INSTITUTE OF MARINE ENGINEERS
INCORPORATED.

Patron : HIS MAJESTY THE KING.

SESSION 1922-23.

President : ENGINEER VICE-ADMIRAL SIR GEORGE G. GOODWIN, K.C.B., LL.D.

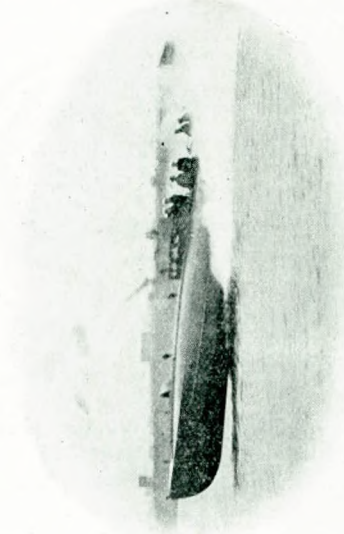
Visits to Works.

On Saturday, May 6th, we were privileged to visit the works of Messrs. John I. Thornycroft & Co., Ltd., on the island at Hampton, and to inspect the various departments, under the guidance of members of the staff.

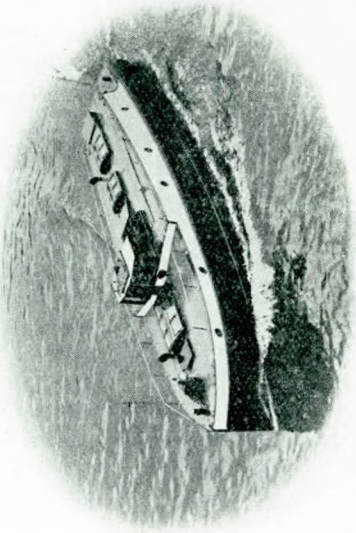
The following vessels were in various stages of progress, and the more interesting points in connection with them were noted. The Motor Yacht *Dragonfly*, 58ft. 6ins. × 13ft., was built in 1913, subsequently commandeered for war service in the Air Force; is now reconditioned for roaming around the coast. The C/4 Thornycroft 47 b.h.p. engine is as originally fitted. The M.Y. *Selene*, 60ft. × 12ft. 6ins., has good accommodation. Saloon with about 7ft. head room, three cabins, bath, pantry, cooking accommodation, etc. The engine is C/4 type, 50 b.h.p. Three hydroplanes—C.M.B.'s—were in course of refitting for peaceful duties. The torpedo firing arrangements in course of removal were described, and in place of these were being fitted seats and cover for the steering gear. The engines were of the V/12 type, 12 cylinders of 250 b.h.p. The *Aphrodite*, auxiliary sailing cruiser was built of teak for Channel Islands service in summer and winter, hence the design and style of build were proportioned to meet severe weather and fitted with a four cylinder 30 b.h.p. paraffin engine and about 600 square feet of sail area. The *Penelope*, a 28ft. auxiliary sail cabin cruiser, for service in North Wales, was

about ready to go off, and also nearing completion was Lord Montague of Beaulieu's 50ft. Solent cruiser, fitted with a 70 b.h.p. engine, to give a speed of 12 knots. An auxiliary yacht

A General View of the Hampton Launch Works.



A 55ft. Hydro-plane at full speed.

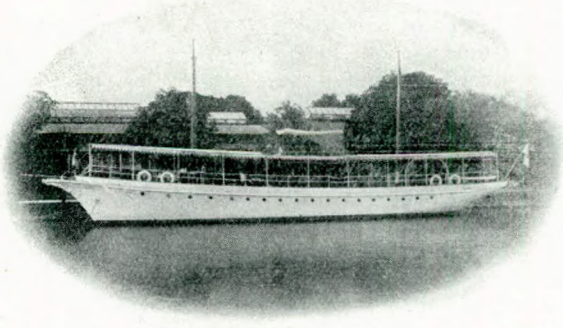


45ft. Cabin Cruiser "Eileen II."

60ft. × 12ft., with large saloon and good accommodation for service on the West Coast, was well advanced, fitted with paraffin engines of 30 b.h.p., to give a speed of eight knots.

The model room contained many interesting momentoes of war service, and types of vessels built by the firm for service in home and distant waters. The propeller adopted to reduce the commotion of the water and fitted to boats for special service during the war, reminded one of the early days of the trials of the screw propeller. The works have a power station fitted on the island so that, although isolated, they have power and light to meet their requirements.

