

At the Turn of the Gentury

THE GENERAL ELECTRIC CO. LTD.



G.C.
AT THE
TURN
OF THE
CENTURY

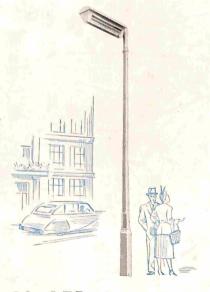
THE LARGEST

BRITISH

ELECTRICAL

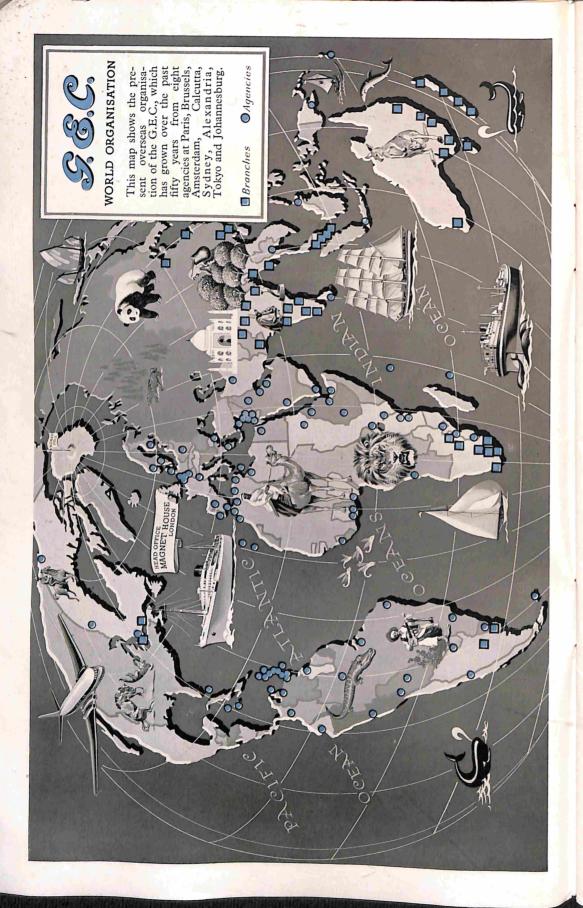
MANUFACTURING

ORGANISATION



THE GENERAL ELECTRIC CO. LTD.

Head Office: MAGNET HOUSE, KINGSWAY, LONDON, W.C.2



9.6.C.

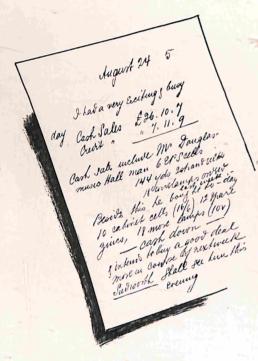
AT THE TURN OF THE CENTURY

The century's half-way house provides a convenient point from which the G.E.C. of to-day, embracing every field of electrical enterprise and endeavour and straddling the world with its organisation, may survey the path it has trodden for the past seventy years. Looking back, the Company may well be proud of the early difficulties overcome and the triumphs and achievements of later years, and although its present stature forces it to look down upon the infant company of 1900, it remembers that this young prodigy of 1900, with quite a few years of manufacturing experience already behind it, was an electrical giant in its day.

The pages of this booklet compare the infant G.E.C. and some of its products as they were in 1900 with the Company and its products of the present time. Within the compass of a booklet of this size the comparison cannot be exhaustive. Indeed, it is possible to spotlight only a few of the many quite fascinating changes wrought by the passing of the last fifty years. One aspect, however, which has not changed is the spirit of adventure which permeated the G.E.C. when it was first formed and which still permeates it to-day. One of the earliest catalogues of the Company, produced in 1886, almost casually informs its readers that "Estimates, advice or information are given verbally or by letter; and our friends are invited to avail themselves of this in writing to us for information on any subject relating to electricity." In the superb confidence of this invitation is struck the key-note of the Company throughout its history.

The curtain is now rising on the problems, effort and achievements of the next half-century. Its challenge, sterner perhaps than that of the half just traversed, is faced confidently by an old organisation with new-springing vitality.

PROGRESS DURING THE PAST FIFTY YEARS



A page from the late Lord Hirst's diary of 1885.

Just nineteen years before the present century was born, a little shop in London was selling crude electric bells and lamps to people who liked new-fangled toys. The shop-keeper was an eighteenyear-old lad named Hugo Hirst. Such was his enthusiasm that each day he would enter in his diary a record of his business transactions, and the entries provide a fascinating glimpse of the man who founded the fortunes of the Company and, who as the late Lord Hirst, controlled the destiny of the largest British electrical organisation employing tens of thousands of people.

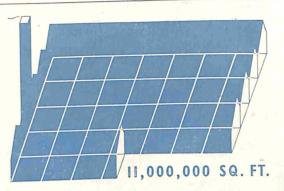
1900 was more than a chronological turning point in the electrical industry's history. In that year the first group of electric power schemes received the sanction of Parliament, and the first electric tube railway was under construction. The same year heralded the emergence of the G.E.C. as a public company.

