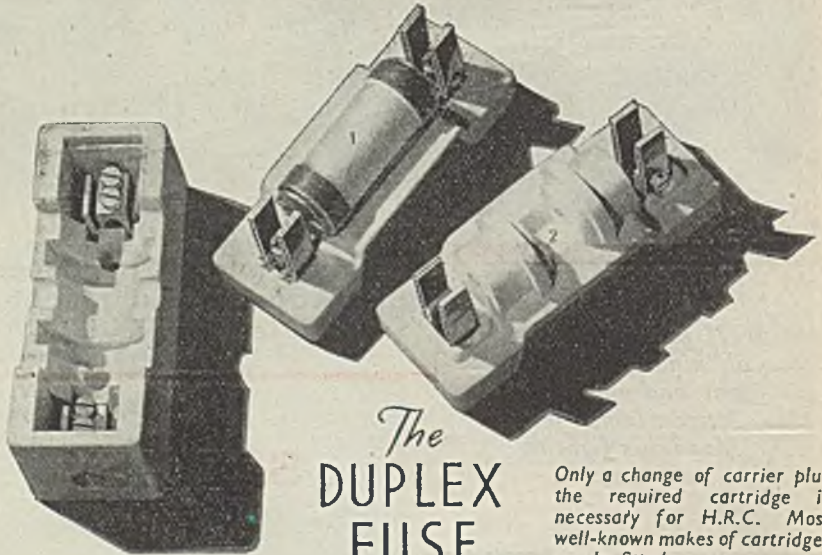


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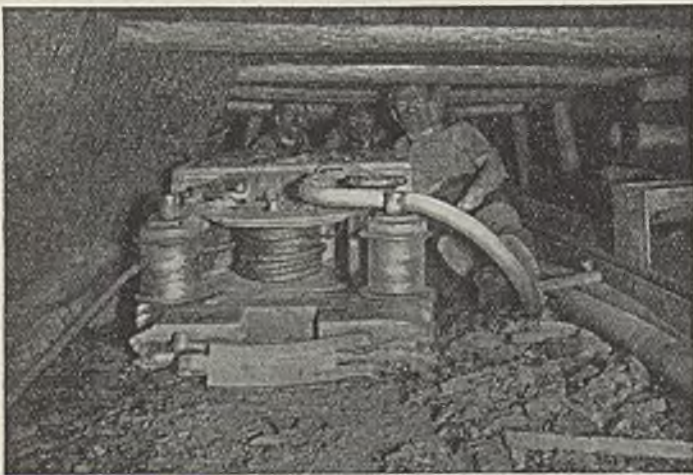
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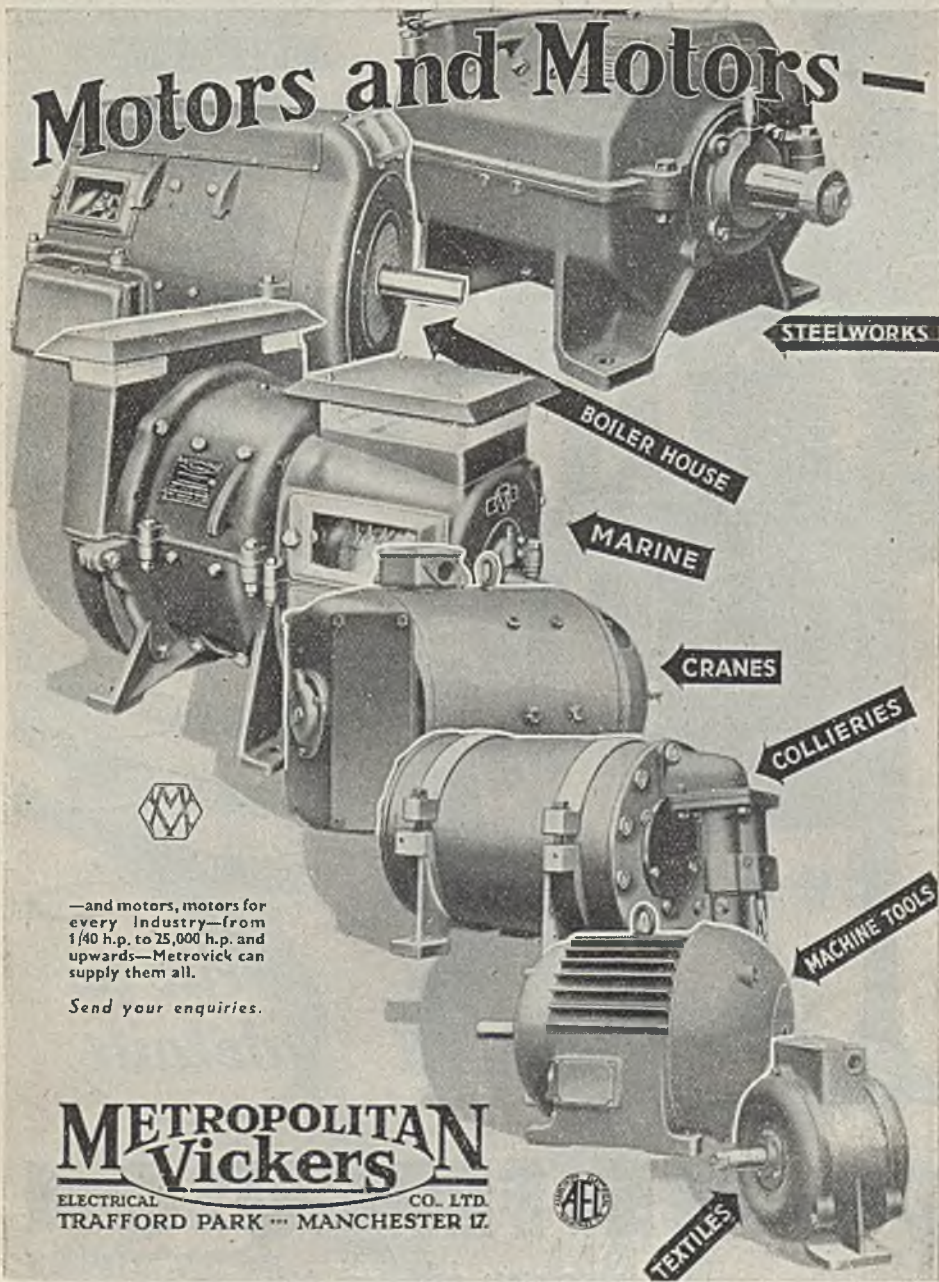
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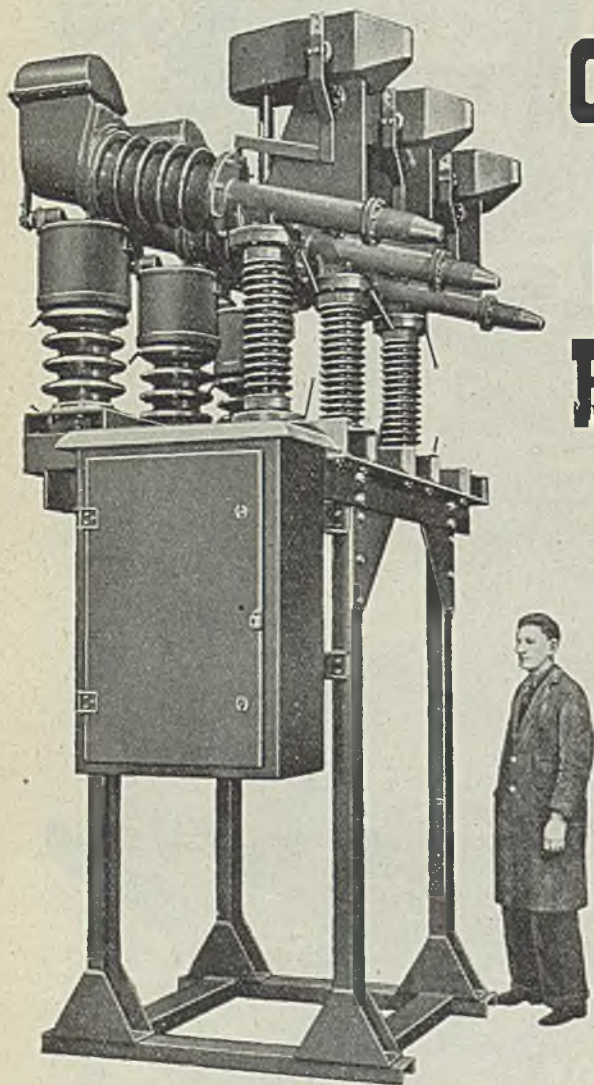
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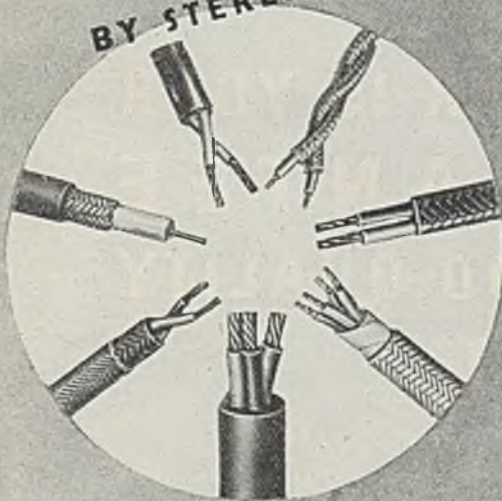
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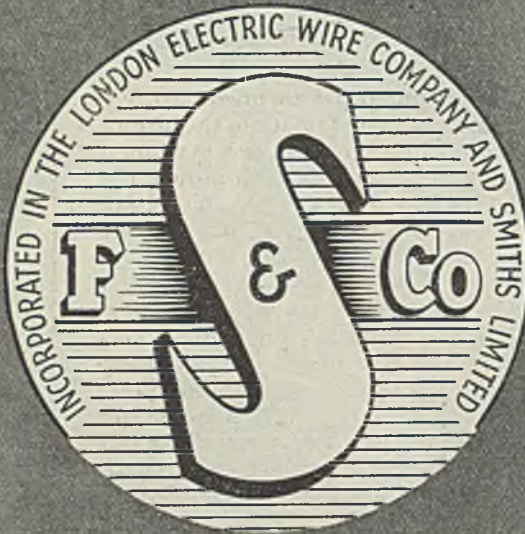


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No. 3500. [Vol. ^{No. 26} CXXXIV]

June 29, 1945

Annual Subscription 25s.
Overseas 30s.

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have those schemes promoted by local authorities and in view of the apparent official favouring of the latter in the present house shortage, their education in electrical methods appears, therefore, to be more imperative than in the case of the former.

Some municipalities, however, it is admitted, already built commendable examples of electrically-equipped dwellings and, we understand, it is their intention to continue to do so; others, however, do not yet appear to be aware of the advantages which electricity offers, both with respect to building costs and maintenance charges, and on average the percentage of electrical penetration for the country is in consequence lower than the industry might reasonably expect it to be.

Electricity and Housing

A PROBLEM which seems to require the immediate attention of the industry is concerned with the need for a more ready adoption of electrical methods by local authority housing committees, for though some headway has been made in ensuring that the domestic service appointments in municipally-built block-flats and on cottage estates will be electrical in character, the country reviewed as a whole shows results which might easily be improved upon.

It seems to be the intention of the Government at the moment to dispense its authority for house-building only among the municipalities, and it is to these bodies rather than to private enterprise that the industry must at present look for immediate custom. Experience in the past has indicated that housing schemes built under private arrangements have, generally speaking, absorbed more electrical appliances, and in consequence resulted in more power consumers, than

Demonstration houses have been shown up and down the country, exhibitions have been staged, and touring displays arranged in order to acquaint housing committees and others with the electrical idea and while these have produced, and will continue to produce, encouraging results we suggest that something more is needed. Housing committees have at the moment too great a tendency to think of electricity in terms of lighting, instead of its being applicable to cooking, water-heating, clothes washing and so on, and we suggest nothing short of an intensive educational campaign is likely to change their outlook.

It might with reason be argued that should such a campaign be successful, the industry has neither the appliances to satisfy the demand nor the labour to make them. And while this would be true at the moment, it must be remembered that it takes time to build block dwellings or cottage estates and no more is asked at this stage in the housing posi-

tion than that local authorities should include in their accepted designs, facilities for electrical service, adequate wiring and power points for the ultimate connection of appliances, and plumbing arrangements for electric hot water. There is already indication of some relief in the scarcity of appliances of certain types, and by the time the housing schemes now in the blue-print stage are ready to be installed with domestic appointments, there is every hope that a much higher percentage of our manufacturing capacity will have been returned to its peace-time pursuits. In any case, the electrical industry is no worse off in this manufacturing respect than its rivals, and by taking offensive action now it will be able to reap better reward in the future.