A vote of thanks was accorded to Messrs. Thornycroft for the visit, and to Messrs. Seward and Tucker for conducting us round and describing the details.

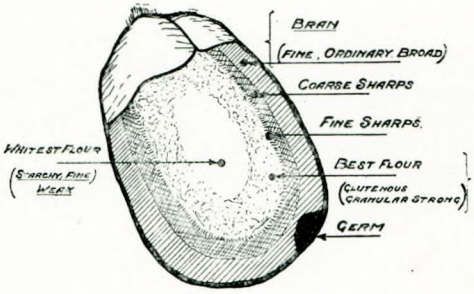


90ft. Motor Yacht "Syrene."

In the "Shipbuilding and Shipping Record" of April 20th, pp. 526-7, there is an illustrated description of the shallow draught motor vessel built for the Maharajah Dhiraz of Patiala.

Our visit to Messrs. Robinson's Flour Mills on June 10th was of great interest from several points of view, as a brief outline of the leading details will show. Engineers have many channels of thought opened up to them in their journeys to and fro, and it is well to follow these, thus developing the mind, and at the same time enlarging the understanding. By coincidence "The Engineer" contained on June 8th a very interesting article on Flour Mills, and we are indebted to the courtesy of the Editor for the loan of the blocks illustrating the germ of

wheat and the teeth of the grinders; we also express our thanks to Messrs. Henry Simon, Engineers, Manchester, for granting the use of electros.

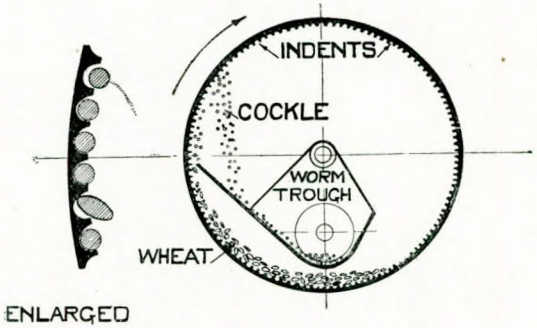


SECTION THROUGH GRAIN OF WHEAT
"THE ENGINEER" SWAIN SC.

The driving power for the mills is obtained from gas engines, the gas being made within the premises. The engines first installed gave considerable trouble, chiefly on account of the cylinders wearing badly, but improvements made as the result of experience, have brought the machinery up to a high standard of efficiency, which is necessary in all running plant.

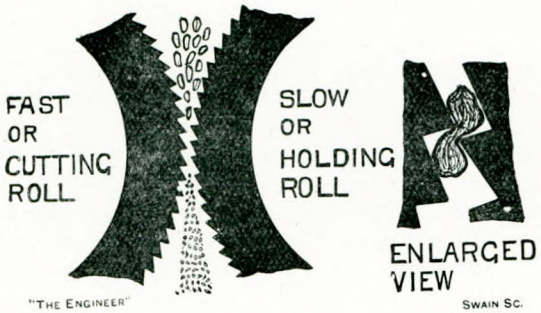
The mills are the largest example of their kind driven entirely by gas engines in London. The first units installed were about 500 B.H.P. two cycle horizontal type Korting system double acting, but in view of the small experience previously in this country with this class of engine, difficulties in design and operation were apparent in the early stages of the installation which have now been overcome. Although most consistent running is attained, gas engines on the two cycle system have not in this country justified their adoption, yet on the Continent they have been used with fair success. The later power units in the mills consist of the well-known National Gas Engine Co.'s tandem vertical four cycle type, having 4 and 6 cylinders of about 350 and 750 B.H.P. While very long non-stop runs are not required the engines are in operation constantly for not less than $5\frac{1}{2}$ non-stop 24-hour days, but if it were desired an 8 week non-stop has frequently been made by this class of engine. The gas plant supplying gas to the engines is of the well-known Mond type, made by the Power Gas Corporation, employing common bituminous slack and of about 2,000 H.P. capacity. The very high economy of this form of power generation compared with a steam driven installation