The General Electric Company (1900) Ltd. was formed with a working capital of £289,000 and its business was stated to embrace "all apparatus and fittings required for or capable of being used in

1951 WORKS 1900 WORKS

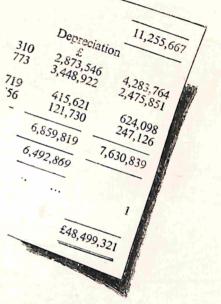


350,000 SQ. FT.



connection with the generation, distribution, supply and accumulation of electricity, whether for lighting, heating, motive power, telegraphic, telephonic, electroplating, metallurgic or other manufacturing processes, or other purposes whatsoever.

This was a prophetic vision. To-day, G.E.C. equipment lights and warms your home, cooks your dinner, makes your toast, dries your hair, keeps your food fresh, heats your bath water and entertains you with radio and television. It signals you into Kings Cross and brings you safely down at London Airport. It generates electricity in power stations and carries it with giant strides over the countryside. It brings coal out of the earth of Britain and gold out of the rocks of South Africa. It gets you that number on the telephone and stops you from being run over in the street at night. It has brought Ariel up to date and put an electrical girdle about An extract from the the earth.



Company's 1951 Balance Sheet.

1951

CAPITAL EMPLOYED 1900

CAPITAL EMPLOYED 1951



EMPLOYEES 1900



57,800

£289,000

3,000

HEADQUARTERS 1900

By 1900, the Head Office of the Company had already

been established in Queen Victoria Street for eleven years and

those pessimists who had voiced their doubts of the wisdom of acquiring premises so much larger than the needs of the

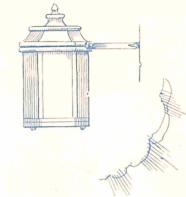
Company indicated were beginning to be proved wrong.

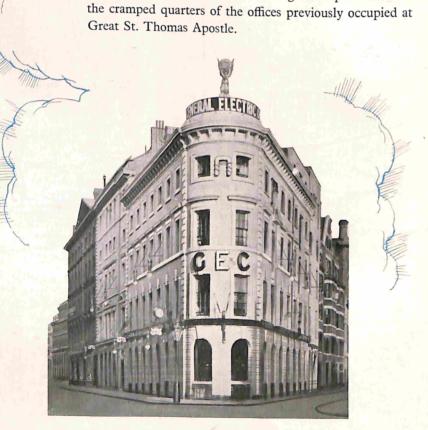
It was an inconveniently arranged wedge-shaped building,

but at the time it was considered a great improvement on

HEADQUARTERS 1951

During the period of reconstruction after the first World War the present G.E.C. headquarters at Magnet House, Kingsway, London, were completed. The steel frame of this building was actually in course of erection in 1914 when the war broke out, but the completion of the structure had to wait until the removal of the restriction on building after the conclusion of the war. In 1921 the staff moved from their old familiar Queen Victoria Street building to their new quarters. To-day Magnet House accommodates a staff of over 2,000, has 90 telephone lines serving 450 extensions, and provides a floor space of 260,000 sq. ft.





The Head Office of the G.E.C. from 1889 to 1921. It was in Queen Victoria Street, London.



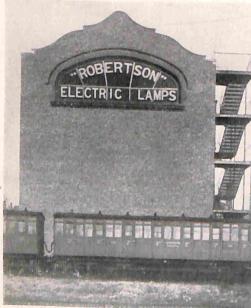
Magnet House, Kingsway, London, the Head Office of the G.E.C. to-day.

G.E.C. WORKS 1900





1901. "The old order changeth, yielding place to new." The first of the large groups of works at Witton, Birmingham, assumes a recognisable shape.

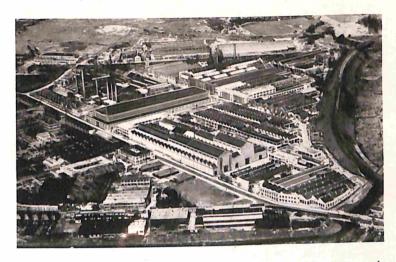




1900. The Robertson Lamp Works, Hammersmith, London, where the famous Robertson falament lamps were made.

G.E.C. WORKS 1951

The expansion of the G.E.C.'s productive capacity from its earliest days has involved the development and exploitation of new materials, the continual replacement of obsolescent machinery with the latest equipment, the building of new factories and the steady extension of old ones to meet the increasing demand for electrical products. The growth of the Witton Works at Birmingham and of the Lamp Works in London (which are illustrated on these pages) is typical of what has been happening for many decades in every one of the Company's establishments.



1951. The Witton group of works now ranks among the largest manufacturing centres of electrical equipment in the world.



1951. The Osram Lamp Works at Wembley which, together with other associated works, form the largest electric lamp manufacturing organisation in the British Commonwealth.