E.D.A. Activities

COINCIDENT with the 21st birthday celebrations of the Electrical Association for Women, the E.D.A. is arranging an electrical exhibition to be held in London. The actual date is not yet fixed, but it will probably fall during the month of October. The exhibition itself will, we understand, be designed to show electrical development during the past 21 years, particularly in so far as it concerns the home, and the service which electricity has to offer women in the future. The association's kitchen exhibition will open at Edinburgh on Monday, until July 28, following which visits will be made to Newcastle from September 10 to 29, to Sheffield from November 12 to December 1, and Wolverhampton from January 21 to February 9. The exhibition has so far created a good deal of interest, and the good attendances which have favoured it are expressive of the appreciation of the ideas demonstrated. It is, however, not yet sufficiently realised that any one of the kitchens shown is a practical possibility within the power of any municipal authority to give to their ratepayers, for many of the remarks made by women visitors suggest that they regard the kitchens as being beyond their acquisition. Some more compelling publicity on the subject might prove helpful.

Neglect of Research

THE Select Committee on National Expenditure had some hard things to say recently, with respect to the official mind towards research. "There were

many examples of wasteful expenditure on warlike stores of all kinds, which it would serve no useful purpose to enumerate," said the Committee. Taken together, these conclusively show that the daily cost of the European war, at least during the earlier years, was unnecessarily increased and its duration prolonged because research had for long been starved; adequate steps had not been taken to maintain during the years of peace a nucleus of skilled men which could be rapidly and efficiently expanded for the purposes of war; and the system of departmental responsibility was not sufficiently flexible fully to meet the changed requirements.

Example of Private Leadership

IF future research and development are not maintained at a high level and encouraged by the right methods of control and co-ordination, and if terms of employment which will attract the best brains are not offered, the nation's bill for the equipment and maintenance of its Forces in a state of fighting efficiency will be disproportionately large. In the long run uneconomic restriction in research expenditure and the failure to evolve means of securing the closest contacts between the scientist, the manufacturer, and the fighting man must inevitably lead to gross extravagance and perhaps imperil the existence of the nation. The electrical industry could quote numerous instances where the official mind has failed to recognise just what the Select Committee has commented upon, and, let it not be overlooked, much of the research which resulted in our being suitably equipped for D-Day, was carried out by private enterprise, in privately-owned laboratories, by private individuals.

Free Enterprise and Supply

THE Incorporated Association of Electric Power Companies has issued a brochure outlining the history of free enterprise in the electricity supply industry. This gives five facts with respect to the development of the industry and explains the unquestionably important part which the company-owned undertakings have played in that development. It is in many ways a counter to the claims for municipalising or nationalising the industry, and it is thus a further shot for the companies in the argument

surrounding the vexed question of ownership. As we have said on other occasions, the pioneer work of the supply companies in finding the initial capital, taking the risks and doing much of the spade work is the foundation upon which the supply industry has been built. There are still further risks which must be covered by the industry before the supply engineer will be satisfied, and whereas there may be some understandable hesitation in taking those risks where municipally-owned undertakings are concerned, private enterprise is only awaiting the opportunity to do so.

B.E.T.R.O Reports Progress

EACH week sees fresh additions to the ranks of the recently formed British Export Trade Research Organisation, in which it is evident that lively interest is being taken. The news of its formation has proved world-wide, and expressions of overseas opinion now being received by the organisation reveal a great deal of satisfaction that British industry intends to analyse the precise requirements of the overseas consumer. There is little doubt that this organisation is assuming the importance that it deserves, for among its aims and objects is the business of overcoming the take-it-or-leave-it methods of some of our pre-1939 exporters. Before designs are put into production in this country for ultimate sale abroad, the conditions obtaining in the country of sale should be well known to the manufacturer—a fact which the electrical industry has demonstrated time and again. To meet such conditions and to give such manufacturers all the local information they need, the B.E.T.R.O. was formed, and its growing strength is indicative of the importance which industry generally attaches to it.

British Trade With Mexico

SOME indication of the opportunities which await the electrical industry in the export field was given by the Mexican economic mission before it left this country to return to Mexico last week. Dr. G. VALENZUELA, who headed the mission, suggested that the sending of a British industrial group to Mexico would show the needs of all kinds of machinery to be urgent, while one of the chief aims of the country was to modernise its industrial processes. The electrification of the town and rural areas has for some

time been the ambition of the Government, and with Germany and her Axis partners no longer exporting to Mexico, Dr. VALENZUELA believes that the British manufacturer will find the United States his only competitor. Such competition is, however, strong in that Mexico not only delivers the best part of her surplus of oil, raw materials and minerals to the United States, but she has, too, sent 300 000 Mexican workers across the border. The result is that a considerable part of her imports are from the United States. British goods, however, already enjoy a worth-while reputation, and as in most cases goods of all classes may be imported without restriction, it is our hope that the market in this quarter may be expanded.

Importance of Personal Contacts

BEFORE the war, the United States supplied over 50 per cent. of Mexico's imports—followed by Germany with 20 per cent. and Britain with 10 per cent.—partly as a result of geographical advantage, but chiefly because of the frequency and regularity of visits to Mexico by influential U.S.A. executives. British interests are not, however, altogether out of the picture, for of the total annual production of hydro-electric power, of which the country has 900 plants, one-third is produced by the Mexican Light and Power Co., Ltd., a British-owned concern. Another British company, the Mexican Tramways Co., has also been responsible for much of the popularising of electricity, and at the end of 1938 was operating 492 electricity-driven vehicles with a pay load of 176 441 422 passengers. The chief comment by Mexicans with regard to British trade is that we pay too little attention to the importance of personal contacts. It may be possible to conduct export business by post or local representation, but the Mexican trader is a stickler for knowing personally with whom he is dealing, impressing him at first-hand with his particular needs, and closing the deal with some mild and pleasant social intercourse. The Americans and Germans before the war readily accepted this Mexican characteristic, and it paid good dividends; by doing more of the same thing we stand to capture some, if not all, of that 20 per cent. of import trade which Germany used to enjoy.

Post-War Housing

Electrical Exhibits to be Seen at Dorland Hall, London

THREE rooms equipped by the British Electrical Development Association as an example of how electricity can assist the housewife in running a low-cost home and in keeping it clean and bright have attracted considerable attention at the Post-War Homes Exhibition, which was opened by Lord Woolton, Lord President of the Council, at Dorland Hall, Regent Street, London, on June 21. They comprise a home laundry, a kitchen and a dining-living room. In the laundry, or utility room, are installed a Hotpoint electric washing machine, with a detachable motor wringer which, when not in use, can be stored in a cupboard in the bottom of the machine, a Sadia U.B.D. water-heater for supplying hot water for domestic needs

frigerator of 3½ cu. ft. capacity, an electric washing machine, with a reversible motor wringer, completely enclosed under a removable stainless steel draining board, a towel dryer in a small ventilated cupboard, a U.D.B. water heater in a corner under the working counter, a horizontal cooker, a kettle, a clock, a large drying



The E.D.A. home-laundry showing electric washing machine and wringer



View of the Ortyx electric kitchen

and the bath, and a clothes-drying, or airing cupboard, with a heating unit in the bottom, an exhaust fan to extract the steam and a three-heat control switch. A Hoover vacuum cleaner is housed in one of the cupboards. The kitchen contains a Prestcold refrigerator of 3 cu. ft. capacity, an upright Jackson electric cooker, above which is an electric clock, and a new form of towel arier by Belling and Co., Ltd., of a very low loading.

There is "Warm-white" fluorescent lighting from a ceiling fitting. The dining-living room has an inset two-bar 2 kW electric fire, an electric toaster and a Murphy television set.

An Ortyx all-steel electric labour-saving kitchen, elaborately designed, and enamelled in the strikingly contrasting shades of cream and black, has been an object of admiration and speculation and demonstrators have been fully occupied in explaining the operation of the various electrical appliances, which include a re-

cupboard and a cornice heater, as well as exhaust fans.

Among the electrical firms who co-operated in equipping the kitchen were Aidax Electric, Ltd. (Sadia water heater), Berry's Electric, Ltd. (a cornice heater), Bulpitt and Sons, Ltd. (saucepans and a kettle), the English Electric Co., Ltd. (cooker), Frigidaire, Ltd. (refrigerator), the Hotpoint Electric Appliance Co., Ltd. (exhaust fans), and J. Smith and Sons, Ltd. (clock).

B. and T. Components, Ltd., are showing a combined heater and cooker, and a thermostatically controlled iron.



The E.D.A. kitchen. In the right-hand corner, below the window, is an electric towel dryer

Current Transformer Errors

By G. W. STUBBINGS, B.Sc., A.M.I.E.E.

THE errors of a current transformer are due to the fact that a component of the primary current is required to magnetise the core for the production of the secondary e.m.f. so that the remaining component, transformed to the secondary circuit in the

components relative to OI_s . In such conditions a further simplification of the vector diagram can be made as shown in Fig. 2. Here OI_s is the direction of the secondary current vector, and this determines the direction of the secondary e.m.f. vector OV_s . OE is the vector of the secondary exciting current lagging an angle Ψ on the OV_s vector. ER is perpendicular to OI_s . Then, to the scale of ER , OR divided by the value of I_s is the ratio error, and ER , or OP , divided by the value of I_s is the radian measure of the phase error. It is easy to see that the ratio error is equal to $\frac{I_e}{I_s} \cos(\Psi - \theta)$ and the radian measure of phase

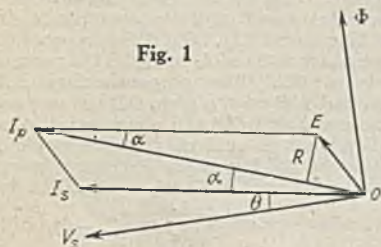


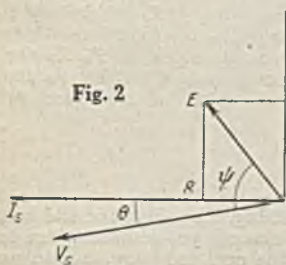
Fig. 1

same ratio as that of secondary to primary turns, is less than its nominal value and is slightly out of phase with the main primary current. A simple form of the vector diagram of a current transformer for an assigned value of the secondary current is given in Fig. 1. The vector of the secondary e.m.f., OV_s , for an inductive secondary circuit, leads the secondary current vector OI_s , by an angle θ depending upon the ratio of resistance to impedance. The vector $O\Phi$ of the alternating core flux is 90° lagging on OV_s . OE is the vector of the current I_e flowing in the secondary winding which would produce the flux corresponding to $O\Phi$. The resultant of OI_s and OE , or OI_p is the vector

error α is equal to $\frac{I_e}{I_s} \sin(\Psi - \theta)$ where I_e is the magnitude of the secondary exciting current, and provided that the turns and the nominal ratios are the same.

If, in Fig. 2, the length of the vector OE is made equal to the percentage ratio of the

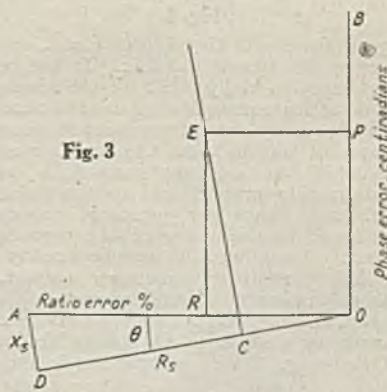
Fig. 2



of the reversed primary current divided by the turns ratio. As OE is usually very small relative to OI_s , the difference between the lengths of OI_p and OI_s is equal very nearly to OR , where ER is perpendicular to OI_p , so that the ratio error is OR/OI_p provided that the turns ratio and the nominal ratio of the transformer are the same.

The radian measure of the angle of phase difference α between the OI_s and OI_p vectors, or the phase error of the transformer is very nearly equal to RE/OI_s . For normal ranges of the primary current of measuring current transformers the errors are only of the order of one or two per cent., and the components of OE , in phase and in quadrature with OI_p are practically equal to similar

Fig. 3



exciting current to the secondary current or to the percentage value of $\frac{I_e}{I_s}$ then it is evident that, to the same percentage scale, OR will give the percentage ratio error, and ER or OP will give the phase error in centiradians.

