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CANADIAN
ELECTRICAL NEWS
AND
ENGINEERING JOURNAL

OLD SERIES, VOL. XV—No. 8.
 NEW SERIES, VOL. X.—No. 8.

AUGUST, 1900

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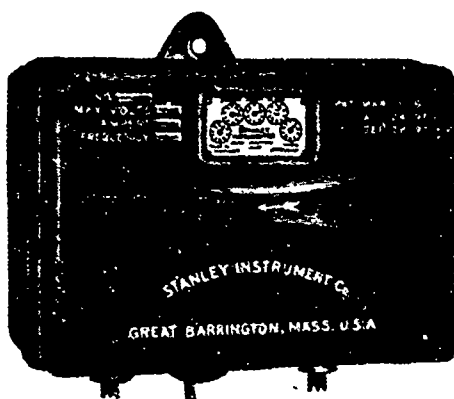
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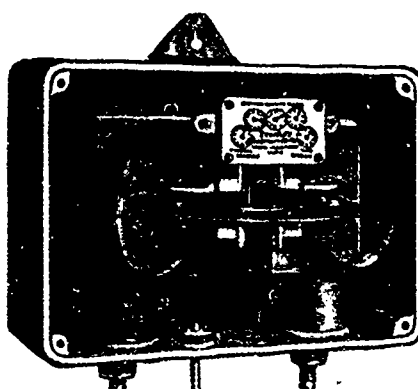
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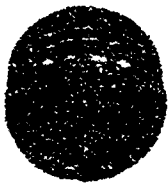
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This Boiler is built with sheet steel case or for brick casing as desired.
It is internally fired, has perfect water circulation, is a quick steamer and gives
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Two settling chambers are provided for catching deposits of scale and every
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The M'Cormick Will develop more power from a given quantity of water than any other Turbine.

OUR WHEEL GIVES MORE THAN DOUBLE THE POWER OF MOST WHEELS OF THE SAME DIAMETER, BY REASONS OF WHICH THE COST IS LESS PER HORSE POWER.

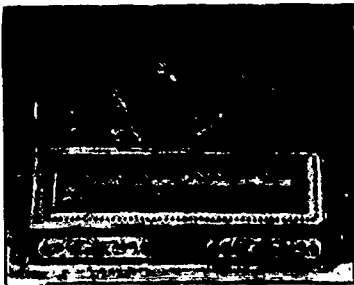
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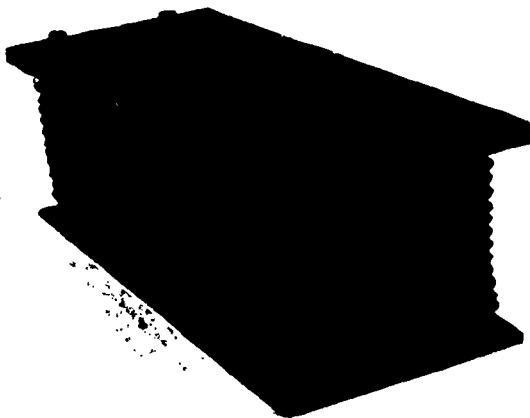
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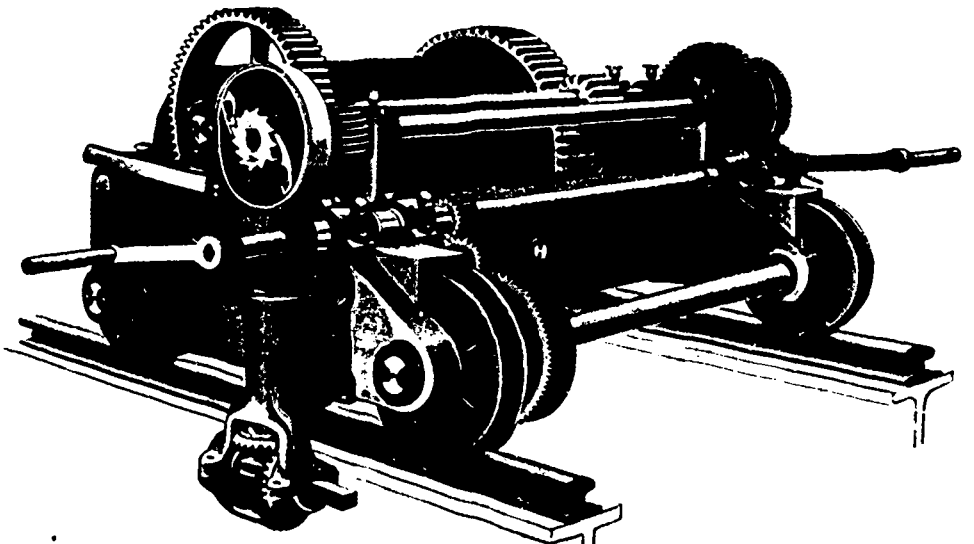
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PERSONAL.

Mr. J. J. Ashworth, late of the staff of the Canadian General Electric Company, has been appointed manager of the General Engineering Company, of Toronto.

Mr. G. A. Powell, assistant manager of the Packard Electric Company, of St. Catharines, is about to sever his connection with that company, to assume the management of the Hamilton Electric Supply & Construction Company.

After an illness of three weeks, Mr. R. J. Holley, of Weston, died a fortnight ago, in his 48th year. Mr. Holley was chief engineer of the electric light plant in Weston, where he had lived the greater part of his life.

Mr. A. E. Payne, who has represented the Packard Electric Company, of St. Catharines, and Mr. R. E. T. Pringle, of Montreal, for the past year and one-half through Ontario and Quebec, has served his connection with these firms.

Mr. E. E. Cary, manager of the Packard Electric Co., St. Catharines, Ont., has recently returned from a trip to Great Britain and the Continent. He reports having had a good time, and feels reinvigorated by the relaxation from business.

Mr. Warren V. Soper, of Ahearn & Soper, Ottawa, recently returned from a visit to the works of the Westinghouse Electric Company at Pittsburg, Pa. Mr. Soper says that the works of this company are over half a mile in length, employing 6,600 hands. Among the large machines now under construction are six generators of 8,000 h.p. each, for the Manhattan Elevated Railway, of New York. The new machines for the Ottawa Electric Company are being manufactured by the Westinghouse Company, for whom Messrs. Ahearn & Soper are the Canadian representatives.

Mr. R. R. Wiley, E. E., has recently joined the staff of the Packard Electric Company, of St. Catharines, as meter expert. Mr. Wiley, since his graduation at Wisconsin in 1898, has been associated with Mr. Sheeffer, of the Diamond Meter Company, and Mr. Duncan, the well known meter inventor now attached to the staff of the meter department of the Packard Company, and his services will be at the command of their customers.

SPARKS.

The Canadian General Electric Company are installing a 75 kilowatt alternator for Dr. A. Groves, of Fergus, Ont.

The Farmers' Co-Operative Packing Company, Limited, Brantford, has purchased from the Royal Electric Company, Montreal, a direct current plant to light its packing houses at Brantford.

The Hull Electric Company, Aylmer, Que., have recently purchased from the Canadian General Electric Company another 250 k.w. monocyclic alternator, with exciter and panel complete.

The first new 2,000 k.w. generator for the Cataract Power Company, of Hamilton, was shipped from the shops of the Royal Electric Company, Montreal, on the 25th of July. It occupied four cars.

The Canadian General Electric Company have just received an order from the British Columbia Electric Company, Vancouver, for 165 of their standard type "H" transformers, aggregating in capacity a total of 6,500 lights.

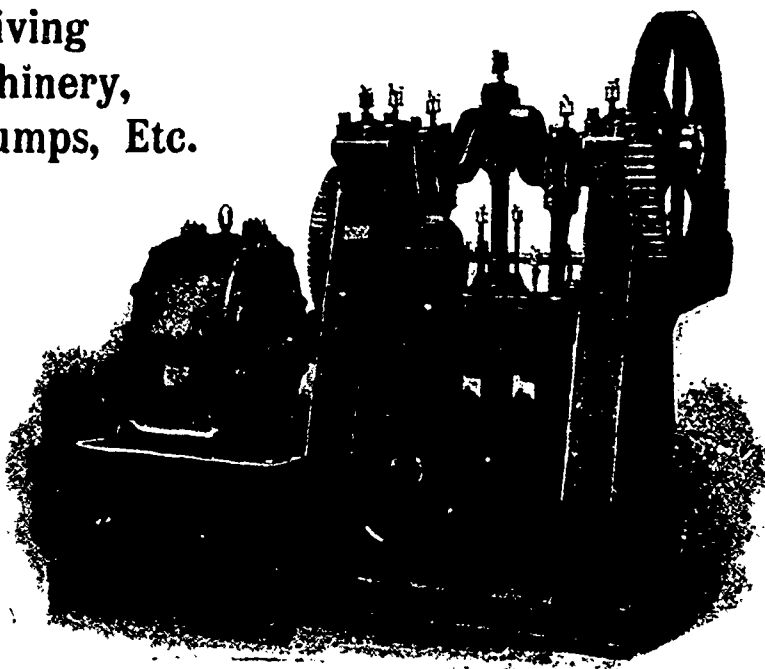
The Electrical Construction Company, of London, Limited, have received an order from the Blind River Lumber Company, Blind River, Ont., for the supply of a 150 light multipolar dynamo for their mills, also for the complete wiring of their mills and lumber docks.

There has recently been formed the Hamilton Electric Supply & Construction Company, which will operate in Hamilton in the near future. Construction work there has already been commenced. The company is capitalized at \$25,000, of which \$15,000 is paid up. They will have the exclusive agency of the Packard Company's and the C. P. Company's electrical specialties for the city of Hamilton and the districts through which the lines of the Cataract Power Company run. They will carry a large stock of electrical supplies, including incandescent lamps, fixtures and bell material, etc., and will be in a position to cater to both the wholesale and retail trade as well as to the ordinary contractor. Mr. E. E. Cary, manager of the Packard Electric Company, of St. Catharines, is president of the company, Mr. G. A. Powell secretary treasurer, and Mr. Norman H. Henderson general superintendent of construction work. The management will be in the hands of Mr. G. A. Powell.

WESTINGHOUSE TYPE "C" INDUCTION MOTORS

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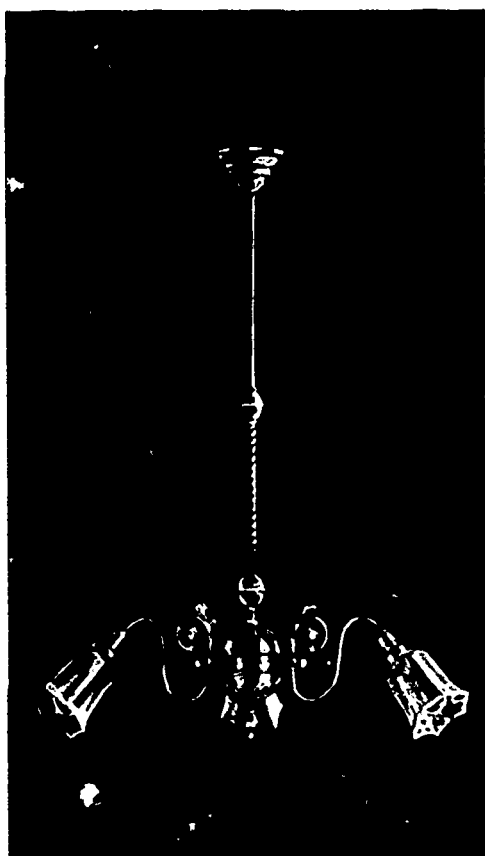
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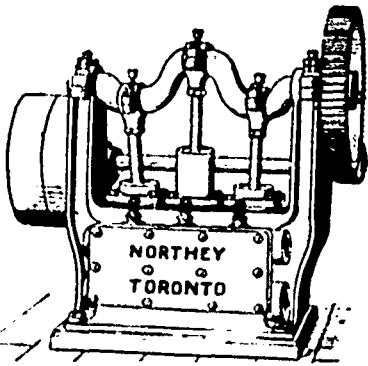
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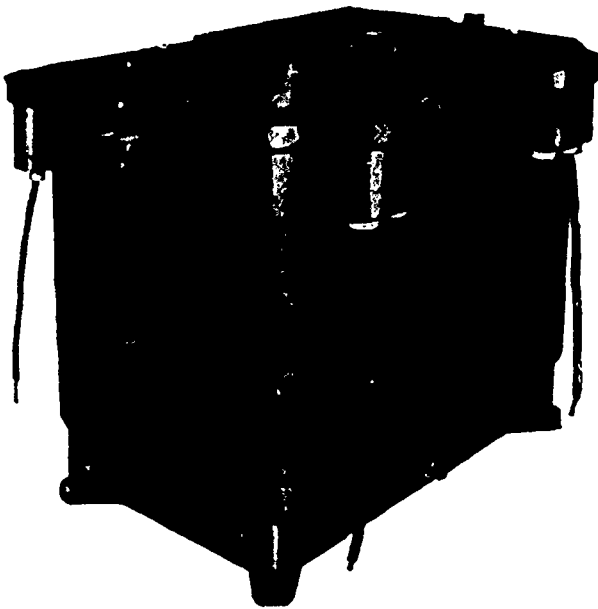


In the Northey Triplex Power Pump we offer a machine put together with skill brought by years of experience in pump building, and with full provision made for the varied demands likely to be made upon a pump of this general character. A feature of value is the situating of the three cranks 120 degrees apart, thus giving a practically constant flow of water, minimizing strain on pump and economizing power. The Pump can be readily re-packed and taken up, and all details are most carefully worked out; it can be conveniently operated by electricity, by water power, or by belt from engine. Different sizes and styles made to suit all duties.

WE ARE MANUFACTURERS OF OVER FIVE HUNDRED DIFFERENT STYLES AND VARIETIES OF PUMPING MACHINERY FOR EVERY CONCEIVABLE DUTY. WE INVITE ENQUIRIES FROM ENGINEERS, MINE SUPERINTENDENTS AND OTHERS FOR THEIR REQUIREMENTS IN OUR LINE. CATALOGUES AND SPECIFICATIONS FURNISHED UPON REQUEST.

We are also manufacturers of the Northey Gas and Gasoline Engine, which has proved to be the handiest and most convenient form of power for small or intermittent power users in the market. Suitable for machine shops, pumping and electric light plants, etc. Write for descriptive booklet.

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If its a

Pittsburg Transformer

TYPE "K"

it is without an equal, and you can Save Money by buying. **WHY?**

Our Catalogue B tells why—we give it away.

We keep everything electrical.

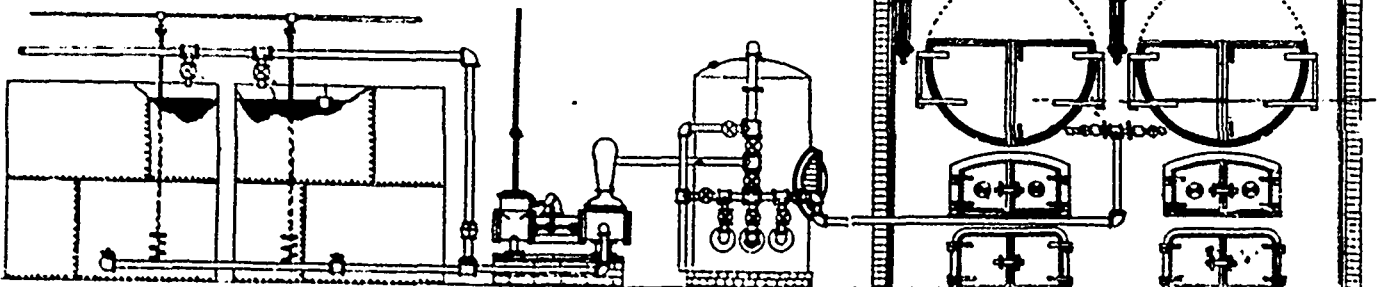
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BOILER FEED WATER PURIFYING SYSTEM

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Galedonian Iron Works, MONTREAL, QUE.

CANADIAN
ELECTRICAL NEWS
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Vol. X.

AUGUST, 1900

No. 8.

Canadian Electrical Association Convention

KINGSTON THE MEETING PLACE

THE great conflagration which occurred in the cities of Ottawa and Hull a few months ago has been responsible for the selection of the city of Kingston as the meeting place of the tenth annual convention of the Canadian Electrical Association, likewise for a change in the date thereof to August 29th, 30th and 31st. These changes, however, are not likely to affect in the slightest degree the success of the convention, which gives promise of being well attended and of an interesting character. A new departure will be an exhibit of electrical apparatus. It is understood that a number of the manufacturing and supply firms are expected to exhibit, and a unique and attractive display may be looked for. Among the social features will be the usual banquet, excursions, and a military tattoo. The business of the convention will close at noon of Friday, 31st inst. Illustrations

and particulars of some of the electrical and other features in and around the city of Kingston, together with the programme of business and social features, will be found on this and following pages.

THE CITY OF KINGSTON.

Briefly sketching the history of this city, which will be pleased to entertain the members of the Canadian Electrical Association; Kingston under the name of Fort Cataraqui was established by the French, under Governor de Courcelles (1672) as a fur trading post. Count Frontenac's strong rule produced the massive stone fort called after himself. Ultimately seized and occupied by both the French and English, it was destroyed by the latter under Colonel Bradstreet in 1878. Rebuilt as Fort Henry, that historical structure

still frowns upon all enemies to the city. The seat of government in 1841, Kingston grew in importance.

The general appearance of the city is that of solidity and antique beauty. Extensive industries of shipbuilding, grain transshipment and the weaving of cotton and woollen goods are carried on. In connection with the latter two, and numerous other local industries, electricity is used as the lighting, and largely as the power medium.



CONVENTION HEADQUARTERS—CITY HALL, KINGSTON.

On entering the harbor of Kingston, the "Sandhurst" or west point of Canada, one is struck with the beautiful natural situation of the city. Nestling at the foot of Lake Ontario, at the head of the St. Lawrence, and at the mouth of the Rideau canal, it has a splendid situation and an excellent harbor. To the west stretches the village of Portsmouth, distinguished for its shipbuilding and trans-ship-

ping industries, where are also the Rockwood Asylum and the Kingston Penitentiary. Fronting the city are the military college, the massive grey stone masonry of Fort Henry, numerous martello towers objects now of historical interest. Imposing public buildings, churches, and artistically designed private dwellings, all display the prevalent limestone architecture which has secured for this military town the name of the "Limestone City." Kingston is well laid out and adorned by massive buildings.