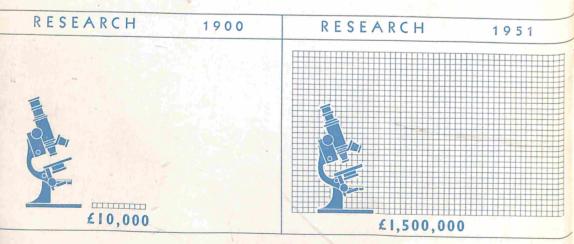
The modern fluorescent lamp developed in the G.E.C. Research Laboratories.

RESEARCH OVER FIFTY YEARS

During the last fifty years, a revolutionary change in attitude towards industrial research has occurred. At the beginning of the century, scientific research was considered to be the sphere of a few workers in universities or of one or two research groups in government establishments. No effort had yet been made to use scientific investigation as a background for industry.

The G.E.C. was among the first in this country to realise the potentialities of industrial research and straight away applied it to their own organisation. As early as 1916, a plan was formed to start Research Laboratories whose services would be available to any manufacturing unit in the Company requiring scientific advice. The decision to undertake this project was particularly farsighted and courageous, since at that time many of those engaged in industry failed to see that any benefit whatsoever could result from the introduction of scientists into the factory.

Now one of the oldest, if not the oldest, industrial research units in the country, the Research Laboratories at Wembley have more than fulfilled the ideals of those who planned them. The work carried out there has not only justified the application of scientific research to industry but has proved the absolute necessity for its existence. To-day, the advice and guidance of trained scientists and technologists is an integral part of every project undertaken by the Company.



An indication of the present scope of the Laboratories is the fact that every works and technical department in the G.E.C. requiring scientific advice is represented by a group of workers in the Laboratories. There are some thirty-five such units, in addition to service groups of analytical chemists, metallurgists, X-ray workers, spectroscopists and others, whose services are generally available throughout the Laboratories and the Company.

As the value of the service which scientists could render to industry became more widely known, the older attitude towards industrial research changed. The example set by the G.E.C. in setting up a research establishment of its own has since been followed extensively by others.

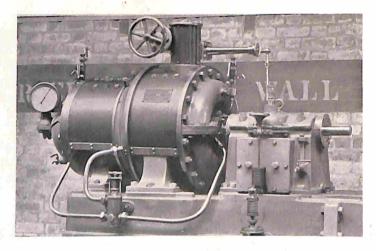


Modern centimetric radar was made possible by the production in the G.E.C. Research Laboratories of the first practical magnetron valve.

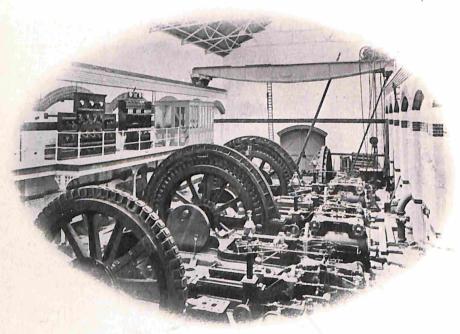
G.E.C. Research Laboratories, Wembley.



POWER STATION PLANT 1900



One of the first Rateau turbines to be manufactured by the Fraser & Chalmers Engineering Works, this 60 B.H.P. turbine was installed at Liverpool University.



1900. Three G.E.C. generators, driven by reciprocating engines, in the electricity works of Fulham Borough Council.

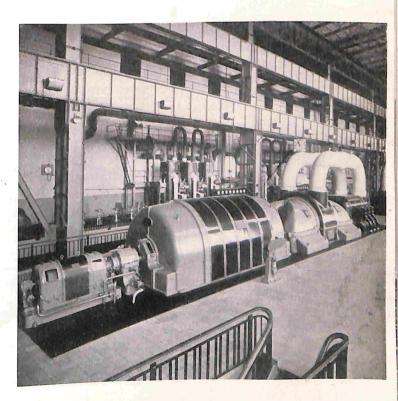
POWER STATION PLANT 1951

About 1900 the evolution of the steam turbine started a new era in the generation of electricity. The old reciprocating engine driving slow speed alternators gradually gave place to turbines with speeds of 1,000, 1,500 and later 3,000 revolutions-per-minute driving much more compact generators.

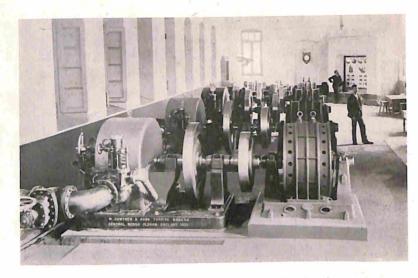
In 1905 the Fraser & Chalmers Engineering Works at Erith became the first British licensees of the Rateau impulse turbine. While generally retaining the "impulse" principle, the Company from 1911 onwards developed its own designs, and now manufactures steam turbines of many kinds. In conjunction with generators made in the Witton Engineering Works the G.E.C. is able to provide electrical equipment for power stations not only in this country but all over the world.



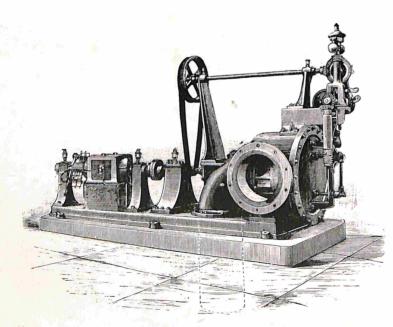
A modern power station with a recently installed 30,000 kW turbo-alternator. This unit generates thirty times more electricity than the three Fulham generators shown on the opposite page.