For constant impedance in the secondary circuit, the secondary e.m.f. is proportional to the secondary current. If the secondary exciting current were proportional to the secondary e.m.f. and were invariable in phase, the ratio $\frac{I_e}{I_s}$ would be constant, and the vector diagram scaled for percentages, would apply to all values of I_s so that the errors would be independent of the primary current value. Actually the ratio $\frac{I_e}{I_s}$ is not constant nor is

the phase angle Ψ of I_e invariable so that the vector OE of percentage exciting current takes a different value and phase for each value of I_s .

The exciting current of a transformer is made up of two components, one in phase with the voltage e.m.f. it induces, known as the core loss component, and which produces the energy loss in the core, and the component

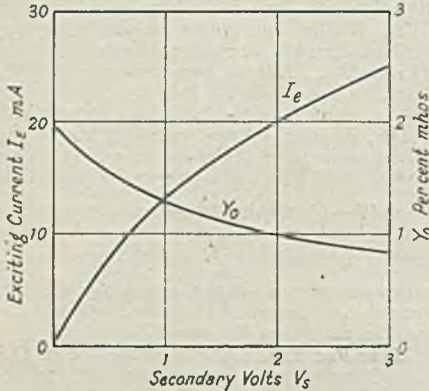


Fig. 4

in quadrature with the induced e.m.f., which produces the alternating flux. It has been found experimentally that, for the range of flux densities corresponding to the normal range of primary current variation in measuring current transformers, the core loss component of the exciting current is very approximately proportional to the induced e.m.f. and, hence for constant secondary impedance, to the value of the secondary current. Assuming this proportionality of core loss current to secondary current, a further important simplification of the diagram showing the transformer errors can be made by a construction due to Mollinger and Gewecke. This construction is shown

in Fig. 3. Here OA and OB at right-angles are respectively the axes of ratio and phase error. OAD is the impedance triangle for the whole secondary circuit, whereof θ is the phase angle of this impedance. OC is marked off along OD so that it is equal to the constant percentage ratio of core loss component of exciting current to secondary current, and the line CE is drawn perpendicular to OD . Then, assigning any value I_s to the secondary current, this value will determine the secondary e.m.f. and the magnitude of the exciting current I_p . OE is made equal to the percentage ratio of I_e to I_s , to the percentage scale of OC . The perpendiculars ER on OA , and EP on OB give, OR the percentage ratio error and OP the phase error in centiradians. It is evident that the angle EOC is that of the lag of the exciting current on the secondary e.m.f., Ψ , so that OR is the percentage value of $\frac{I_e}{I_s} \cos (\Psi - \theta)$, and OP

the percentage value of $\frac{I_e}{I_s} \sin (\theta - \Psi)$. Thus, having the saturation curve for the transformer core, the errors for any value of the secondary current can rapidly be found by calculating the percentage value of the

ratio $\frac{I_e}{I_s}$
 The ratio $\frac{I_e}{I_s}$ is equal to $\frac{I_c Z_s}{V_s}$ or to $Y_0 Z_s$,

where Y_0 is the admittance of the secondary winding with open circuited primary, and Z_s the impedance of the whole secondary circuit. The variation of Y_0 with V_s can easily be plotted as a graph derived from the saturation curve, as is done in Fig. 4. For each value of V_s the value of Y is equal to the corresponding value of I_e divided by V_s . Using the graph of Y_0 the length of the line OE in Fig. 3 is made equal to $Y_0 Z_s$ for a value of Y_0 corresponding to the V_s fixed by the assigned value of the secondary current.

Book Reviews

Prefabricated Homes. By BERNARD H. Cox, F.S.I., L.R.I.B.A. (London: Paul Elek). Pp. 36. 2s. net.

This book gives a sympathetic study of the subject of prefabrication as applied to housing, its present and future scope. The book was prepared for the Association of Building Technicians and covers work already carried out in this country, the United States, Sweden and elsewhere.

"Coal Facts About 'An Unknown' Industry. By A Colliery Manager. (London: Chapman and Hall). Pp. 100 2s. 6d. net.

In view of the coal position in the electrical industry there will be found in this book much that is interesting and much

that is enlightening. The object of the book is not to put forward yet another plan for the future of the coal industry, but to put on record the facts about the industry as known by one whose daily job is to see that the maximum quantity of coal is extracted from a particular mine. The coal position between 1913 and 1944 is reviewed, and American methods of coal winning are compared with our own.

BOOKS RECEIVED

Science Abstracts. Secs. A and B. Vol. 47, No. 564 (December), and Annual Index. Single Numbers, 3s. 6d. An. sub. 35s., or 60s. for both sections.

Preheating of Laminated Stock

Development of a Method for Increasing Output

THE electrical, radio and allied industries are considerable users of Bakelite laminated sheet for components, including special grades which can be punched, using presses similar to those employed for metal stampings. In

vide an effective means of uniform heating, but strips must not be left in the bath too long. Oil is, however, left on the punchings, and these have to be degreased, thus introducing an additional process.

Oven heating is clean, but in practice the length of time the strips are left in the oven tends to vary widely. None of these methods is entirely satisfactory, and the need for a better system of heating laminated punching strip, accentuated during the war by the increased demand for high grade paper laminated materials, has resulted in the development of a method which consists of passing the punching strip through an air-heated guideway attached to the punching tool. The strip is heated by physical contact with the air chests forming the guideway, which is of such length and so heated that the strip attains the required temperature before reaching the tool.

Heated air exhausted from the air chests is not wasted, but is blown on to the tool, both punch and die, which keeps it warm and free from swarf; the warmed strip then coming into contact with the warm tool is not chilled during the punching operation. In addition, the exhaust may be used to spray a fine oil mist on to the tool; this would only be necessary on special jobs and would defeat one of the advantages of the process.

The equipment is shown diagrammatically in Fig. 1. A heater is connected to a supply of compressed air. The heated air

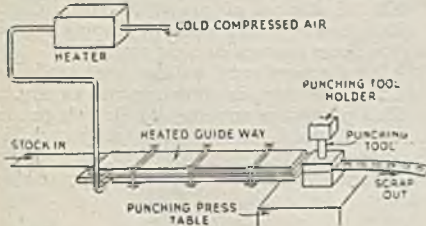


Fig. 1

general, laminated punchings are made in a range of thicknesses from .010 in. up to $\frac{1}{8}$ in., and stock possessing the highest electrical properties must be hot punched at temperatures of 100 to 140°C.; certain grades, suitable for low tension insulation under oil, or where the component is not subjected to humid conditions, can, however, be cold punched, though hot punching is still preferable.

In the circumstances, therefore, we were pleased to receive last week from Bakelite Ltd., details of a new continuous method of preheating which should enable the treatment to be extended with advantage.

Several methods of heating punching stock are in regular use, and the merits of the new method may be better appreciated if the advantages and disadvantages of existing methods are first considered. The principal methods normally employed involve hot plates, oil baths, and air ovens. The heating equipment is usually separate from the punching tool, entailing the transfer of the material from the heater to the tool—an intermittent operation, and requiring additional floor space. Loss of heat necessarily occurs, not only during transfer, but progressively as the strip is punched, with the result that the successive punchings are made at diminishing temperatures, and it becomes necessary to reheat each strip several times before the entire length can be punched.

Considering these methods of heating separately, hot plates are convenient and economical to construct and operate. It is, however, difficult to control the temperature of the plate and since the strip is heated from one side only, uniformity of heat is difficult to attain.

Thermostatically controlled oil baths pro-



Fig. 2.—A continuous pre-heating production unit at the works of Pye Ltd.

passes to heating chests on each side of strip guides. One end of the heated guideway is attached to the press table, so that when the strip is fed into the guideway

from the free end it can be pushed through and into the punching tool.

It will be realised that the principles involved are simple, and it should be possible to adapt the equipment for use under most conditions likely to be encountered in practice.

The following is a brief description of a demonstration equipment, together with results obtained, in order to give an indication of power and quantities involved. The heater was placed above the press and took up no floor space. This particular air heater was unlagged for demonstration purposes, used electric heating and had a loading of $7\frac{1}{2}$ kW. It was automatically controlled and capable of heating 40 cu. ft. of free air per min. up to 500°C.

The following results were obtained with the unit:—

Thermostat set at 300°C. (572°F.).

Volume of air used, approx. 10 cu. ft. of free air per min.

Temperature of tool heated by warm exhaust air 65°C. (150°F.).

Temperature of air chest surfaces in contact with strip 300°C. to 110°C. (572°F. to 230°F.).

Length of air chests, 27 in.

Width of strip, $2\frac{3}{8}$ in.

Thickness of strip, $\frac{1}{8}$ in.

Rate of feed, 8 ft. per min.

No. of strokes of press, 30-50/min.

This heater is capable of supplying hot air to four presses of this size.

A production unit at the works of Pye Ltd., Cambridge, is shown in use in Fig. 2.

This process is covered by British patent number, which has been acquired by Bakelite Ltd., and they propose to make it freely available to interested manufacturers.

News in Brief

Volk's Electric Railway.—The Brighton Public Utilities Committee is in favour of reconstructing Volk's electric railway and has appointed a sub-committee to make investigations and submit proposals.

Standards Conference.—A further conference at which long-standing differences in Anglo-American engineering practice and standards of measurements, particularly in relation to screw threads, which have impeded war production are to be discussed, will be held in Canada this autumn. The United Kingdom delegation includes two representatives of the British Standards Institution.

Trolley-bus Scheme.

—The South Shields last tram service operating to the Ridgeway will be replaced by trolley buses by the end of this year, provided labour and materials are available. Trolley-buses are also to be run to the Lawe.

Merchant Navy Comforts Service.

—The North Somerset Electric Supply Co., Ltd., have expressed their appreciation of the work of our merchant seamen by a thanksgiving donation of £25, to the Merchant Navy Comforts Service.

Traffic Light Installation.—The Carlisle City Council is applying for consent to instal traffic lights at the junction of Scotch Street, and East and West Tower Streets.

New Members of E.D.A.—Seven new members have enrolled in the E.D.A. in the first six months of 1945. They are, in the order of enrolment, Bolsover U.D.C., Keighley Corporation, Felixstowe U.D.C., Huddersfield Corporation, Macclesfield Corporation, Loughborough Corporation, and the West Gloucestershire Power Co., Ltd.

E.T.S. Electroplating Course.—The evening course in electroplating and electro-

deposition will be resumed next season (1945-46). Enrolment will take place early in September. Further information may be obtained from the Applied Chemistry Department, Northampton Polytechnic, London, E.C.1.

Transatlantic Telephone.

—The transatlantic radio-telephone service, which had been suspended during the war, was resumed on Saturday when many American soldiers telephoned home at a rate of £3 for three minutes.

TWENTY-FIVE YEARS AGO

FROM THE ELECTRICIAN of June 25, 1920: Last year we called the I.M.E.A. gathering at Ipswich the Peace Convention. At that time industry was still neurasthenic, and even the most energetic were only beginning to look round, somewhat fearfully, at the multiplicity of tasks that lay before them. Last year there was anxiety; this year there is an air of enthusiasm which it is good to see. There is no doubt that the outstanding feature of this year's Convention is the way in which the minds of all are anxiously exercised as to the future of electricity supply.

Electrical Personalities

We are always glad to receive from readers news of their social and business activities for publication in this page. Paragraphs should be as brief as possible

Mr. Claude D. Gibb, Director-General of Armoured Fighting Vehicles and Chairman of the Tank Board, Ministry of Supply, who has been created a Knight, was previously Director-General of Weapons and Instruments Production and in 1942 he received the honour of C.B.E. He is a vice-president of the Institution of Mechanical Engineers, President of the Institution of Welding (North East Centre), joint managing director of C. A. Parsons and Co., Ltd., a director of A. Reyrolle and Co., Ltd., and of the Parolle Electrical Plant Co., Ltd. He was born in Australia, and became an employee of C. A. Parsons and Co., Ltd., in 1922.



Mr. C. D. Gibb

Ashton-under-Lyne Town Council has appointed **Mr. N. Jones** to the position of chief engineer and chief officer of the electricity department, and **Mr. W. B. Bradley** as commercial assistant.

Mr. Frank Ashton, works manager for Bulpitt and Sons, Ltd., who has been made a M. B. E., joined that company in 1918, from the Royal Naval Torpedo Factory, Greenock, and has been in charge of the torpedo warheads and after-body production. He has been concerned with the re-design and improvement of many weapons which contributed to victory.



Mr. Frank Ashton

Within the framework of the Metropolitan-Vickers Electrical Export Co., Ltd., in London, the following appointments have been made:—**Mr. T. C. Hunt**, manager, South American Division; **Mr. R. V. D. Kirby**, manager, Eastern Division; **Mr. J. W. Bell**, manager, Dominions Division; and **Mr. G. Turkus**, manager, Continental Division. The Metropolitan-Vickers Electrical Co., Ltd., at Trafford Park, announce that **Mr. F. Gurney** has been appointed sales manager of the plant department, relinquishing

his position as sales manager of the transformer department, and **Mr. R. J. Cochran** has been appointed sales manager of the transformer department.