is striking, when it is realised that every ton of coal gasified in the producer gas plant produces about 2,000 B.H.P. Ammonia recovery is not attempted in this instance in view of the thickly populated area, or still better running costs would be attained. A feature of interest is the method employed for dealing with the cooling water for the gas engine jacket section, the water being passed to a system of surface cooling apparatus, water cooled, enabling, with small make up, the same water to be used continuously. The reason for this is not lack of water but due to the fact that the Kent water, owing to its hardness, causes considerable deposits to accumulate in the engine jackets, which marine engineers will appreciate are of highly calcareous nature, tending to cause overheating owing to the circulation of water round the jackets becoming congested; with however the softened water in constant use these troubles are eliminated. The exhaust from the engines passes through special boilers and a considerable amount of steam is generated, this is used for purposes in connection with the gas plant, and for the steam blast, also for an 80 H.P. steam engine which derives its power from this source. Power transmission is effected both by direct drives and also by electrical means to various parts of the mills. Most of the visitors saw for the first time, as an item of interest, steel belts in operation for driving pulleys.



In the repairing shops the process of cutting the teeth of the cutting and grinding wheels for the grain was explained; also the shape and clearances to give the best results. We then proceeded upwards and examined the six different floors of the mill, and process carried on on each floor; the cleaning and

separation of the best grain to the final stage when the pure white flour is produced and packed ready for use. In the intermediate stages were seen the different products, the husk, bran, middlings, semolina; each stage illustrating the care and attention given to arrive at the production of the purest flour for



domestic use. The carriers, breakers, grinders and machinery with their surroundings emphasised cleanliness as an essential. Samples of the grain before and after passing through one process after another were shown.

The view from the top floor of the mill was of great interest, by reason of its height and position, the Crystal Palace, the Houses of Parliament, and the London Docks being within the visible area.

The Producer gas plant was examined, and tea was afterwards served, through the kind hospitality of Messrs. Robinson, to whom a vote of thanks were accorded; also to Mr. W. E. Thompson and his assistants for devoting their time to our delectation.

West Ham Power Station.—Our visit to the West Ham Power Station on July 8th showed by contrast the great extensions which have been made since our former visit some years ago. Our thanks are accorded to Mr. F. W. Purse, Engineer-in-Chief, and to the members of the staff for pointing out the interesting details to their visitors.

The increase in the demands for lighting and power has been so great year by year that the periodical additions made to the plant have only barely kept the supply going, owing chiefly to the conditions prevailing during recent years. In 1919 it was decided to instal a 10,000 k.w. turbo-alternator with the necessary auxiliary and upkeep plant. The completion of this new

up-to-date equipment was well in hand on the occasion of our visit, and the opening ceremony took place the following

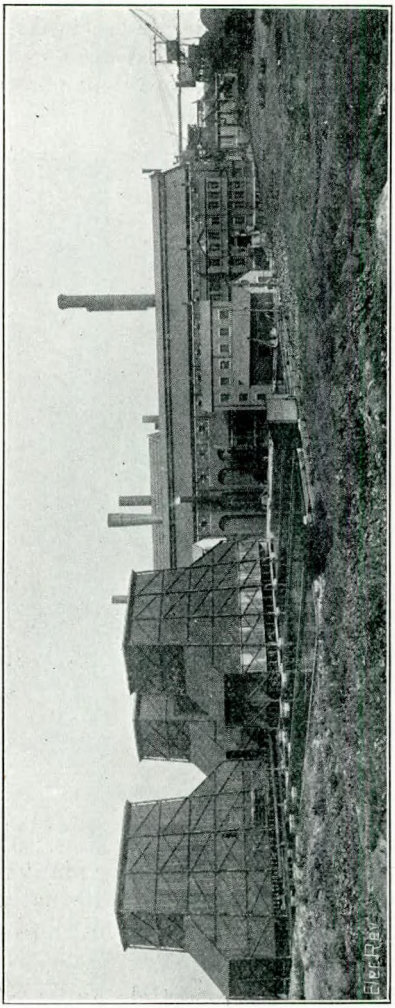


Fig. 1.—General view of Station showing Cooling Towers and Ponds.

week. It is intended to duplicate the turbo-alternator, as there are indications of further increasing demands being made on the supply of current at an economic rate. The Port

of London Authority is probably the largest customer, and the Dock extension adds considerably to the service requirements.