Visitors should not fail to see the city hall, one of the oldest but at the same time best designed municipal buildings in Canada, the court house with its pillars and dome in Grecian style, the post office, custom house, St. Mary's cathedral the tower of which, situated in the heart of the city and a masterly work of

Gothic architectural skill, can be seen at a great distance. St. George's cathedral, recently rebuilt and decorated in the interior with a magnificence of design and finish, unrivalled before in the history of local architecture, will well repay a visit. In the artificial lighting of the interior of this church, Mr. I. H. Breck, the Princess street electrician, displayed great skill and judgment. Delegates visiting the church will not fail to admire the elegance of design in the fixtures and the specially designed corrugated reflectors in the altar. The high shapely dome is supplied with 54 lights of the Edison base and 16 candle power. Shades are set in porcelain. The switchboard, of polished white marble, has eight separate switches. The fixtures and controlling power of the 150 lights are considered to be the best work in electrical illumination yet done in the city.

Kingston's colleges are of continental repute. They are Queen's University, Royal Military College, Royal Medical College, School of Art, Business College, Con-

judges' chambers, sheriff's offices, etc. On an elevation, the building commands a fine view of the cricket field, city park, and some very handsome residences. It is in front of this building that the Sir George A. Kirkpatrick memorial fountain will be placed. Street cars pass close by, so every delegate should see the building.

SOME PLACES OF BUSINESS.

The three storey building of the wholesale dry goods firm of Macnee & Minnes is one of the largest, finest, and handsomest stores in Kingston. Made of solid stone, the massive structure is the most conspicuous in the city. The business is over half a century old, and its age is exceeded by its solidity and sound financial basis. The firm exports wholesale every description of dry goods to all parts of the world. Mayor Minnes is a member of the firm. On the corner of Bagot and Princess streets the building presents a most imposing appearance. The delegates will receive a hearty welcome from the proprietors and staff of fifty hands.



THE CITY OF KINGSTON.

gregation de Notre Dame, etc. Each of these, the magnificently equipped General Hospital and Hotel Dieu, and the public school building are well worth a visit. All the institutions named have all modern conveniences of electricity, such as lighting, communication and heating.

Running in a northerly direction are Princess, Brock, and, slightly more to the east, Barrie streets, while King and Ontario streets stretch parallel to the water front and from east to west.

The city buildings, where the coming convention will be held, overlook the harbor, command a splendid view of Fort Henry and Barriefield, and are within a few yards of both the Grand Trunk and the Kingston & Pembroke Railway depots.

THE COURT HOUSE.

In architecture the Court House most resembles the City Hall, and built of limestone it has the same large front pillars, the same massive proportions, and is about of the same dimensions. In the building are the court rooms, county council chambers and offices,

This old wholesale establishments, one of the city's landmarks, is well worth a call.

Wormwith & Co. is one of the oldest, most noted and prominent firms in the piano industry, which has for a third of a century enjoyed the highest reputation. The business was established in 1862, and the firm soon became known as makers of distinction, and almost from the start their instruments have been regarded as among the most reliable made. Their present factory is situated on the corner of Princess and Ontario streets, and is one of largest buildings in the city, it being 166 by 66 feet, of cut stone, four storeys and basement, with a 60 by 60 foot building in the rear, and is among the most extensive and best equipped factories in the Dominion, having a capacity for turning out 900 pianos per year. Formerly the firm used electric motors, but increase of business has demanded the use of steam for motive power.

THE MAYOR OF KINGSTON.

In this number will be found a portrait of Mayor Minnes, who has served four years as alderman and is

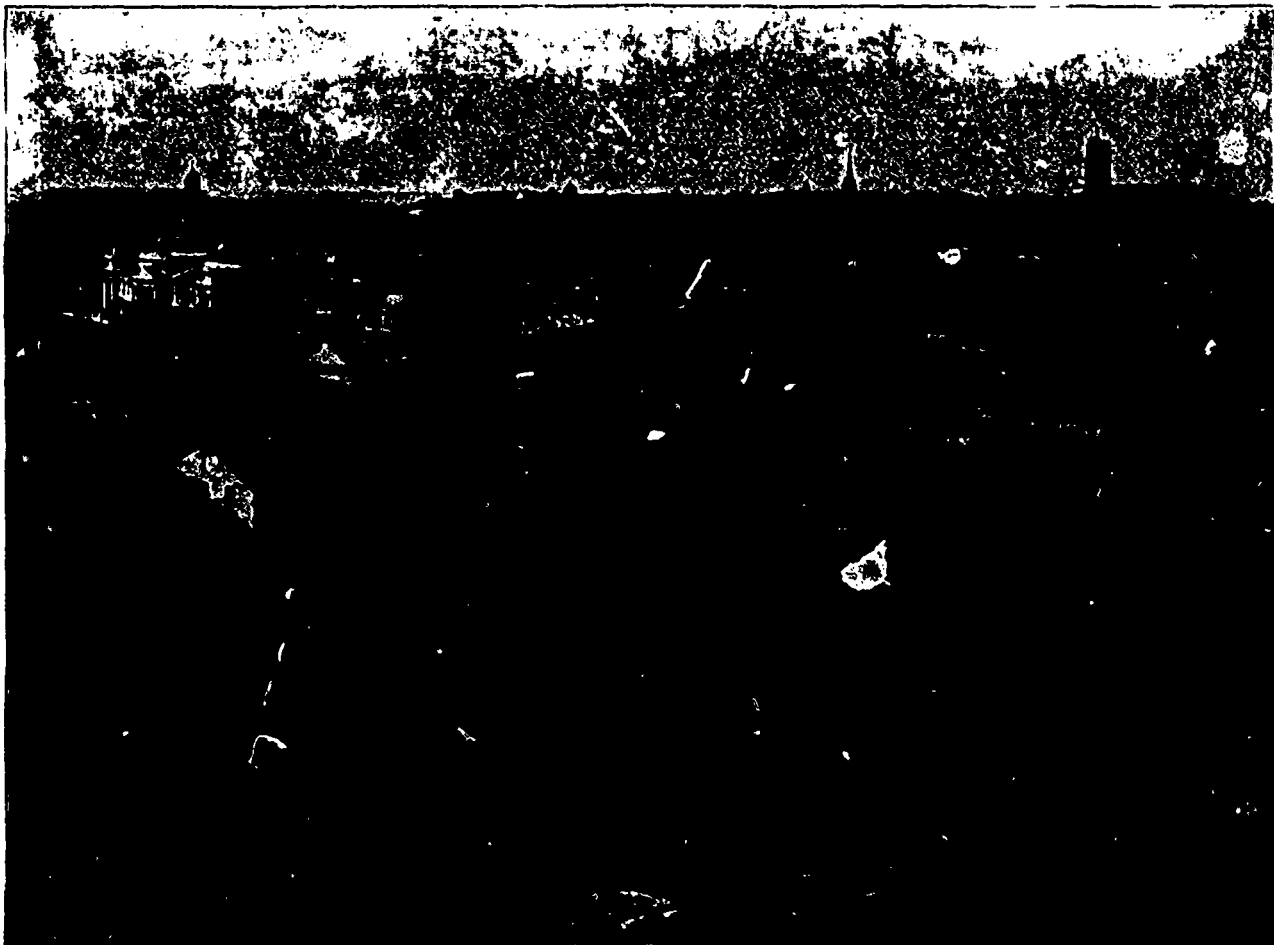
now chief magistrate of the city. Connected with Macnee & Minnes, wholesale dry goods firm, he and his father before him have long been identified with the soundest and most substantial business enterprises of the city. Although only 31 years of age, Mr. Minnes is a friend of all and an idol with the laboring classes. The friendly interest that he takes in all the city's functions, be it a fair, a celebration, or a convention, is now being exerted to entertain in a fitting manner the Canadian Electrical Association delegates.

THE FIRE BRIGADE.

Chief Youlden, assistant chief Elmer, and engineer Miller, with the other thirteen men of the fire brigade, will be glad to show the delegates around the two well equipped city stations. With all modern appliances,

THE RAILWAY STATIONS.

In front of the city hall is situated the Kingston and Pembroke Railway station. The handsome building, 65 x 24 feet, built of cut limestone, coursed ashlar style, is two storeys high. It has a mansard roof covered with slate, and is ornamented with pretty iron designs. Finished in natural woods, with plate glass windows, and transoms of beautifully colored glass, and containing offices, waiting rooms, lavatory and electric lights, the interior is handsome in appearance. The building cost \$12,000. In the rear of the station is the two story freight shed, 100 x 34 feet. It is constructed of wood and iron, ornamental windows projecting from the upper story. Electric lights, appliances, gongs, a telegraphic plant, offices, and a library for employees, are some of the features. The cost was \$6,000.



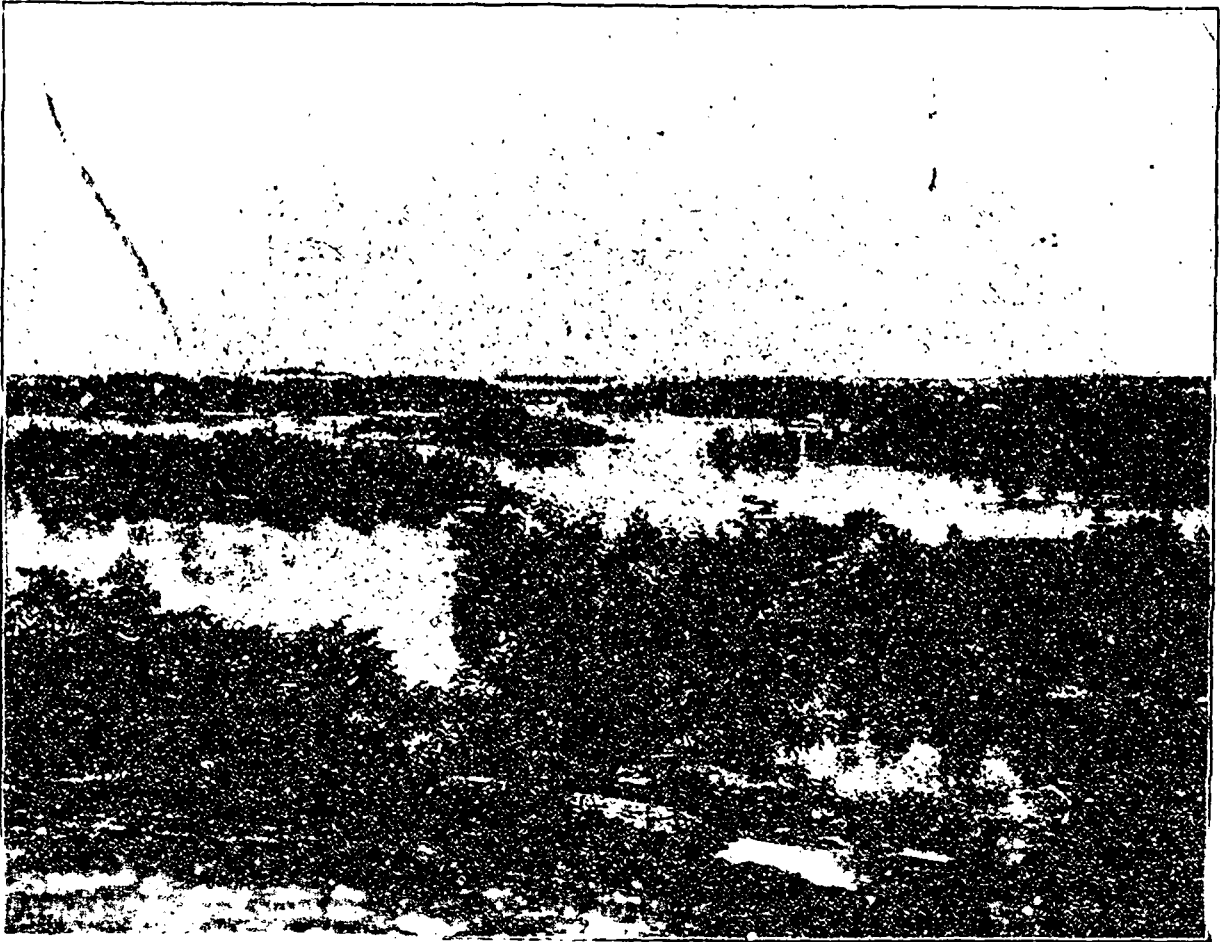
KINGSTON HARBOR AND PART OF THE CITY FROM THE TOP OF ONE OF THE GRAIN ELEVATORS.

3,200 feet of hose and a system of alarm including 26 boxes, most of them made by Anderson, of Toronto, the brigade does first-class work. In connection with the alarm system 15 miles of galvanized wire (fast giving place to the more modern and enduring covered wire), are Manual switchboards, one in the Ontario street, and one in the Brock street stations. Four mechanical and eight electrical gongs are placed in the stations, firemen's homes, police headquarters, etc. The system is run by a 102 cup gravity battery. Electrical devices as to alarms, closing doors, etc., are in vogue in both fire stations. Anderson, of Toronto, laid a large part of the system. The Bell Telephone Co., Montreal, turned out four of the alarm boxes. The Dominion Government has an arrangement with the Department as to protection of the Royal Military College.

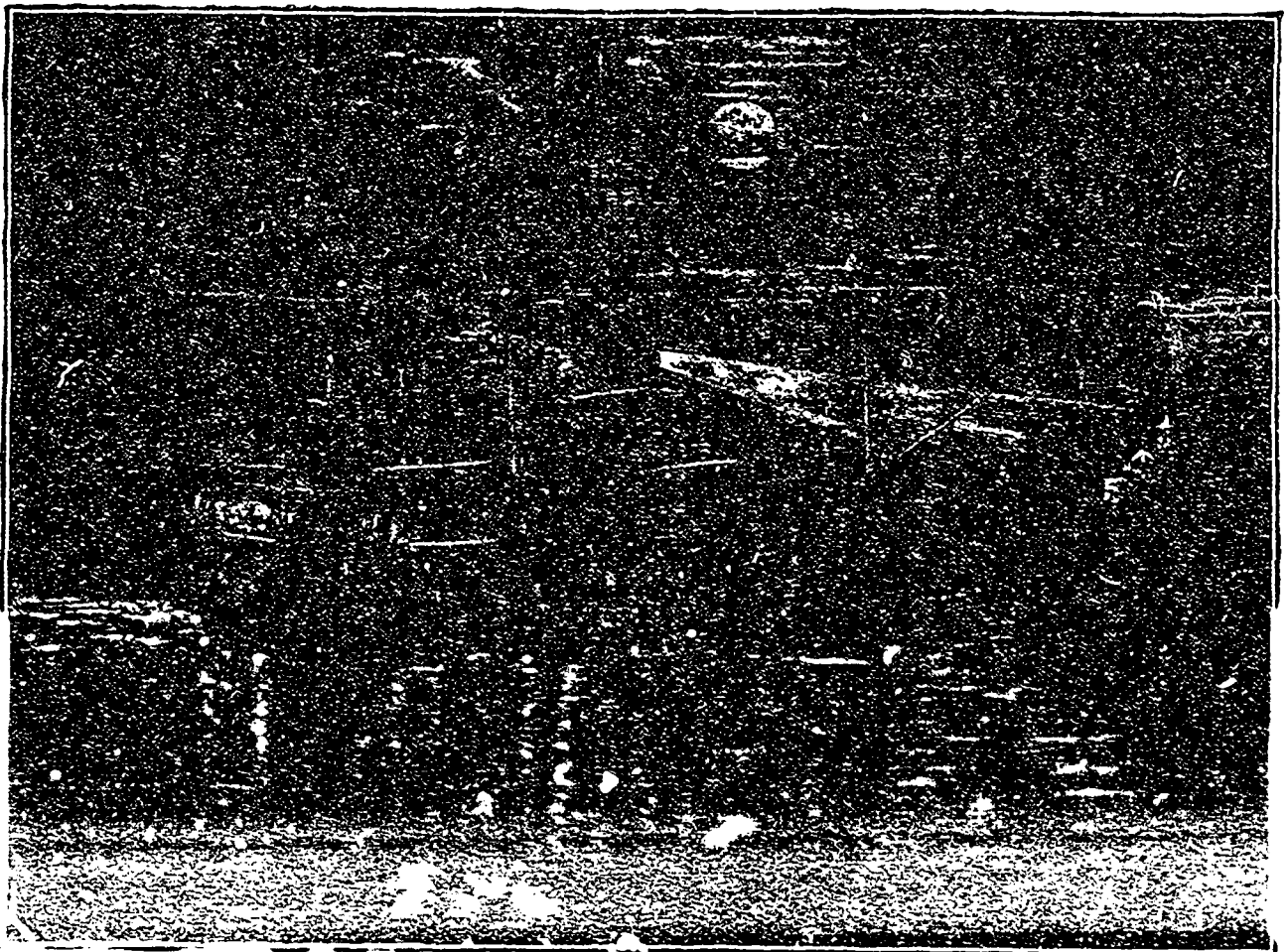
The G. T. R. outer station, two miles from the city is a one story building, thoroughly equipped with offices, waiting rooms, electrical devices, telephone and telegraphic communication, etc. The city depot at the foot of Johnston street, and a few minutes walk from the Hotel Frontenac, is built of brick and stone. It is a two story building, bright, large, and well ventilated and illuminated. The waiting rooms and offices are neatly furnished. Electric cars pass the door, and opposite the station is Swift's wharf where the palatial steamers of the Richelieu and Ontario Navigation Co. are also the Bay of Quinte Steamboat Co. touch.

ELECTRIC STREET RAILWAY.

The street railway system of Kingston, extending to Willamsville on the north, Portsmouth, passing directly in front of the asylum and penitentiary, on the east, and a branch line connecting with the G. T. R.



A VIEW FROM SMOKE ISLAND, IN CANADIAN CHANNEL ON THE NEW "ISLAND WANDERER."



STEAMER ST. LAWRENCE ON HER SEARCHLIGHT EXCURSION AMONG THE THOUSAND ISLANDS.

depot on the west, is one of the most modernly equipped in Canada. The company has a capital stock of \$200,000. The road is well laid out over 12 miles with a 4 ft. 8½ in. gauge track, made of "T" rails, 55 to 65 lbs. to the yard. The current is supplied by the Kingston Light, Heat & Power Company from the power house on Queen street to the 19 handsome motor cars of modern upholstery and furnishing.

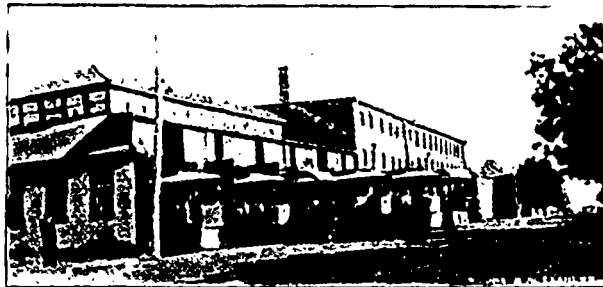
Skirting the lake front, the eastern portion of the line passes several city parks, many handsome private dwellings, churches, public schools, etc., on King, Ontario, Barrie and Union streets; and running for two miles passes Portsmouth to enter Lake Ontario park, Kingston's "Hanlan's Point," where 40 acres fronting the lake front have been converted into an ideal park, with horse track, diamond, bicycle track, etc., in connection and in the best of condition. The asylum and penitentiary nearby are interesting places the delegates will be requested to visit.

