

action, besides being free from the intolerable heat and smell and explosion of the jerky gas machine. For small powers it will be cheaper than steam, and even for larger ones the advantages enumerated above will counterbalance a slight increase in the expense. A notable field for its use will be in driving freight and passenger elevators. Its first cost will be less than for a similar power of hydraulic elevator, and its many expenses afterwards very much less. The cost of repairs to hydraulic apparatus in this city during the past year on account of sand and grit have been large, besides the risk of stoppage during the dry months on account of a shortage of water in the city reservoir. Altogether, the electric motor has a large field before it, and its merits are such that before long we may expect its use to be all but universal.

HERE will shortly be a fine chance for electrical men to show what can be done by electricity on a city street railroad. Up to the present time electric roads in Canada have been confined to one or two short lengths of suburban railway. In fact, taking the continent all over, with the exception of Boston, electric roads, though many in number, have been principally operated in the smaller cities. Large centres of population are, however, rapidly coming into line, Cleveland and Buffalo being the latest additions to the list. There is no question but that the electric car is the ideal of urban transit. Its cleanliness—the number of horses used on the streets being reduced by thousands—the decrease in wear and tear of the road, its rapidity of motion and docility—if such a word may be permitted—to the ease with which it may be handled, stopped, started and reversed in a crowded thoroughfare—are but a few of its many advantages, and for the sake of these the citizens may well afford to put up with the necessary additions to the overhead system of wires that it will entail. The conversion of the present street railroads of Toronto, which must be done in the near future, to an electric system, will involve the construction of immense steam and electric works in the city. In the first place, steam power to the extent of between three and four thousand horse power will be needed. This will require buildings, engines, boilers, pumps, immense smoke stacks and foundations. Then there will be the electric generators, which will no doubt conform to the most recent practice of large power machines driven by interchangeable mechanism to allow of each being stopped and started independently of the others. The overhead construction will require a large amount of copper and line material, and the roadbeds will require relaying with the most approved form of rails. The cars and electric motors will not be the least part of the undertaking, and if built and equipped in the city will be equivalent to the introduction of a new industry amongst us. The power plant will have to be centrally located to avoid loss in transmission and unnecessary wires, and of course will be arranged with a view to economical fuel supply. The combined and finished work will be an extensive undertaking, and will give our electrical men a fine opportunity to show what can be done in city street railway work, besides being to the successful contractors a source of profit. If this work is commenced at once—as there is every probability—together with the meeting of electricians and manufacturers in convention in Montreal, it should give an impetus to electrical matters in the Dominion which we hope may redound to the honor and profit of all concerned.

AT a recent meeting of one of the English engineering societies, a paper was read giving a description of an experimental engine which had been constructed for the use of a Professor of Engineering in one of the technical schools. It was so arranged that work up to 150 horse power could be taken out of it, and steam of any pressure up to about 200 lbs. could be used. Different styles of valve gear could be attached, and it was believed to be the most complete and comprehensive engine ever built. In the discussion which followed, one member threw out a very valuable suggestion. It was to the effect that if he had a class to teach in the use of the steam engine, he would have an engine in which the valves would be wrongly set and the bearings loose and working badly, and then he would set the class to work with the indicator to find out what was wrong and to remedy the defect. Could not our own local Society of Stationary Engineers act upon this idea? It has been often said that every steam engineer should study indicator diagrams. The study of a diagram will not do much good, however, unless one knows something of the engine from which it was taken, and how the diagram was obtained. During the coming winter could not a class be formed to try experiments on actual steam engines? Owners of engines could be found who would be willing to allow them to be used for so good a purpose, if used under the directions of some one competent to advise and instruct the class. For example, an engine with a common slide valve might first be examined and measured, after working hours, by the class, and then put together for next day's work. During next two or three days the pressure of steam carried and coal used should be carefully noted by the engineer in charge. During those days the teacher should apply the indicator and obtain some diagrams. At the next meeting these results should be reported and studied. The setting of the valve should then be changed to whatever the majority of the class might decide would improve the engine, and for another few