The River Lea supplies the circulating water, provision being made for a reserve in large water tower tanks. The steam is generated in Stirling boilers, with Green economisers. The stoking is by means of Babcock and Wilcox chain grate. Forced

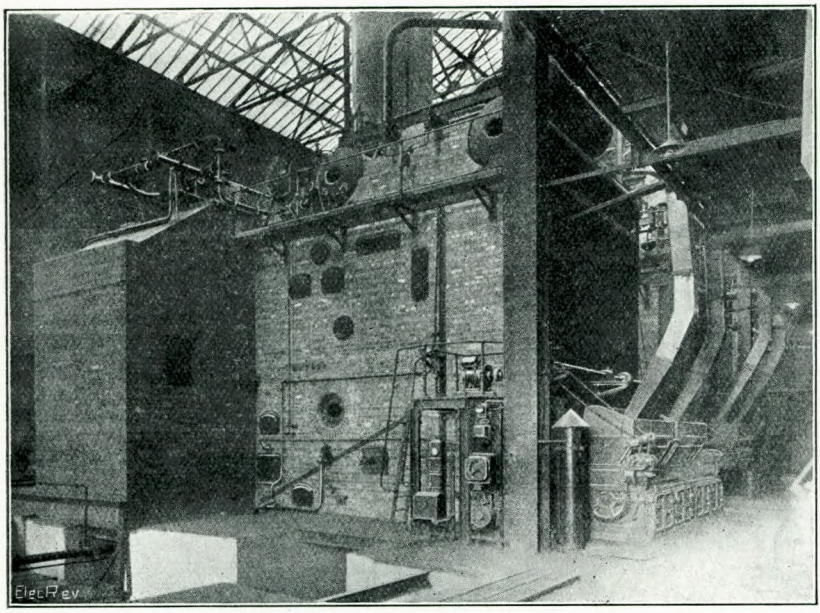


Fig. 2.—Boiler House.

and induced draught are fitted to the fires, so that either can be used. The turbine for the generating plant was supplied by Messrs. Belliss and Morcom, and the alternator is by Messrs. Metropolitan-Vickers, connected by flexible coupling. The station is well worth a visit to examine the plant.

Since our visit a descriptive article appeared in *The Electrical Review* of July 14th, so that members who desire information as to the various details may obtain it in the article referred to on pages 40/42. We are indebted to the Editor for the loan of the blocks to illustrate the works and plant.

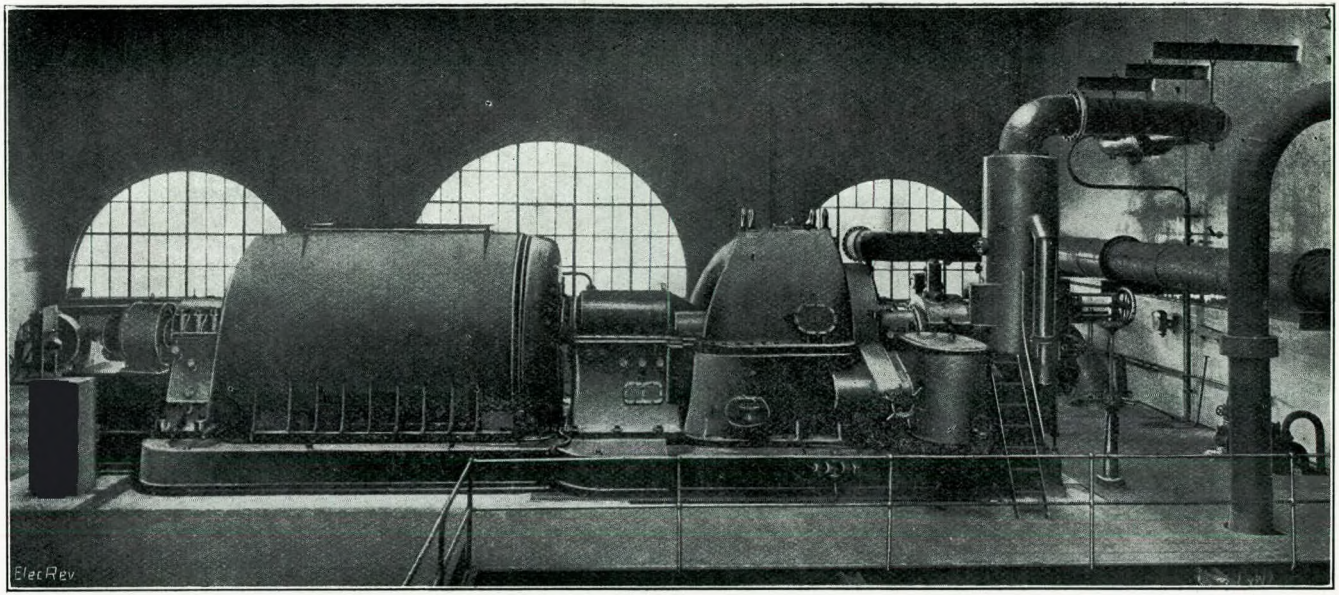


Fig. 3.—10,000 k.w.. 3,000 r.p.m. Belliss and Morcom-Vickers Turbo-Alternator Set.