The other two branches—the belt line and that running two miles out to the depot—pass some fine buildings, parks, and natural scenery, which Kingstonians claim are unrivalled.

The officers of the company are : Ira A. Breck, presi-

to the opposite side of the road to light up the interior and grounds of Warden Platt's palatial residence and magnificent grounds. Wm. Derry is chief engineer, and Charles Bailey electrician.

At Rockwood Asylum a small Edison bi-polar ma-



CAR BARNS OF THE KINGSTON, PEMBROKE AND CATARAQUI ELECTRIC RAILWAY COMPANY.

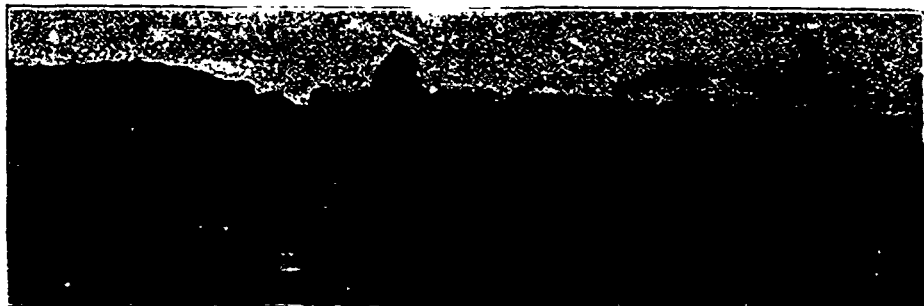
chine supplies 60 lights to illuminate the music hall. The matter of installing a large and modern plant to light the whole building is under consideration. The street cars pass both penitentiary and asylum.

ELECTRICITY IN QUEEN'S UNIVERSITY.

At Queen's University the current is supplied to the general buildings by the Kingston Light, Heat & Power Co. It is used in running two motors in the mechanical laboratory for the purpose of driving the various pieces of machinery, and one motor in the Carruthers Science Hall for purposes of ventilation, in decomposing water for the purpose of obtaining oxygen and hydrogen for the chemical laboratories, in exciting elec-

tro-magnets in the magnetic separator in the mining mill, and in running a number of electric lanterns, of which there is one in connection with nearly every department, and as the alternating current is not adapted to lantern work, on account of its objectionable singing, the direct current is the only one employed.

Preparations are at present being made for a very much more extended use of electricity than at present ; for in addition to the present use it is proposed to intro-



KINGSTON PENITENTIARY.

dent ; B.W. Folger, vice-president and manager ; J.W. Bowden, secretary ; H. C. Nickle, superintendent ; J. Halliday, electrician. One of the views shown gives a good picture of the street cars, showing six of them leaving the car barns on King street at 7 o'clock in the morning.

ELECTRICAL PLANT AT THE PENITENTIARY.

No doubt all the delegates will make it a point to visit the penitentiary, where upwards of 600 prisoners are confined, amongst the number the celebrated trio of dynamiters, Walsh, Nolan and Dullman, whom the government are so zealously guarding. The penitentiary has an electrical plant, built by W. A. Johnston, of Toronto, consisting of two 250 light Ball machines. The offices, avenues, guards' quarters, etc., in the big enclosure are all supplied with lights, and one incandescent is placed in each prisoner's cell. Fronting the huge main gateway, near the observation towers, and in the interior yard, are several powerful arc lights, all lit up every night. Electrical communication, bells, gongs, etc., are in vogue through all parts of the prison. The current is carried



QUEEN'S UNIVERSITY, KINGSTON.

duce a complete system of fan ventilation in each building, both old and new, and to drive the fans of each building by separate motors.

In connection with this the university will erect a central heating and power station within its own grounds, from which heat, power and light will be distributed to the buildings as required. It will be feasible then to light not only the buildings, but also the campus by electricity when required. To accomplish all this a considerable number of dynamos and motors, as well as other electrical appliances, will be required. And as Queen's, although well grounded in the public confidence, has no liberal millionaire at her back, she has to go slowly, much more slowly than her progressive spirit desires, and she will always be thankful for any aid extended to her in carrying out her proposed and much required extensions and improvements. Prof. N. F. Dupius, one of the best known mathematicians in America, has long been Dean of the Faculty of Practical Science at Queen's.

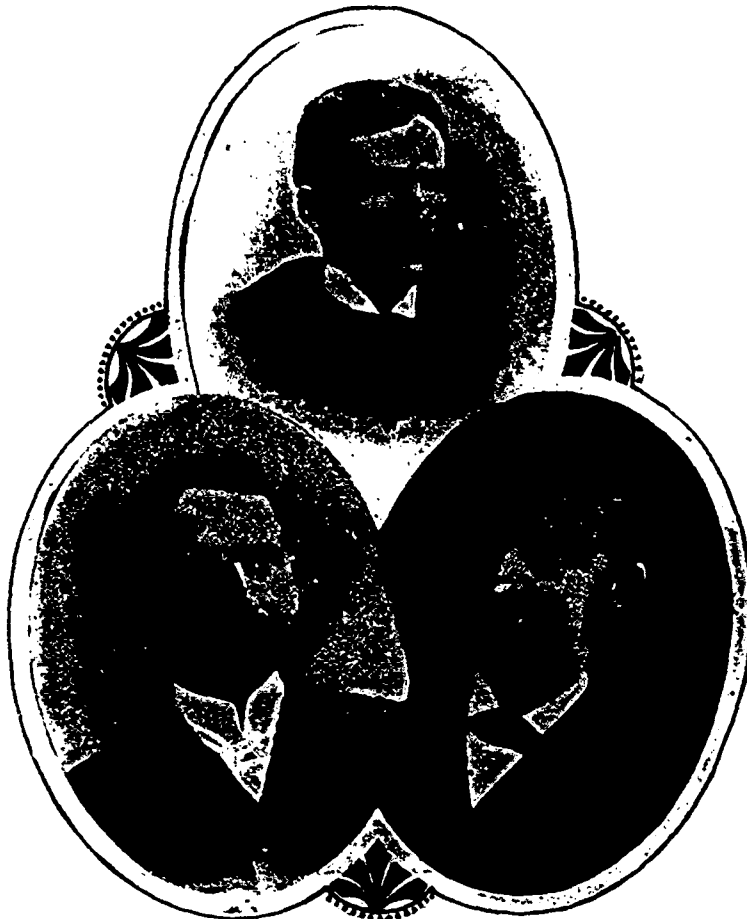
KINGSTON LIGHT, HEAT AND POWER COMPANY

The Kingston Light, Heat & Power Company's plant is located on the corner of King and Queen streets. The power house is of stone and brick, 40 feet by 80

pump for hoisting elevator, &c. The fan outfit is used very seldom, as a well constructed brick chimney 5 feet in diameter by 60 feet high supplies ample draught. Two tons of hard to one of soft coal screenings are used for fuel.

In the engine and dynamo room are two tandem compound condensing Corliss engines of 350 horse power each, built by Messrs. John Inglis & Son, Toronto; one Northey condenser and one Northey tandem compound feed pump for supplying the boilers; one upright brass tubular heater made by the Kingston Foundry Company. The engines are belted direct to a main line shaft, from which are driven two No. 20 Edison dynamos coupled up for the Edison three wire system for central distribution; one No. 60 T & H 2,000 volt alternator for the long distance lighting; three 50 light American arc machines for supplying street lighting; one 200 k.w. 500 volt multipolar street railway generator, manufactured by the Canadian General

Electric Company, and one 100 k.w. 500 volt multipolar street railway generator manufactured by the same company. Power is supplied from these machines for the operation of the street railway system. In the front of the building is one of the best equipped switch-boards in Canada, made of slate slabs one inch thick by 5 feet



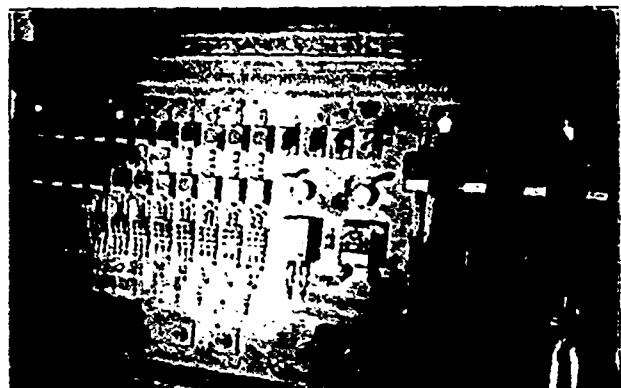
MR. M. H. FOLGER,
President Thousand Island Steamboat Co.

MR. F. A. FOLGER, SR.
Manager Kingston Light, Heat and Power Co.

MR. B. W. FOLGER, SR.
Manager K.P. and C. Electric Railway Co.



POWER HOUSE, KINGSTON LIGHT, HEAT & POWER CO.



SWITCHBOARD, KINGSTON LIGHT, HEAT & POWER CO.

feet, with boiler room 32 by 49 feet. The water supply for the condensers and boilers is taken from the foot of Queen street, which is about 300 feet distant. In the boiler room are five tubular boilers 66 inches by 14 feet, with 106 three inch tubes each, one upright engine and fan outfit for forced draught, and one duplex

square. It stands 10 feet high by 23 feet long, with all the necessary instruments that are required to duplicate the generating plant, which was the original design of the plant.

The plant is now at times taxed to its full capacity, and the company are preparing for extensions to meet

the fall business. There are 8,000 sixteen candle power lights installed and 115 arc lamps for street lighting.

Annexed to this building is the gas plant, which has just gone through a renovation and is now one of the most up to date plants in Canada. The electric light and gas business are one of the many lines of business which Messrs. Folger Brothers are interested in, and is



Mr. JAS. A. MINNES, Mayor of Kingston.

under the management of Mr. F. A. Folger, sr.; secretary and treasurer, E. Moore; superintendent of electrical department, F. Simmons.

THE BELL TELEPHONE EXCHANGE.

Amongst other places of interest to the delegates attending the Convention at Kingston, the exchange of the Bell Telephone Company will be visited with pleasure.

Like other branches of the art, telephony has been brought to such perfection that one hardly recognizes in the modern exchange any signs of the business having once been crude, irritating and unsatisfactory.

Kingston is a fair sample of the progress made during the past twenty years. This exchange was started in 1880 with about thirty subscribers; most of the lines were on house-tops, and "Gilleland" switches were the standard equipment of that day. There were no long distance lines. The growth was very slow, only reaching 175 subscribers in 1885. Since that date three complete changes in switching equipment have been made, long distance lines have been built, and Kingston is to-day one of the most progressive telephone cities in Canada. The local subscribers number 540, while the splendid service furnished has induced merchants and the management of large marine interests to liberally patronize the long distance lines. The exchange is a model for convenience and up-to-date equipment. The operating room has been specially designed for perfect light, ventilation and convenience. The distributing arrangements, arresters, power generators, etc., are of the most modern type, and everything about the place has an unmistakable business air about it.

The exchange has since 1885 been in charge of Mr.

A. T. Smith, now district superintendent of the Ontario department, with headquarters at Toronto, whose thorough knowledge of the details of the business is well known to the members of the Association. He has been succeeded by Mr. H. W. Snelling, of Montreal, who reports business as flourishing and repudiates that old "chestnut" that Kingston is "slow."

A visit to the exchange, where all are welcome, will well repay the delegates.

FURNISHED WITH ELECTRIC PLANTS.

The Montreal Transportation Company's mammoth elevator at the foot of Barrack street is well worth a visit. The plant is equipped with a 250 light multipolar dynamo of the Canadian General Electric Company's type, which is directly coupled to an Ideal engine. Numerous powerful arc lights, some of them movable, illuminate the surroundings very brightly and make the loading and unloading of thousands of bushels of grain at night time an easy matter. This company frequently trans-ships as much as 250,000 bushels of grain in 24 hours.

The Kingston Hosiery Company is another industry that has a plant of its own. It is equipped with a 500 light multipolar Walker type dynamo, manufactured by the United Electric Company, of Toronto, and coupled to an Robb-Armstrong engine. Knitting machines, etc., are driven by motive power.

The Royal Military College has a small plant furnished with all the necessary appliances that are required for technical purposes, and for instruction in classes in connection with military engineering, electrical engineering, etc.

The Dominion Cotton Company last spring installed in their local mill an excellent plant, including one 650 dynamo made by Siemens & Halske. The current is direct from a coupled dynamo. The engine is a Robb



INTERIOR OF BELL TELEPHONE EXCHANGE, KINGSTON.

one. The plant was installed by the Royal Electric Company, of Montreal.

ELECTRIC SEARCH LIGHTS.

Kingston is surrounded with the elements of the beautiful. From the "Limestone City" to Brockville the scenery is most magnificent. Between the points mentioned seventeen hundred isles the renowned thousand islands—all sizes, from a barren rock to large islands covered with the richest foliage, and containing some of

their palatial summer residences, rise from the bosom of the St. Lawrence. The well equipped steamers of the White Squadron thread their way through the labyrinthian channels, disclosing little islets, isles, artificial devices, etc., of the most delicate and varied type of loveliness. It will be the privilege of the delegates to view some of these islands under the searching beams of



MR. I. A. BRECK,
President Kingston, Pembroke and Cataraqui Electric Railway Company.

the powerful searchlights of one of the steamers referred to. This line of boats, conducted by the Folger Bros., are all equipped with electric plants. The electrical plants of the steamers St. Lawrence and Empire State each consist of a Westinghouse engine, C and C dynamos of 500 lights capacity, and searchlights made by the General Electric Company, Schnectady, and of 2,000,000 candle power. The steamer America has an Edison dynamo of 500 lights capacity, and searchlight of 2,000,000 candle power made by the United Electric



MR. W. F. SIMMONS,
Superintendent Kingston Light, Heat & Power Company.

Company, of Toronto. The New Island Wonder, the New York, the Hero, and other steamers, all have powerful searchlights and are beautifully illuminated with incandescent lights. The searchlight trip down the River St. Lawrence is something no delegate should miss. On the return trip the steamer will pass near Wolfe Island, Garden Island, and all along the harbor front, which the powerful searchlight will illuminate brilliantly.

CITY ELECTRICIANS.

A word might be said regarding those engaged in the electrical business. Mr. W. F. Simmons commenced

his electrical career in 1888 as errand boy with the then Kingston Electric Light Company. By his close observation he was soon promoted to engineer and dynamo tender, under the superintendence of Mr. J. M. Campbell. In a very short time the company found it necessary to enlarge their plant and add an incandescent plant. At this change Mr. Simmons was promoted to foreman of construction. This position he held until the amalgamation of the electric light and gas companies in 1890, under the name of the Kingston Light, Heat & Power Company. At this stage Mr J.



MR. J. HALLIDAY,
Electrician Kingston, Pembroke and Cataraqui Electric Railway.

M. Campbell resigned to accept a position with the Canadian General Electric Company as electrical engineer, and Mr. Simmons was advanced to the position of superintendent. This position he has held for ten years, and has certainly proved to be a thoroughly practical electrical and steam engineer.

Mr. I. H. Breck commenced business in 1897 at 339 King street. He remained here until the year 1899, when he found it necessary, owing to increased business, to move to the large and commodious store that he



MR. HUGH C. NICKLE,
Superintendent Kingston, Pembroke and Cataraqui Electric Railway.

now occupies. In his place of business, 79 Princess street, will be found everything of interest to an electrician, all of the latest things in the electrical lines, etc., for being an electrician himself he knows exactly what and where to buy. His workmen are skilled electricians who have spent years at their trade, and the several large buildings he has wired speaks well of his ability and serves to show that he is competent to undertake any work entrusted to him. His work in St. George's Cathedral, at Kingston, is a good

example of his workmanship. He makes a specialty of all kinds of electric wiring and motor work, and has full and complete facilities for testing and repairing. Mr. Breck learned his trade with the Kingston Light, Heat & Power Co., and studied the several branches of the work there, and has now a thorough knowledge of the electrical business. Mr. Breck's men are under the supervision of Mr. W. S. Raymond, who is an expert electrician.

Mr. R. Boyd, electrician, at his store, 327 Princess street, keeps always on hand dynamos, motors, annunciators, gongs, bell wire, electric lights, etc. He also learned the business with the Kingston Light, Heat & Power Co., and has met with considerable success. He makes a specialty of window electric wiring and illuminating.

Mr. George R. Tomlinson keeps a supply of all kinds of electrical goods at his well equipped store at 258 Princess street. He makes a specialty of window illuminations.

NOTES ON THE CONVENTION.

Mr. I. H. Breck will have constructed over the platform in letters of incandescent lights the words "Welcome C. E. A." They will be set on a background designed as a maple leaf, emblematic of the Association, and will be brilliantly illuminated with colored lights.

In connection with the proposed exhibit of electrical apparatus, it is learned that the Packard Electric Company, of St. Catharines, have secured 900 square feet of space, that the Royal Electric Company will make an exhibit, and that the Western Electric Co., of Chicago, and the Adams-Bagnall Co., of Cleveland, will each make a display of enclosed arc lamps.

Kingston owns its waterworks, the pump house being on Ontario street near convention headquarters. All delegates should inspect it, as the system is an excellent one, and most of it but lately built.

The delegates will mostly register at the Hotel Frontenac, the largest and best equipped in the city. The genial proprietor, Mr. Thomas Crate, so well known to the travelling public as a first-class hotel keeper, will look well after the wants of the members of the Association. The "Frontenac" is on Ontario



Mr. I. H. BRECK, Electrician.

street, about 100 yards from the City Hall. It is in sight of both railway stations, and near the city wharves. The street cars pass directly in front of the hotel.

Electrical time detectors manufactured by the Cleveland, Ohio, Electrical Co., are used at the Cotton Mill, Anglin's Wood Yard, Locomotive Works, Kingston Foundry and by the Montreal Transportation Company.

There are three well equipped telegraph offices in Kingston. Mr. Wm. Bamfield is general manager of the North American Telegraph Co.'s branch, Mr. R.

J. Wilson conducts the C. P. R. Telegraph Co.'s local office, and Mr. James Kearns has control of the G. N. W. Telegraph Co.'s city business. All three offices are on Clarence street.

Several of the illustrations shown were obtained through the courtesy of Mr. Breck. In addition to his



Mr. R. BOYD, Electrician.

electrical knowledge, he is an excellent amateur photographer.

PROGRAMME.

WEDNESDAY, AUGUST 29th.—Meeting of Executive Committee at Hotel Frontenac, 9 a.m. sharp. Opening of Convention at the Hall (City Hall Chambers or Hotel) 10 a.m. Order of business: (1) Welcome by Mayor of Kingston; (2) President's Annual Address; (3) Reading of Minutes of last Meeting; (4) Report of Secretary-Treasurer; (5) Reports of Standing Committees; (6) Appointment of Nominating Committee; (7) Reading and Discussion of Papers; (8) General Business. (To be continued into the Afternoon Session which will begin at 2.15 p.m.)