Mr. T. G. Travis, sales manager of the Witton Engineering Works of the G.E.C., who was awarded the O.B.E. in the Birthday Honours, served his apprenticeship and was subsequently for 18 years with the British Westinghouse Co., Ltd., Manchester. In 1921, he joined the General Electric Co. Ltd., as branch engineer at Manchester and was appointed sales manager for heavy electrical plant at the Witton works of the company in 1924.



Mr. T. G. Travis

Mr. R. H. Coates, deputy general manager and engineer of the Sheffield electricity department, has been appointed engineer and manager of the Portsmouth electricity undertaking. He received his technical training at the Regent Street Polytechnic, passing out as a gold medallist, and at the Royal Technical College, Salford, and took an honours degree in engineering at the London University. He served his apprenticeship with the Metropolitan-Vickers Electrical Co. Ltd. Prior to going to Sheffield in 1937, as technical assistant, Mr. Coates held appointments with the C.E.B. and with Messrs Kennedy and Donkin.



Mr. R. H. Coates

Oldham Electricity Committee has recommended the appointment of **Mr. John Ashton Ogden** as deputy electrical engineer. He is the son of Mr. F. L. Ogden, a former electrical engineer at Oldham.

Mr. Henry Nimmo has been appointed an Electricity Commissioner in succession to **Sir Leonard Pearce** who has resigned. Mr. Nimmo has been chief engineering inspector at the Electricity Commission since 1929 and was formerly electrical inspector to the Govern-

ment of Burma. Sir Leonard Pearce is engineer-in-chief of the London Power Company, and has held office as an Electricity Commissioner during the years 1925-26 and as a part-time Commissioner from May, 1940, to the present time.

Mr. S. E. Goodall has been appointed deputy chief engineer of W. T. Henley's



Mr. S. E. Goodall

Telegraph Works Co., Ltd. He became assistant chief engineer to the company in January, 1944, having previously served in the research department of the Metropolitan-Vickers Electrical Co., Ltd. (1928-1943).

Mr. James R. Beard, senior partner of Messrs. Merz and McLellan, a past-president of the I.E.E., has been elected chairman of

the Association of Consulting Engineers for 1945-46.

The Council of the E.D.A. have appointed **Mr. V. W. Dale**, the general manager and secretary, and **Mr. J. I. Bernard** as the association's delegates to the conference of the Association of Public Lighting Engineers. Mr. Dale will also represent the association at the conference of the National Chamber of Trade, and he has been nominated to serve on the Building Industries National Council.

Mr. B. Moore and **Mr. R. E. P. Briebach** have been appointed executive directors of Crompton Parkinson, Ltd., Mr. Moore joined F. and A. Parkinson, Ltd., a subsidiary of the company, in 1922, and is works director for the company at Guiseley. Mr. Briebach is general manager of the company's lamp works, after some 14 years' service.

Addressing electors in North Bradford, **Major John Benn**, the National Conservative candidate, who is a director of Benn Brothers Ltd., proprietors of THE ELECTRICIAN, stressed his advocacy of nation before party. The times were too serious for party strife; yet the Socialists were trying to force the pace and wanted to make nationalisation the main election issue. The sturdy independence and sense of neighbourliness combined in our national character enabled us to avoid the extremes of violent disunity found in some other countries. He was convinced that English men and women detested regimentation and red tape, and that redundant controls must be swept away to restore vigorous trade and full employment.

Mr. and Mrs. William R. Rawlings cele-

brated their diamond wedding on Sunday, June 24. About 60 years ago Mr. Rawlings, with his elder brother, the late Mr. John J. Rawlings, founded the business of Rawlings Bros., of which he is chairman. He is also chairman of the Rawplug Co., Ltd., and a director of Automatic Controls, Ltd., the Kolstore Co., Ltd., and the Sun Electrical Co., Ltd (of which he was one of the founders). He has been president of the E.C.A. on three occasions.

The directors of Hadfields Ltd. announce that on June 30 **Sir Peter B. Brown** retires from the chairmanship and will be succeeded by **Lieutenant-Colonel Lord Dudley Gordon**. **Sir Peter B. Brown** and **Major A. B. H. Clerke**, deputy-chairman, retire from the board and, therefore, as managing directors of the company. **Mr. J. B. Thomas** has been appointed general manager of the company, and **Major H. G. Freeman** has been elected to the board as from July 1.

Mr. G. A. Meier has joined Cooke and Ferguson, Ltd., as chief designer to the electrical division. He was for more than 12 years engaged in research, design and development of circuit-breakers with Brown Boveri and has recently been assistant to Dr. Haefely of Micanite and Insulators, Ltd.

Wing Commander C. E. Verity, technical engineer to the London Power Company, who was seconded to the R.A.F. in February, 1941, was awarded the O.B.E. in the Birthday Honours List.

Mr. F. Barrell, deputy electrical engineer with the Blackburn electricity undertaking since 1941, has been selected by the Leeds Electricity Committee, for the position of deputy city electrical engineer and manager, under Mr. F. Nicholls. Mr. Barrell received his technical training at Oldham Technical School, Manchester College of Technology, Birmingham Technical School and Woolwich Polytechnic. He received his early training with Messrs. J. P. Halls of Oldham and the Metropolitan Vickers Electrical Co., Trafford Park. Subsequently he was in the development department of the G.E.C., Witton, and later was designing engineer with the same firm, specialising in automatic plant and schemes. He joined the Poplar electricity undertaking in 1935, as superintendent of sub-stations, being promoted chief engineering assistant in 1939.



Mr. G. A. Meier

Lighting of Aerodromes—II

By G. A. T. BURDETT, A.M.I.E.E.

THE chief difference in the characteristics of 1945 aerodromes compared with those of 1939, is that of runways. Until the development of multi-engined aircraft, grass aerodromes were the most common. It is anticipated that in the future such aerodromes will be rare. Previously, the pilot, as far as possible, landed into the wind, and upon approaching an airfield at night was guided by an illuminated electric Tee pointing into the wind. One or more floodlights positioned at strategic points on the aerodrome were then illuminated upon the approach of the aircraft. In some instances the whole airfield was thus illuminated, while in others only a strip along which the pilot was expected to land was flood-lighted.

A number of disadvantages were apparent with this method of illumination. Either the floodlight had to be positioned behind the aircraft as it touched down (that is, at the leeward end of the airfield) or by careful positioning, two floodlights could be placed at the sides.

Later, a modification was introduced in the form of a shadow bar held in front of the light, which allowed the aircraft to fly towards the floodlight. As this bar was manually-operated its success was dependent upon the efficiency of the operator, and since it is difficult to follow the course of an approaching and descending aircraft at night, the highest efficiency could not always be achieved.

Runway Lighting

Runway aerodromes simplify night landing operations. The basic illumination in this case is, of course, the runway lighting. In addition, a floodlight can be used for purposes of emergency or, alternatively, the pilot may switch on his aircraft landing lights. If the runway lighting is adequate, additional illumination can be more confusing than useful, since nothing gives a pilot more confidence at night than when he sees a double string of lights between which he can land.

A number of such installations were in use on grass aerodromes for some years before the war. This lighting, termed contact lighting, consisted of unscreened bulkhead circular fittings laid flush in the ground, allowing aircraft to run over them without damage to either aircraft or fitting.

This type of lighting was not always popular with pilots, who complained of glare from the unscreened white lights. They were, however, in most cases installed

in conjunction with the Lorenz beam approach system and were used both by day and night in conditions of poor visibility and were, in fact, all-purpose systems, enabling landings to be made under adverse conditions which otherwise would have been impossible.

Continental Methods

It is not sufficient to provide for illuminated runways and no more. Otherwise, if only a double row of unscreened white lights are provided, a pilot could attempt to land down the reverse runway (downwind), perhaps with serious consequences should he not be in a position to bring his aircraft to rest at the end of the runway, or should a second aircraft approach in the opposite direction. To overcome this, various systems of lighting have been employed. For instance, on the Continent a multi-coloured system of lights was employed, which not only gave indication of direction but also position of aircraft in relation to the runway. The pilot could tell, if he was conversant with the complicated colour scheme, his exact position, the length of runway still to go, and whether he could pull up upon landing or whether it would be safer to gain height and make another approach.

The employment of a number of colours in a runway lighting system can, however, cause confusion. All a pilot requires to know is that before touching down on a runway, he can, provided his braking system is serviceable, bring his aircraft to rest before reaching the limit of the runway. For this, some indication of the length of runway from the upwind end would suffice. For instance, assuming 500 yards to be the length, upon reaching the point of indication the individual pilot would know whether he were able to pull his aircraft up in the 500 yards or whether he would have to take off again.

Unscreened runway lights have the disadvantage that a pilot can inadvertently approach and land from either end, which, as pointed out above, can give rise to serious consequences.

Runway lights should, therefore, be screened. The light should emit at an angle above the horizontal to indicate to a pilot upon his approach his approximate height above the aerodrome level.

Boundary lights are installed on the effective edge of an aerodrome to enable a pilot to estimate from the air its approximate size and shape. The following is a brief summary of B.S.S. 563/1937 in so far as boundary lighting is concerned.

"The light shall be aviation yellow with a fixed character (not flashing). It shall emit a light from 5° below the horizontal to the zenith and through 360° in azimuth. The total luminous flux emitted shall not be less than 60 lumens of yellow light." (The table on p. 11 of the B.S.S. covers more fully the recommended intensities.) "Its height above ground level shall not be more than 3 ft. 3 ins. and the centre of the light source not less than 2 ft. above ground level. Where a boundary fence exists the fitting may be raised to a maximum height of 6 ft., provided the boundary lights are not placed more than 10 ft. inside the fence. There should be spaces approximately 300 ft. apart except where aircraft are manoeuvred on the ground, where the lengths may be omitted. A weak link should be fitted to each light which allows each fitting to collapse should it cause an obstruction to an aircraft."

As these lights are usually wired in series, an automatic device is fitted to ensure that the circuit is not broken.

The fittings are, however, flexible to ensure that only under extreme circumstances do the weak links operate.

Another boundary light which became increasingly popular before the war was the flush-fitting type which, like the runway lights, allowed aircraft to run over it without damage.

Boundary lights, particularly the pedestal type, are essentially for grass aerodromes. Therefore, with the increased adoption of runway aerodromes, they may tend to become obsolescent.

illuminating Aids

Consideration must be given in the future to the provision of illuminating aids for aircraft circling an aerodrome before landing. Since multi-engined aircraft cannot make the tight circuits of the smaller type, and lighting placed on the boundary of the aerodrome proper would have limited value, a greater boundary of lights would in such cases be more suitable, but the question of cost arises. Wayleaves, too, would have to be obtained from owners of the land upon which the fitting and poles (if any) were installed.

On the other hand, a limited number of special "circuit" beacons might easily meet the requirements. That is, provided approach lights were installed to enable a pilot to make an accurate approach to the particular runway in use at the time.

This equipment usually consists of a framework made in the form a large T. Small lights are installed down the shaft and cross-arm so that it is easily distinguished from the air.

The recommendation in B.S.S. 563/1937 is as follows: "The colour of the light emitted shall be aviation white and fixed

in character. The lighting system shall be such that the intensity shall be between 10 and 15 candles of aviation white per foot run. When the lighting is provided by light sources of small dimensions (small individual light fittings), the distance between the sources shall not exceed one foot. The length of the cross-arm shall be equal to that of the shaft and shall not be less than 20 ft."

Landing Direction Indicators

Landing direction indicators were normally placed direct into wind; on grass airfields this practice was essential. On runway airfields, however, the indicator must indicate the runway in use and not necessarily the actual wind direction. Where these do not coincide owing to a cross wind, the pilot would normally be informed by radio telephony of the strength and the angle of the cross wind.

Research was conducted before the war regarding the introduction of illuminated wind cone (or sock) indicators. The writer considers that while these would serve to show a pilot the exact wind direction, they are apt to confuse him where the landing T. deviates from this.

A pilot landing an aircraft on a grass aerodrome can swing his aircraft off the landing strip as soon as he has reached a low safe ground speed. He can then taxi over the grass to where he is to unload his passengers or freight.