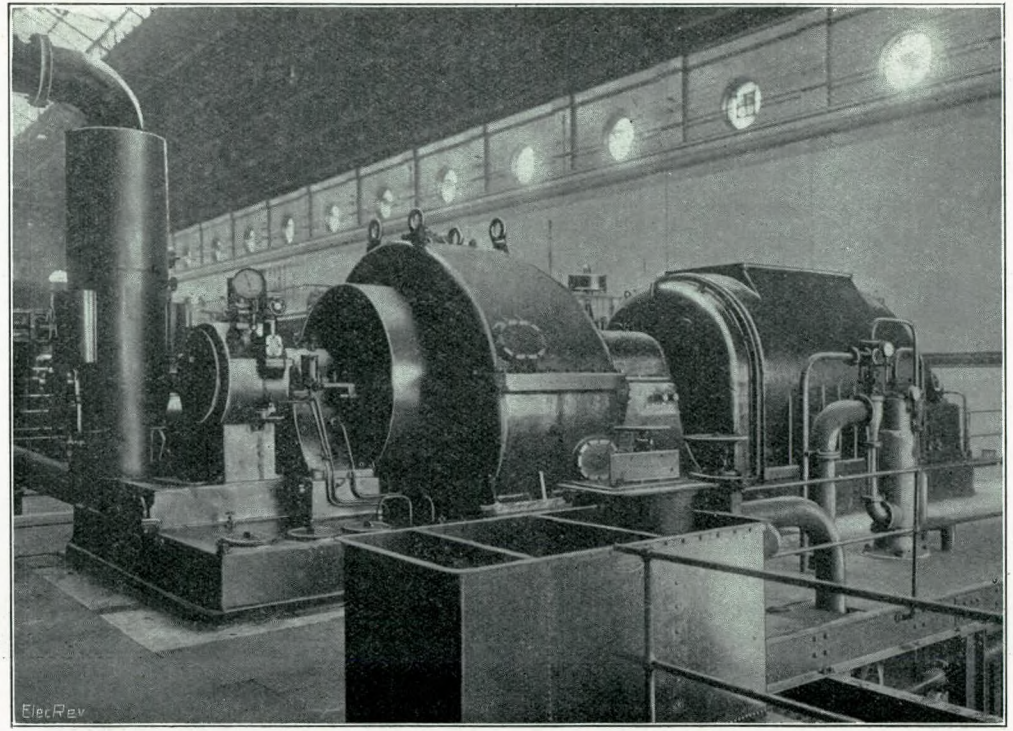


Fig. 4.—Steam End of Turbo-Alternator Set.

The Institute was represented at the International Foundry Trades Exhibition held in Birmingham from June 15th to 24th. A general invitation was also extended to our members to visit it. The exhibits embraced the various details in connection with moulding and casting, including pattern making and the breaking of pig iron for the melting furnace. The exhibiting firms are well known, and it is due to their enterprise that visitors were enabled to see samples of up-to-date machinery and tools best suited for economic results in the casting of metals.

Space was devoted to display patterns made by apprentices, for which prizes were awarded, and an inspection of the patterns showed that they came from many different districts of the kingdom. This was an excellent feature of the exhibition —an encouragement towards good workmanship, and an incentive to study the best features of a pattern to meet moulding conditions.

A section was laid out as a moulding shop, where modern methods could be seen in operation. The exhibits of the different firms are described in the exhibition catalogue, in the "Iron and Coal Trades Review," and "The Foundry Trades Journal," also notes in "The Engineer and Iron Trades Advertiser."

Coincident with the date of the exhibition a conference was held in the Chamber of Commerce Hall, Birmingham, by the Institution of British Foundrymen, when the following papers were read and discusesd:—"The Manufacture of Semi-Steel," "Safety in Foundry Operations," "American Methods of Manufacture of Mal. Iron Castings, and some data in connection with the finished product," "Manufacture of Light Steel Castings," "On New Methods of Testing Iron," "The Casting of Brass and Bronze," "Some Influences of Low Temperature on the Strength and Properties of Cast Iron," "Loam Moulding in the Liege District."