THURSDAY, AUGUST 30th—10 a. m.—Consideration of President's Address and Reports of Secretary-Treasurer and Standing Committees; Election of Standing Committees; Reading and Discussion of Papers; General Business. (To be continued into Afternoon Session—2.15 p.m.)

FRIDAY, AUGUST 31st.—10 a. m.—Selection of Place of Next Meeting and Approximate Date; Election of Officers and Executive Committee; General Business.

SOCIAL FEATURES.

WEDNESDAY, AUGUST 29th.—7.30 p. m.—Complimentary search-light excursion among the Thousand Islands, tendered by the Mayor and citizens of Kingston.

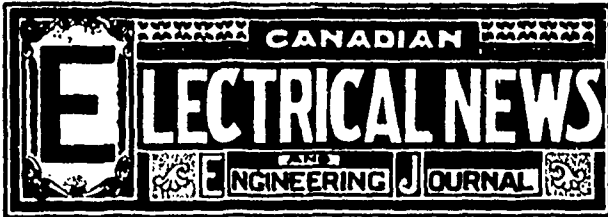
THURSDAY, AUGUST 30th.—9.30 p. m.—Annual Banquet at Hotel Frontenac.

FRIDAY, AUGUST 31st.—Excursions will be arranged for the afternoon, and at 8 p.m. a grand spectacular band concert by the famous 14th Regimental Band, introducing an electrical musical fantasy of the Battle of Paardeberg, with electrical effects and fireworks.

LIST AND ORDER OF PAPERS.

- "Use of Dynamo and Storage Battery in Telegraph Offices." Mr. W. J. Camp, C.P.R. Telegraph Co., Montreal.
- "Utilizing the Available Central Station Capacity." Prof. R.B. Owens, McGill University, Montreal.
- "Power Factor as Affecting Operation and Investment, with Special Reference to Induction Motors and Enclosed Arc Lamps." Mr. F. H. Leonard, jr., Montreal.
- "Conditions Affecting the Wave Form of Alternators." Prof. L.A. Herdt, McGill University, Montreal.
- "Rotary Converters." Mr. A. Gordon Grier and Mr. J.C. Hyde, Montreal.
- "Railway Subject, Giving Several Curves Showing up the Average Power During a Day, and Maximum and Minimum Requirements for Power Called For on the Quebec System." Mr. Blair, Quebec Railway & Lighting Co., Quebec.

In order to give closer attention to their Canadian business, The Edwin C. Lewis Company, electrical contractors, of Boston, have established an office in the Temple Building, Montreal, which will be under the management of Mr. Philip Lahee, who has been associated with them for the past ten years.



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ADVERTISEMENTS.

Advertising rates sent promptly on application. Orders for advertising should reach the office of publication not later than the 28th day of the month immediately preceding date of issue. Changes in advertisements will be made whenever desired, without cost to the advertiser, but to insure proper compliance with the instructions of the advertiser, requests for change should reach the office as early as the 26th day of the month.

SUBSCRIPTIONS.

The *ELECTRICAL NEWS* will be mailed to subscribers in the Dominion, or the United States, post free, for \$1.00 per annum, 50 cents for six months. The price of subscription should be remitted by currency, registered letter, or postal order payable to C. H. Mortimer. Please do not send cheques on local banks unless 25 cents is added for cost of discount. Money sent in unregistered letters will be at sender's risk. Subscriptions from foreign countries embraced in the General Postal Union \$1.50 per annum. Subscriptions are payable in advance. The paper will be discontinued at expiration of term paid for if so stipulated by the subscriber, but where no such understanding exists, will be continued until instructions to discontinue are received and all arrearages paid.

Subscribers may have the mailing address changed as often as desired. When ordering change, always give the old as well as the new address.

The Publishers should be notified of the failure of subscribers to receive their paper promptly and regularly.

EDITOR'S ANNOUNCEMENTS.

Correspondence is invited upon all topics legitimately coming within the scope of this journal.

The "*Canadian Electrical News*" has been appointed the official paper of the Canadian Electrical Association.

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H. F. REESOR, Manager Electric Light Co., Lindsay, Ont.
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How to Become an Electrician.

THE eagerness of young men to enter the electrical business shows no signs of abatement. The superintendent of one of the Canadian electrical manufacturing companies states that he receives on an average twenty applications per week from youths wishing to enter the factory as apprentices. These applications come from all parts of the country. Many of the applicants have a very indefinite idea of the work which they will be called on to perform. They seem to think that an electrical manufactory is a place where a large amount of experimental work is done. On entering, they find that most of the work is purely mechanical and by no means clean; that the experiments and tests which are made from time to time are for the first few years beyond their comprehension; that they are confined for many hours each day within doors, and are required to give close application to whatever work may be given them to perform. All this is contrary to their preconceived notions, and as a consequence many abandon the business and turn their attention to something else. In the opinion of the above-mentioned superintendent, the best preliminary training for the young man who wishes to work his way up in the electrical business is two or three years' experience in a machine shop.

Canadian Electrical Association.

THE Executive Committee, at a meeting held a fortnight ago, decided to accept the cordial invitation extended by the city council and electrical companies of Kingston to hold the annual convention this year in the Limestone City. This decision meets with the approval of the members and friends of the Association in Ottawa, which was to have been the place of meeting. It is felt that, owing to the disorganized condition of affairs in that city at present, due to the recent disastrous fire, the convention could not conveniently be held there this year. As will be observed by the illustrations and descriptions appearing in this number, Kingston is an interesting city. Situated in close proximity to the Thousand Islands, a locality famous the world over for its natural beauties as well as the beautiful and unique character of the summer residences erected upon the islands, the surroundings as well as the city itself will repay a visit. Kingston's location, midway between Montreal and Toronto, and conveniently reached by rail or water from all points of the compass, adds to its suitability as the place of meeting, and should assist to ensure a large attendance.

The programme prepared for this convention is one of the most interesting and instructive that has ever been placed before the members. It is printed in detail in another column. The papers cover a wide range of subjects relating to various departments of electrical work. The standing of the authors is a guarantee that the matter of these papers will be interesting and instructive. This being the case, the discussions should be full and profitable. A new feature will be introduced this year by providing, without charge, by courtesy of the city authorities and the Kingston Light, Heat and Power Co., space, current and labor to manufacturers who may wish to install exhibits of electrical appliances. A cordial invitation is given to manufacturers and dealers in electrical supplies to avail themselves of this offer. The Kingston Street Railway Co. has offered to carry free, all persons wearing the Association badge and

to supply extra cars for special trips. The city council have appropriated the sum of \$200 for the entertainment of the visitors, and have appointed a committee to assist in making the necessary local arrangements. The city council chamber has been placed at the disposal of the Association for the convention, and space in the City Hall for exhibits. An afternoon and evening trip among the Thousand Islands will form a delightful feature of the programme of entertainment.

A large turnout of the members of the Association is looked for at this convention. A cordial invitation is also extended to persons connected with any branch of the electrical industry to become members and take part in the approaching convention. During the last two years the Association has done valuable service in protecting the interests of electric lighting companies. Such of these companies as are not already represented on the membership of the Association should now make connection with it, give it the benefit of their support and ideas and assist to place it in a position to exercise still greater influence in behalf of electrical interests.

The Operation of Synchronous Motors.

A superficial comparison between the action of the synchronous and of the direct current motor with which we are all so familiar generally leads to the view that they are direct opposites. In the effects produced in actual operation in many respects they are, but in the principles involved when allowances are made for the different actions of direct and alternating currents, the results attained are seen to be such as might have been expected. The practical operation of the direct current motor shows that it possesses high starting torque; that it may be run at any desired speed, and that its current consumption varies with its power output. On the other hand, the synchronous motor develops small starting torque, it runs at an absolutely unvarying speed, which is fixed by the generator from which it is driven, and can exert but little turning effect except at that fixed speed, and its output in power is frequently not commensurate with the current input. For these reasons, where variable speed with a large torque is required, the direct current motor is the most suitable, while if it be desired to have an absolutely uniform speed, the synchronous motor holds the field. These differences in action are due primarily to the pulsating character of the current supplied to the synchronous motor as distinguished from the pulseless direct current operating the direct current motor. The results are that while in the direct current motor there are two E. M. Fs., the impressed and counter E. M. F., in the other there are three, the impressed, counter and reactance E. M. Fs. In the first case the impressed and counter E. M. Fs. act in opposite directions; in the second they may or may not be directly opposite. A rise of voltage in the first case means increased speed, in the second no increase of speed, but an increase of wattless current.

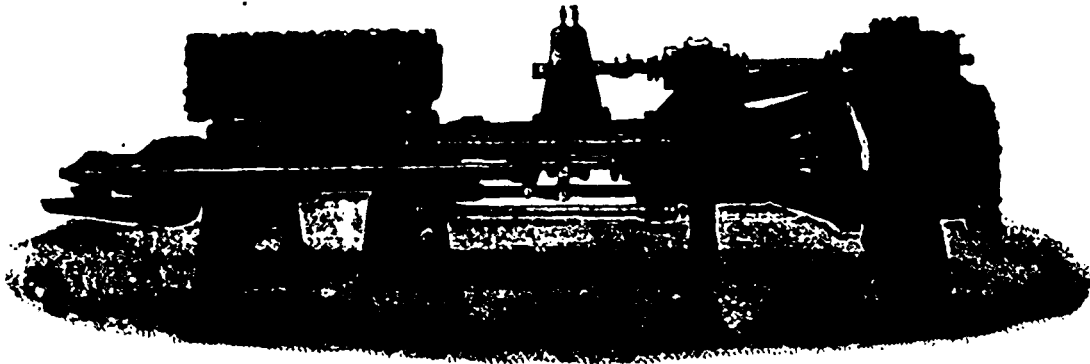
Probably the most instructive method of comparing the actions of the two motors is to consider the action of two engine driven direct current dynamos feeding into the same set of bus bars, and two alternators under similar conditions. If in either case the driving

belt be thrown off one machine, it becomes a motor driven from the other. In the case of the direct current machine the speed drops somewhat until the counter E. M. F. is so reduced that enough current enters the motor to allow it to overcome its own friction, and if a load be placed upon it a further decrease of speed follows. In the case of the alternating dynamo, its speed being fixed as rigidly as if it were geared directly to the other alternator which is supplying current to the bus bars, in order that enough current may flow to operate it as a motor it drops back in phase behind the impressed E. M. F., but not enough to throw it out of synchronism, and as the load increases so does the angle of lag between the E. M. Fs. In case the load became excessive, say three or four hundred per cent. of full load, the motor would lose synchronism and immediately come to rest just as it would were it gear driven and the teeth of the gears stripped off. Considered in this way, the direct current motor adjusts its input to the load to be carried by change of speed, while the synchronous motor automatically adjusts the angles at which its three E. M. F. act so as to allow combined pressures to force enough current in phase with the active pressure to operate the load. In fact, the synchronous motor is in every respect an alternating dynamo and uses the same station equipment with the addition of some starting apparatus and a larger exciter. In operation some means of starting is employed, either a resistance or impedance to keep down the rush of current as in the direct current motor starter, or by using a compensator which is a transformer with a variable ratio of primary to secondary E. M. Fs., enabling the motor to start on a low voltage, which is then gradually increased up to the running pressure. The above apparatus is used where the motor is not required to start under full torque, but still to be self starting. By these means a starting torque of about 25% of full may be obtained with not much more than full load in amperes. Where the motor has not enough torque to start from rest without assistance, a starting motor or a friction clutch, or both, are used, the main motor is driven to synchronism, and when in phase opposition to the supply current it is thrown in as a motor.

In operation a few points may be noted as being peculiar to the synchronous machine. The speed is independent of the voltage applied, but the torque varies as the square of the voltage, so that the pressure of supply should be kept up at least to the rated volts of the motor, and preferably higher. Under proper conditions the motor may operate at five hundred per cent. over its rating before breaking out and coming to a stand still. Where the motor is self starting it should be noted that when starting the fields are subjected to the inductive action of the current flowing in the armature and become practically the high voltage side of a transformer, and while, of course, the field circuit is not closed under the condition of self starting, and no current can flow in them, the high voltage introduced by induction places a great stress on the insulation of the coils to ground. To obviate the danger of puncturing, the fields are generally arranged to be cut in several places by a switch which is opened when starting. Probably a better method is to use few turns on the field with a low voltage exciter giving large currents; this method of avoiding the trouble depending, of course

upon the fact that the voltage induced in the field coils is proportionate to the number of turns in the coils.

One of the most valuable properties of the synchronous motor is its ability to overcome the lagging currents on the lines of long transmissions, which is accomplished by raising or lowering the excitation. The reasons for this ability to operate in this manner will be seen when it is remembered that the impressed E.M.F. is dependent upon the generator, the counter E.M.F. upon the excitation of the motor, and the reactance E.M.F. upon the load. The first being thus fixed and the latter usually out of the control of the motor operator, leaves the counter E.M.F. available for regulating the lines. As this counter E.M.F. depends, just as in a dynamo, upon the speed and the excitation, and as the first in the case of the synchronous motor is fixed, a variation in the exciting current might be expected to produce various results depending upon that excitation, and this is found to be the case. If the exciting current be varied while the motor is running under steady load, it will be found that at one point the input of current to the motor terminals is a minimum, and that as the excitation is either raised or lowered within limits,



SMITH-VAILE COMPOUND DUPLEX PRESSURE PUMP.

the current required to operate the motor is increased.

As the heating of the motor is dependent upon the current taken, independent of whether this is useful or wattless, that point of excitation is usually selected which gives the lowest current reading of motor input. In some cases, however, where it is advisable to overcome the inductive drop in long lines, the excitation may be increased so that the counter E.M.F. becomes greater than the impressed, when the motor acts as a condenser, and gives leading currents to the lines. Where a load of induction motors at the end of a long line gives a large inductive drop owing to the wattless currents flowing, a large synchronous motor over excited will be found to help out the transmission by supplying leading current to counteract the wattless, but it must not be forgotten that as the capacity of the synchronous motor is limited by the currents, whether active or wattless, which flow in its windings, it cannot be called upon for help to the others if it be already loaded to its capacity by its own load. Fortunately for the type, when the excitation is set at any load so that the motor will operate with a power factor of one, or in other words consume the least current for that particular load, any change of load will not be found to affect the required excitation quality. In other words, the excitation once set will be suitable, generally speaking, for any load within the capacity of a good type of motor.

NEW DESIGN FOR A COMPOUND DUPLEX PRESSURE PUMP.

The illustration given herewith is for a compound duplex pressure pump to develop a maximum pressure of 700 lbs. per sq. in.

The liquid end is of the end packed trombone style, the cylinders being made of special metal. Mounted thereupon are separate chambers for the location of the valves; chambers are also constructed of special metal and designed with a view of facilitating quick access for the inspection of the valves.

The valves are of the hydraulic pattern, made of steel and guided from below. An extension piece is provided for supporting the water plunger, and an approved adjustment device provided therefor.

The water end is mounted on heavy supporting columns. An engine of the transposed cylinder type is furnished, giving free access to all steam pistons without dismantling the pump.

The outside valve adjustment is a feature of this design. Further particulars regarding this style of pump can be obtained from the manufacturers, The Stilwell-Bierce & Smith-Vaile Co., 278 Lehman street, Dayton, Ohio, U. S. A.

ANNUAL REPORT OF ROYAL ELECTRIC COMPANY.

The seventeenth annual meeting of the Royal Electric Company was held in Montreal on July 17th, at which the chief business was the reception of the annual report. The report in part stated:

The gross amount to credit of revenue accounts for the year aggregated \$1,519,911.76; the gross amount to debit of revenue accounts for the year aggregated \$921,980.27; leaving a balance of \$597,931.49; from this is to be deducted: Interest and fixed charges to the sum of \$31,239.06; leaving a net profit for the year of \$556,692.43. Of this net profit the sum of \$300,000 has been realized out of the investment in the Chambly Manufacturing Co.

Out of the above earnings there have been declared four quarterly dividends of two per cent. each, to the total amount of \$157,021.14, leaving the sum of \$399,666.29.

During the year expenditures have been made for additions to the plant of the company, as follows: To the factory and its equipment, \$37,458.51; to the lighting stations, lines and installations and general construction, \$135,106.34; making a total of \$172,564.85.

The total net increase added to and connected with the alternating current system during the year was the equivalent of 14,460 incandescent lamps of 16 candle power each, and 2,176 horse power capacity in motors. The volume of business in the city, as well as many orders for electrical machinery and apparatus manufactured by the company, has been very satisfactory and gratifying.

The directors have made arrangements with the Chambly Manufacturing Company, which, subject to your approval, will enable your company to contain and control the whole of the power produced by that company on the Richelieu river, and to dispose of the stock and bonds which it now owns in that company upon advantageous terms; the whole in lieu of the contract now existing.

The agreement with the Chambly Manufacturing Company regarding the purchase of power was ratified. The terms of this agreement extend over a period of fifty years, and at the end of that time the whole reverts to the Chambly Manufacturing Company. The Royal Electric Company is to pay fifteen dollars per horse power for the first 15,350 horse power, and for all in excess of that amount at the rate of ten dollars per horse power.

The following were elected directors of the company for the coming year: Rodolphe Forget, J. A. L. Strathy, J. R. Meeker, H. B. Rainville, George Caverhill, James Wilson, F. C. Henshaw. At a subsequent meeting of the board, Mr. Forget was appointed president, and Mr. James Wilson vice-president.

In answer to a question, Mr. Browne stated that about 12 per cent. of the power will be lost in transmission from Chambly. The Chambly company reserve the right, if the Royal Electric do not exert themselves to obtain customers, to canvass themselves; but not to sell at a lower price.

If not already a member of the Canadian Electrical Association, you are invited to join the organization and participate in the approaching convention at Kingston, which will afford opportunity to make new acquaintances, renew old ones, and store up a stock of valuable information and enjoyment.

LIGHT
POWER
HEAT

The Royal Electric Co.

MONTREAL.
HALIFAX.

TORONTO.
VANCOUVER.

GENERATORS

MOTORS

TRANSFORMERS

The Royal Electric Co.

MONTREAL. HALIFAX. TORONTO. VANCOUVER.