On runway aerodromes taxiing over the grass is usually not permissible except in special circumstances. In fact, concrete runways are usually laid down where the grass surface is unsuitable either for landing or taxiing. The pilot must, therefore, continue down the runway until he reaches his taxi lane, also of concrete. Where large numbers of aircraft are over an aerodrome waiting to land, speed in landing is most essential. Speed in landing aircraft can be maintained where a pilot, after landing, clears off the runway as quickly as possible; he can do this when he is sure of the exact location of the taxi lane. At night, therefore, a taxi track, or the turning point off a runway, should be easily distinguishable to a pilot long before he reaches it; otherwise he will slow down his aircraft and taxi slowly down the remaining portion of the runway until he reaches the turning off point. In the meantime no other aircraft can land owing to the risk of collision. The taxi track itself should be well illuminated, particularly round bends, since time is lost if the taxi track is obstructed by aircraft.

There are a number of other points in aerodrome illumination, such as special marshalling lights, which require serious consideration, and the scope for research is wide.

Correspondence

The Editor welcomes the free expression in these columns of genuine opinions on matters of public interest, although he disclaims responsibility alike for the opinions themselves and the manner of their expression.

Earth Leakage Trips

[TO THE EDITOR]

Sir,—“Supervisor’s” insistence that the voltage is the only thing to consider shows an obstinacy which he deplores in others. Any trip coil or solenoid depends on amp-turns to produce the necessary pull to work the tripping mechanism, and the coil may be designed for any voltage. Consider the d.c. case for simplicity: the regulations suggest 30 mA as a suitable current with a coil designed for 40 V; therefore the total resistance in circuit should not exceed $40/.03=1330\ \Omega$ approximately, the suggested maximum electrode resistance is $500\ \Omega$, which leaves roughly $800\ \Omega$ for the coil resistance.

If the trip earth is connected to an earth electrode of negligible resistance, the operating voltage will be $800 \times .03=24\ \text{V}$. I fail to see why the trip should be connected to a separate earth electrode unless the said electrode has a lower resistance than that which he calls the conventional electrode, because the earth path between the two may have negligible resistance, and, as he points out, things that are electrically connected to the same thing are connected to one another.

Are we to believe there is some advantage to be gained by ensuring that there is a quantity of earth path resistance between the trip electrode and the conventional electrode, or any fortuitous earth contacts?

His quotation from the report by the I.E.E. Committee on Multiple Earthing of the Neutral Conductor unfairly left out the last line, which was “The Committee are not, however, impressed with the practical danger of such an occurrence,” which covered the point on which he criticised the report most strongly.

It is always as well to remember that any fortuitous contact with earthed metal has an advantage over the trip coil circuit as a path for leakage currents, which is equal to the resistance of the coil, i.e., 500 to $800\ \Omega$ assuming that the earthed metal has the same resistance to earth, as the small driven trip electrode recommended. This raises a very important point that may be overlooked, in that when it is suggested that the trip electrode may be anything up to $500\ \Omega$ it leaves the uninitiated to think that any old earth will do, whereas the trip earth should be the best possible earth that can be obtained in that locality.

In his last article on the subject, in THE

ELECTRICIAN of June 1, he seeks to prove as a fundamental fact that the voltage on the framework of faulty apparatus falls from a maximum to some lower value, and uses as his proof the comparatively rare case of direct metal to metal contact.

Most earth faults arise due to the carbonisation of the insulating material or tracking across the surface, which deteriorates from the megohm range to something much less or to zero. Therefore the regulations rightly convey the impression that the voltage rises; as also does a paragraph in “Supervisor’s” notes in THE ELECTRICIAN of May 18, i.e., “Even so, it will be ensured that the circuit will be isolated without rise of voltage on the conduits, as if operation of the fuse under excess current be delayed the requisite potential for the operation of the trip will appear.”—Yours faithfully,

Newcastle, Staffs.

S. COOPER.

Electricity Supply and the Election

[TO THE EDITOR]

Sir,—With reference to my letter of June 14, and published in last week’s issue of THE ELECTRICIAN, below is a copy of a letter signed by Mr. A. V. Alexander and addressed to Mr. A. J. Fippard, together with a copy of the latter’s reply:—

“Sir,—I had your telegram on my return to the office. I used a remark made to me by a naval officer to illustrate a point which I desired to make, and although the name of the place was not mentioned I believe it was somewhere in the Hants area. However, apart from the remark made to me by the naval officer, I have no doubt you are aware that there are numerous instances of differential charges as between municipal and company concerns. Compare, for example, the charges for light in Southwark and Holborn. I return your reply-paid telegram.

(Signed) A. V. ALEXANDER.”

“Sir,—I thank you for your letter of the 14th instant, and I am sure you will forgive me in saying that the statement you made on the information supplied to you by a naval officer is most misleading, for, on comparing like with like, no such position exists.

“That you would intentionally mislead is unthinkable, but much damage can be done by the repetition of remarks which cannot be substantiated.

“You did not give me the name of the area to which the naval officer referred, and I am therefore unable to give you the facts which would show a very different state of affairs from those stated in your speech.

(Signed) A. J. FIPPARD.”

Yours faithfully,

H. F. CARPENTER,

Hon. Secretary.

Joint Committee of Electricity

Supply Organisations.

A Re-housing Achievement

Electric Homes for Displaced Cottagers

AT this time when housing is the subject of keen controversy among post-war planners and others, an achievement of free enterprise associated with the extension of the Stourport power station is of general interest. In the shadow of the station were nine cottages, somewhat dilapidated and lacking modern amenities, and when the Central Electricity Board decided that the capacity of the station be increased from 180 000 kW to 240 000 kW, it was found that the new cables which had to be laid in the process of the extensions must follow a line passing through the cottages. This meant that the houses must be pulled down and new homes would have to be provided for the nine families as quickly as possible. It took 11½ weeks to obtain the necessary permits to build and equip alternative accommodation, and in under nine weeks, that is 2½ weeks less than it took to obtain the permits, a piece of waste land had been transformed into a model miniature housing estate, complete with a service road, footpaths, drainage, water and electricity services. By the end of the ninth week the nine families had been transported to as many new bungalows half a mile away.

In place of their ancient cottages with inconvenient and badly ventilated rooms, poor lighting, worn-out cooking apparatus, and inadequate sanitation and drainage, the families were given the comfort of modern homes, each comprising three

in addition to lighting and points for an iron, toaster, radio, and so on. Fruit and vegetable gardens at the back and flower beds in the front were provided.

The fact that the official permits were secured in war-time conditions in the com-



Interior view of one of the bungalow kitchens showing electric cooker

paratively short period of 11½ weeks was due to the co-operation of the Electricity Commissioners, the Ministry of Works, the Ministry of Fuel and Power and the local council.

The building contractors did not attempt to break any records. "It was," they said, "a job of work we took in our stride and can be repeated at any time, on any scale." At the peak, when the road was being made, sewers and drains laid, prefabricated parts of the buildings were being unloaded and assembled and electricity being connected, not more than 80 men were employed.

The normal complement was far fewer and none worked on Sunday.

The full cost of the bungalows, including the road, paths, sewers, drainage and electric fittings, averaged £800 each. This would have been less if there had been bungalows on both sides of the road, because the cost of the external services would have been halved.

Cockermouth.—The Mid - Cumberland Electricity Co., Ltd., is preparing a scheme for supplying electricity to the Borrowdale Valley.



The Mill Road bungalow site at Stourport

bedrooms—12 ft. by 10 ft., 12 ft. by 9 ft. and 12 ft. by 7 ft. 9 in., respectively—a living room, 13 ft. 3 in. by 12 ft.; a kitchen, 10 ft. by 8 ft., a bathroom, fitted with a full-sized bath, etc.

The electricity services included a cooker, wash-boiler, and an airing cupboard,

Answers to Technical Questions

We produce below the answers to a selection of questions which have been sent to us by readers. The co-operation of students, and others in making this feature one of general interest is invited.

Give graphs showing the relation between the force acting on the movable core of a solenoid and the distance of the core from the centre of the solenoid for a.c. and d.c.

It is shown in text books that if a flux is entering a flat surface the force exerted on the surface is given by :

$$\text{Force} = \frac{B^2 A}{11.2 \times 10^6} \text{ lbs.}$$

where B is the flux density in gauss and A the area of the surface in sq. cm.

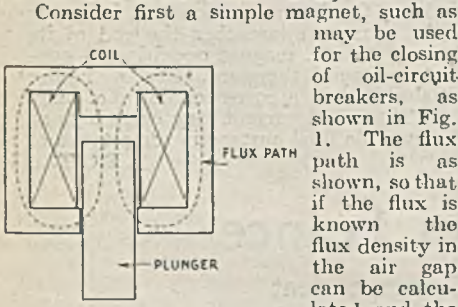


Fig. 1.

Consider first a simple magnet, such as may be used for the closing of oil-circuit breakers, as shown in Fig. 1. The flux path is as shown, so that if the flux is known the flux density in the air gap can be calculated and the force found. Assuming a constant current in the exciting coil and, therefore, a constant m.m.f. acting round the magnetic circuit, the flux will be inversely proportional to the reluctance of the flux path. If it could be assumed that the whole of this reluctance were in the air gap between the plunger and the stop, the flux would be inversely proportional to the length of the air gap. Since the force is proportional to the square of the flux it would, therefore, be inversely proportional to the square of the gap length. On account of the reluctance of the iron part of the circuit and various leakage fluxes,

the lines cross the gap at right-angles to the surfaces it can be seen that to reduce the gap by, say, a half, the distance which the plunger has to move is greater than in the previous case, thus flattening the curve.

A more uniform force curve can be obtained by using a conical-faced plunger and stop as shown in Fig. 3a. Assuming that

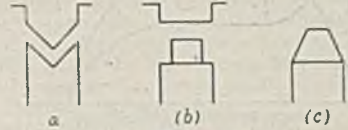


Fig. 3.

A still flatter curve can be obtained by using a stepped plunger as shown in Fig. 3b, and 3c. The actual calculation of the fluxes involves the determination of the reluctance of the magnetic circuit and is very difficult unless some experimental data regarding the leakage fluxes for the particular type of magnet under consideration is available.

If the magnet has no stop or if the stop is of non-magnetic material, i.e., if it is a simple open-ended solenoid, the increase of force near the end of the stroke is avoided as there will be no big increase of flux as

the plunger approaches this point. With high force, short stroke magnets, similar in shape to Fig. 1, an appropriate shaping of the plunger can be made to give a reasonably uniform force throughout the stroke, as shown in Fig. 4. With low force, long stroke magnets there is little difficulty in obtaining a uniform force throughout the stroke as shown in Fig. 5. The ironclad type of solenoid shows a peak of force near

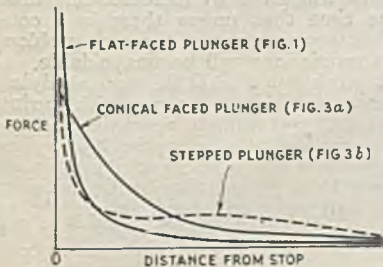


Fig. 2.

the force-distance curve will depart somewhat from the above theoretical value, especially at the shorter gaps, but a typical

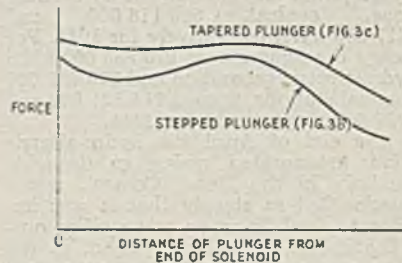


Fig. 4.

the plunger approaches this point. With high force, short stroke magnets, similar in shape to Fig. 1, an appropriate shaping of the plunger can be made to give a reasonably uniform force throughout the stroke, as shown in Fig. 4. With low force, long stroke magnets there is little difficulty in obtaining a uniform force throughout the stroke as shown in Fig. 5. The ironclad type of solenoid shows a peak of force near

the finish of the stroke due to the increase of flux which occurs as the plunger approaches the iron shrouding over the end of the coil; shaping the end of the plunger

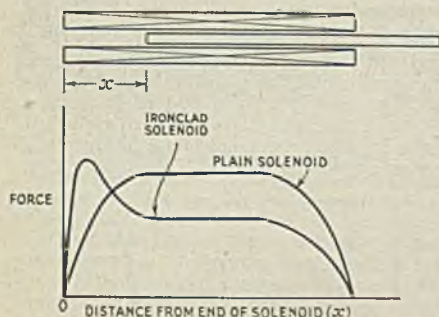


Fig. 5.

has an important effect on the shape and magnitude of this peak. Calculations of force in magnets of this type are even more difficult since the leakage fluxes, i.e., fluxes

crossing the turns of the winding, have a preponderating effect.