The paper on new methods of testing cast iron was by E. C. Ronceray, of Paris, who was desired by the French Technical Foundry Association to give the details of the research work conducted by Messrs. Portevin and Fremont. It was pointed out that great advancement could be made in the foundry by systematic use of their methods of testing by dealing with small shearing and compression test pieces, and inviting British cooperation in formulating international specifications. In preference to the tensile and impact tests, the method adopted was

that of trepanning specimens from the castings and shearing these several times, then crediting the average as the true test value.

The Paper by A. Campion, F.I.C. (Falkirk) and J. W. Donaldson, B.Sc. (Greenock) on some influences of low temperature on the strength and other properties of cast iron was of considerable interest to engineers, as the developments of recent years involving high speeds, temperatures and pressures have demanded superior castings to withstand the strains. The authors of the paper indicated that there is great scope for the metallurgist to investigate the subject with a view to the production of cast iron to meet present needs.

There were official visitors from the American, French and Belgian Foundrymen's Associations, an excellent feature in connection with the exhibition tending to promote friendliness and goodwill.

The British Section of the Société des Ingénieurs Civils de France met on June 26th, when an interesting paper on "The improvement of the Rhine between Basle and Strasburg," was read by A. Antoine. The Institute was represented by invitation. In his preparatory note the author stated that "The question of the improvement of the Rhine is a great technical and economic problem, interesting not France only, but also the neighbouring States, and indeed the whole of Europe, for the navigation of the Rhine has been placed under International control. In conformity with the Treaty of Versailles, the plans made by France for the improvement of the Rhine were communicated, more than a year ago, to the Central Committee exercising International control over the navigation of the river. The discussion of these plans, started many months ago, terminated lately in an important decision sanctioning an agreement between the delegates of the three chief countries concerned: France, Switzerland and Germany. This agreement relates not only to the French plans, but also to the Swiss plan for the regulation of the Rhine. It may therefore be hoped that work will soon begin for the improvement of the Upper Rhine, and it is thought, in consequence, that it might be interesting to British technical and commercial circles to have particulars of the great plans that have been laid out, and which will make the development of navigation possible in the upper reaches of a great International river, one of the greatest highways penetrating into Central Europe."

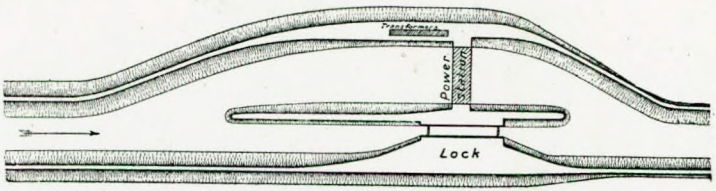
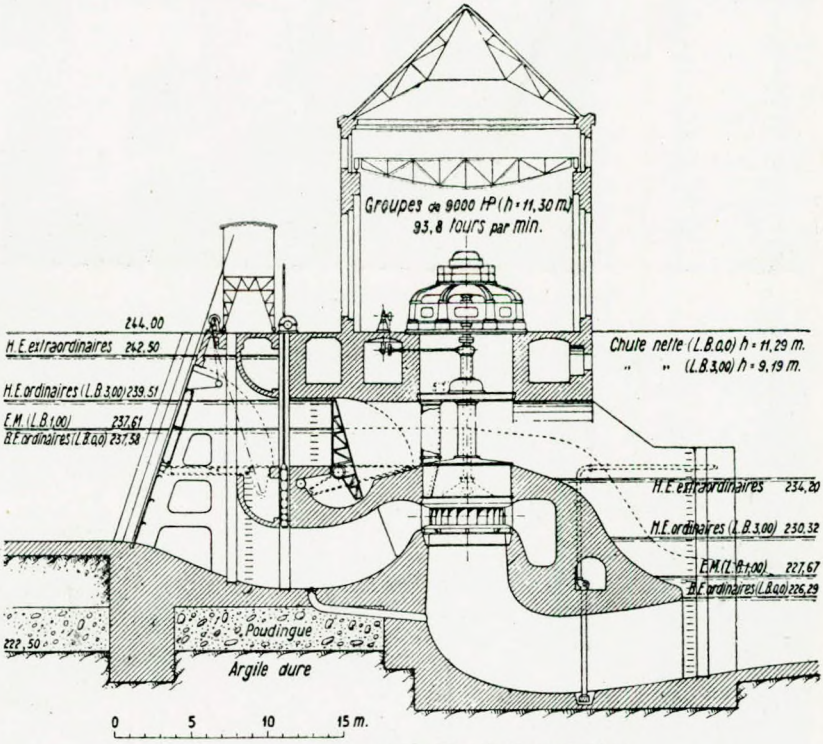