On October 15, 1895, the first "S.K.C." Generator manufactured in Canada was put in operation. To-day the following "S.K.C." Generators are in Service and on Order

COMPANY.	TOWN.	KILOWATT CAPACITY.
W. J. Fletcher.....	Alliston, Ont.....	60
C. O'Dell Electric Co.....	Annapolis, N. S.....	60
Baie St. Paul Electric Co.....	Baie St. Paul, Que.....	25
Corporation of Barrie.....	Barrie, Ont.....	150
Berlin Gas Co.....	Berlin, Ont.....	50
Bowmanville Electric Light Co.....	Bowmanville, Ont.....	90
Brantford Electric & Operating Co.....	Brantford, Ont.....	540 (2 MACH)
Cookshutt Plow Co.....	".....	20
Wood Bros.....	".....	50
Bridgewater Power Co.....	Bridgewater, N.S.....	40
G. H. Davidson.....	Brighton, Ont.....	30
Calgary Water & Power Co.....	Calgary, Alberta.....	150
Corporation of Campbellton.....	Campbellton, N.B.....	60
The Electric Co.....	Chicoutimi, Que.....	80 (2 MACH)
Drayton Electric Light Co.....	Drayton, Ont.....	40
Corporation of Dundalk.....	Dundalk, Ont.....	30
Edmonton Electric Light & Power Co.....	Edmonton, N. W. T.....	75
Corporation of Farnham.....	Farnham, Que.....	30
Hamilton & Prout.....	Forest, Ont.....	30
Corporation of Fort William.....	Fort William, Ont.....	180
Trent River Paper Co.....	Frankfort, Ont.....	40
The Electric Light Co.....	Glen Williams, Ont.....	30
John Phillip.....	Grand Valley, Ont.....	60
E.F.G. Fletcher.....	Gravenhurst, Ont.....	40
Greenwood Electric Co.....	Greenwood, B.C.....	150
Hamilton Electric Light & Cataract Power Co.....	Hamilton, Ont.....	6,840 (7 MACH)
Lake & Bailey.....	".....	50
Lawry Packing Co.....	".....	75
Volta Storage Battery Co.....	".....	75
Riordan Paper Mills Co.....	Hawkesbury, Ont.....	30
Corporation of Joliette.....	Joliette, Que.....	120
Kootenay Electric Co.....	Kaslo, B.C.....	75
J. T. Ayers.....	Lachute, Que.....	120
Corporation of Liverpool.....	Liverpool, N.S.....	75
Corporation of Markham.....	Markham, Ont.....	20
Corporation of Moncton.....	Moncton, N.B.....	60
Dominion Cotton Mills Co.....	Montreal, Que.....	180
McGill University.....	".....	10
Montreal Street Railway Co.....	".....	576 (2 MACH)
Montreal Water & Power Co.....	".....	360
The Royal Electric Co.....	".....	2,555 (11 MACH)
Labrador Electric & Pulp Co.....	Murray Bay, Que.....	125
Napanee Water & Electric Co.....	Napanee, Ont.....	35
Corporation of Newmarket.....	Newmarket, Ont.....	50

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RAILWAY GENERATORS AND APPARATUS - ELECTRIC SUPPLIES OF ALL KINDS
 Write us your Requirements.

The Royal Electric Co.

MONTREAL. HALIFAX. TORONTO. VANCOUVER.

COMPANY.	TOWN.	KILOWATT CAPACITY.
Eastern Townships Electric Light Co.....	North Hatley, Que.....	75
Corporation of Orillia.....	Orillia, Ont.....	600 (2 MACH)
Owen Sound Electric Illuminating & Mfg. Co.....	Owen Sound, Ont.....	50
Penman Manufacturing Co.....	Paris, Ont.....	30
Canadian Electric & Water Power Co.....	Perth, Ont.....	238 (2 MACH)
Electric Light & Power Co.....	Peterborough, Ont.....	180
Penetanguishene & Midland E. St. Ry. Co.....	Penetanguishene, Ont.....	150
Corporation of Picton.....	Picton, Ont.....	120
Central Electric Co.....	Portage la Prairie, Man.....	150
Maple Leaf Rubber Co.....	Port Dalhousie, Ont.....	150
Montmorency Electric Power Co.....	Quebec, Que.....	4,080 (3 MACH)
Chambly Manufacturing Co.....	Richelieu, Que.....	16,000 (3 MACH)
A. Riendeau.....	Richelieu, Que.....	100
Richmond Co. Electric Co.....	Richmond, Que.....	60
W. McMahon.....	Ridgetown, Ont.....	60
Iron Mask Gold Mining Co.....	Rossland, B. C.....	150
St. Catharines Electric Light & Power Co.....	St. Catharines, Ont.....	200
Geo. Wilson & Co.....	" ".....	60
Welland Vale Manufacturing Co.....	" ".....	30
St. Jerome Power & Electric Light Co.....	St. Jerome, Que.....	75
St. Thomas Gas & Electric Co.....	St. Thomas, Ont.....	150
Shawinigan Water & Power Co.....	Shawinigan Falls, Que.....	288
Sherbrooke Gas & Water Co.....	Sherbrooke, Que.....	840 (3 MACH)
S. George.....	Stouffville, Ont.....	20
Corporation of Sudbury.....	Sudbury, Ont.....	75
Sussex Water & Electric Co.....	Sussex, N.B.....	40
Sydney Gas & Electric Co.....	Sydney, C.B.....	210 (2 MACH)
Teeswater Light & Power Co.....	Teeswater, Ont.....	20
North Shore Power Co.....	Three Rivers, Que.....	480 (2 MACH)
Tweed Electric Light Co.....	Tweed, Ont.....	30
Vankleek Hill Electric Co.....	Vankleek Hill, Ont.....	50
Windsor Electric Light Co.....	Windsor, N. S.....	140 (2 MACH)
Corporation of Winnipeg.....	Winnipeg, Man.....	75

77 Companies

117 Generators

38,410 KILOWATT CAPACITY

Customers are Best References

Apparatus Speaks for Itself

SOLE MANUFACTURERS IN CANADA OF THE

"S.K.C." SYSTEM

GENERATORS MOTORS TRANSFORMERS

The only perfected system for the supply of Power and Light from the same Generator and Circuit. Sole Agents for the Dominion of the

RECO. INCANDESCENT LAMPS

STANLEY WATT METERS

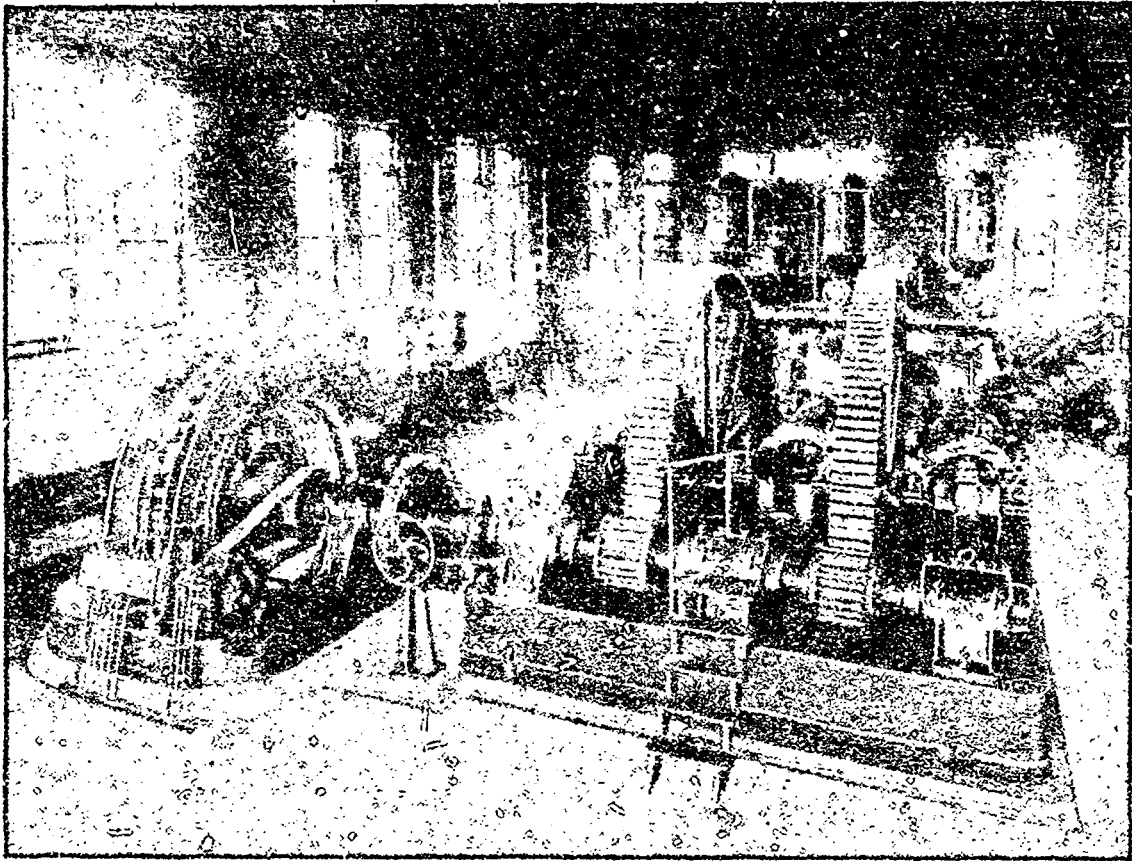
ENQUIRIES SOLICITED

PUMPS

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PUMPING

PLANTS



480 H. P. SYNCHRONOUS MOTOR DIRECT CONNECTED TO PUMP AT ST. CUNEGONDE PUMPING STATION OF THE MONTREAL WATER & POWER COMPANY.

MANUFACTURED AND INSTALLED BY

The Royal Electric Co.
MONTREAL. HALIFAX. TORONTO. VANCOUVER.



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PROF. R. B. OWENS, MONTREAL



MR. A. G. GRIER, MONTREAL

AUTHORS OF PAPERS, CANADIAN ELECTRICAL ASSOCIATION
CONVENTION, KINGSTON, 1900.

PLYMOUTH CORPORATION ELECTRIC WORKS.

By BURCHAM HARDY.

The ceremony of opening the Plymouth Corporation Electric Works at Prince Rock, and the inauguration of electric tramways, took place September 22nd last. Plymouth was the first town in England to be incorporated by Act of Parliament, and was equally the first city to design an electrical plant combining both lighting and power. The business of the corporation has had so rapid a growth that within six months of commencing operation a contract has been placed which will double the supply of current.

The power plant is built on corporation land at Prince Rock, on the Cattewater, the estuary of the river Plym. Three Lancashire boilers, rated at 350 horse-power each, furnish steam; they are operated at a pressure of 130 pounds, but are constructed for a working pressure of 160 pounds to obviate reducing the working pressure as the boilers become old. Welsh coal is delivered by steamer to the wharf alongside the power house, and a branch of the London and South Western Railway runs in front of the works, which are thus supplied with ample accommodation both by land and water. Mechanical coaling stokers are fitted to each boiler, and a complete system of coal handling arrangements conveys the supply of fuel mechanically from the coal stores to the furnaces. An electric motor operates the mechanical stokers. An economizer of 256 tubes has been erected beside the boilers. A cast iron tank holding 28,000 gallons, upon the roof of the coal store, is fed by a three inch pipe from the town mains, the supply of water being paid for at 2d. (four cents) per thousand gallons. Alongside the power house there will shortly be constructed a refuse destructor for the town garbage. The electricity committee of the Corporation will pay the works committee, who are responsible for the destructor, at the rate of one farthing (one-half cent) per k.w. hour of electric energy produced. This arrangement will make a considerable saving in the cost of fuel for the electricity works, and will give over \$7,500 a year to the credit of the destructor.

The generating machinery is contained in a building constructed principally of limestone. The spacious and lofty machinery room is designed to accommodate further units than are at present erected. The lighting and power plant are coupled together in a somewhat ingenious manner. The electrical equipment of the tramways was carried out by the Westinghouse Electric Company, Limited. Illustration No. 1 shows two sets of generators, each unit consisting of a high speed compound engine of 150 h. p. and 275 r. p. m., direct coupled by means of a friction clutch to an alternator of 100 k. w., and also to a Westinghouse direct current generator of 100 k. w., both being on the same side of the steam engine. The engine is capable of driving either the alternator or the generator at full load, or both at half load, or each one in such proportion as the calls for alternating or direct current may require.

A storage battery of 260 Tudor cells is in parallel with the generator. During the day the engine can be run at full load, the alternator supplying whatever small amount of current is required for lighting, and the generator supplying direct current for the tramways. The storage battery, in parallel with the generator, provides for any heavy demand for the tramway service, any current beyond the needs of the tramway line being stored by the battery. By this means a practically constant load is kept upon the engines, and the cells of the battery are continually being charged, or are discharging, according to the demand of the circuit.

During the evening the demand for current for lighting purposes increases, and the supply of current for the tramway line is gradually taken off the generator and supplied by the battery, leaving the engine free to drive the alternator at full load for lighting. After midnight, when the lighting circuits are virtually closed and the cars have ceased running, the generator is driven at full load for charging the battery, until six o'clock in the morning, when the cars again commence to run.

The power house also contains two 200 k. w. alternators, supplying current for lighting, driven at 250 r. p. m., and a 20 k. w. booster, motor driven, used in series with the D. C. generator so that the bus-bar pressure need not be raised. The booster generator is so arranged that when the demand for current is equal to the output of the generator, the battery will neither charge nor discharge. When the line current is less than the output, the booster will aid in the charging of the cells. When the line current is greater than the output, the booster will add a pressure to the battery circuit and thus help it to discharge.

Between each of the engines and the alternators and Westinghouse generators shown in the illustration, is a special shaft coupling, so that the engine can be disengaged when desired. The use of the clutch enables the generator and alternator to be used independently of the engine. On Sundays when no cars run, the generator is operated as a motor from the storage battery, driving the alternator for whatever light load there may be. Similarly, the alternator can be run as a synchronous motor from either of the other alternators in the station, and the D. C. generator used either for

charging the battery or for tramway work with the battery in parallel. This plant was designed some two years ago, but if it were designed today, according to the latest Westinghouse practice in the United States, instead of separate alternators and generators, a combination A.C.-D.C. generator would be employed.

The storage battery consists of 260 Tudor cells, of 600 ampere hours capacity, the maximum discharge rate being 200 amperes. The Tudor Com-

pany maintain the battery under guarantee for ten years at a rate of five per cent. on the original cost. The contract stipulates that at any time within twelve hours of being fully charged, the battery must give its full specified capacity of 600 ampere hours without the voltage per cell falling below 1.85 volts.

The power house is equipped with three switchboards for the lighting and power circuits, which are erected on a gallery upon two sides of the machinery room. The alternating current switchboard is of the ordinary pattern, arranged on the single pole principle. The direct current tramway switchboard is of the usual Westinghouse design, being shown in Fig. 2, and is fitted with instruments for controlling and regulating the current. The regulating resistances are fixed in a room immediately under the switchboard recess.

The length of the tramway lines already opened is 3 1/10 miles, running from the Theatre Royal to Prince Rock, but this is only a part of the projected line. Extensions are being made to Hyde Park, at Mutley, and from the Market Place to Compton, passing through the residential district of Mannamead, and later on will be further extended to Pounds and Lipson. Now that these additional lines are approaching completion, the present type of combination generators will not be continued, but there will be installed a steam driven direct current Westinghouse generator of 500 k. w., a battery for 1700 ampere hours at Compton, a 36 k. w. booster, and a 200 k. w. motor alternator.

Five direct methods of carrying the overhead wires have been employed to suit the character of the road. Owing to the great number of telegraph and telephone wires, guard wires have been used for more than half the route, which rather distracts from the

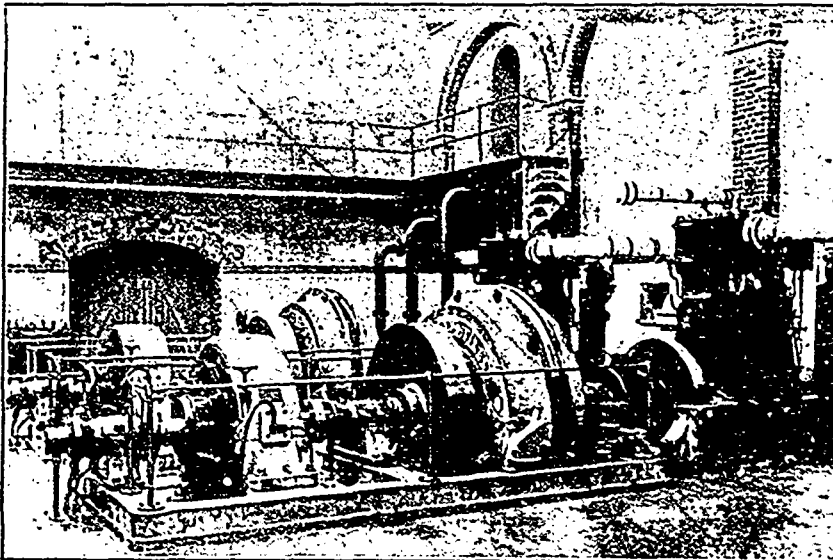


FIG. 1.—100 K. W. WESTINGHOUSE DIRECT CURRENT GENERATORS AND ALTERNATOR.

exceptional artistic appearance of the overhead construction. The poles are three sectional, with S. S. joints, of 7 inches, 6 inches and 5 inches outside diameter, with heavier poles of 8 inches, 7 inches and 6 inches diameter at curves. There are a few single tube poles, 8 inches in diameter for half way and then tapering to 6 inches at the top. Arc lamps are fixed on the top

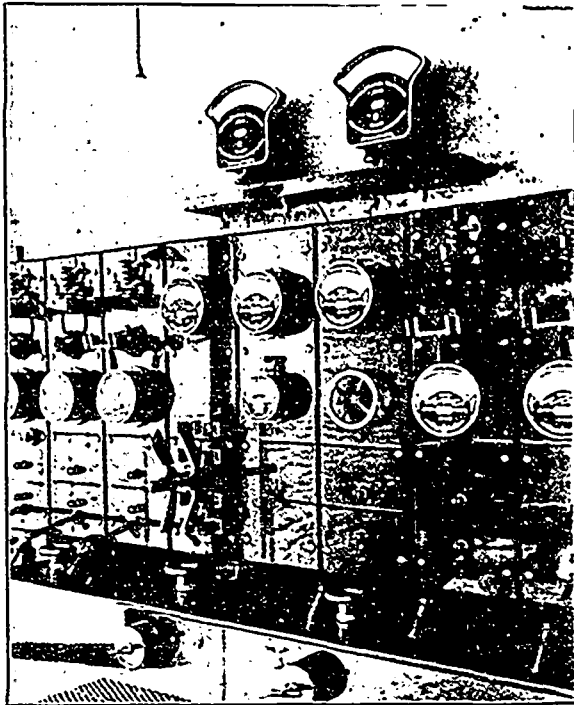


FIG. 2.—WESTINGHOUSE SWITCHBOARD.

of alternate poles in a number of the streets, and where possible on alternate sides of the street, a fiddle bow suspension, between the cars, holding the wires, has been fitted to avoid oscillation of the lamps. The line is divided into $\frac{1}{2}$ mile sections, according to the English Board of Trade requirements, and insulated in the usual manner. Of the section boxes, two have been very neatly built into the walls of the Corporation building. They contain four switch fuses, lightning arrester, telephone and wire terminals.