HYDRO-ELECTRIC PLANT 1900



One of the earliest G.E.C. hydro-electric installations was at Coonoor, India.



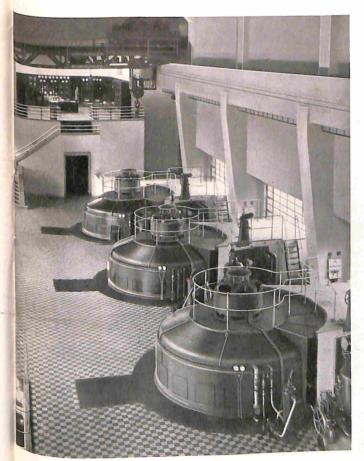
"Turbine for Electric Lighting and Power Transmission" illustrated in the 1889 Catalogue.

HYDRO-ELECTRIC PLANT 1951

"The advantages of water power for the generation of electricity are numerous, more especially in small towns and country mansions, where comparatively small streams may, by careful engineering, be made available. The water supply of towns may also be used, the turbines being placed where the main pipe enters the reservoir."

This excerpt from the Company's 1899 catalogue is of interest when compared with the present-day conception of the use of water power for the generation of electricity.

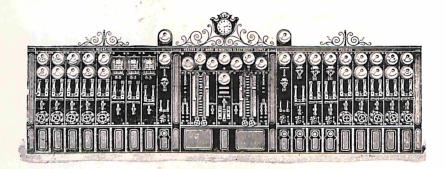
Water power still remains the cheapest source of electricity wherever geographical conditions are favourable. International necessity has prompted the implementation of hydro-electric schemes in which the Company has shared in all parts of the world.





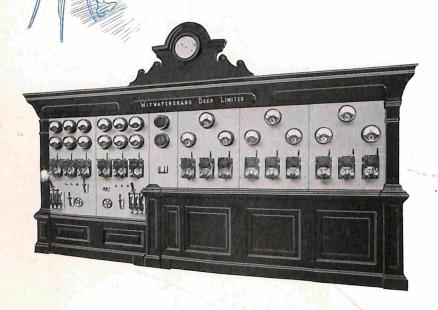
A modern hydroelectric power station.

SWITCHGEAR 1900

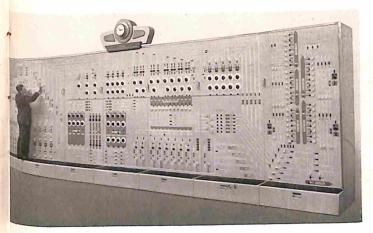


A lighting switchboard supplied in 1899 to the Vestry of St. Mary Newington.

At the beginning of the century switchboards of this type were being manufactured for several South African mines.



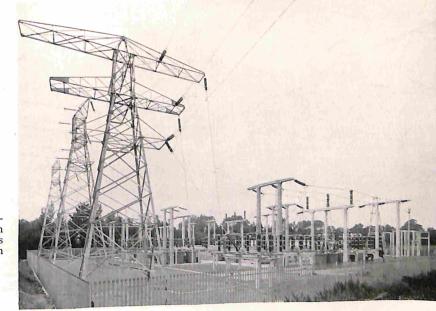
SWITCHGEAR 1951





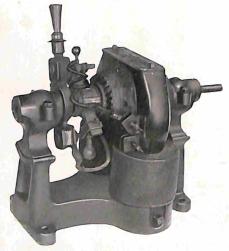
One of the latest designs of control boards. It has just been shipped to South America.

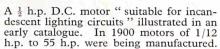
It is a far cry from the switchboards of 1900, with their cumbersome slabs of enamelled slate or polished marble enriched with fussy iron scrollwork, to those of the present day with their streamlined efficiency. In the early days of this century G.E.C. switchgear was made on a balcony overlooking the engineering shop at Witton. Nowadays, large specialised works are devoted to its manufacture with special testing laboratories which can momentarily generate as much electricity as a modern super power station.

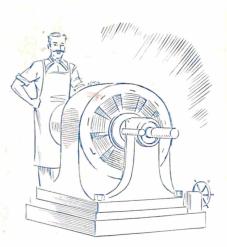


Outdoor switchgear as used in large quantities on the British grid.

MOTORS 1900

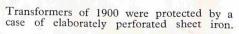




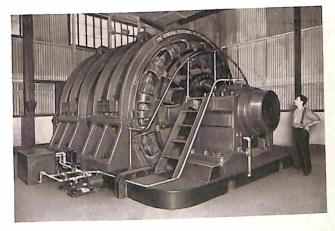


TRANSFORMERS 1900

"The desiderata in a good transformer are now generally understood and appreciated, so that we are enabled to manufacture a thoroughly reliable apparatus and obtain the best results." Thus wrote the G.E.C.'s engineers in 1900, happily unaware of the problems to be overcome in producing the giant transformers required to-day.