With a.c. magnets similar considerations govern the shape of the force-distance characteristic, but for a given cross-sectional area of plunger with the same maximum flux density, the magnitude of the average force at any position will be half that of a corresponding d.c. magnet, due to the fact that the force is pulsating and not continuous. If the coil is supplied with a constant current, i.e., if it is a series coil, the shape of the force-distance characteristic will be similar to that of a corresponding d.c. magnet. If, however, the coil is supplied at a constant voltage, the current will be governed largely by the reactance of the coil; this reactance depends on the flux and, therefore, increases as the plunger approaches the end of its stroke. An a.c. magnet operating at constant voltage, therefore, has a higher initial pull than a corresponding d.c. magnet. The initial current may be as high as 10 times the final current in some types of magnet.

E.O.T.

Electricity in France

From Our Paris Correspondent

DURING February, March and April, electricity generation in France was satisfactory and though it was hoped that such progress would continue, a serious setback took place in May due to various causes.

The only figures available at the moment are for January and February; during the first month 928 474 000 kWh were produced by hydro-power and 595 025 000 by thermal stations, against 800 118 000 and 726 217 000 kWh respectively for 1944. For February the figures were 970 888 000 kWh by hydro-electric generation and 375 465 000 by thermal stations, against 714 821 000 and 762 937 000 respectively for 1944.

At the end of April the hydro-electric position deteriorated owing to drought, particularly in the Massif Central, where production fell so steeply that it was impossible to feed Paris or other cities outside the immediate region. Then, in the opening weeks of May there was a cold snap which immediately increased consumption. The position became serious. In the Alpes and Pyrenees the water situation was less grave and it would have been possible to have exported current from those regions, but for the fact that war damage to the network made it inadvisable to completely load it.

In the Paris area the power shortage has been felt very keenly. During the fine weather, consumption fell to 241 million

kWh in April or a little more than 8 million kWh per day, after having stood at 295 millions in February and 315 millions in March. Imports from the Massif Central fell to below 500 000 kWh per day and thermal station generation had to meet requirements. The VE-Day celebrations, with all their night time gaiety and flood-lighting, stepped up consumption and taxed coal stocks unduly. On April 30 these stocks stood at 90 150 tons, or just enough for 42 days supply, while by May 26 they were no more than 58 271 tons. Coal stocks are being eked out by the burning of heavy oil in the Arrighi plant, and while this is of material assistance at the moment, consumption will have so increased in three months time that unless there is a considerable improvement in the coal problem serious restrictions will be unavoidable.

Last week the C.P.D.E. were studying the prospects likely to be met with during next winter, and while it is certain, that restrictions will have to be applied if everyone is to receive a quota of electricity, it is, at the same time, hoped that by the autumn repairs will have advanced sufficiently to assure a better hydro-electric supply; the falling coal supply is, alas, expected to continue.

Bradford.—The Electricity Committee is to extend mains to the Clayton estate at a cost of £1 234.

Industrial Information

Changes of Address.—Sams Distribution Ltd., of 72, Newman Street are removing on July 1, to new offices and showrooms at 100, Wardour Street, London, W.1.—S. D. Sullam, Ltd., of 72, Newman Street, are moving on July 1, to new offices at 100, Wardour Street, London, W.1.

Blasting of Castings, etc.—Special regulations under the Factory Act., 1937, for the protection of workers engaged in the blasting of castings and other articles in factories have been drafted by the Minister of Labour and National Service.

Battery Chargers.—A technical catalogue, No. 20/45, published by Meritus (Barnet), Ltd., gives a general specification of the Meritus battery chargers and also detailed descriptions of individual types, which are illustrated.

Control of Boiling Plates.—Sunvic Controls, Ltd., have issued an illustrated leaflet describing the operation of their Simmerstat device which can be fixed in place of the usual 3-heat switch in any electric cooker, for the control of radiant and solid boiling plates.

Aerial Efficiency.—Aerialite, Ltd., have issued two booklets of interest to the radio professional and listeners. One explains the "Mastatic" noise-free aerial system, and the other deals with Aerialite television aeriels, their installation and working.

Control of Engagement Order.—In calling attention to the provisions of the Employment—Control of Engagement Order, which came into force on June 4, the Electricity Commissioners invite electricity undertakers to forward to the Commission particulars of any ex-employees who wish to return to their previous employment.

Location of Industry.—The Board of Trade have revoked the Location of Industry (Restriction) Order, 1942, and replaced it by the Location of Industry (Restriction) Order, 1945, under which the control on the use of factories and warehouses is relaxed. It no longer applies to premises with an aggregate floor space of less than 3 000 sq. ft.

B.E.A.M.A. Contract Price Adjustment Formulae.—For purposes of calculating variations in (a) rates of pay, the rate of pay for adult male labour at June 16 shall be deemed to be 95s.; (b) costs of material, the index figure for intermediate products last published by the Board of Trade on June 16 is 181.1 and is the figure for the month of May, 1945.

A.E.I. News.—The current issue of this monthly magazine for the employees of the Associated Electrical Industries, Ltd., contains a letter signed by the Chairman, the

deputy-Chairman and Managing Director, on behalf of the boards of directors of the several companies, thanking every employee for his or her efforts during the last six years, and paying special tribute to those who made the supreme sacrifice.

New Silentbloc Catalogue.—Elaborately produced and illustrated, the new catalogue issued by Silentbloc, Ltd., forms a complete reference book for every application of flexible bearings, anti-vibration mountings and flexible couplings, and the data given should be of considerable value in every engineering drawing office, as well as to the engineering buyer. Copies will be supplied in response to applications on business notepaper.

Metropolitan-Vickers Gazette.—The current number contains articles on "Improvement in Thermal Efficiencies with High Steam Pressures and Temperatures in Non-reheating Plants," by K. Baumann; "Mobile Power Stations for the U.S.S.R.; Electrification of a Flour Mill," by S. McCracken; "The Metrovick Roller-type Spot-welding Machine for Aluminium Alloys;" "Bridgnorth Castle Hill Railway," by E. L. N. Towle; and "The Reduction in Noise from Air-conditioning Systems," by A. J. King.

Electricity on the Farm.—Two attractive publications of particular interest to farmers and wiring contractors covering rural areas have been issued by Callender's Cable and Construction Co., Ltd. One is entitled "Callender's Farm Wiring System," and the other "Electro-Farming with Callender Cables." The first describes the company's farm wiring system, which has been designed to meet the exceptional and varying conditions encountered on farms. The second booklet illustrates, with the aid of nearly 100 pictures, some of the many ways in which electricity is helping the farmer in agricultural and horticultural work in twenty English counties.

Institute of Welding.—The twenty-second annual report of the Council of the Institute of Welding states that the three principal changes effected as the result of reorganisation are the establishment of the research department of the institute as an independent British Welding Research Association with a council of its own, but in close collaboration with the Institute; the reduction in size of the Council of the institute with the aim of increasing its effectiveness as the supreme governing body; and the establishment of regional committees to promote co-operation between neighbouring branches and act for the Council in matters relating to education and research in their respective areas.

The net increase in membership in the year ended March 31, 1945, was 1 255—the highest recorded—making a total of 4 507.

Future of Workers in South Wales.—Sir George Usher, chairman of Aberdare Cables, Ltd., spoke of the future for South Wales workers when he visited the Aberdare factory recently, and mentioned the establishment of two more factories under the same régime. South Wales Switchgear, Ltd., Treforest, an associate company, gave employment to as many as did Aberdare Cables, Ltd., while another factory taken over would also employ hundreds of people. Sir George was welcoming the chairmen and engineers of the electrical undertakings in South Wales and in the course of his remarks said that he felt that too many war-time industries had been developed in South Wales and not enough of the type which would give employment in the district afterwards.

High-frequency Heating.—At the recent exhibition arranged by the N.W. area of the E.D.A., at Manchester, a demonstration of radio-frequency heating for preheating moulding powders and preforms for the plastics moulding industry attracted considerable attention. The arrangements were made by Ferranti, Ltd., and Wild-Barfield Electric Furnaces, Ltd., who are collaborating in the development and application of h.f. heating for industrial purposes. The equipment demonstrated was similar to models in continuous practical use. It operates from a standard single-phase 50 cycle supply at 230 V and gives a maximum radio-frequency output of 3.5 kW at frequencies up to 15 m.c.s. The press, manufactured and loaned by T. H. and J. Daniels, Ltd., gives a maximum pressure of 30 tons with a platen area of 10 sq. in.

The Hais Pipe-line.—A continuous extrusion machine designed and produced by the Pirelli-General Cable Works, Ltd., to meet the needs of oil-filled cable in 1936 was found to be capable of producing lead piping which fulfilled adequately all the requirements of the Hais cable for "Operation Pluto." It was on an entirely new principle in the extrusion of lead sheathing or tubing, and was different from any other type of lead press in existence. About 50 miles of 3-in. lead pipe were extruded in the Pirelli-General Cable Co.'s works at Eastleigh, Southampton. Of this, about 20 000 yards were covered and armoured in the works, to form the completed H.A.I.S. cable, and the remainder was transported to other cable factories to be similarly treated. In addition, approximately 100 miles of lead pipe were produced on the P.G. extrusion machines possessed by other firms.

Early in the development of "Operation Pluto" it was agreed that as their wharf-

age at Woolwich was unsuitable for direct shipment of complete armoured lengths of H.A.I.S. cable, the Standard Telephones and Cables, Ltd., should concentrate on the extrusion of the lead alloy pipe for transport by road to more suitable sites for armouring and shipment. After overcoming several difficulties in the adaptation of an existing machine and reeling gear, the company proceeded with the production of complete lengths of 700 yards each, and in spite of the excessive loading of the machine a number of lengths were completed and their quota of the contract was successfully attained.

Contracts Open

WE give below the latest information regarding contracts for which tenders are invited. In the case of overseas contracts, particulars are to be had from the Department of Overseas Trade, Millbank, London, S.W.1 (corner Horseferry Road), unless otherwise stated.

Gellygaer U.D.C., June 30.—Supply and delivery of house service units for one meter per consumer. Specifications from the Electrical Engineer and Manager, Electricity Offices, Hanbury Road, Bargoed, Glam.

Hazel Grove and Bramhall U.D.C., June 30.—Supply and delivery of three 250 kVA transformers fitted with externally operated off-load tap-changing gear. Specification from the Chief Electrical Engineer, Chapel Street, Hazel Grove, Ches.; deposit, £1 ls.

Epsom and Ewell, July 2.—Supply and delivery of h.t. and l.t. cable, p.i., lead covered and armoured. Specification from the Electrical Engineer, Electricity Department, Church Street, Epsom.

Prestonpans T.C., July 2.—Various works, including electric lighting, at three blocks of houses and shops. Schedules from Messrs. R. and A. K. Smith, 4, Forbes Street, Edinburgh, 3.

Salford Public Health Department, July 7.—Supply and delivery to Hope Hospital, Salford of (a) electric platform truck, 15-20 cwt. capacity, with batteries; (b) electric unit, suitable for one or more trailer units, capacity up to 15-20 cwt., with batteries. Specifications from Town Clerk, Town Hall, Salford 3.

Kingston-upon-Hull Electricity Department, July 13.—Supply and erection of two 1½ million galls. per hr. vertical spindle electric motor-driven pumps. Tender forms from the General Manager, Ferensway, Kingston-upon-Hull; deposit, £1.

West Riding C.C., July 16.—Rewiring of electrical installation at Oulton Hall Institution, Oulton, near Leeds. Specification from West Riding Architect, County Hall, Wakefield.

Electricity Supply

Glasgow.—The Electricity Committee is to extend mains at a cost of £4 130.

South Shields.—Application is being made to the Electricity Commissioners by the T.C. for sanction to borrow £14 919 for electrical developments.

Swindon.—The Electricity Committee is to provide a supply to the Pinehurst and Beech housing estates at a cost of £8 500.

Glasgow.—The Transport Committee reports that in all likelihood it will require one 25 000 kW turbo-alternator and one 75 000 lbs. water tube boiler at Rinkston power station in the future.

Barrow-in-Furness.—Sanction to borrow £5 000 for mains and services in connection with the change-over and £3 500 for meters has been obtained by the Electricity Committee.

Tynemouth.—The Electricity Committee is seeking sanction to borrow £8 000 for mains and services and £4 000 for sub-station plant.

Burton-on-Trent.—Supply is to be afforded to temporary bungalows at Harper estate at a cost of £2 271; to farms at Netherseal at £1 161 and to farms at Drakelow at £708.

Wallasey.—An increase of 25 per cent. in the terms with local registered electrical contractors for wiring as necessary for the connection of cookers, wash-boilers and water-heaters, has been agreed upon by the Electricity Committee.