The motor cars have a seating capacity for twenty inside and twenty-two outside. Each car is fitted with two Westinghouse No. 40 motors, giving 1,000 pounds tractive effort, at eight miles an hour. The controllers are of the Westinghouse series parallel type, with graded brake. Perfect control is kept over the car by putting the two motors in parallel, and by connecting them by a variable resistance, if necessary to the extent of short circuiting the motors. This brake has been working very satisfactorily. The tracks are double nearly all the way. The rails are grooved girder section, 92 pounds, 30 feet in length. The extensions are laid with sixty foot rails. Each joint is bonded with three No. 000 Chicago bonds, 30 inches long. The tests of the conductivity have given most satisfactory results. Probably no more difficult piece of tramway equipment has yet been completed in England, since the three miles already laid is through tortuous and narrow streets with extremely sharp curves.

The combination of supplying both light and power from the same units enables the Corporation to fix a low price for tractive purposes and for lighting circuits. In fact, Mr. Rider, the electrical engineer of the Plymouth Corporation, in a speech made at the opening ceremony, stated that the prices charged were the lowest that had ever been offered at the opening of any electricity works. The tramway is charged $3\frac{1}{2}$ pence (seven cents) per unit up to 150,000 units per annum; beyond this figure there will be a reduction in price. The contemplated extensions to tramway lines will necessitate some 600,000 units, the price for which, it is estimated, will be reduced to 2.3 pence (under five cents) per unit. The price for lighting for private customers is $4\frac{1}{2}$ pence (nine cents) per unit, and the same rate has been made for public lighting. The charge for an arc lamp, including cost of cleaning and maintenance, for one year is £16 (\$77.00). According to Mr. Rider, the cost of electric lighting in Plymouth is about double that of gas, but the former gives about twenty times as much illumination as the latter, so that in effect the public by using electricity obtains ten times as much value for

their money. Twenty-one miles of mains have been laid on the three wire system of distribution, and a large number of houses and stores are being connected up. At the date when the plant was started, connections had been made for 5,000 lamps, and applications in hand showed that this number would be increased to 8,000 before the end of the winter.

The expectations of the resident engineer appear to have been more than realized, since the demand for current has already outrun the station capacity, and a contract has been placed with the British Westinghouse Electric & Manufacturing Company for a 500 k. w. direct current 550 volt engine type generator, to be direct connected to a steam engine running at 330 r. p. m. Two boilers of 350 h. p. each will be added to the present equipment.

For the summer railway traffic fourteen new cars are being built, to be equipped with Westinghouse No. 40 railway motors.

The telephone exchange at St. John, N.B., is to be thoroughly modernized, at a cost of upwards of \$100,000.

The Vernon, Nelson and Kootenay Telephone Company are extending a line from Kootenay to the B. C. Mines.

The electric railway from Quebec city to Ste. Anne de Beaupre, built by the Quebec Railway & Lighting Company, is about to be opened.

The Bell Telephone Company have just put down an underground cable on Portage avenue, Winnipeg, said to be the largest yet used in Canada.

The Bell Telephone Company have recently completed a copper metallic line from Three Rivers to Shawinguan Falls and Grand Mere, Que., thus connecting those places with Montreal, Toronto and other large cities.

The T. Eaton Company, Toronto, have placed an order with the Canadian General Electric Company for two 225 kilowatt, 125 volt direct current generators. These will be direct driven by Robb engines. The installation when completed will, with one exception, be the largest isolated plant in the Dominion, the other being that of the Montreal Cotton Company at Valleyfield, Que.

It is expected that there will be a number of interesting exhibits of electrical and kindred appliances in connection with the annual

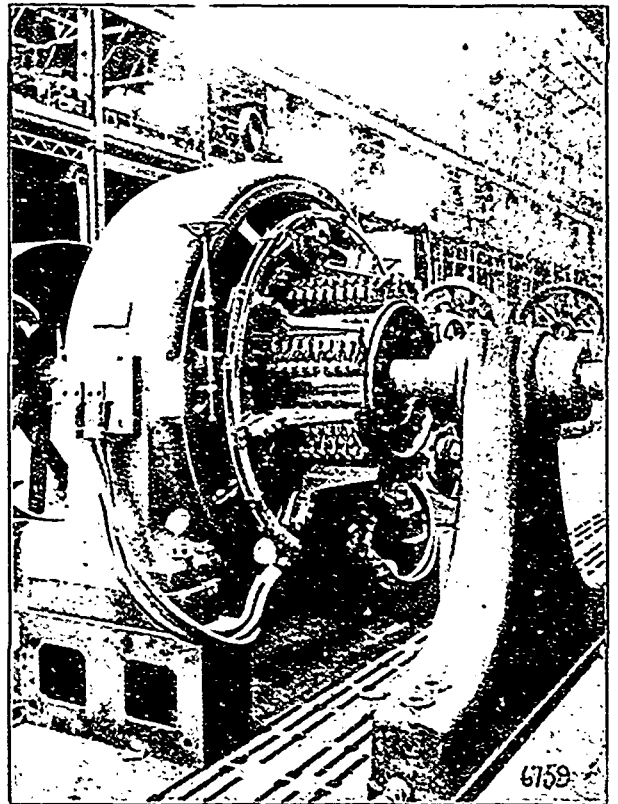


FIG. 3.—WESTINGHOUSE 500 H. P. DIRECT CURRENT GENERATOR—500 VOLTS.

convention of the Canadian Electrical Association to be held at Kingston on the 29th, 30th and 31st inst. Space, current and labor for this purpose are supplied free of charge to manufacturers and dealers.

TELEGRAPH and TELEPHONE

OTTAWA EXCHANGE OF THE BELL TELEPHONE COMPANY.

On April 12th, 1900, the lines of the Bell Telephone Company's subscribers in Ottawa were transferred from the old switchboard to a new one of the most recent type. The work necessitated by this transfer had been going on for over twelve months, during which time every line in the exchange system had been entirely rebuilt, giving all subscribers metallic circuits of copper and phosphor-bronze wire.

All lines entering the company's building on Queen street come in cables through the basement from the street underground system. These cables vary in size from those containing 50 pair of wires to large ones of 200 pair capacity. The underground system has been greatly extended during the past year, until at present there are about 3,000 miles of telephone wires underground in the city of Ottawa. From the basement the cables are carried up a chute to an iron distributing frame in which changes of the location of the terminals of the lines are made and from which all testing is done. Here the cables are terminated in rubber-covered wire ends, which are attached to the

protecting arrestors put into the line circuit, to prevent injury to the apparatus should an abnormal current of sufficient strength to do harm be conducted on to the line wires. From the main distributing frame the lines are carried in small 20 pair flexible cables to the intermediate distributing frame, a structure similar in construction to the main distributing frame and from which cables are led direct to the switchboard. Connected to the intermediate frame is a relay rack on which are mounted the relays which control the various lamp signals on the switchboard.

The necessary current for the operation of the switchboard and for the subscribers' transmitters (this being a common battery or central energy system in which local batteries at subscribers' stations are done away with, and all instruments are operated by one large battery at the central office) is furnished by a battery of eleven type "G 15" chloride storage cells having a capacity of about 1,200 ampere hours. For charging this battery two Western Electric dynamos, direct coupled to motors of the same make, are provided; one motor being run from a 500 volt circuit and the other a 250 volt circuit, thus giving an alternate charging machine in case of a break-down, either of the motor-generators, or of either of the outside power circuits.

Two dynamotors to furnish current for ringing the subscribers' bells are provided and arranged to be run from the storage battery. The switches, protectors, measuring instruments, etc., used in connection with the power plant are mounted on a marble switchboard in a convenient location near the machine, and large mains carry the current from this switch to bus-bars, which are mounted on a marble panel in the operating room, and from which panel leads are carried to the various sections of the switchboard. Protecting fuses are also mounted on this panel.

The last, but by no means the least important piece of apparatus in the exchange, is the switchboard itself. This is radically different in its mode of operation, though not in its appearance, from any other of the older types of switches. Formerly it was necessary, when a subscriber wished to call the central office, for him to ring the bell on his instrument, thus operating an annunciator in the central office; he then removed his telephone from the hook and waited for the operator to answer; it was necessary for the operator to restore this annunciator by hand. When the conversation was

completed, the subscriber rang off (perhaps), displaying another signal similar to the annunciator, upon which the operator listened in on the line to see if the conversation was finished or if another connection was wanted. On account of a great many subscribers not ringing properly, it was necessary, in order to give

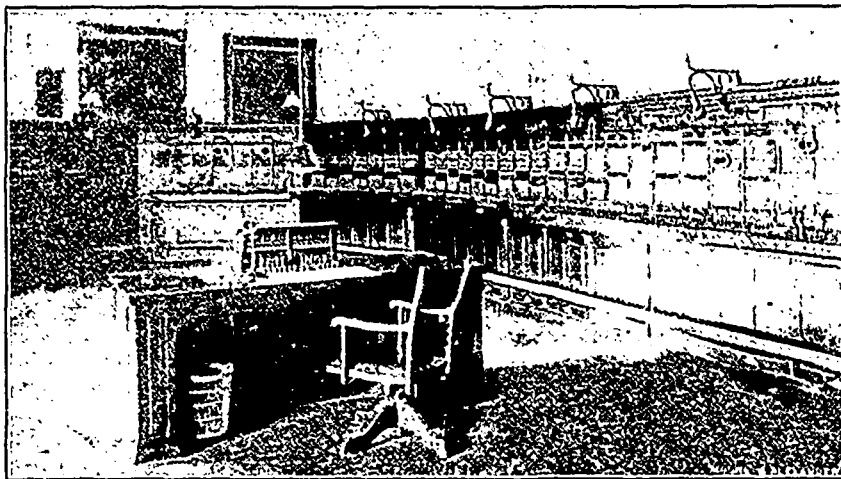


BELL TELEPHONE EXCHANGE, OTTAWA MACHINES AND POWER SWITCHBOARD.

good service, for the operator to come in on the line occasionally to see if the subscriber called for had answered, or ascertain if the conversation was completed, without a disconnect signal being sent in. This gave rise to the more or less annoying questions to the operator, "Have they answered?", "Are you finished?" etc.

The present system is designed to obviate all this. A subscriber signals the central office by removing his telephone from the hook, which act lights a small incandescent lamp in front of the operator at the central office. Before her are a number of pairs of cords and keys similar to the usual operator's equipment, but with the addition of a small incandescent lamp connected in the circuit of each cord of the different pairs. The operator answers the subscriber by inserting a plug into a jack, or connecting point, immediately above the signal lamp; by so doing the line lamp is extinguished. The other cord of the circuit is then inserted into the connecting jack of the line called for and the subscriber is rung up in the usual way. Until he answers by removing his telephone from the hook the lamp connected with the cord circuit remains lit, being a signal to the operator that the subscriber has not answered and that she is to continue ringing until he does so. When both lamps in the cord circuit are out, it signifies to the operator that the conversation is in progress.

When both lamps light, it is a positive signal to the operator that both subscribers' telephones are on the hook and that the conversation is completed. When one or both lamps flash intermittently, it shows that one or both the subscribers are moving the switch hooks of their telephones for the purpose of attracting her attention. When a conversation is started, it is



BELL TELEPHONE EXCHANGE, OTTAWA—PORTION OF MAIN SWITCHBOARD.

unnecessary for an operator to cut in on the line for any purpose, unless she sees this intermittent flashing of the lamp; in this way, interruptions to the subscribers' conversations are reduced to a minimum and the greater part of an operator's work is done by the eye, rather than the ear, making her work simpler and less arduous. The general result is a more satisfactory service all round.

The long distance calls are handled at special sections of the switchboard in a manner very similar to the method described above; all calls being timed by a special recording machine, called a calculagraph, which reduces errors in time record to a minimum. New sets are now being installed in all subscribers' stations, and by the time this work is completed, the city of Ottawa will have a telephone equipment and service not surpassed by any city in America.

With the exception of the storage cells, charging and ringing machines, lamps, and cable, all apparatus used in the exchange and subscribers' stations was manufactured by the Northern Electric & Manufacturing Co., Montreal.

The plant was installed under the direction of the electrical engineering department of the Bell Telephone Co.

The Bell Telephone Company have just installed in the Goldie & McCulloch works, at Galt, Ont., a private telephone exchange, including five desk telephones and seven regular wall instruments. The Goldie & McCulloch Company also have a long distance equipment, and possess one of the most complete telephone systems in Canada. The Bell Telephone Company have also installed a ten set warehouse system for MacGregor, Gourlay & Co., and a seven set system for the C. Turnbull Company, all of Galt.

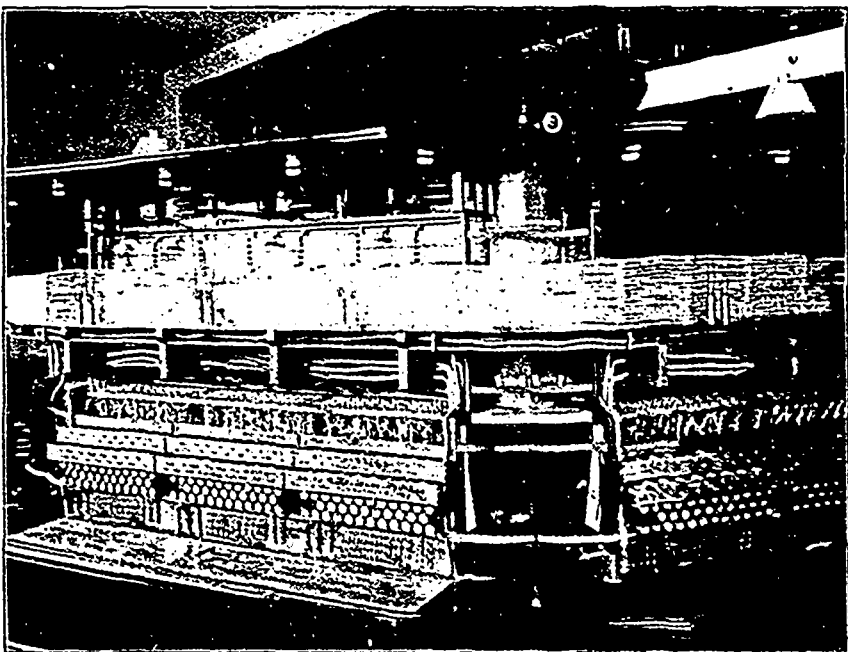
TELEGRAPHY IN THE ATLANTIC.

Mr. F. A. Hamilton, E.E., of Halifax, N. S., has recently completed his commission by the Commercial Cable Company in connection with the laying of a cable from Canso, N. S., to New York. In an interesting communication to the ELECTRICAL NEWS, Mr. Hamilton says:—

"I am now testing the new Canso New York cable during the guarantee period, likewise the Canso-Azores cable recently laid by the "Faraday." This is an eventful year in respect to Atlantic telegraphy. Besides the last mentioned cable laid by the Siemens Bros., Ltd., from their ship the "Faraday, the India Rubber & Gutta Percha Company, with the "Silvertown," have laid the section which I am now testing. This cable is 895 nautical miles in length, and was paid out between July 10th and July 21st. Then there is the German cable now about to be laid by the S. S. "Anglia," belonging to the Telegraph Construction and Maintenance Co. All these companies works are, as you know, on the Thames. The "Silvertown is the oldest ship of the three. She was built by Mitchell & Co. of Newcastle, one year before the "Faraday, and is the larger vessel of the two. The latter vessel was built in the same stocks. The "Anglia" is the latest addition to the great telegraph fleet of the world. She is expected to arrive in New York on the ninth of August."

Mr. Hamilton has recently been appointed by the U. S. A. Signal Corps to accompany an expedition to the Philippines, and expects to leave for New York immediately on the completion of his present contract. He will probably be absent about two months.

The Manhattan General Construction Co., of Newark, N. J., advise us that although midsummer is usually a dull season for arc lamp business, their orders for July, 1900, exceeded those for any one month in their experience, extending over the past seven years. The Manhattan Series A. C. System is being adopted very rapidly, a few of the orders closed recently being: Evanston Electric Mfg Co., Evanston, Ill., 211 lamps; Fairport Electric Co., Fairport, N. Y., 60 lamps; W. M. Sheehan & Co., Wap-



BELL TELEPHONE EXCHANGE, OTTAWA—REAR VIEW OF SWITCHBOARD.

pinger Falls, N. Y., 52 lamps; Hagerstown Municipal Plant, Hagerstown, Md., 117 lamps; Town of Phillipi, W. Va., 20 lamps; Urbana Lt. & Pr. Co., Urbana, Ill., 78 lamps; N. Y., N. H. & H. R. R., Hartford, Conn., 50 lamps; Hamilton Electric Lt. & Pr. Co., Hamilton, Ont., 200 lamps. In addition to shipping 350 series A. C. lamps to the Northern Ohio Traction Co., of Akron, O., the Manhattan Company have received their order for 350 multiple A. C. enclosed arc lamps.

MONTREAL

Branch office of the CANADIAN ELECTRICAL NEWS,
Imperial Building.

MONTREAL, Aug. 6, 1900.

The Lachine Rapids Hydraulic and Land Company are to be congratulated on the manner in which they managed to keep their service going after their late fire at the McCord street distributing station, the delay being trifling. In fact, when one looks at such fires as occurred, for instance, in Toronto, and more recently Ottawa, where do we find any industry that works so unflinchingly to repair fire damage? In giving evidence regarding the fire, Alfred C. Reid testified that when the fire started he was in the switchboard room with Messrs. Dorais and Roberts. The switchboard was in the part facing on Seminary street. He was looking towards the switchboard, suddenly heard a roaring noise and saw issuing from the switchboard a large peculiar flame. The flame was about six feet from witness, who called to the men to get some sand to throw on the flames, for they could not use water. The switchboard was of maple and birch. On the back there was asbestos, and the switchblocks were on slate, and everything arranged so as to make the place as safe as possible. The sand put out some of the fire, but the flame was so hot that they could not get nearer than ten feet, and the flames presently extended to the other insulators. The heat melted the insulating covers and the flames extended in all directions. There are nine main wires coming to the switchboard from the transformers. The board in which the fire caught held only wires of 2,000 volts.

Quite a number of gasoline launches are now in vogue amongst our suburbanites, at Lachine, on Lake St. Louis, and elsewhere. Referring to those which utilize the gas and "fire" it with the electric spark every revolution or second revolution: How many owners have become disgusted, and probably blamed a good engine and boat simply through using improper batteries? Quite a number have sal-ammoniac cells, and some even dry cells, although it is distinctly marked on them for "open circuit work." Now, such work can hardly be called "open circuit," and if some of the disgruntled ones will try one or other of the numerous makes using elements of copper oxide and zinc in a solution of caustic potash, they may find a change for the better. Such cells will run on "closed circuit" work, and this is pretty much what the service required is. It is necessary to have a cell or two more of these than of the sal-ammoniac or dry varieties, owing to their lesser voltage. A reserve set of dry cells, to carry you in should others fail, is not a bad precaution. Some iron contact pins are also in vogue; such should certainly be tipped with platinum, or preferably "platinum-iridium," which, although more expensive, are harder and wear longer. Another point—do not connect cells up together with No. 20 magnet wire or No. 18 bell wire, but use No. 14 or even No. 12 rubber covered wire, and, lastly, see that spark coil is kept dry.

