Mr. Gordon J. Henderson, who has recently been appointed manager of the company, and whose portrait is herewith presented, was born in the city of Montreal in the year 1872. He is a son of Mr. David H. Henderson, a prominent lumber merchant. For some years he has been connected with his brother, Mr. C. W. Henderson, the well-known electrical contractor of that city. He is quite prominent in Montreal's society, and holds a commission as Captain in the 6th Battalion Fusiliers, having the honor of turning out the best drilled company in his battalion. Mr. Henderson is a business man of considerable ability, and under his supervision the company will no doubt enjoy a marked degree of prosperity.

Mr. T. W. Martin, chief electrician, was born in London, England, 26 years ago. His family came to Canada, and at the age of fourteen years he entered the employ of the Toronto Electric Light Company, under Mr. Wright, in the old Sherbourne street plant. He was removed to Hamilton two years ago. He is a

MR. R. DICKENSON,
Chief Engineer Hamilton Electric Light and Power Company.

clever electrician and fills his position in a creditable manner.

Mr. R. Dickenson, chief engineer, was born in Dover, Kent, in 1841. He entered the Royal Navy in 1858, in which he served for some years, leaving it for merchant vessels. In 1874 he came to Canada, filling different positions, and eleven years ago he entered the employ of the Hamilton Electric Light Co.

## THE PARAGON OF EXHIBITIONS.

THE major part of the entries having now been made for Toronto's big exhibition, which is to be held from August 31st to September 12th, it is possible to state definitely that the scale of the exhibition will really be greater than ever. Never before did the exhibits cover such a wide range as they will this year. It almost looks as if every province had striven to do its best to make the exhibition worthy of the country. At the forthcoming exhibition in Toronto there will be seen food products of Prince Edward Island; food products, manufactures, fruit and live stock, of Nova Scotia and New Brunswick; an extensive display of horses and cattle, manufactures and minerals, from Quebec; the products of forests, waters, mines, gardens, farms, studs, workshops and art studios of Ontario; the grain, minerals and horses of Manitoba; the grain and minerals of the North-West; and cereals, fish and minerals of British Columbia. The governments of Ontario, the Dominion and British Columbia will make special exhibits of the wealth of the earth, while the Canadian Pacific Railway will supplement these displays by showing cereals, vegetables and minerals from many points on their lines, to the extent of double what the company has shown in other years. In art especially will the exhibition be strong, with the three pictures painted by F. M. Bell-Smith, illustrating incidents connected with the death of Sir John Thompson, at Windsor Castle, for one of which pictures Her Majesty the Queen, Princess Beatrice and members of the Royal household gave special sittings. There will be Edison's wonderful Eidoloscope, an electric theatre; Ontario Trotting Horse Breeders' stake races; Lockhart's performing elephants; the magnificent historical spectacle, entitled the "Feast of Nations" and commemorating the "Taking of the Bastile," and a thousand and one other things; while in consideration of the cattle being on show the first week the railways have agreed to grant one fare for the round trip for the entire exhibition from all points in Canada, and to run a special cheap excursion the first week, on Sept. 3rd, and two the second week.

## TRANSFORMERS.

By G. W. F.

THE really distinctive feature of an alternating current system is the transformer. Without it the alternating current would possess no advantages over the direct, and the transmission of power for lighting or motor purposes would be impracticable except at the cost of very large conductors. The use of the alternating current in connection with station transformers arose out of the practical limitations imposed on direct current apparatus, and in so far was an improvement in the art. *In direct current working the pressure* generated by the dynamo is maintained throughout the entire system; a 220 volt machine will cause a pressure of 220 volts (less the "drop" of course) between the positive and negative wires at all points; a 500 volt machine gives a pressure of 500 volts everywhere, and so on. In order to distribute current over an extensive area, it is evidently necessary to use either heavy, and therefore expensive, feeders with a 220 volt pressure, or to use a higher pressure and so allow of smaller feeders. *But as it is not at all desirable to introduce a* high pressure into lamps placed in private buildings, where they have to be handled constantly, and where the wires are frequently exposed to risk of grounding, it is evident that a limit of pressure is soon reached, and that any extension of business must be met by an additional expenditure for feeder copper. In a district where there is a large amount of lighting this may be commercially possible, but it is quite easy to imagine conditions where the additional amount of lighting would not actually justify the necessary feeder expense. It is easily seen that any method which permits of the use of a high pressure for transmission, and at the same time of a low pressure for utilization, *meets the conditions of* economical supply and safe use. The static transformer renders possible an advantage beyond the power of the direct current.

It would be strange if a piece of apparatus possessing such great importance were not worth capable study, and in fact the electrical principles governing its action, and the electrical, magnetic, and mechanical features entering into and influencing its design and construction are not merely of great interest, but a thorough comprehension of them is necessary before the constructing or operating electrician can be considered conversant with alternate current working. To the casual observer a transformer is *merely a quantity of insulated* copper wire wound in two separate coils round an iron core; the whole placed inside a box and what goes on *inside* that box when the current is turned on is of no more interest to them than the mechanism of a musical box—you turn the handle and grind out music; you turn on the current and you get light somehow. It is thought by those whose interest in electrical matters leads them no furthur than the study of how to pay the least money for plant that once a transformer is hung up on a pole and connected into circuit there is the end of it; that the worst thing that can happen to it is to have one of its fuses blow, or lightning get into it and burn it up. As to its being *a source of expense all the time*, as to its capacity for wasting current, the matter not only does not occur to them, but they actually smile when it is suggested to them, How can a transformer be a source of expense? How can it waste current? It isn't doing anything; it isn't moving or revolving; there's no friction about it—it doesn't need oiling might as well suggest that a glass insulator is a source of expense. A little investigation, however, will show that the transformer is not the simple thing it is popularly supposed to be, and that careful study and educated thought were just as necessary in its evolution as introducing the high class modern dynamo. The basis of transformer action *is the same as that of dynamo action* —induction. If a closed conductor be placed in a magnetic field, the intensity of which is rapidly varying, an E. M. F. is set up in that conductor, the direction of the E. M. F. will depend on whether the intensity is increasing or decreasing its strength on the rate of variation.

N S are two poles, the space between them being a