MOTORS 1951



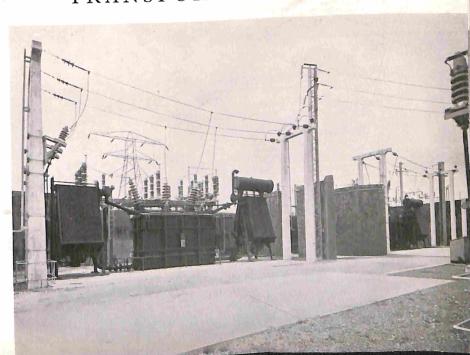
A 20,000 h.p. motor driving a steel mill.

"The use of electrical power," states the 1902 edition of the G.E.C. Catalogue, "is one of the successes of the age," and judging by the space devoted to electric motors in this astonishingly comprehensive catalogue the Company was already well to the forefront in this particular field. This is equally true to-day and motors are produced at the Witton Engineering Works in Birmingham for purposes as widely divergent as driving gramophones and London's Underground trains, textile mills and hair dryers, ocean-going liners and drink mixers.

TRANSFORMERS 1951



A large outdoor transformer stepping down the grid voltage of 132,000 volts to 33,000 volts.

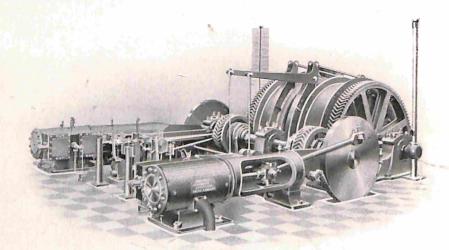


MINING EQUIPMENT 1900



An electrical coal-cutting machine of 1900 driven by a G.E.C. motor.



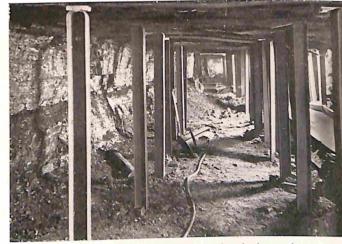


An early Fraser & Chalmers steam-engine driven colliery winder.

MINING EQUIPMENT 1951

It is always surprising to find how many seemingly modern developments had been thought of and introduced many years ago. The present urgent need for coal, for example, has emphasized the necessity for mechanical coalwinning plant and in view of all the publicity that has been given to modern equipment of this type it is interesting to find that the Company was selling an electrically - driven coal-cutting machine as far back as 1900.

To-day there is no part of a mine, whether it be a coal mine or a gold mine, for which the G.E.C. does not supply equipment specially designed to assist the miner in his arduous work and to ensure his well-being and safety.



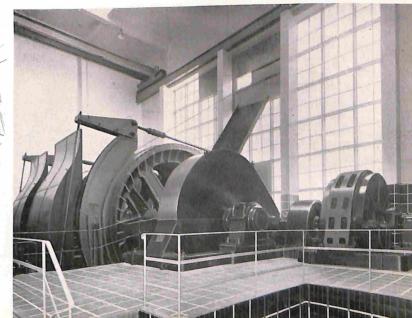
How a coal-seam in a mine looks to-day when lighted by modern fluorescent lamps.

Special flameproof lighting fitting for use in mines.





A modern electrically driven colliery winder.



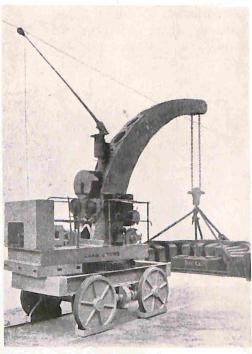
MINING AND MATERIALS HANDLING PLANT 1900



A small ore crusher of the type made in the early years of the century.

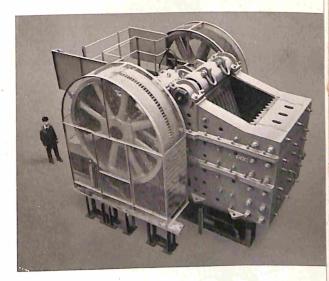


In 1900, an electric crane which could lift an 8-ton load was an innovation. It drew its electric current from an overhead cable.



MINING AND MATERIALS HANDLING PLANT 1951

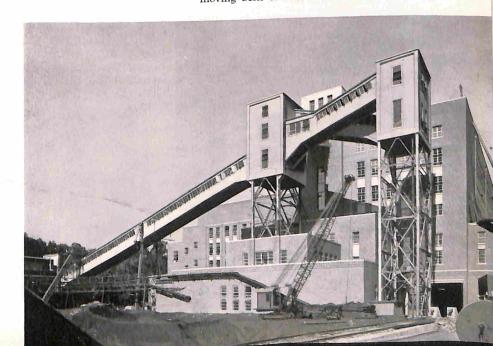
Any large electrical manufacturing concern would be incomplete without a works specialising in mechanical engineering, and in the Fraser & Chalmers Engineering Works at Erith, Kent, the G.E.C. possesses a mechanical engineering works which even at the beginning of this century was world-renowned for its mining plant. During the past fifty years the Fraser & Chalmers Engineering Works has added steam turbines, turbo - blowers, mechanical handling equipment, coal preparation plant, furnaces and Diesel engines to its products, to mention only a few. There is a heavy demand for this class of equipment from all quarters of the world.



