

greater, in fact, than in those of the claimant company itself. An adverse opinion, therefore, would carry with it an enormous amount of responsibility for damages. In Canada, however, it is a matter of very little moment, comparatively, as under the peculiar patent laws of this country the owners of a patented article are compelled to sell to all comers at what is termed in the statute "a reasonable price." A reasonable price, of course, would be held to be a price at which the article in question could be imported at or manufactured for sale at a profit by parties other than the patentee. There being no other lamps manufactured in Canada at present except by the Edison concern, and as the protective tariff gives that concern an ample profit, it is as much to their interest to sell as it is the consumers' to buy from the patentee, and thus avoid any responsibility for infringement. Without expressing any opinion as to the validity of the patents in question, it is safe to say that what the rival companies in the United States consider their rights will not be surrendered without a long and bitter struggle.

THE death of Sir John Macdonald while marking perhaps the most important epoch in the history of Canada, seems not likely to result in a present disturbance of affairs political or commercial. Inasmuch as in the minds of many persons a national upheaval was believed to be the inevitable result of the event which all deplore, there naturally exists a feeling of anxiety regarding our national future. It is yet too soon, of course, to be able to form a well founded opinion on the subject. Certain it is, that the removal of Sir John Macdonald from the position he so long occupied at the head of affairs, will be an important influence in hastening the solution of the problem. It is not generally believed that the Dominion will continue to occupy its present position for any lengthened period. If there exists any widespread feeling in favor of separation from Great Britain, it may now be expected to become manifest. If no such feeling obtains, we may expect to see a movement in the direction of closer commercial relations between the Dominion and the mother country. Meanwhile, all who have at heart the prosperity of our commercial and industrial interests must rejoice to observe the patriotic spirit in which the colleagues of the late Prime Minister have assumed the great responsibilities which he was forced to lay down, touching the nation's development and welfare. Canada has already attained to a position of no small importance, and the death of the one to whose efforts her past progress is so largely due, should serve as an incentive to those who shall hereafter be entrusted with the shaping of her legislation and consequent destiny.

THE inability of the average municipal corporation to successfully conduct a business enterprise, is receiving one more exemplification in the case of the Toronto Street Railroad. Though it has been a little over a month in the hands of the city, the receipts have shown a falling off of over a thousand dollars by the time they have reached the city treasury as compared with the same period last year, the expenses have increased fifty per cent., the cars are dirty and uncomfortable, and the state of the roadbed is simply villainous. Unless the railroad is speedily handed over to a private corporation the chances are that in a short time there will be no railroad to hand over. There have been handsome offers by a syndicate of citizens to take the property and pay the amount of the arbitrators' award and a handsome sum per year for the franchise, with an undertaking to make the change from horses to electricity within two years. Why this offer is not accepted is a mystery. Its acceptance would mean the expenditure of two millions of private funds in the work of construction. One of the largest steam and electric plants in existence would be at once installed, and a rapid and comfortable service given to the citizens. The success of the electric method of propulsion is now demonstrated beyond question, and the citizens should no longer be deprived of its advantages. The overhead method of construction would have to be employed, as nothing successful has as yet been evolved in the way of a conduit, but while properly constructed, it need not be considered a permanency, as it could be changed in the future if the development of the art ever permits of its being done. Let the Mayor and Council respect the pledge they gave the people when the funds to purchase were provided, that the city would in no case attempt to run the road, and hand it over

to the company who will pay the most for the privilege, with the undertaking to provide electrical rapid transit at the earliest possible moment.

ONE of the most difficult problems that confronts the electrical engineer is to decide which of the many methods or systems in vogue may be most profitably employed in the particular location he has chosen as his field of operations. If it is an incandescent system of lighting that he is exploiting, and his source of power is at some little distance from the point of consumption, the question has to be decided between a direct and an alternating current with transformers. Of course we would all prefer the low tension direct current system, provided that the cost of copper for conductors does not make it prohibitive. If a system of this kind is considered to be feasible, the engineer has then to strike a balance as it were between the interest on cost of his copper conductors and the required size of his coal pile. By enlarging the wire there is less loss in transmission, but on the other hand, it may be made so large that the interest on cost of construction would be more than the extra cost of coal required to drive the current through smaller mains. Then, if a straight incandescent system is impracticable by reason of distance, a choice must be made between a series or an alternating current system with converters. Both involve higher tension on the wires, but this is becoming every day a matter of smaller moment, as improved insulation is a large factor both as regards safety and immunity from loss of current through leakage. If a power distributing circuit is contemplated, the problem is even more intricate. To get any distance from the generating station, a considerable voltage must be employed, and this precludes the use of very small motors, it being almost impracticable to build a motor as small as one-eighth horse power to work a 500 volt constant potential circuit. The constant potential method of distribution is the most suitable for motors, though in case of greater distances a series system may be employed. The motor on a series current is not self regulating as on a constant potential, and requires special regulating devices. Throughout the whole range of the electrician's duties, this problem of doing the right thing at the right time and in the right place is the most important one, and the failure of many a promising venture in the electrical field has been brought about by the inexperienced manipulator endeavoring to fit a square peg into the inevitable round hole.

THE MONEY VALUE OF HEAT.

THE *Journal of Industry* discusses the money value of heat, which it argues will in the future become a standard of value perhaps more stable than gold or silver just now. The gist of its investigation just now is: In its primary form of fuel representing power, light and a solvent in the various industrial processes in which it is an agent, heat is now one of the most important commodities we have to deal with. Without fire and power we would be in barbarism, or some other undesirable state.

It is not very long since heat and its relations were a mystery. If we call it fifty years since it became a recognized element in all natural forces, it is easy to see how rapidly it is working its way to becoming a "commodity" that we will have to measure and price the same as wheat, cotton, or iron. At this time there is a singular variation in its price, due to various means of its generation and application. In coal, wood and petroleum, example, when used as fuel their measure of value should be the heat contained and the relative expense of converting this heat into useful form. That this will be the end no one can doubt, but the claims of economy for various different kinds of engines, and systems of lighting and warming show that the price of heat is far from fixed at this time.

In science, or even in the treatment of steam and gas engines, units of heat have become a tangible and convertible quality, having a constant symbol of T for total heat units, less units lost, and it will not take long to find a common price for this indispensable commodity.

The Montreal Metal Works (Limited), Montreal, will be incorporated with a capital stock of \$50,000, to manufacture and deal in wires, rods, cables, and every description of apparatus and metals used in connection with the business of telephone, telegraph, electric light, electric railroad or cable companies.