Darlington.—The T.C. is to supply electricity to temporary housing sites at Harrowgate Hill, Green Street, and East Cemetery. The cost will be about £5 555 and application is being made to borrow this amount.

Swansea.—The Electricity Committee is to extend the 33 kV and 6.6 kV distribution system and provide sub-stations and equipment at an estimated cost of £134 000 to provide supply to a new housing estate at Penlan and factories at Fforestfach.

Wigan.—At a meeting of the T.C., it was reported that the net profit on the electricity undertaking for the year 1944/45 was £28 517, compared with £54 794 for the previous year. The profit would have been greater but for the fact that nine months ago, the Corporation increased the discount rate to consumers at a cost of £17 277, reduced the tariff to contract consumers and bulk supply consumers and brought in out-districts on the same conditions as applied in the borough of Wigan. The Chairman of the Electricity Committee said the department expected to spend £156 000 on

new plant. One councillor stated that the charges for electricity, for power and light, were with one exception, the lowest in the north-west area.

Leeds.—The report of the electricity department for 1944-45, showed that the number of consumers increased by 721 and the kilowatts connected by 21 371—the largest increase since 1941. An increase of 38 209 200 in the units generated produced the record total of 662 130 000. After contributing £14 083 19s. 4d. from revenue for capital expenditure, the accounts showed a deficit of £28 602 14s. 1d. Extensions at the Kirkstall power station, directed by the C.E.B., include a 30 000 kW turbo-alternator and two 250 000 lb./hr boilers for the autumn of 1946, and a 30 000 kW turbo-alternator (No. 7) and a 250 000 lb./hr. boiler (No. 12) for the autumn of 1947. These extensions will entail another boiler house (No. 4), two cooling towers and the necessary auxiliaries.

Tools for Building

WITH the object of speeding up house-building by more extensive use of power-driven hand tools, a series of demonstrations of the operation of such tools has been arranged by the Ministry of Works to be given by a mobile unit which will tour the country. The first of the series was opened by Mr. Duncan Sandys, Minister of Works, who was introduced by the Lord Mayor of London, in a marquee on a bombed site at Watling Street, behind St. Paul's Cathedral, on Wednesday morning. This closes to-morrow, June 30, and the next demonstration will open at Notting-ham on July 11.

The electrical tools shown may be operated either from a public supply or by the use of Diesel- or petrol-driven generator sets.

Among those who are taking part in the exhibition are Black and Decker, Ltd., Broom and Wade, Ltd., Campbell and Isherwood, Consolidated Pneumatic Tool Co., Desoutter Bros., Ltd., S. Wolf and Co., Ltd., The Central Tool Equipment Co., Ltd., Electrona Electrical Products, Ltd., W. Hardill, Sons and Co., Ltd., Landale and Co., Ltd., Electrical Sealing Hammers, Ltd., Flexible Drive and Tool Co., Flexible Shaft Manufacturing Co., Ltd., Flextol Engineering Co., Ltd., F. Gilman (B.S.T.), Ltd., Grimston Electric Tools, Ltd., E. C. Hopkins, Ltd., B. O. Morris, Ltd., Nerns Flexible Shaft and Equipment Co., and the Westminster Engineering Co., Ltd.

Company News

R. B. PULLIN AND CO. LTD.—Intm. div. 5% on ord. (same).

GENERAL CABLE MANUFACTURING CO., LTD.—Intm. div. 6% (same).

ELECTRIC FURNACE CO., LTD.—Sec. intm. on ord. 4½% (same), mkg. 8% (same).

OLIVER PELL CONTROL, LTD.—Div. yr. to June 30, 1943, 6% on ptg. pref.

TELEPHONE MANUFACTURING CO., LTD.—Fin. div. 6½% (same), mkg. 9%, less tax for yr.

NOTTING HILL ELECTRIC LIGHTING CO.—One yr.'s div. arrears on 6% cum. pref. to Dec. 31, 1943.

VICTORIA FALLS AND TRANSVAAL POWER CO. LTD.—Fin. div. on ord. 11% (same), less tax, mkg. 15% (same).

CLIMAX ROCK DRILL AND ENGINEERING WORKS, LTD.—Fin. 7½% (same), mkg. 12½% (same), payable July 4. Net pft. 1944, after E.P.T., £60 084 (£59 243).

REVO ELECTRIC CO., LTD.—Fin. div. 10% (same) and bonus 2½% on ord., mkg. 17½% (same). Net pft. returned as £70 121 (£66 845).

LIGHTFOOT REFRIGERATION CO., LTD.—Blee. pft. and loss carried fwd. for 1944 £3 591, after writg. off debit of £26 417 brot. in. Distributn. of 5% out of cap. pfts.

RADIOVISOR PARENT LTD.—Pft. to Mar. 31 £5 708 (£2 466), adverse blee. brot. in. £34 184 further reduced to £28 476. Bank overdraft (secured by deb.) down from £5 393 to £3 580.

BOSTON AND DISTRICT ELECTRIC SUPPLY CO., LTD.—Net rev. 1944 £41 703, plus int. £826. To taxn. £18 500, off apparatus on hire £650, fin. div. 6%, mkg. 10%, to res. £11 674, fwd. £16 147 (£14 142).

NORTHWOOD ELECTRIC LIGHT AND POWER CO., LTD.—Net rev. 1944 £59 529, plus int. £1 279. To taxn. £32 000, off apparatus on hire £2 184, fin. div. 5%, mkg. 8%, to res. £14 744, fwd. £15 780 (£15 261).

COLNE VALLEY ELECTRIC SUPPLY CO., LTD.—Blee. on rev. accts. 1944 £62 843, plus interest £1 721. To taxn. £29 000, off apparatus on hire £1 921, fin. div. 4½%, mkg. 7%, to res. £19 623, fwd. £39 559 (£37 614).

MUSSELBURGH AND DISTRICT ELECTRIC LIGHT AND TRACTION CO., LTD.—Total income 1944 £15 453. After taxn. £5 800 and exes. there remains £4 724, plus £5 606 brot. in. Div. 3%, to res. £3 333, fwd. £5 476.

SHEERNESS AND DISTRICT ELECTRIC SUPPLY CO., LTD.—Rev. 1944 £34 194 (£33 125). To taxn. £8 590 (£7 372), and

after exes., etc., there remains £15 529 (£15 595). Div. 8%, to gen. res. £10 000, fwd. £7 814 (£6 685).

LEWES AND DISTRICT ELECTRIC SUPPLY CO., LTD.—Net rev. 1944 £17 314 (£15 279). After taxn. £4 835 (£4 372) and exes. there remains £7 213 (£5 611). Div. 10% (same), gen. res. £3 750 (£3 500), fwd. £3 462 (£3 449).

EASTERN TELEGRAPH CO., LTD.—Inc. 1944 £744 910 (£756 600). To deb. int. and exes. £86 886 (£91 780), leavg. £658 044 (£644 820), plus £41 972 (£22 152) brot. in, mkg. £700 016 (£686 972). Pref. div. takes £70 000, ord. div. 11½% (same) £575 000, fwd. £55 016.

BRIDGWATER AND DISTRICT ELECTRIC SUPPLY AND TRACTION.—Trdg. blee. 1944 £28 256 (£30 138), brot. in £539 (£482); res. for inc.-tax £1 800 (£1 500), res. for E.P.T. £11 500 (£13 250), res. for deprecn. £6 300 (same), res. for war dngs. £1 000 (same), pref. divs. and int. £6 531 (same). 6% on ord. £1 500 (same), fwd. £165 (£539).

RUSTON AND HORNSBY CO. LTD.—Div. on ord. 12½% (same). Prelim. statem. for yr. endg. Mar. 31 gives pft. of parent Co., before enc-tx., £302 904 (£292 485). Inc.-tax takes £149 751 (£141 420), pension res. £15 000 (same), and post-war contngs. res. £50 000 (£25 000). After providg. for ord. div. and divs. on 5% and 6% pref. stks., carry-fwd. is £60 143 (£60 615).

BRITISH THERMOSTAT CO., LTD.—Trdg. pft. to Jan. 31 £176 579 (£165 838), interest and fees £2 661 (£2,758), pft. sale of plant £333 (nil), mkg. £179 573 (£168 596). To dirs.' fees £500 (same), war dngs. £281 (£406), deprecn. £7 394 (£8 059), A.R.P. £1 288 (£3 073), tax £147 499 (£135 635), leavg. net pft. £22 611 (£20 924). To gen. res. £5 000 (spec. res. £5 000), div. 18½% £13 875 (same), fwd. £21 569 (£17 832).

PERMUTIT CO., LTD.—Trdg. pft. 1944 £62 105 (£53 252). To inc. tax. £28 928 (£22 532), N.D.C. £3 012 (£2 137), dirs.' fees (and addnl. remun. 1943) £1 400 (£6 724), deprecn. £8 103 (£4 070), leavg. net pft. £20 662 (£17 789), plus £25 629 (£15 450) brot. in. Pref. div. absorbs £1 310 (same), ord. div. 10% and bonus 2½%, to gen. res. £15 000 (nil), off patents, etc., £979 (£1 300), fwd. £22 752.

MINIMAX LTD.—Trdg. pft. 1944 £95 313 (£100 772). To patent fees £238 (£457), dirs.' fees and comm. £6 073 (£6 049), E.P.T. £50 500 (£54 800), lvg. net pft. £38 502 (£39 466). To inc. tax £22 000 (£22 800), lvg. £16 502 (£16 666). Div.

16% and bonus 4% £12 500 (same), off patents and trade marks £314 (£75), staff retiring allowances £2 218 (nil), fwd. £44 842 (£43 372).

BARTON AND SONS, LTD.—Trdg. pft. 1944 £255 850 (£237 695), less net admin. exes. £3 213 (£5 529), leavg. £252 637 (£232 166), plus £22 147 (£20 114) brot. in, mkg. £274 784 (£252 280). To deprecn. £20 359 (£20 864), tax £179 709 (£160 064), prov. for loss on invests. in subs. £6 086 (£6 000), pref. divs. £7 266 (£7 389), to cap. redemptn. res. £6 830 (£7 466). Fin. ord. div. 4%, mkg. 7% (same), fwd. £26 182.

DERITEND STAMPING CO. LTD.—Tdg. pft. for yr. to Feb. 28, £50 874 (£61 071), plus E.P.T. recoverable, less Ministry of Supply rebates, £10 680 (nil), mkg. £61 554; deduct deprecn. freehold props. £2 000 (same), staff pension fund £2 733 (£3 343), dirs.' fees £900 (same), prov. for inc.-tax £31 418 (£31 052), leavg. net pft. £24 503 (£23 776). To intm. 5% £4 350 (same), fin. 10%, £8 700 (same), res. £5 000 (same), fwd. £36 247 (£29 794).

WESTON - SUPER - MARE AND DISTRICT ELECTRIC SUPPLY.—Net rev. 1944 £64 704 (£57 168). To exes. £15 871 (£17 427), employees' benefit funds and natl. insur. £618 (£502), taxn. £24 128 (£18 561), leavg. £24 087 (£20 678), plus £4 064 £2 586 and taxn. written back £5 000 brot. in. To pref. div. £1 200 net (same), fin. ord. div. 5%, mkg. 8%, tax free (same) £14,000, gen. res. £9,000 (same), fwd. £3 951.

W. T. HENLEY'S TELEGRAPH WORKS CO. LTD.—Trdg. pft. (includg. income from invests.) after providg. for taxn., bad debts, contng. and spec. expend., £445 781 (£438 209). To dirs.' rem. £12 750 (£11 750), audit. £1 500 (same), deprecn. £83 679 (£70 395), leavg. £347 852 (£354 566). Intm. div. 5% on ord. £65 000 (same), div. 4½% on pref. (gross) £9 000 (same), spec. deprecn. and obsoles. nil (£13 247), war contngs. £75 000 (£50 000), staff pensions nil (£10 000), fin. 10% and cash bonus 5% on ord. £195 000 (same), fwd. £399 326 (£398 974).

TELEGRAPH CONDENSER CO. LTD.—Dirs. allowance fst. and fin. div. on ord. 7½%, plus 2½% bonus (nil), mkg. 10%, less tax for 1944. Net trdg. pft. (after E.P.T.) for 1944, according to prelimy. statmt. was £77 398 (£74 473); int. on investmtns. £36 (£30) and int. on tax res. cert. £1 200 (nil) makes £78 632 (£74 503). Deprecn. takes £13 451 (£11 164) and dirs.' fees £1 400 (same), leavg. pft. at £63 781 (£61 039). Inc.-tax absorbs £35 413 (£37 902). Net pft. £28 368 (£24 037).