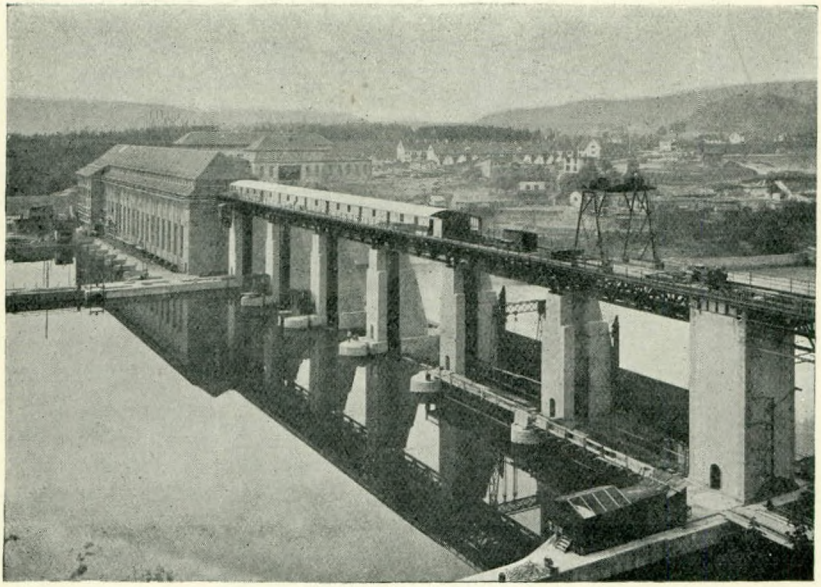
Diagram of a Standard Hydraulic Station and of the corresponding Lock on the Grand Canal d'Alsace.



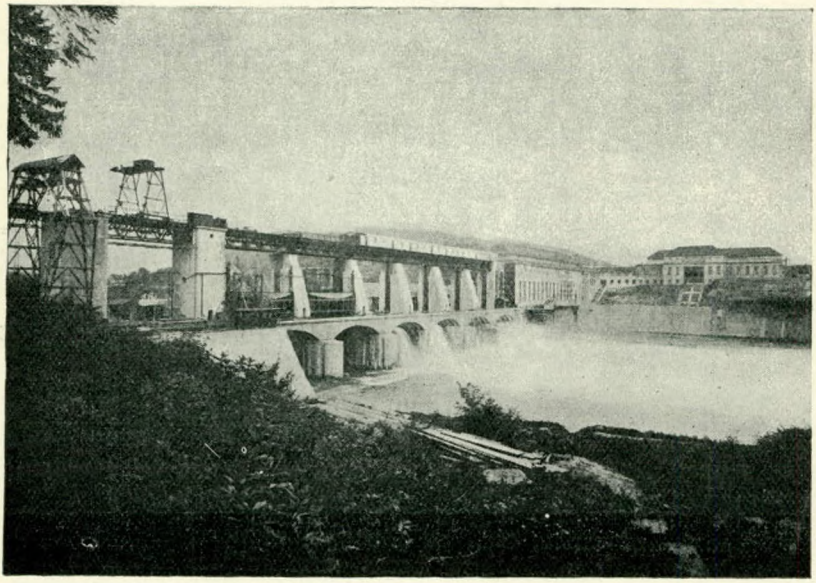
Cross-Section View of Hydro-Electric Power Station.

A copy of the paper is in the Reading Room for those to whom the subject appeals and who desire to study it.

The use of water, etc., as a power-producer, has not been developed as it might have been. The subject has been frequently referred to during past years and with fuel costs rising



Up-Stream View of the Hydro-Electric Power Station.



Down-Stream View of the Hydro-Electric Power Station.

the question of utilising water for power plant has come home for consideration more keenly than ever. The supplies of coal and oil are available for present purposes, but are not inexhaustable, and while there are temporary shortages of water in districts for general use, there is abundance available for power users to utilise to the best advantage. The above views called forth the comment. Another phase of the subject is brought forward in an article in the " Electrical Review " of August 25th on " The effect of water power development abroad on our manufacturing position."