Railways, some how or other, seem to be at logger-heads with the public or their representatives, as shown lately in Toronto and Montreal. Now, were they to give the public one moment's consideration in some affairs, they might secure some champions from the ranks of the people; for instance, around Mountain street, in this city, the Grand Trunk railway manage to make night hideous with their shunting, as do the C. P. R. at Westmount (suburb). It would seem an easy matter to get a branch off the trolley of the Montreal street railway, which is adjacent to both railways mentioned, and use an electric locomotive to do the shunting. The stentorian puffs and whizzing of steam being absent, the nuisance would be minimized to such an extent as to come within the bounds of toleration.

There are certain electricians who "kick" at U. S. alien labor law allowing U. S. men to come into Canada and do electrical work, when they cannot do likewise across the border. Might one question be put to the kickers: Do they subscribe to the CANADIAN ELECTRICAL NEWS at \$1 (only) per annum, or do they subscribe, and generally at higher expense, to alien electrical periodicals in the U.S.A.? There is no harm in their doing both, but "Canada first" should be the motto in this argument as well as in the other.

The old time controversy of direct vs. alternating for interior illumination in large cities seems to be pretty well settled in favor of the latter, although one of the arguments brought forward at

the time by advocates of the former, viz., the danger of breakdown in transformers, permitting the high pressure current to enter buildings, is bearing abundant fruit at present. Of course, there has been considerable lightning about, which may have caused some of the trouble, but the half will never be known, as companies, and rightly so, frown down any publicity of such events whenever possible.

Has not the demand for high efficiency and low priced transformers got something to do with this state of affairs? In the past far less of this sort of thing was met with, although it is equally true that many more transformers are now in use. Whatever may be the cause, central stations should ferret it out, or some suitable device to prevent disaster when such an event does happen, as many of the general public are beginning to think that gunpowder and electric light (especially during thunder) are equally dangerous to have around. The underwriters, who make numerous regulations, should see that Tom Jones house, wired in 1886, is not fed from the same transformer as is feeding Bill Smith's house, wired in 1900, as in so doing they bring the latter high risk down to the former low level.

All that the companies care is that the installation is safe "at the date when connected." True, they have inspectors, who no doubt condemn such faulty "fittings" as they may come across, but it is not reasonable to suppose that they cut the mains (where there is no main switch) and "ring out" the various residences for "grounds." A company's inspector may report "lack of main switch," and the tenant retort "looking for a job" it would be otherwise, however, if from the official underwriters' inspector. The insurance companies lose most, and yet seem to fear the expense of employing an electrical expert whose sole duty it would be to coach and confer with the usual routine inspectors of the underwriters. It has got to come some day, and the time is ripe now. So far indoor wiring has had all of the attention, such as it is; there is evidence, however, that a little attention to outdoor wiring, transformers, grouping of buildings, etc., of this nature would not be amiss.

SPARKS.

The British Columbia Electric Railway Company are building an extension of their road from New Westminster to Sapperton.

The Hamilton Gasoline Engine & Automobile Company, Limited, has been incorporated, with a capital of \$40,000 and head office in Hamilton.

The Cape Breton Tramway & Electric Company, with a capital of \$500,000, have decided to build an electric railway connecting Sydney, Glace Bay, and Sydney Mines.

The Central Electric Street Railway Company have made a proposition to build a street railway along the streets of Sarnia. The Sarnia Street Railway Company have asked a similar franchise.

A by-law to raise \$100,000 to purchase the electric light and gas plants of the Brockville Light & Power Company was sanctioned by the ratepayers recently. A vote as to whether the plant should be under the control of the town council or five commissioners resulted in favor of the latter.

The Penman Manufacturing Company, Paris, Ont., are installing a new electric plant in their No. 1 mill, and have purchased a 55 kilowatt multipolar generator from the Canadian General Electric Company for the purpose. This is the fourth plant the Canadian General Electric Company have supplied to the Penman Company for their different mills.

The Electrical Construction Company, of London, Limited, have received orders from G. E. Matthews, Montreal, Que., for one 6 h.p. motor; Clark, Pennock & Co., London, Ont., one 8 h.p. bipolar motor; Malloch & Co., London, Ont., three 6 h.p. elevator motors; Burnett & Sons, London, Ont., one 8 h.p. hoisting motor, with controller.

The Mail Job Printing Company, Toronto, have placed their order for six slow speed press motors with the Electrical Construction Company of London, Limited. This order, together with the three recently placed for the same purpose with the Salvation Army, Toronto, and two with the W. J. Gage Company, Toronto, show the general favor with which these special slow speed motors are regarded.

The Canadian Electrical Association is ten years old. Will you assist to celebrate the event at Kingston on the 29th, 30th and 31st inst.

ENGINEERING and MECHANICS

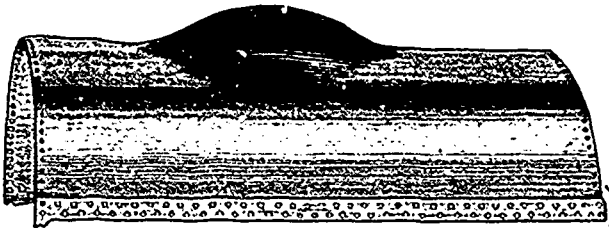
ANNUAL CONVENTION OF STATIONARY ENGINEERS.

The annual convention of the Canadian Association of Stationary Engineers will be held in Toronto commencing on Tuesday, August 28th, at 11 o'clock a. m. Arrangements have been made for an interesting programme, including papers on "Chimneys" and "Injectors" by Messrs. E. J. Philip and A. E. Edkins. Mr. H. E. Terry is chairman of the local committee, the members of which are working energetically to make the convention even more successful than any held heretofore. As the Toronto Exhibition will be in progress, reduced railway fares from all parts will be obtainable, and there is reason to expect a large attendance of members and visitors. The meeting place will be Engineers Hall, 61 Victoria street. Particulars regarding the convention will be gladly furnished by Mr. A. M. Wickens, executive secretary, 280 Berkeley street.

THE EFFECT OF OIL IN BOILERS.*

We often referred to the fact that the presence of grease or any of the animal oils in steam boilers is almost certain to cause trouble. Our illustration gives a better idea of the effect produced than pages of verbal description possibly could. It is from a photograph and is no wise exaggerated.

The boiler from which the plate shown in the cut was taken was a nearly new one. It was made of a well-known brand of mild steel, and that it was admirably adapted to the purpose for which it was used, is proved by its stretching as it did without rupture. The dimensions of bulge shown are four feet lengthwise of the boiler, three feet girthwise and nine inches deep. The metal, originally $\frac{5}{16}$ of an inch thick, drew down to $\frac{1}{8}$ inch in



EFFECT OF OIL IN BOILERS.

thickness at the lowest point of the "bag" without the slightest indication of fracture.

The circumstances under which the bulge occurred may best be described in the words of the inspector who examined the boiler, and are as follows:

"Last Tuesday morning I was called in great haste to the works. Upon arrival I found one of the boilers badly bulged, and with twenty pounds of steam up. I could give no explanation until I had thoroughly examined the internal parts of the boiler. I gave directions for cooling the boiler and ordered top man-hole plate to be loosened, but not to be taken out until my arrival in the afternoon, that I might see everything undisturbed. This was done. On my arrival I took out the man-hole plates in top of shell and front head . . . and made an examination."

"I found the boiler had been cleaned from preceding Sunday, and at that time a gallon or more of black oil had been thrown into it. Monday morning the boiler was fired up and was run through the day at a pressure of 90 pounds per square inch. At six o'clock Monday night the engine was stopped, the drafts were closed, and no more firing was done until nine o'clock. Upon going to fire up at this time, the bulge was observed. From six to nine o'clock a pressure of only 40 pounds was carried."

"Upon examination I found the entire boiler saturated with this oil."

This is almost certain to be the result of putting grease into a steam boiler. It settles down on the fire-sheets, when the draft is closed, and the circulation of water nearly stops, and prevents contact between the plates and the water. As a consequence, the plates over the fire become overheated; and under such circumstances a very slight steam-pressure is sufficient to bag the sheets. Unless the boiler is made of very good material, the

*From the eighth edition of "Helios," published by the Heine Safety Boiler Company, and reproduced by permission.

plate is very apt to be fractured, and explosion is likely to occur.

When oil is used to remove scale from steam-boilers, too much care cannot be exercised to make sure that it is free from grease or animal oil. Nothing but pure mineral oil should be used. Crude petroleum is one thing, black oil, which may mean almost anything, is very likely to be something quite different.

The action of grease in a boiler is peculiar, but not more so than we might expect. It does not dissolve in the water nor does it decompose, neither does it remain on top of the water, but it seems to form itself into what may be described as "slugs," which at first seem to be slightly lighter than the water, of just such a gravity, in fact that the circulation of water carries them about at will. After a short season of boiling, these "slugs" or suspended drops seem to acquire a certain degree of "stickiness," so that when they come in contact with shell and flues of the boiler, they begin to adhere thereto. Then under the action of heat they begin the process of "varnishing" the interior of the boiler. The thinnest possible coating of this varnish is sufficient to bring about overheating of the plates, as we have found repeatedly in our experience. We emphasize the point that it is not necessary to have a coating of grease of any appreciable thickness to cause overheating and bagging of plates and leaking at seams.

The time when damage is most likely to occur is after the fires are banked, for then, the formation of steam being checked, the circulation of water stops and the grease thus has an opportunity to settle on the bottom of the boiler and prevent contact of the water with the fire-sheets. Under these circumstances, a very low degree of heat in the furnace is sufficient to overheat the plates to such an extent that bulging is sure to occur. When the facts are understood, it will be found quite unnecessary to attribute the damage to low water.

This accident also serves to illustrate the perfection to which the manufacture of steel or boiler plates has attained. It would be an extraordinarily good quality of iron that would stand such a test without fracture.

TRADE NOTES.

Messrs. Geo. May & Sons, Ottawa, have placed an order with the Electrical Construction Co. of London, Ltd., for a 5 h. p. motor.

The Goldie & McCullough Company, of Galt, Ont., have installed a 10 h. p. "Model" gasoline engine at the Royal Military College, Kingston.

C. W. Thompson, of the Napanee Mills Paper Company, Newburg, Ont., is replacing his arc lighting plant with a complete direct current incandescent system, supplied by the Royal Electric Company.

Messrs. Jack & Robertson, of Montreal, have recently been appointed sales agents for the Robb Engineering Company, of Amherst, N.S., manufacturers of the celebrated "Robb" engines, "Mumford" boilers, feed water heaters, etc.

The Volta Electric Storage Company, of Hamilton, Ont., is installing a 120 k. w., 110 volt, bi-polar direct current generator and a 25 k. w. direct current 250 volt multipolar generator for charging batteries and for testing purposes, purchased from the Royal Electric Company.

Mr. R. E. T. Pringle, dealer in electrical apparatus and supplies, Montreal, is about to open an establishment at 72 Prince William street, St. John, N. B. This branch will be in charge of Mr. Geo. C. Rough, who has been sales manager at Montreal for Mr. Pringle for the past four years.

The Dominion Government has placed an order with the Royal Electric Company, of Montreal, for a 30 k. w. direct current multipolar generator, direct connected to a Robb-Armstrong engine, together with a marble switchboard, and arc and incandescent lamps to light the docks at Sorel, P. Q.

The following are a few of the orders received by the Electrical Construction Co. of London, Ltd., during the last month: Messrs. Lamb & Bate, Stratford, 3 h. p. motor; Chas. Allan, Ingersoll, 2 h. p. motor; Mitchell & Co., Ingersoll, 3 h. p. motor; Thos. A. Cooley, Peterborough, 1 h. p. motor; G. E. Matthews, Montreal, two 2 h. p. motors.

The Electrical Construction Co., Ltd., of London, recently received the following orders from their agents in Winnipeg: Two one h. p. motors, 2 h. p. motor, 3 h. p. motor, 4 h. p. motor, 8 h. p. motor, 30 light dynamo. Messrs. Hoffmeister Bros., Vancouver, B. C., have placed an order for a 3 h. p. multipolar motor with the Electrical Construction Co. of London Ltd. The Georgian Bay Navigation Co., Collingwood, have placed an order with the same company for the supply of a 150 light dynamo, including the complete wiring of their boat Britannic.

QUESTIONS AND ANSWERS.

A Montreal correspondent asks: "What are the changes, if any, necessary in the connections of (a) a series, (b) a shunt, (c), a compound wound dynamo, in order to keep the polarity of the circuits the same, when the dynamo is running in the opposite direction to its original rotation?"

ANSWER. If it is necessary to change the direction of rotation of any dynamo, the easiest way to maintain the same polarity in the circuit is to reverse the terminals of the circuit at the terminals of the dynamo. This would apply to any description of dynamo.

SPARKS.

The Herald Publishing Company, Montreal, have purchased a 30 h.p. 250 volt motor from the Canadian General Electric Company.

The Canadian General Electric Company have sold the Guelph Street Railway Company one of their standard General Electric

1,200 two motor railway equipments, complete with two k. 21 controllers.

The Plessisville Electric Company, of Plessisville, Ont., have recently installed a 120 k.w. single phase alternator purchased from the Canadian General Electric Company.

The Ottawa, Brockville and New York Railway Company propose, it is said, transmitting electric power to the town of Brockville. Messrs. Geo. E. Kidd and James Stratton, of Ottawa, are interested.

Those who attend the Convention of the Canadian Electrical Association at Kingston on the last three days of this month will see, in the best and most comfortable manner and in excellent company, the beauties of the famous Thousand Islands.

FOR SALE—A Five-Hundred Alternating Westinghouse Dynamo; one thousand volts. G. F. FROST, Chelley, Ont.



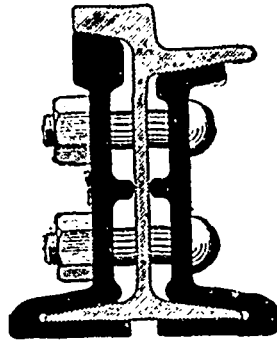
Tie Plates

Keeps rails in Surface Gauge and Line. Quadruples Life of Ties.

Pearson Jacks

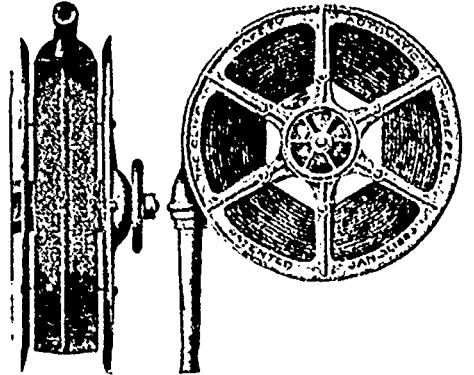
Quickest and Best Rerailing Device for Electric Roads.

- Q. & C. Track Jacks.
- Q. & C. Rail Drills.



Continuous Rail Joint

Strongest Joint made.



Automatic Reel

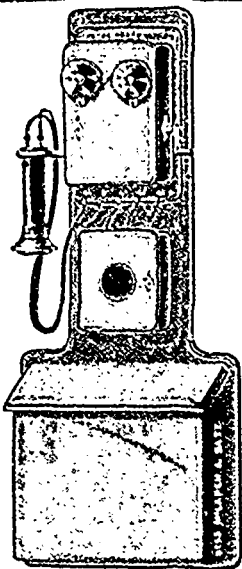
Unwinding Hose opens Valve. Water at nozzle when Hose is unreeled.

Bryant Rail Saw

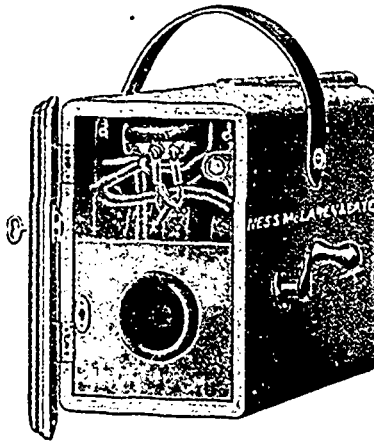
Saves taking rail from track, saves labor and cost, and makes a job.

F. E. GAME, Manufacturer, 17 Place d'Armes Hill MONTREAL

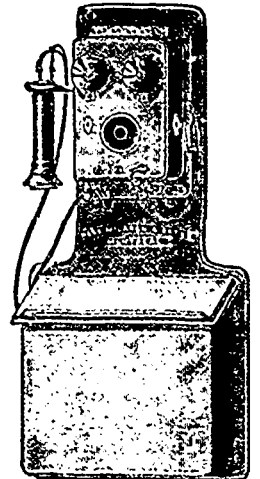
TELEPHONES



MAIN LINE



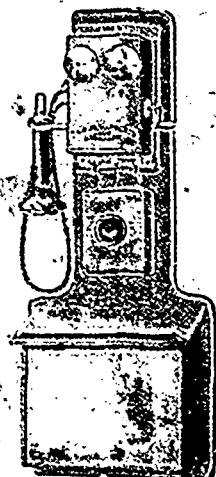
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WAREHOUSE

ALL INSTRUMENTS GUARANTEED FULLY.

SEND FOR CATALOGUES.



Ness, McLaren & Bate
 SUCCESSORS TO T.W. NESS & CO.
 MANUFACTURERS OF
TELEPHONES AND ELECTRICAL SUPPLIES.

419 St. James Street
 Corner Craig

MONTREAL

SPARKS.

The electric light plant at Danville, Que., was recently sold at auction to Thomas Crockett for \$6,500.

The Paisley Electric Light Company have purchased a 1,200 light S. K. C. generator from the Royal Electric Company.

The Almonte Electric Light Company have not yet been successful in securing a renewal contract for street lighting in the town of Almonte, Ont.

The electric light plant at Revelstoke, B. C., may be purchased by the corporation. Col. Tracey, C. E., of Vancouver, recently valued the plant.

The Royal Electric Company, of Montreal, have been given a contract for 20 years for street and commercial lighting within the corporation of St. Laurent, Que.

The Ballard Electric Co., Toronto, have recently sent out a neatly printed catalogue of 100 pages, containing numerous illustrations and prices of electrical supplies.

Owing to some disagreement, the town of Springhill, N. S., is reported to be in darkness, but the authorities are making an effort to install a new electric light plant.

The town council of Yarmouth, N. S., have accepted the offer of the Yarmouth Gas Light Company to light the streets of the town for one year, at the price of \$3,500.

The Canadian General Electric Company have just completed the installation of one of their standard 60 kilowatt single phase alternators for the Leamington Electric Light Company.

The Fensom Elevator Company have secured the contract for the erection of an electric elevator to be operated in connection with the rapid handling of mail matter at the Union Station, Toronto.