Pref. div. again requires £3 900, and ord. distribun. £7 500 (£5 625). To gen. res. £16'200. Carry-fwd. £38 919.

(Continued on page 590.)

COMPANY MEETING

British Electric Traction

War-Time Activities

The forty-ninth annual general meeting of the British Electric Traction, Co. Ltd., was held on June 22, in London.

Mr. Richard J. Howley, C.B.E., the chairman, said that they were largely interested in the provision of road passenger transport and in the supply of electricity. Both those public utility services had been of major importance during the war and in the aggregate their associated companies had played a not unimportant part in the successful prosecution of the war. The omnibus undertakings now operated just over 9 000 public service vehicles, which during 1944 had run approximately 240 million miles and carried 1 500 million passengers, the gross receipts amounting to £21 500 000. The figures had been much the same during the other war years and illustrated the magnitude of the transport services which they had been able to provide for the general public and, in particular to meet the needs of the large number of workers engaged in vital war-time production. The undertakings had had to face many difficulties, but they had been successfully overcome. Of their employees, over eleven thousand, or about 30 per cent, were called up under the National Service Acts. It was pleasing to know that 55 men had, so far, been awarded decorations.

Throughout the war their associated electricity-supply companies had provided electricity for many essential war-time purposes and during 1944 had sold a total of close on 330 million units.

While he was able to give a good report of their various activities during the war, he was not unmindful that they were about to face a difficult and anxious time in settling down to peace conditions. The industry had to find new levels of receipts and expenses which would be reasonable for those engaged in it and for the public. These changes could not be accomplished without close co-operation between employers and employees. They could not be carried through merely by changing a Government and, least of all, by turning our social and economic life topsy turvy.

The report was adopted.

(Continued from page 589)

THE BRITISH ELECTRIC TRACTION CO., LTD.—The forty-ninth ordinary general meeting was held in London on June 22, Mr. Richard J. Howley, the chairman, presiding. He said the omnibus undertakings associated with the company now operated a total fleet of just over 9 000 public service vehicles. During 1944 the vehicles ran an aggregate of approximately 240 million miles, carried 1 500 million passengers, and the gross receipts amounted to £21 500 000. Their associated companies, during 1944, sold a total of close on 330 million units. He was not unmindful that they were about to face a difficult time in settling down to peace conditions. The public must have comfortable and convenient travel at a reasonable cost; the employees must receive reasonable remuneration for their work; and the employers must have a fair return on the capital they had expended.

BRAZILIAN TRACTION, LIGHT AND POWER CO., LTD.—Presiding at the annual meeting in Toronto on June 21, Colonel Walter Gow, the chairman, referred to the increase in the volume of business in 1944 of all services. The increased operating expenses were, he said, proportionately greater than the increased earnings; that was not unexpected, as war-time business activity in Brazil was accompanied by progressive increases in wages and cost of materials. The year's results, however, were gratifying.

Commercial Notes

Mortgages and Charges

NOTE.—The Companies Act of 1908 provides that every Mortgage or Charge shall be registered within 21 days after its creation, and that every company shall, in its annual summary, specify the total amount of debt due from it in respect of mortgages or charges. The following mortgages and charges have been registered. The total debt prior to the present creation, as shown in the annual summary, is given—marked with an *—followed by the date of the summary, but such total may have been reduced.

E. DYNE AND CO. LTD., London, S.E., engineers.—June 7, mort., to Midland Bank Ltd, securing all moneys due or to become due to the Bank; charged on contract moneys. *£3 100. May 14, 1942.

J. AND N. WADE (LONDON) LTD. Portsmouth, elec. accessory dtrs.—June 8, general charge. *£3 000. Dec. 31, 1941. £5 000 deb., to Branch Nominees Ltd;

Satisfactions

A. F. BULGIN AND CO. LTD., Barking, radio manufacturers.—Sat'n. May 28, of a charge reg. Aug. 24, 1939.

ERGON ELECTRICAL MANUFACTURING CO. LTD., London.—Sat'n. May 17, £2 500 debts., reg. Aug. 26, 1936.

FYFE WILSON AND CO. LTD. London, engineers.—Sat'n. June 9, £700, reg. Dec. 22, 1921.

County Court Judgments

NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be actions. But the Registry makes no distinction. Judgments are not returned to the Registry if satisfied in the Court books within 21 days.

FOULKES, A. (male), 108, Chester Road, Warrington, wireless dealer. £15 17s. 6d. May 10.

Metal Prices

		Monday, June 25.	
		Price.	Inc. Dec.
Copper—			
Best Selected (nom.)	per ton	£60 10 0	—
Electro Wirebars ...	"	£62 0 0	—
H.C. Wires, basis ...	per lb.	9 ³ / ₁₆ d.	—
Sheet ...	"	11 ⁷ / ₁₆ d.	—
Phosphor Bronze—			
Wire(Telephone)basis	"	1s. 0 ⁷ / ₁₆ d.	—
Brass (60/40)—			
Rod, basis ...	"	—	—
Sheet " ...	"	—	—
Wire " ...	"	—	—
Iron and Steel—			
Pig Iron (E. Coast Hematite No. 1)...	per ton	£7 13 6	—
Galvanised Steel Wire (Cable Armouring) basis 0.104 in. ...	"	£28 5 0	—
Mild Steel Tape (Cable Armouring) basis 0.04 in. ...	"	£20 0 0	—
Galvanised Steel Wire No. 8 S.W.G. ...	"	£26 0 0.	—
Lead Pig—			
English ...	"	£31 10 0	—
Foreign or Colonial	"	£30 0 0	—
Tin—			
Ingot (minimum of 99.9% purity) ...	"	£303 10 0	—
Wire, basis... ..	per lb.	3s. 10d.	—
Aluminium Ingots ...	per ton	£85 0 0	—
Speller... ..	"	£31 5 0	—
Mercury (spot) Ware-house ...	per bott.	£69 15 0	—

Prices of galvanised steel wire and steel tape supplied by the C.M.A. Other metal prices by B.I. Cables Ltd.

COMING EVENTS

Friday, June 29 (To-day).

E.P.E.A. SOUTHERN DIVISIONAL METER ENGINEERS' GROUP.—Room 19, Livingstone House, Broadway, Westminster. Paper, "Some Experiences in Servicing A.C. Meters." 6.30 p.m.

ELECTRICAL INDUSTRIES BENEVOLENT ASSOCIATION.—2, Savoy Hill, Strand, London, W.C.2. Annual meeting. 11.30 a.m.

Saturday, June 30.

I.E.E., S. MID. STUDENTS' SECTION.—Visit to Hams Hall Power Station. Buses leave Easy Row, Birmingham. 2 p.m.

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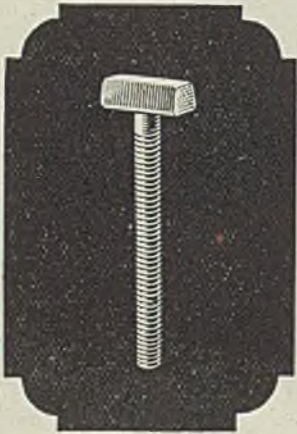
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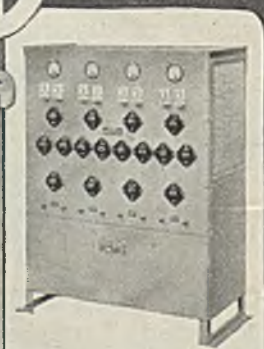
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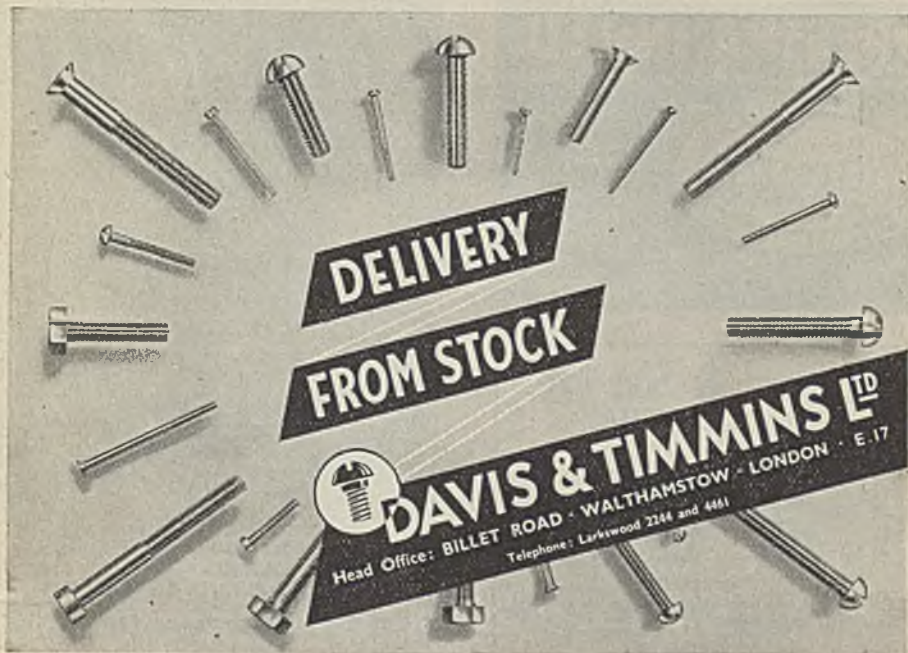
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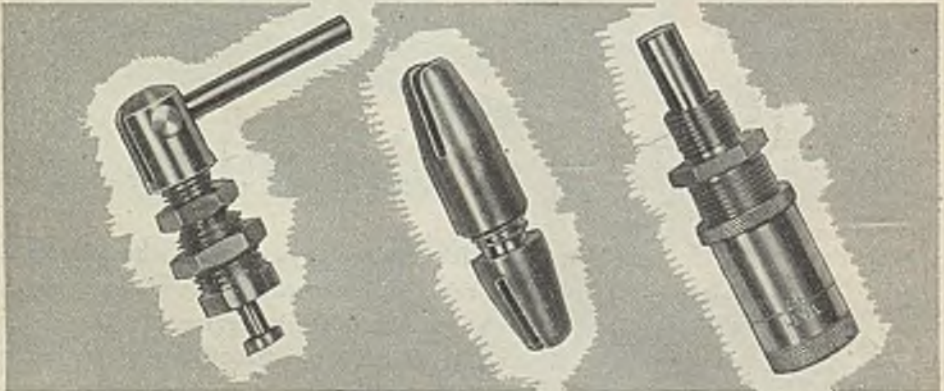
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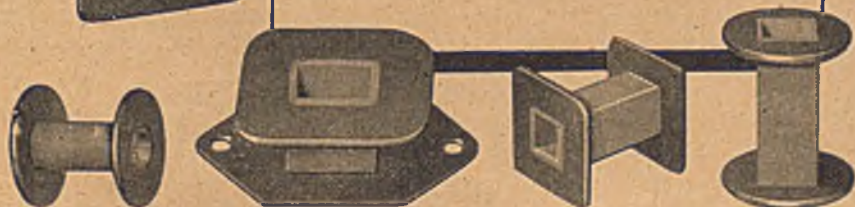
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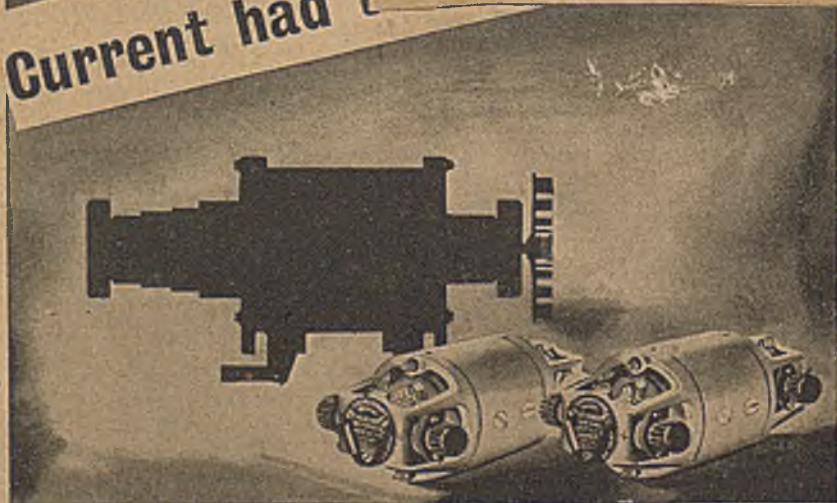
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