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Review of Books presented to the Library.

Engineering Workshop Handbook, by *Ernest Pull (Crosby, Lockwood and Son)*. 3/6.—We have not seen so admirably compiled a book for a long time. This little volume, in which the author, with commendable courage, attempts to embody a very large amount of information, achieves its object in a remarkably efficient manner; the range of subjects treated and the manner of their treatment are alike excellent, it is obviously the work of an experienced teacher whose knowledge of his subject is equalled only by his appreciation of his pupil's difficulties, an all too rare combination. The book is for beginners at engineering, but as a specimen of sound and comprehensive knowledge and lucid exposition it is well worth a place in every practical engineer's library.

Journal of the Institute of Metals, Vol. XXVII., 1922.—We have again been favoured with a copy of this valuable journal, the contents of which fully maintain the high standard which has been set by the contributors to the Transactions. All the papers contained are the result of original research, and all have an important bearing on marine engineering, especially that on the Corrosion and Protection of Condenser Tubes, the work of a committee, which, under the lead of Dr. Bengough, have been carrying out research work on this subject for 10 years. The reading of such reports is most inspiring, teaching every thoughtful student how by infinite patience and skill, learning and enthusiasm, our knowledge is continually expanded by quiet unobtrusive workers whose lives are devoted to this high service. It is noteworthy that even after ten years of research the problem of corrosion in condenser tubes still awaits a satisfactory solu-

tion, which, it is to be hoped, the Committee will succeed in finding. Our thanks are due to them and to the Institute of Metals for this valuable Journal.

NOTES AND SKETCHES ON MARINE DIESEL OIL ENGINES, 25/-. *J. W. M. Sothern.* (*Jas. Munro and Co., Ltd., Glasgow*).—

This new volume is on lines long familiar to sea-going engineers, and appears to be primarily intended as a guide to students preparing for marine engineers' examinations. It is well written and illustrated and will help the student to obtain a clearer view of some aspects of the subject, which cannot of course be mastered by the aid of such a volume alone. In this connection the papers read at this Institute and now about to be published in book form will greatly assist those who are seeking information to obtain a fairly sound knowledge of the subject, quite apart from purely examination purposes, and to one so equipped the perusal of Mr. Sothern's new volume will present no difficulties, and may well afford new light on an important and complicated development of marine engineering science.

Election of Members.

Members elected at Council Meeting of September 4th, 1922:—

Members.

Alfred Hay Barnicoat, 49, Glenroy Street, Roath, Cardiff.
Joseph Henry Ellis, 37, Hertford Road, Bootle, Liverpool.
William Thomas Harris, Zennor, Baroness Place, Penarth, Glam.
Duncan Campbell Linn, Carnac Works, Messrs. Alcock, Ashdown & Co., Ltd., Bombay.
William Scott, 18, Marldon Avenue, Great Crosby, Liverpool.

Associate-Members.

Lewis Brace, Dunsmore, Horeham Road, East Sussex.
Victor Tom Linden Carwood, 147, Hollydale Road, Peckham, S.E.15.
Robert Walter Thompson, 155, Fenchurch Street, E.C.3.
Robert William Whittle, Newhouse Farm, Grangemouth, Scotland.

Associate.

Edward William Brown, 14, Piershill Place, Edinburgh, N.B.

Student-Graduates.

Henry Duthie, 471, Great Northern Road, Woodside, Aberdeen.
Frank Jamieson, 102, Great Northern Road, Woodside, Aberdeen.
Aeneas Anderson Mair, 96, Walker Road, Torry, Aberdeen.
David Murray, Millseat Manse, By Turriff, Aberdeenshire.
Charles Simpson, 36, Mount Street, Aberdeen.
John Will, Balneden Cottage, Bedford Place, Aberdeen.

Transfers from Associate-Member to Member.

Fairbairn Downie, Major, C.B.E., National Liberal Club, Whitehall Place, S.W.1.
Fred. W. Laverick, 37, Drayton Grove, West Ealing, W.13.
H. Ian MacIver, 44, Chapel Street, Liverpool.

Transfer from Graduate to Associate-Member.

James F. Pilton, 85, Galbraith Street, Cubitt Town, E.14.

Transfer from Graduate to Associate.

Thomas E. C. Tonks, 28, Rossett Road, Blundellsands, Lancs.