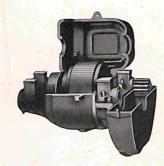
9.6.C.

A very large modern ore crusher.

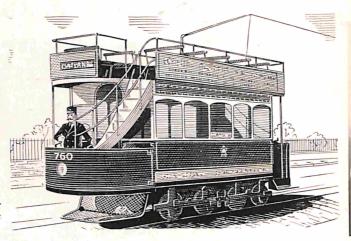
Coal-handling plant at a modern power station. Coal is taken from the stock-piles up inclined moving belts to the boilers.

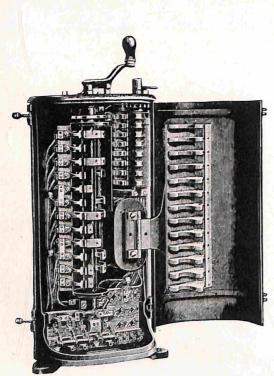


TRANSPORT 1900



A 25 h.p. tramcar motor marketed by the G.E.C. in 1900.





A tramcar controller of 1900.

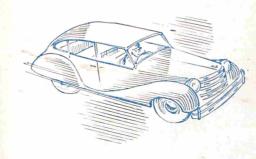
In 1900 the manager of a municipal tramway could consult his G.E.C. catalogue and order everything electrical that a tramcar used, from the overhead cables, trolleys and poles to the actual tramcar motors and controllers. He could also buy himself a snow plough. A railway-coach builder could select his lighting fittings from a comprehensive and highly decorative stock of specially designed fittings and there were many other items which he must have been sorely tempted to embody in his well-built and beautifully finished rolling stock.



TRANSPORT 1951



In fifty years the Company has extended its activities to cover the phenomenal growth of world transport. London's underground trains, powered by G.E.C. motors, convey their millions of passengers into and out of London every day. Ocean-going leviathans propelled by G.E.C. motors plough their way over the world's seas. Electric locomotives in Europe and India, trolley buses in Ireland and Australia, air liners in most continents of the world are operating with G.E.C. equipment.



The world-famous Comet jet air-liner is fitted with G.E.C. aircraft galley equipment, and special heavy alloy for mass-balancing flying controls.

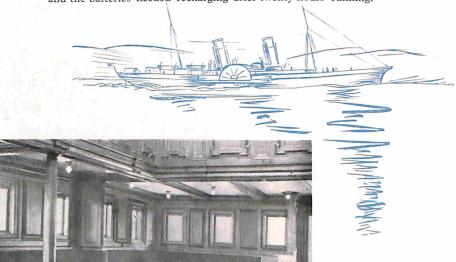


The recently electrified railway between Estoril and Lisbon (Portugal) operates with G.E.C.-equipped electric locomotives and motor-driven coaches.

MARINE ELECTRIFICATION 1900



An electric launch of 1900. It had a speed of five miles per hour and the batteries needed recharging after twenty hours' running.



Interior of the 1st class smoking saloon of the P. & O. S.S. Mongolia (built in 1903) illuminated by Robertson carbon filament lamps.

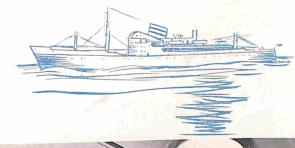
MARINE ELECTRIFICATION 1951

If there is one characteristic of the Victorians which impresses itself on the reader of the G.E.C. Catalogue for 1899, it is their willingness to experiment. Typical of their inventive ingenuity were the electric launches which were offered complete for £200. It was claimed that they would be found "a great convenience wherever facilities exist for recharging the accumulators."

Ship propulsion is a far more complicated nowadays, when turbo-electric and Diesel-electric equipments have replaced "accumulators and motors" as a source of propulsive power and when the safety and comfort of passenger and crew depend almost entirely on electrical devices.



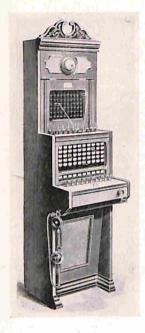
The tug Acklam Cross towing the then unfinished tanker San Salvador, both vessels being equipped with G.E.C. electric propulsion machinery.





Lighting in a modern ship — the Ocean Monarch. The Company supplied practically the whole of her extensive electrical equipment.

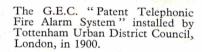
COMMUNICATIONS 1900



Standard G.E.C. telephone switchboard of the early part of the century.



The table telephone of 1900 . . .





COMMUNICATIONS 1951



and its modern counterpart.



Electronic equipment on national trunk telephone circuits, enabling twelve conversations to take place simultaneously over one pair of wires.

Modern police car fitted with radio transmitter and receiver.

"By the use of a telephone a gentleman may order his carriage without leaving his breakfast table. In fact, the telephone can truly be said to have successfully overcome impossibilities due to time and space under which mankind has laboured for so many centuries" (1899 Catalogue).