The Canadian General Electric Company have recently received an order from the Lake Superior Power Company, Sault Ste. Marie, for a 400 h.p. 500 volt direct current dynamo, with switch-board complete.

The Renfrew Electric Company, of Renfrew, Ont., held its first semi-annual meeting recently, and after only six months of corporate existence, declared a dividend on the basis of 6 per cent. per annum.

The Canadian Electric & Water Power Co., Limited, of Perth, have purchased a water power at Glen Tay, three miles from Perth, on the Tay River, where they intend installing an electric plant as an auxiliary to their present plant.

The Canadian Manufacturer has recently published a special number, in which is printed in detail the Canadian, United States, British and Newfoundland customs tariffs. This number will no doubt be found very useful for reference.

Almonte, Ont., town council voted down a resolution to accept the offer of the Almonte Electric Company for a ten years' contract for street lighting until midnight at \$55 per 2,000 c. p. lamp per annum. It is likely that the corporation will purchase a municipal plant.

Mr. J. P. Graves has submitted a proposition to acquire the waterworks and electric light plants at Grand Forks, B. C., for 25 years. Mr. Graves offers to pay the corporation \$70,000 and to expend \$30,000 in improving the plants. He has also submitted a proposition for the construction of an electric railway.

The Canadian Woollen Mills Company, of Carleton Place, Ont., have just purchased from the Canadian General Electric Company an electric plant for transmitting power and light to their various mills. The order consists of one 100 h.p. multipolar 500 volt generator, one 75 h.p. multipolar 500 volt motor, and all the necessary switch-board apparatus.

The American Alkali Company, of Sault Ste. Marie, Ont., have recently put into operation the two 225 k.w. 200 volt generators purchased from the Canadian General Electric Company. These generators are direct connected to water-wheels operating at a speed of 200 revolutions per minute. The process used by the Alkali Company is one of the most interesting in the country.

Mr. J. A. Valois, manager of the Chambly Electric Company of Montreal, in company with Mr. J. G. Petit Clair, foreman of the same company, have within the last month visited New York, Philadelphia and Chicago, where they purchased a few thousand dollars worth of electric light and electro medical apparatus. It is rumored that their company have a large contract in view.

The Canadian General Electric Company have received an order from the Aylmer Electric Manufacturing Company, Aylmer, Ont., for one of their standard 2,000 light revolving field monocyclic alternators, with panels. This is a type of machine which will be

very much sought after in the future where it is desired to furnish electric power to polyphase motors of all sizes and still maintain the simplicity of single phase distribution for lighting.

The Rev. Sisters of St. Anne, inaugurated about the end of July their new incandescent lighting plant installed at their convent at Lachine, P. Q. The plant was put in by the Chambly Electric Company, of Montreal. Mr. J. A. Valois, manager of that company, at first signed a contract for the installation of a few lamps, but the sisters after seeing the advantages of electric light over coal oil lamps, decided to install an 800 light plant.

It is said that a company is being formed to manufacture incandescent coal oil lamps after a model invented by Mr. V. L. Emerson, of Ottawa. The incandescence is created by blowing a thin stream of coal oil in a spray over a film shaped like the auer light burner. The result is said to be a light of much higher brilliancy than an ordinary sixteen c. p. electric light, while the cost is claimed to be but one-tenth of a cent per hour.

The city council of St. John, N. B., recently invited tenders for electric street lighting. The Carleton Electric Light & Power Company tendered to light the west side of the city at \$105 per light per year. The St. John Railway Company offered to supply 90 lights for the Portland side at \$75 per light per year, and to light the east side of the city for \$85 per light per year. The Board of Public Safety have recommended that the council accept the tender of the St. John Railway Company.

Mr. Roderick J. Parke, consulting engineer, of Toronto, has been engaged by the municipal council of St. Marys, Ont., to prepare plans and specifications for the reorganization and combination of the present municipal arc lighting plant and the incandescent lighting plant recently acquired by the corporation from the Reesor Company. A new power station will be erected and a completely new engine and boiler plant will be purchased and installed. Work will be commenced as soon as possible.

The construction of the Crocker improved turbine is well shown in the fourth edition of the Jenckes Machine Company's water wheel catalogue. The various illustrations pertaining to the Crocker wheel show the adaptability of the Crocker turbine to varying requirements and local conditions. The tables of horse powers, which are guaranteed to be substantially correct, have been extended from 40 feet to 100 feet head. The figures are given for any wheel from 15 to 55 inches. There are also other valuable tables, which evidently have been prepared to meet the needs of the practical man and to facilitate the calculations and estimates required in connection with water wheel work. Diagrams of the principal methods of setting have also been inserted.

The Niagara, St. Catharines, & Toronto Railway Company, of St. Catharines, have just placed an order with the Canadian General Electric Company for two 300 kilowatt rotary converters, together with switch-board panels and high potential transformers of the oil cooled type complete. The transformers for this installation are very special in their construction, each having a primary connection for 2,200 volts, 11,000 volts, 22,000 volts, with secondaries of 375 volts. Total capacity of the six transformers will be 800 horse-power. The railway has already commenced operations in a temporary way until such time as they can procure power, and from the business being done there can be no doubt that this will be one of the most successful electric railways in Canada.

A wave motor is being built at Atlantic City by the Atlantic Wave Motor & Power Company, of Philadelphia, the object, of course, being to utilize the rise and fall of the sea to generate electric power. Henry C. Essington, the inventor of the machine, describes it as follows: "A ball twelve feet in diameter, on a revolving shaft with two yokes of solid cast steel weighing 850 pounds each, attached to a solid rocker arm or segment weighing 2,010 pounds, with a tensile strength of 60,000 pounds to the square inch. The whole attached to a twelve-foot revolving turn table which will hold the machinery, and to accommodate itself, and oscillates in accord with all the changes of the wind or current, the rise and fall of the tide, waves motion and swell of the ocean. The ball in riding the waves will be submerged two feet, and revolve on the axle or shaft continuously from the incoming waves, thereby relieving the strain from the machinery. We obtain direct power by discharging the water into the bottom of the receiver from the pump supplying the turbine wheel from an outlet which is placed on the bottom of the receiver. This receiver will act as an air chamber to a pump, and will fill the other part of the receiver with compressed air, which will force the water against the turbine."

SPARKS.

The Canadian General Electric Company are just completing the installation of one of their 300 k.w. monocyclic alternators for the Winnipeg Street Railway Company.

The members of the Toronto Railway Electrical and Mechanical Benefit Association held their annual excursion to St. Catharines a fortnight ago. About 500 persons enjoyed the outing.

The Canadian General Electric Company are supplying the Tagona Water and Light Company with two 35 light 6-8 ampere arc dynamos, complete with lamp. The plant is to be used for lighting docks, etc., at Michipicoton.

The Volta Electric Storage Company, Limited, of Hamilton, is installing a battery switch-board for Mr. W. E. H. Massey, at his farm at East Toronto. This switch-board is being built by the Royal Electric Company.

The Central Peat Company, Welland, Ont., have placed an order with the Electrical Construction Company, of London, Limited, for one 25 h.p. multipolar generator, and one 15 h.p., one 10 h.p., and one 5 h.p. multipolar motors, to operate their works at Welland.

The Galt Gas Light Company, of Galt, Ont., have ordered from

the Royal Electric Company a 100 k.w. S.K.C. generator, with switch-board and exciter, also a switch-board for their present single phase alternator and one for their arc lighting system.

A project is said to be under consideration involving the construction of an electric railway from Three Rivers to Grand Mere, Que.

The Electrical Construction Company, of London, Limited, are having a great demand for machines from Winnipeg. They have received a further order from the Stuart-Arbutnot Machine Company for one 16 h.p. multipolar motor, one 15 h.p. multipolar motor, and one 8 h.p. bipolar motor.

Messrs. R. & W. Conroy, Ottawa, Ont., are installing a large transmission plant at Deschenes Falls, P. Q., for the purpose of furnishing electric power to the E. B. Eddy Company and others. Their electrical equipment consists of two 800 kilowatt revolving field three phase generators, wound for a potential of 10,500 volts E.M.F.; the current is transmitted a distance of 6 miles to Hull, where it is transformed to a potential of 400 volts through step-down transformers of the oil cooled type, all the electrical apparatus being furnished by the Canadian General Electric Company.

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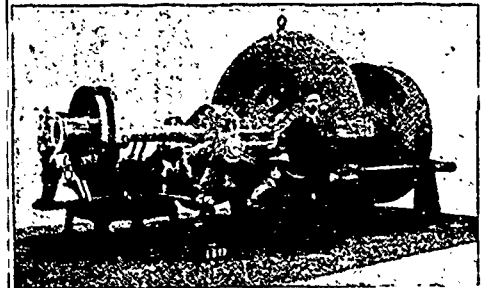
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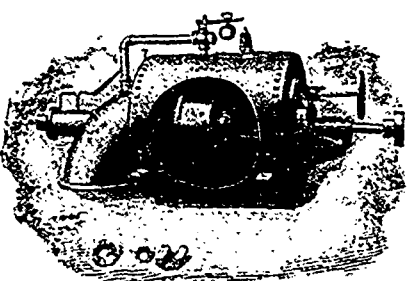
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Stilwell-Bierce & Smith-Vaile Co.

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DAYTON, OHIO, U. S. A.

SPARKS.

The electric light plant at Farnham, Que., will be sold by the sheriff.

Incorporation has been granted to the Renfrew Power Company, Limited, with a capital of \$50,000.

The McLachlan Electric & Gasoline Motor Company have removed to new premises at 115 Bay street, Toronto.

The premises of McDonald Bros., electrical contractors, Winnipeg, Man., were recently damaged by fire to the extent of \$5,000.

The Leamington Electric Light Company have just put in a new 1,500 light dynamo, furnished by the Canadian General Electric Company.

A company has been formed at Ottawa for the manufacture of automobiles. Messrs. John Sutherland and J. Carling Kelly are the promoters.

W. H. Meldrum, of Peterboro, has just recently installed a 20 h.p. three phase induction motor purchased from the Canadian General Electric Company.

Wm. Clark, a lineman in the employ of the Winnipeg Street Railway Company, recently came in contact with a live wire and was electrocuted.

The Canadian General Electric Company have recently installed one of their standard 120 k.w. single phase alternators for the Chesley Electric Light Company.

The ratepayers of Cannington, Ont., have voted against the purchase of the Dobson electric light plant which it was proposed to operate as a municipal concern.

The Shawinigan Water & Power Company, of Montreal, have purchased a 75 k.w. multipolar 125 volt generator from the Canadian General Electric Company.

The Montreal Automobile Company have made application for a Dominion charter, with a capitalization of \$250,000. Messrs. Emile Lepage and J. W. Faucher are interested.

The Canadian General Electric Company are installing one of their standard 150 kilowatt three phase revolving field alternators for the Hanover Electric Light Company. The order covers the

furnishing of several induction motors and a complete installation of series alternating arc lamps, with constant current automatic regulating transformer.

The council of Newmarket, Ont., are in favor of spending about \$10,000 to increase the electric light and water works plants, and the ratepayers will be asked to sanction the outlay.

The Hamilton Motor Company, of Peterborough, Ont., has been incorporated, to manufacture electric and gasoline motors. The directors include T. A. Colley, W. J. Hamilton and J. W. Bennett.

The ratepayers of Dartmouth, N. S., recently rejected a recommendation of the town council that the plant and franchise of the Dartmouth Electric Light Company be purchased for the sum of \$25,000.

A company has been formed, known as the Gasoline Engine Company of Toronto Junction, to manufacture gasoline engines. Recently authority was obtained to increase the capital stock to \$50,000.

The ratepayers of Bracebridge, Ont., are evidently progressive, as by a vote of 72 to 5 they expressed themselves in favor of raising the sum of \$27,000 for the purpose of extending and improving the electric light plant.

The Richelieu & Ontario Navigation Company have equipped two of their new boats with 30 kilowatt direct current generators direct driven by "Ideal" engines, all of which were purchased by the Canadian General Electric Company.

The corporation at Hespeler, Ont., have purchased the electric light plant of J. S. Shantz for the sum of \$2,800, which does not include the boiler and engine. The town will install an incandescent system in connection with the present arc plant.

The Canada General Electric Company are supplying Mr. J. A. Williams, of Dawson City, Alaska, with a complete electric plant, consisting of one standard 200 k.w. revolving field three phase alternator, on 50 h.p. and one 10 h.p. induction motor, together with all transformers and electrical supplies required. This plant will be in operation very shortly and the indications are that Mr. Williams' enterprise will be a very successful one.

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SPARKS.

An electric railway may be built between Brighton and Havelock, Ont.

The Guelph Street Railway carried 25,000 more passengers during the last fiscal year than in the preceding one.

The Hamilton, Grimsby & Beamsville Railway Company has made a proposition to build a spur line from Grimsby to the G. T. R. line. This would be of great benefit to the fruit growers in the vicinity.

The Ottawa Electric Railway Company have placed an order with the Ottawa Car Works for eight new cars. The Niagara, St. Catharines & Toronto Railway Company have placed an order with the same firm for four 15-bench open cars.

The Massey-Harris Company have just placed an order with the Canadian General Electric Company for one of their standard 75 kilowatt direct driven direct current generators. This is to be used for furnishing light and power in their Bramford works.

The Cataract Power Company have submitted a new proposition to the civic authorities of Hamilton in connection with the construction of an electric railway to Galt and Guelph. With the connections proposed it is claimed that the city would be brought into touch with 100,000 persons through an hourly service.

The St. Thomas Street Railway Company have been operating the road at a loss of \$6,177.02 for the past two years. It is probable that the road will be handed over to the mortgagees.

The R. Forbes Co., of Hespeler, Ont., have in the remodelling of their mills decided to use electric power throughout, for driving the different lines of shafting. For this purpose they have placed and order with the Canadian General Electric Company for one of their standard 200 kilowatt revolving field three phase alternators, together with generator and feeder panels and a full complement of three phase induction motors.

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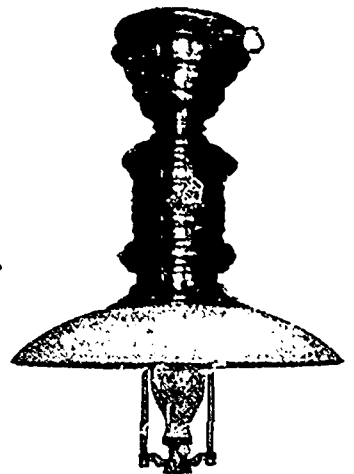


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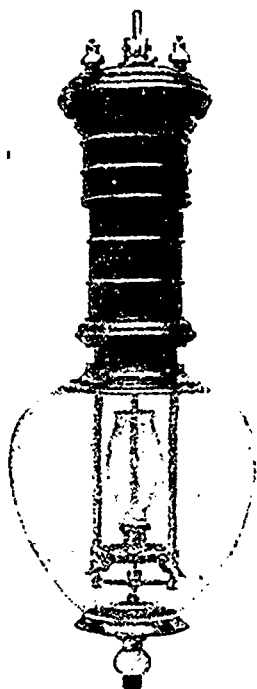
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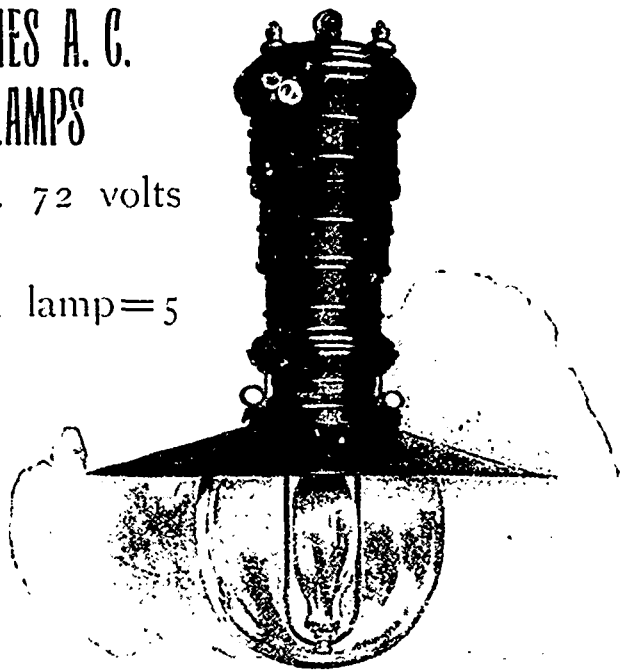
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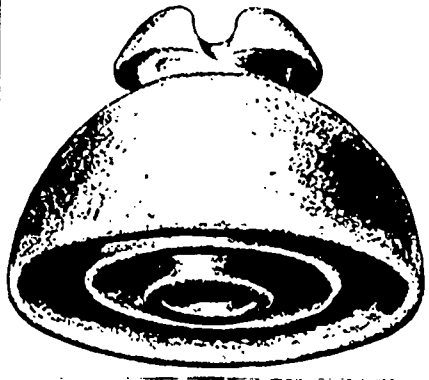
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Scientific American, Oct. 14, 1899.

THE AUTOMOBILE MAGAZINE has at last come to hand and is the most thoroughly satisfactory periodical which we have seen in any language on the subject. It is of regular magazine size and has 111 pages. The quality of the articles is very high and the illustrations are of the best. Everyone who is at all interested in the automobile will find something in the new magazine which will interest him. Even the social side is far from being neglected, as there is an article on the recent floral parade at Newport and on the Automobile Club of France. The Automobile Index, which occupies some nine pages, is exactly what has been needed. On the whole the magazine is a most satisfactory one.

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N. Y. Evening Post, Oct. 9, 1899.

The new illustrated AUTOMOBILE MAGAZINE (New York: U. S. Industrial Publishing Co.) has a very attractive appearance, and is so varied in contents, without undue padding, that one wonders how the editor can fill his pages hereafter. Still, the list on page 101 shows that there is a considerable "foreign automobile press," and what foreigners can do in the way of furnishing "copy" to the printer, Americans can. The society feature of the new vehicle is brought to the front with news from the Newport festival—the driver, by the way, not always sitting on the left. There are competent-seeming book reviews, and some concessions are made to the general reader in comicalities of pencil and verse. The magazine seems free from bias.

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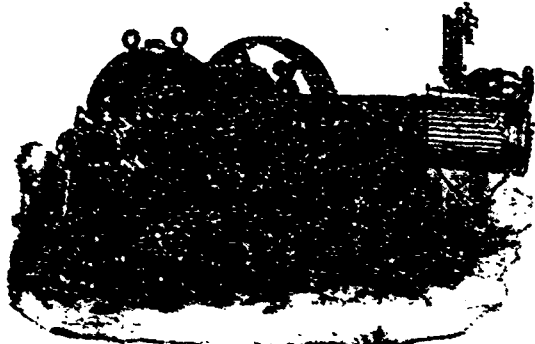
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