days the coal should be weighed and the effects of the changes noted. When a common slide valve engine had been thus studied, a Corliss and a Brown could be obtained, and the methods of testing and adjusting these valve gears practically studied. There should not be too many in a class probably seven or eight will be found quite large enough but the Association might form more than one class. This method of studying the steam engine would prove of immense advantage to the students, and so profitable to owners that there should be no difficulty about getting engines to experiment upon. In some cases it might be possible to get the members of the class together in the engine room while the engine was being run with a load on. In such a case, the members themselves could take the diagrams under the teacher's directions, and so obtain practical knowledge of the use of the indicator in the taking of diagrams. A class of this kind under a good teacher would do more for its members in a single winter than could be got by three times the time spent in merely studying diagrams in books on the steam engine.

WE must protest against the manner in which some parties interested in, or desiring to be interested in, the electrical business, are working to injure not only the entire electrical business, but more especially the business of certain parties who have invested large amounts in the business expecting that they would have a few years quiet in which to reap some results from their investments. We refer more particularly to the conduct of some so-called agents in going into a town where a reliable electric light company are doing business, making a canvass of the customers and would-be customers, and offering them all sorts of inducements to take lights at a lower figure than they have been in the habit of paying. Especially is this the case in certain districts of cities or towns that the local company may not have been in a position to reach yet. The mode usually adopted by these agents is to forestall the company and endeavor if possible to get a number of contracts signed at a lower price than the company have intended to offer at. Their next step is to call upon the management of the local company and offer them these contracts for a certain sum, threatening that if they do not meet their demands, they will establish an opposition plant. Not only has this mode of procedure been adopted by men of no standing, but, we are sorry to relate, companies who are doing a fairly good and legitimate business have sanctioned the actions of their own representatives in trying to force a local company into meeting their demands. This is not a legitimate way of doing business, for in ninety nine cases out of a hundred the companies using this sort of blackmail have no intention whatever of putting in a plant. The fact is, it would not pay to do so, but simply for the sake of either selling their goods or of benefiting an agent by levying blackmail upon the local company, they resort to such tactics, which not only have the effect of injuring the reputation of the local company, but injure the entire electric lighting business. Whilst we believe that good healthy competition is the life of trade, when two companies oppose each other might and main and reduce the price to a basis on which no money can be made, the result will be felt more by the manufacturers of electrical apparatus than by anyone else. This sort of thing has been going on for some time, and the sooner it is stopped and the demands of these unprincipled parties refused point blank by local companies, the more universal will the use of electric lighting become. We could understand a company who intended doing simply a constructing and operating business, indulging in a little of this sort of thing, but not running the business into the ground. This unprincipled way of doing business has been decried in the United States, and it is time that something was done in Canada to stop it before it goes too far. We believe that if local companies would stand together in such matters, the scheme would soon die out. Intending users of electricity should be very careful with whom they sign contracts. They should know positively beforehand that the parties canvassing them for their lights are responsible and reliable, and not working a scheme whereby they can levy blackmail on legitimate business. We venture to make the assertion that not 2% of the contracts for lights taken in this way within the last year have been carried out. They are simply held by the unprincipled parties who obtain them as a club over the heads of those who already have plants. We trust our readers will assist by every means in their power to cry down this unprincipled mode of doing business, and protect the parties who have invested large sums of money in electrical enterprises.

The offer of the local electric light company of Owen Sound to supply 30 or more lights for five years from October next has been accepted.

The annual convention of the Association of the Edison Illuminating Companies was held a fortnight ago in the city of New York. The convention lasted three days, and was most interesting and profitable.

The plant which is being erected by the Standard Electric Co., for supplying light and power to the citizens of Ottawa, Ont., is of an extensive character, and will be operated by three 66 inch turbine water wheels, developing 100 h. p. The shafts from the water wheels are of steel 2½ inches in diameter, each fitted with a mortise bevel gear wheel, 8 feet in diameter, with teeth 20 inches long. The iron pinions which work in these wheels are nearly 4 feet in diameter. The three main shafts are also of steel, 7 inches in diameter, and have on them the three main driving pulleys, which are 10 feet in diameter, and 52 inches wide. The shafting, gearing and pulleys are carried on nine massive iron bridge trees.