In fifty years the G.E.C. has helped to overcome many more "impossibilities" in the field of communications. Not only has it effected great improvements in the quality and design of telephone equipment but it has also played a vital part in the development of radio and television, of which the London-Birmingham television link is only one outstanding example.



STREET LIGHTING 1900





"G.E.C. Patent Lantern, Switch and Fuse with Robertson Carbon Filament Lamps" in one of the streets of Poplar, London, 1900.



STREET LIGHTING 1951

By 1900 the Company had already become firmly established in the field of street lighting and had developed and introduced some ten years before the remarkable "Angold" electric arc lamp which used "Apostle" electric light carbons (receiving their name from the first home of the G.E.C.—at Great St. Thomas Apostle, London). Smaller fittings with Robertson carbon filament lamps were being increasingly used for side-street lighting.

Within the next fifty years G.E.C. street lighting had set a standard which most of the cities and towns of Britain had adopted and which had spread to the furthermost corners of the civilised world.



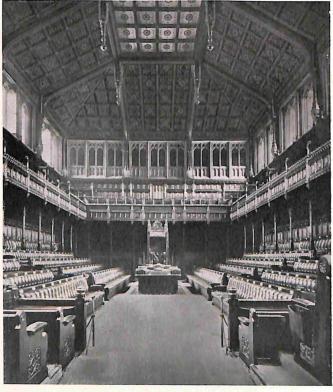
One of the many main thoroughfares of London lighted by Osram fluorescent lamps mounted in G.E.C, street lighting lanterns.

9.6.C.

INTERIOR LIGHTING

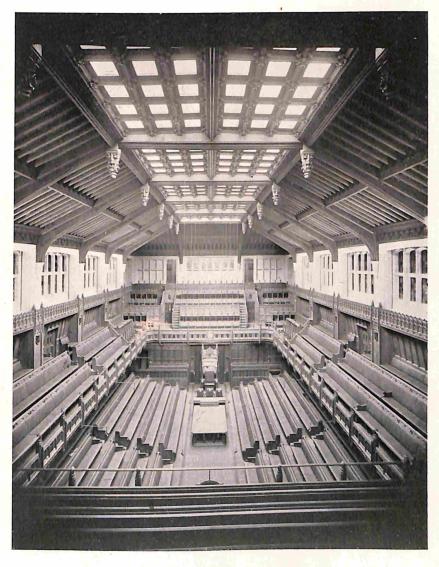
Although the lighting of the House of Commons as it was in 1900 and as it is to-day does not provide a comparison of G.E.C. interior lighting then and now (in 1900 the House was lighted by gas), the lighting by the Company in 1951 of the new Chamber—the very heart of Parliamentary institutions—crowns with pride and glory the achievements of the years. The difficulties and delicate task of applying modern lighting equipment and technique to meet the most exacting architectural requirements exercised to the full the ingenuity of the Company's lighting engineers.





The Chamber of the House of Commons as it appeared in 1900 (Architect: Sir Charles Barry). At night the Chamber was lit by gas.

INTERIOR LIGHTING



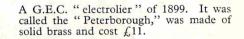
The Chamber of the House of Commons as it is to-day (Architect: Sir Giles Gilbert Scott, O.M.). The main lighting is by special Osram fluorescent lamps concealed behind glazed roof panels which by day are indistinguishable from oak.



INTERIOR LIGHTING

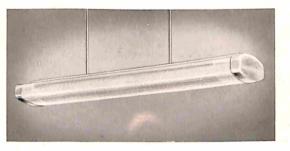


The original reproduction of this fine steel engraving appeared in the *Illustrated London News* of 1851 and shows the main transept of the Great Exhibition of that year at the Crystal Palace. Thirty-two years later the eyes of Londoners were dazzled for the first time by an array of electric lamps at the Electrical Exhibition at the Crystal Palace. The G.E.C. was then one year old.



INTERIOR LIGHTING

A lighting triumph of 1951 hardly less spectacular than that of the House of Commons is provided by many of the major lighting effects in the Festival of Britain South Bank Exhibition where the underwater lighting of the pools and fountains, the floodlighting of buildings and decorative features and, above all, the auditorium lighting of the Festival Concert Hall, are a measure of the Company's versatility in this field. Here in this exhibition, the modern may feast his eye on the art and fashion of his day. He may regard the elaborate ornamentation of the Victorians as being fussy, purposeless, and even irritating. Nevertheless, the electroliers, pendants, and other lighting fittings marketed by the G.E.C. in 1900 were greatly admired in their time. An intricate pattern was the mark of special skill on the part of the individual craftsman. Modern production methods find their expression in the functional simplicity of most contemporary styles.



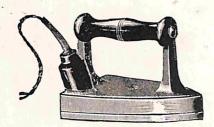


A typical modern fluorescent lighting fitting.

The main lighting of the auditorium of the Royal Festival Hall, the only permanent for the 1951 Festival of Britain South Bank Exhibition, was entrusted to the G.E.C.



HOUSEHOLD APPLIANCES 1900



A "light work" electric iron of 1899.



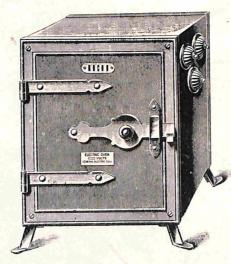
The electric kettle of 1900 was made in 1, 2 and 3 pint sizes.



Even the electric light switch had its full share of ornamentation.



"They look very pretty when lighted" was the catalogue description of this 1902 electric radiator.



"For an average family of seven or eight persons"—the G.E.C. 1900 electric oven.

HOUSEHOLD APPLIANCES 1951

One of the advantages of an early G.E.C. electric cooker according to the 1899 catalogue, was the maintenance of "a constant and even heat, thus preventing undue burning." Users of electric irons were adjured "never to immerse the utensils bodily in water."

The modern counterparts of what were freak gadgets in 1900 are regarded by the modern housewife as indispensible labour-saving devices. To meet her demands the G.E.C. makes equipment for the home which is efficient, reliable and pleasing in appearance.



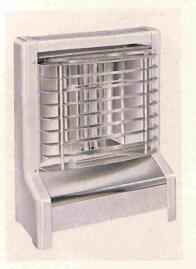
The modern rapid-boiling kettle is fitted with replaceable immersion elements.



The latest type of thermostatic iron.

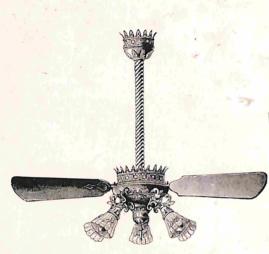


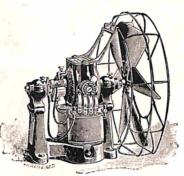
The modern domestic electric cooker.



One of the new dispersive reflector fires fitted with the latest form of safety guard.

ELECTRIC FANS 1900

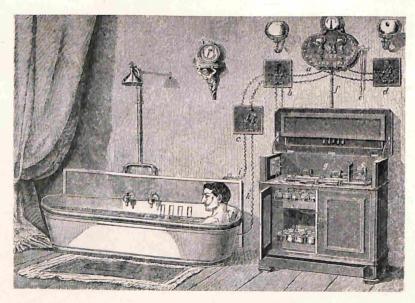




An 1889 fan—efficient, but hardly up to modern standards of design.

"During the winter the blades can be removed"—a 1900 electrolier ceiling fan.

ELECTRO - MEDICAL EQUIPMENT 1886

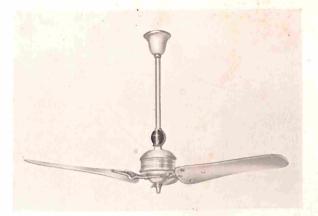


Not a Victorian form of suicide, but a gentleman of that era indulging in a little "constant and Faradaic current application." (Illustration from the G.E.C. Catalogue of 1886).

ELECTRIC FANS 1951



The new rubberbladed fan which requires no guard.



A modern ceiling fan.

"These fans are a great convenience and are always appreciated, as they give a pleasant breeze from an apparatus which can be moved about upon a desk" (1899 Catalogue). Fans of to-day are still a great convenience and are much more easily moved about a desk.

Fans bring one form of comfort to mankind. Electro-medical equipment brings aid to ailing humanity, and the G.E.C. is proud to have been marketing this class of equipment ever since 1886 when quite an array of appliances was catalogued.

ELECTRO-MEDICAL EQUIPMENT 1951



The latest X-ray equipment takes X-ray cine pictures of the movements of the body.

OVERSEAS ORGANISATION 1900/1951

Overseas, the growth of the G.E.C. over the past fifty years has reflected its expansion at home. At first, in the early years of the present century when the volume of overseas business was small, requirements were met by the establishment of agencies in Paris, Brussels, Amsterdam, Calcutta, Sydney, Alexandria, Tokyo and Johannesburg.



The corrugated iron shed which formed the first Head Office of the British General Electric Co. Ltd., in Johannesburg, South Africa.

The present Head Office in Johannesburg of the British General Electric Co. Ltd. of South Africa.



To-day the G.E.C. is represented by no fewer than eleven overseas trading companies with 42 overseas branches and 105 agencies: in addition, auxiliary manufacturing centres operate in Australia, India, South Africa, Eire and France.

THE GENERAL ELECTRIC CO. LTD. OF ENGLAND

Known throughout the world as the

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BRIGHTON, 1	Regent Hill, Western Road		 2212
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CROYDON	516, London Road		
IPSWICH	Electric House, Lloyds Avenue		 3771
LUTON	39/43, John Street		 3531
PLYMOUTH	Belgrave Lane		 60226
READING	72/74, Castle Street		 60251
SOUTHAMPTON	Magnet House, Commercial Road		 3511
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CARDIFF	Magnet House, Kingsway		 8860
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NORTH-WEST AREA:	Magnet House, The Kingsway	• • •	
NEWCASTLE ON TYNE	Manual II-was Callamanta		25160
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